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FEASIBILITY STUDY ON INTRODUCTION OF ENERGY SERVICES COMPANIES IN INDIA

- Final Report -

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FINAL REPORT

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Submitted to:

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LIST OF ABBREVIATIONS

ADB	Asian Development Bank
BJP	Bharatiya Janta Party
BOF	Basic Oxygen Furnace
CEA	Central Electricity Authority
CLB	Company Law Board
DFI	Development Financial Institutions
DSM	Demand-Side Management
EAF	Electric Arc Furnace
EAS	Energy Audit Subsidy
EFEC	Equipment Finance for Energy Conservation
EMC	Energy Management Centre
EMCAT	Energy Management Consultation and Training
ESCO	Energy Services Company
FERA	Foreign Exchange and Regulation Act
GDP	Gross Domestic Product
GEB	Gujarat Electricity Board
GEDA	Gujarat Energy Development Agency
GEF	Global Environmental Facility
GWH	Gigawatt hours
HSD	High Speed Diesel
HVAC	Heating, Ventilation and Air Conditioning
ICICI	Industrial Credit and Investment Corporation of India
IDBI	Industrial Development Bank of India
IFCI	Industrial Finance Corporation of India
IPP	Independent Power Producers
ITO	Indian Tax Office
JV	Joint Venture
KWh	Kilowatt hours
LDO	Light Diesel Oil
LPG	Liquid Petroleum Gas
MEDA	Maharashtra Development Agency
MSEB	Maharashtra State Electricity Board
MW	Megawatts
NAESCO	National Association of Energy Services Companies
NHPC	National Hydro-Electric Power Corporation
NPV	Net Present Value
NTPC	National Thermal Power Corporation
OPIC	Overseas Private Investment Corporation

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OTCEI	Over the Counter Exchange of India
PACER	Program for the Acceleration of Commercial Energy Research
PCRA	Petroleum Conservation Research Association
RBI	Reserve Bank of India
REB	Regional Electricity Board
ROC	Registrar of Companies
SEB	State Electricity Board
SEBI	Securities and Exchange Board of India
SIDBI	Small Industries Development Bank of India
TEDA	Tamil Nadu Development Agency
TNEB	Tamil Nadu Electricity Board
UNDP	United Nations Development Program
USAID	United States Agency for International Development
USD	U.S. Dollar
WB	World Bank

EXECUTIVE SUMMARY:
FEASIBILITY STUDY ON THE
INTRODUCTION OF ENERGY SERVICES COMPANIES IN INDIA

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EXECUTIVE SUMMARY:

FEASIBILITY STUDY ON THE INTRODUCTION OF ENERGY SERVICES COMPANIES IN INDIA

The information contained in this report was compiled to help U.S.-based ESCOs and Indian companies evaluate the attractiveness of the market for ESCOs in India, while simultaneously enabling them to form at least a preliminary strategy for entering and exploiting the market. More specifically, this report addresses three interrelated questions: 1) are ESCOs feasible in India, 2) what are the principal opportunities and barriers presented by the Indian ESCO market, and 3) how can these opportunities and barriers best be addressed by sponsoring institutions as well as prospective ESCOs so as to maximize the chances for a successful ESCO industry in India? While the facts and arguments involved in answering these questions comprise the balance of this report, the broad findings are the subject of this Executive Summary.

This report concludes that all of the fundamental market drivers necessary for the emergence of a successful and vibrant ESCO industry exist in India today. These include:

- *A large market* -- a very large market of industrial companies exists which can significantly improve their energy utilisation through adoption of energy efficient technologies and practices (India is the world's 12th largest industrial economy)

- *Highly educated workforce* -- there is a ready supply of highly educated technical and managerial expertise needed by ESCOs to implement energy saving technologies and processes on behalf of customers; this is true despite the apparent anomaly that energy conservation is not yet widely practised

- *Severe energy shortage and trend toward higher prices* -- there is a severe electrical energy capacity shortage, coupled with reasonably high

energy prices in the industrial sector for all forms of energy, and a marked trend towards increasing energy cost (and hence increasing value of energy savings)

- *Current environment of economic reforms* -- although growing slowly by developing country standards at 2 to 3 percent per year, the economy is relatively stable and embarked on a program of sweeping reforms aimed at making India more open and competitive on a global basis; reforms include: the easing of restrictions on foreign equity ownership, streamlining the investment process, elimination of export requirements, elimination of local content requirements, facilitation of technology

All the fundamental market drivers necessary for the emergence of a successful and vibrant ESCO industry exist in India today. These include:

- Large Market
- Highly Educated Workforce
- Severe Energy Shortage and Trend towards Higher Prices
- Current Environment of Economic Reforms
- Stable and Supportive Political System
- Confidence of Potential Participants
- Availability of Efficient Equipment

licensing agreements, elimination of the requirement that dividend remittances be balanced by export earnings, liberalisation of exchange rate policies, curtailment of import licensing requirements, and a lowering of import duties

- *Stable and supportive political system* -- a democratic political system which is receptive and supportive of improvements in energy efficiency

- *Confidence of potential participants* -- there is a strong belief by Indian companies who would likely be a part of the ESCO industry that it can

work; these companies are prepared to invest considerable resources on a sustained basis

- *Availability of efficient equipment* -- Indian manufacturers are rapidly adding energy efficient technologies to their product ranges; where domestically manufactured products are not available, the government has shown its willingness to permit imports by reducing the customs duties levied on such imports.

In addition to the fundamental market drivers outlined above, the following are additional opportunities and/or positive indicators for ESCOs in India:

Additional opportunities and positive indicators include:

- *The possibility of early market entry* -- currently there are no full service ESCOs operating in India; experience has shown that early entry was a significant determinant in the success of the largest ESCOs in the U.S. today

- *Relaxation of restrictive foreign equity ownership requirements* -- foreign companies can now own 51 percent of an Indian company, up from 41 percent a short while ago; additionally, if a foreign company is in the independent power production business, it can gain an exemption to own up to 100 percent of the company; ESCO's offering co-generation services may be able to qualify under the 100 percent exemption regulation (this regulation has not yet been tested)

- *Accelerated depreciation on energy conservation equipment* -- to encourage conservation, 100 percent of the cost of energy conservation equipment is depreciable over the first year; this is a significant tax benefit which can lower the normally high cost of capital substantially

- *Availability of joint venture partners* -- a number of Indian firms expressed interest in becoming a joint venture partner of a U.S. ESCO, including two large consulting firms and two large manufacturers;

similarly, several U.S.-based ESCO's have expressed interest in entering into joint venture relationships with an Indian company

- *Potential access to the public stock markets* -- the public markets in India offer the real possibility of raising equity and debt on a large scale due to their lenient listing requirements and the high demand for new stock issues; the availability of capital on a large scale will be important because energy efficiency technologies for industrial applications are capital intensive

- *Existence of a robust banking system* -- the banking system in India is well developed and extremely comfortable with project financing as a

Additional opportunities and positive indicators for ESCOs in India include:

- The Possibility of Early Market Entry
- Relaxation of Restrictive Foreign Equity Ownership Requirements
- Accelerated Depreciation on Energy Conservation Equipment
- Availability of Joint Venture Partners for U.S. ESCOs
- Potential Access to the Indian Public Stock Markets
- Existence of a Robust Banking System in India
- Liberalisation of the Economy

means of capitalising equipment purchases and/or process improvements for industry; debt capital for projects is available for any economically sound project

- *Liberalisation of the economy* -- as the economy liberalises, indigenous industry must become more energy efficient to compete in both the domestic and international markets.

The successful transfer of any technology is based on the ability to concisely define the key attributes of the technology in question while pinpointing the unique challenges as well as opportunities presented by the target market. Unless this is done, technology transfer fails or falls short of its potential. With this in mind, the study sought to identify the most significant barriers to the establishment of an ESCO industry.

Barriers include:

- *ESCOs are a totally new concept in India* -- it will take time and an investment of resources to establish an ESCO industry in India; however, all of the resource inputs are available and, of the fifty or so organisations interviewed for this report, there was widespread agreement that the ESCO concept is easy to understand, offers significant benefits to customers and ESCOs, and can work in India

- *Poor image of India as an investment opportunity by U.S. ESCOs* -- ESCOs in the U.S. have a negative view of doing business in India based upon a limited knowledge of India and its market (in particular of the current programme of economic and political reforms being pursued by the Indian Government); it is expected that the information in this report may serve to modify this view

- *Lack of a large commercial sector* -- the very small market for commercial offices and institutional buildings (in comparison to the U.S. market) means that the technical experience of most U.S.-based ESCOs, which is predominately in the commercial sector, will not be directly applicable to the Indian market; however, since the key defining attribute of ESCOs is their ability to integrate diverse resources to solve any problem related to the delivery of energy services, this integration capability alone is judged to be sufficient to enable U.S. ESCOs to address the industrial market in India, especially if they obtain an Indian partner with good access to the industrial market

- *High cost of capital* -- for a company with a solid credit rating, the cost of capital in India is currently in the vicinity of 20 percent for debt; this

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has an adverse impact on ESCO project economics while making the task of securing project financing more difficult

- *High tax on corporate profits* -- corporate taxes are high compared to the U.S.; the effective tax rate for foreign companies and publicly listed Indian companies is 65 percent and 52 percent, respectively; private Indian companies are taxed at 57 percent; however, under the system of economic reforms, the corporate tax rate is expected to be lowered in gradual steps to 40 percent by 1994/95

The Barriers to entry of ESCOs in India are:

- ESCOs are a Totally New Concept in India
- Poor Image of India as an Investment Opportunity by U.S. ESCOs
- Lack of a Large Commercial Sector in Comparison to the U.S.
- High Cost of Capital
- High Tax on Corporate Profits
- Minimal Near-Term Support Expected from the Electricity Boards

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- *Minimal near-term support expected from State Electricity Boards (SEBs)* -- as a group, the SEBs are not heavily involved in promoting an awareness of the benefits of energy conservation, nor are they currently prepared to provide strong collateral support of ESCOs as is the practice in the United States; however, several of the more progressive SEBs are engaged in energy conservation activities of one type or another, and have expressed interest in exploring ways in which they could work together with ESCOs.

Beyond reviewing and analyzing all of the above points in considerable detail, the report describes how ESCOs typically market and prosecute their services, and contains a special tutorial on the economics of shared savings contracts. A Model Shared Savings Contract tailored to meet the requirements of India's system of taxes and contract law is also included and ready for utlilsation. Additionally, alternative approaches to ESCO/client contract instruments in the form of lease and hire-purchase contracts specifically applicable to India are offered. The intent of all the forementioned supporting information and documentation is to transfer not simply the basic vocabulary and concepts of energy services, but to enable the most aggressive and enterprising firms (especially Indian firms less familiar with energy services) to begin to pursue the energy services business using the report as a guide in association with the model documents so provided.

This report concludes that ESCOs can in fact be a highly successful feature of the Indian economy, and that in balance, the potential risks and rewards to foreign and domestic companies make India an attractive market for ESCOs. However, it emphasizes that the barriers to entry cannot be trivialized, and to accelerate the emergence of an ESCO industry and maximize its near-term impact on the Indian economy, a series of recommendations are made for guiding and supporting the early and successful establishment of ESCOs. Key recommendations include:

- *Financial support of a Model ESCO* -- financial assistance in the form of a loan, repayable from profits starting in the third year of operation; emphasis would be on early demonstration of the viability of completing energy conservation projects using ESCOs

- *Investment in Training* -- a key determinant in the success of any technology transfer is the investment made in training people; it is not enough to provide reports and contract instrumentalities, people must be taught every aspect of the operation of an ESCO; this training could be implemented separately or as part of the financial support of the Model ESCO

- *Formation of low cost sources of financing* -- the Industrial Development Bank of India can help to solicit and channelize sources of low cost financing as they may become available from various multilateral banks and institutions

- *Investment in gathering and disseminating key information* -- as integrators of resources to implement energy efficiency technologies, the

Key recommendations to foster the emergence and growth of the ESCO industry in India are:

- Financial Support of a Model ESCO
- Investment in Training
- Formation of Low Cost Sources of Financing
- Investment in Gathering and Disseminating Key Information
- Investment in an Energy Information and Technical Assistance Centre
- Comprehensive Database for End Use Energy Consumption
- Feasibility Studies and Demonstration Projects for Targeted Technologies
- Technology Transfer Program

health and ultimate success of the ESCO industry in India depends on the availability of certain key data; EMCAT should therefore consider investing in those parts of the energy services information infrastructure which are the weakest; such investments could include support of the following:

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- *Investment in an Energy Information and Technical Assistance Centre* -- the Centre would coordinate the worldwide acquisition of case studies and related information on best practices in energy conservation technologies

- *Comprehensive Database for End Use Energy Consumption* -- lack of comprehensive energy consumption data is a major deterrent to ESCOs and related service providers and manufacturers wishing to implement energy conservation projects

- *Feasibility Studies and Demonstration Projects for Targeted Energy Conservation Technologies* -- commercially proven technologies which have high technical potential in the Indian market but which are not well represented in India can be targeted

- *Technology Transfer Program* -- this program would fund the identification of needed energy conservation technologies and identify sources in the U.S. interested in forming joint ventures and partnerships with Indian companies; requests for such services occurred a number of times during interviews with Indian companies

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1.0 INTRODUCTION

The rapid economic development of India has created a critical need for additional power generation capacity. India's next two five-year plans call for the construction of over 100,000 MW of new generation. Studies of energy utilisation in India have pointed out that a significant portion of the new generation capacity requirements can be avoided through improvements in end-use efficiency in major energy consuming sectors. Recognising this, the U.S. Agency for International Development (USAID), in cooperation with the Indian government, has established the Energy Management Consultation and Training (EMCAT) project designed to improve India's technological and management capabilities in the area of efficient utilisation of energy by private industry and other sectors.

Experience in the United States, Canada, Europe, and Australia has indicated that the implementation of technologies and practices to improve end-use efficiency is constrained by a large number of barriers. Some of these barriers, such as inadequate knowlegde and experience, limited capacity for project design, consultation, and engineering, limited supply of energy-efficient products, technologies, and equipment, inappropriate financial institutions and mechanisms, lack of motivation on the part of end-use customers, and limited availability of investment capital, are particularly important in developing countries such as India. EMCAT is exploring approaches to overcome such barriers. An innovative approach that has proved successful in increasing the installation of energy-efficient technologies, products, and equipment in the U.S. and Canada is the approach of using performance contracting through energy service companies (ESCOs). There are a number of issues related to the successful operation of ESCOs as performance contractors to implement energy-efficiency measures.

This study was commissioned by USAID/India as part of the EMCAT project to:

- evaluate the applicability of the ESCO concept in India
- determine the potential for ESCOs in India, and,
- examine, and to the extent possible, develop the appropriate legal framework, business plans, and financial background for establishing an ESCO industry in India.

1.1 PROJECT PURPOSE AND OBJECTIVES

The principal objective of the proposed project is to investigate the feasibility of establishing ESCOs in India. This project includes the assessment of appropriate financial, legal, and institutional (hosts) mechanisms to implement ESCOs, and identification of possible ESCO partners and clients. To achieve the objectives, the project team:

- Assessed the potential applicability as well as the specific role, scope, and advantages/limitations of ESCOs in India, and identified possible barriers to the establishment and operation of ESCOs
- Examined the existing legal framework affecting business operations, and developed model contract terms for typical energy-efficiency projects involving performance contracting with the shared savings approach
- Conducted an assessment of the existing institutional framework to establish the appropriate rules, procedures, and functions for ESCO programs
- Identified the most attractive end-users who should be targeted as hosts for ESCO operations in India
- Identified Indian business organisations who could act as potential partners for U.S. ESCOs to set up operations in India

- Developed a detailed action plan for EMCAT and Industrial Development Bank of India (IDBI) in launching the ESCO industry in India.

1.2 DEFINITION OF ENERGY SERVICES COMPANY

An Energy Services Company (ESCO) is a private company that provides a wide range of energy conservation and/or load reduction services to owners of industrial, commercial, institutional, agricultural, and domestic facilities in such a way that the owner's risk and required capital outlay are greatly reduced or eliminated.

The ESCO concept was pioneered in the United States in the mid-1970s to overcome a number of barriers to the implementation of cost effective energy efficient technologies and practices. These barriers included the limited availability of investment capital, uncertainty regarding the types of technologies and practices most worth adopting, and risk averseness and lack of motivation on the part of facility owners. Similar barriers to the adoption of energy efficient equipment and practices exist in India today.

ESCOs are defined by the following key attributes:

1. **Total Service Provision:** ESCOs offer complete energy services, including preliminary feasibility analysis, detailed energy audits, design, installation, finance, and (in some cases) maintenance of energy efficient technologies.

   Because ESCOs get paid based on actual energy savings achieved, they are highly motivated to install the best array of equipment for each client. Most ESCOs do not maintain loyalty to any particular manufacturer, and all cost effective options are evaluated before a final selection of the best ones is made.

2. **Reduction of Risk to the Facility Owner:** ESCOs are paid based on their performance; clients pay for ESCO services based on a portion of energy savings actually achieved. If the ESCO does not perform as promised, it does not get paid and facility owners are no worse off.

3. **Flexibility:** Measurement technologies and payment terms are negotiated individually with each facility owner and specified in a mutually agreed-upon contract. Contracts are effective for a specified term, but contain "buy-out" clauses, which allow the facility owner to terminate the contract at any time. Upon termination of the contract, equipment ownership transfers to the facility owner, and the facility owner then retains 100 percent of the energy savings.

Over the course of their evolution in the US, ESCOs have developed a variety of mechanisms to finance their activities. Although many variations exist, the primary contract vehicles are summarised below:

- Shared Savings or Performance Contracting - All capital to fund the project is invested and/or arranged by the ESCO. The ESCO is repaid by the client, and the payments are typically structured as a percentage of the energy savings actually realised by the client over a period of 5 to 10 years.

- Equipment Lease/Purchase Agreement with Guarantee of Savings - This alternative is similar to standard Performance Contracting, except that the equipment financing is arranged separately through a lease/purchase agreement executed between a financing agency and the facility owner. Client savings are guaranteed by the ESCO to an amount that is adequate to pay the lease amount.

1.3 POTENTIAL FOR THE ESCO INDUSTRY IN INDIA

The Eighth Five-Year plan (GOI, 1992) states that 5,000 MW of electric power and 6 million tonnes in petroleum products can be conserved through the National Energy Efficiency Programme. An outlay of Rs. 1,000 crores has been provided for energy conservation during

the Eighth Plan which includes activities on energy conservation being carried out in different energy departments.

Using a conservative estimate that the ESCO industry will capture 15 percent of the 5,000 MW of conservation potential in five years, at a cost of Rs. 30,000 per kW reduced, the total value of the ESCO industry would be [15% x 5000 MW x 30000 Rs/kW / 5 years] Rs. 450 crores per year [equivalent to US$ 150 million per year]. This estimate does not include the potential for the ESCO industry for savings in petroleum products.

1.4 SUMMARY OF PROJECT APPROACH

An overview of the project approach is summarised in Figure 1.1. The key tasks that were completed to accomplish the project objectives are summarised below:

- Assessment of the role, scope, and potential of ESCOs in India
  - examination of the structure of energy supply and demand in India
  - identification of target markets and financing sources
  - examination of the feasibility of establishing joint venture ESCOs
  - assessment of the feasibility of U.S. ESCO investments in India
  - examination of potential roles of EMCAT in establishing ESCOs
  - definition of training needs
  - identification of barriers and obstacles to ESCO operations
- Develop model contract terms for a typical energy efficiency project, including:
  - identification of major legal and business issues
  - development of collaboration agreements between U.S. ESCO and the local partner
  - development of a model energy services agreement
  - evaluation of uncertainties and contingencies
  - identification of potential financing arrangements

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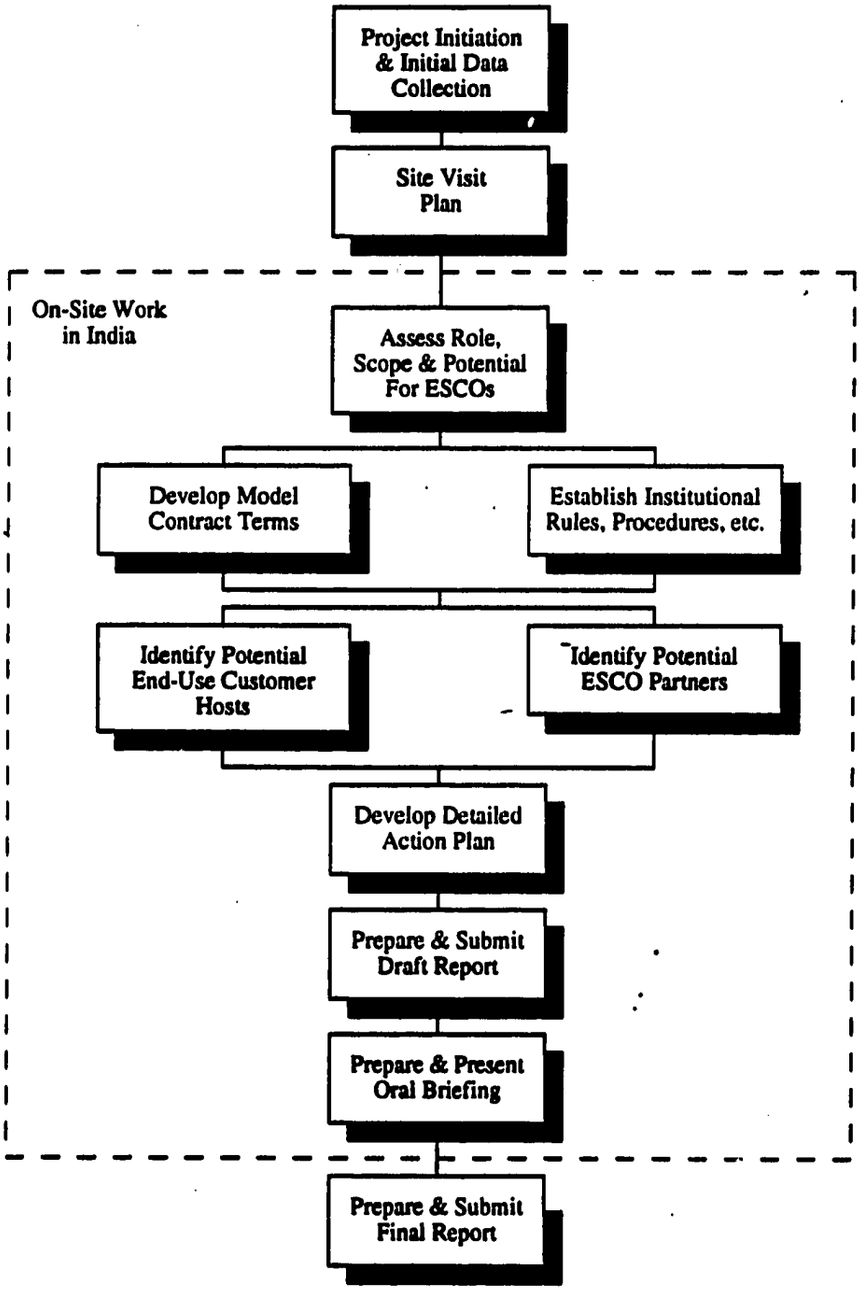
Figure I-1

SUMMARY OF APPROACH



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- evaluation of contractual issues
- assessment of relationships to utilities and private power producers
- assessment of institutional issues
- definition of typical agreements between ESCOs and their allies

- Establish institutional roles, procedures, and program functioning, including:

  - the potential role of IDBI
  - program for participating investors
  - options for risk minimisation
  - options for credit enhancement

- Identify potential ESCO partners and end-use customer hosts in India

- Develop a detailed action plan for EMCAT and IDBI.

The activities conducted by the project team included:

- **project initiation** - where the project team met with EMCAT (both USAID and IDBI personnel) at the start of the project

- **literature review** - including a review of recently completed reports on energy efficiency, government publications, guides to government publications, and other relevant publications

- **interviews** - of various organisations both in and outside India. The interviews in the U.S. were conducted with established ESCOs by phone. In India, personal interviews were conducted by the project team in Delhi, Bombay, Madras, and Bangalore. Organisations from other cities met with the project team in one of these cities. The types of organisations interviewed included engineering consulting firms, energy auditing firms, manufacturers, financial institutions, electricity boards, and government organisations. In addition, the project team had discussions with the World Bank and the Asian Development Bank

- **synthesis of information** - a significant amount of information was collected by the project team from the literature review and the interviews. This information was synthesised and reported in the final report to EMCAT

- **presentation and final report** - to EMCAT in both Bombay and Washington, D.C.

1.5 FORMAT OF THIS REPORT

The focus of this report is on the financial, organisational, business, and legal issues related to the establishment of the ESCO industry in India. This report does not evaluate the technical details of energy efficient technologies or the potential for savings and cost-effectiveness of the technologies, all of which can be obtained from other recently completed reports referenced herein. This report provides basic information for any interested company on the issues, barriers, and opportunities facing the ESCO industry in India.

Sections 2 and 3 of this report provide background information on the energy scenario in India. Sections 4 and 5 discuss the key markets and technological issues. Sections 6, 7 and 8 provide information on ownership structures, corporate and legal issues in company formation, and sources of capital, respectively. Section 9 evaluates the risks and uncertainties to ESCOs of doing business in India. Section 10 deals with the ESCOs relationships with the electricity boards, market intermediaries, and independent power producers. Model contracts are introduced in Section 11. The study conclusions and recommendations are provided in Section 12.

And finally, we have used both U.S. and Indian currency in this report. The Indian currency is Rupees (Rs.) and paisa (p.) with 100 paise equal to 1 Rupee. The currency exchange rate used in this report is Rs.30 = 1 US$.

2.0 CHARACTERISTICS OF ENERGY SUPPLY AND DEMAND

2.0 CHARACTERISTICS OF ENERGY SUPPLY AND DEMAND

2.1 ENERGY SUPPLY AND CONSUMPTION PATTERNS

2.1.1 Primary Energy Supply

India's energy requirements are met from age-old traditional energy forms - wood, biomass and animals - as well as commercial (i.e., purchased) forms of energy. Commercial energy requirements are met primarily by coal, oil, natural gas and electricity. Consumption of commercial forms of energy has increased at a compounded annual growth rate of 10.8 percent, and currently encompasses about two-thirds of total energy consumed. The remainder of this section will focus on commercial forms of energy.

Coal is the prime source of commercial energy in India, with over 80 percent of total coal output produced by the government-owned Coal India Limited. However, the share of coal as a primary source of energy (including electricity generation) has been declining since the mid-1970s. In 1975-76, coal and lignite together accounted for 65 percent of primary energy consumption; in 1990-91, coal and lignite together accounted for 60 percent of total primary commercial energy consumption. Direct use of coal is being gradually replaced by its indirect use through electrical power generation.

The share of oil in primary energy sources has remained around 30 percent, although this level varies somewhat from year to year, suggesting that it acts as a *swing fuel* as other resources become more or less available. Oil comprises the major component of energy imports. Given the Indian Government's concern with balance of payments, it is not surprising that Government policy consistently addresses management of oil demand.

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Over the past two decades, natural gas has emerged as an important source of commercial energy; its share in total primary commercial energy consumption has increased from 2 percent in 1970-71 to 8 percent in 1990-91. Much of this increase is due to Government steps to decrease the flaring of natural gas at petroleum production sites.

Over the past 30 years, various central Government reports[1] have indicated that due to large coal reserves, coal is likely to be the source of primary energy for electricity generation as well as for industrial use. The reports have stressed the need for management of oil demand, increased use of existing natural gas supplies, energy conservation, and, for the rural sector, maintenance of fuelwood supplies and introduction of small-scale renewables.

2.1.2 Electricity Supply

As a result of the Electricity (Supply) Act of 1948, state electricity boards (SEBs) were created in each state. The SEBs were to coordinate the development of generation, transmission, and distribution of electricity within their states in the most efficient and economic manner. The Act also empowers the SEBs to set tariffs and revise them from time to time. The SEBs were established as an autonomous body, and the Act provides for state governments to provide direction on matters of policy to guide the functioning of the boards.

Licencees already engaged in generation and distribution of power were allowed to continue in business. Presently there are 57 distribution licencees operating in the country. Of these, five private utilities are engaged in power generation. These are: Tata Electric Company,

[1] *Report of the Energy Survey of India Committee* (1965), *Report of the Fuel Policy Committee* (1974), *Report of the Working Group on Energy Policy* (1979), and the *Study of the Advisory Board of Energy* (1984).

Calcutta Electricity Supply Company, Ahmedabad Electric Company, Gujarat Industrial Power Corporation Ltd., and Andhra Pradesh Gas Power Corporation.

In 1963, India was divided into five regions - Northern, Western, Southern, Eastern, and North-Eastern. Regional electricity boards (REBs) were created through central government resolutions as associations of constituent SEBs and other power utilities operating in their respective regions. REBs are voluntary associations and come under the Central Electricity Authority (CEA). REBs coordinate power generation schedules and maintenance programmes of the generation companies, monitor systems operations, and help arrange inter-state power exchanges. REBs function in an advisory capacity.

The central government created the National Thermal Power Corporation (NTPC) and the National Hydro-electric Power Corporation (NHPC) for thermal and hydro-electric development. NTPC and NHPC generate and supply power in bulk to the SEBs according to allocated shares. The state governments also established corporations for generation and transmission of power.

The overall responsibility of power development lies with the Ministry of Power Government of India. The Ministry of Power is responsible for formulating policy and plans for power development, processing power projects for investment decisions, training, human resource development, and administrating any legislation pertaining to power generation and supply. The CEA is a statutory body set up under the Ministry of Power to coordinate the activities of the power sector in the country. CEA is also responsible for promoting the integration of the state's power systems and for providing technical support to the SEBs.

2.1.3 Sectoral Energy Consumption

The Eighth Five-Year plan reports that the relative shares of oil and electricity in the total final commercial energy consumption have increased steadily over the years. In 1990-91, coal accounted for 39 percent of the total commercial energy consumption, oil and gas accounted for 43.3 percent, and electricity was 17.6 percent (GOI, 1992).

The breakdown of the final energy consumption by sector in 1990-91 (GOI, 1992) was: Industry, 50.4 percent; Transport, 24.5 percent; Household, 13.8 percent; Agriculture, 9.0 percent; and Other Sectors, 2.3 percent.

The breakdown of electricity consumption by sector in 1989-90 (Nadel, 1991) was estimated to be: Industry, 51.1 percent; Transport, 2.1 percent; Domestic, 14.4 percent; Agriculture, 23.2 percent; Commercial and Miscellaneous Non-Industrial, 6.6 percent; Public Lighting, 0.8 percent; and Public Water Works, 1.6 percent.

2.2 PROJECTED ELECTRICITY GROWTH AND COST OF SUPPLY

Electric utilities may be viewed as potential collaborators with or supporters of ESCOs, provided that a number of pre-conditions exist. These conditions include shortage of supply and marginal costs that exceed the cost of providing energy conservation through ESCO services. The underlying characteristics most likely to ensure utility cooperation - supply shortage and cost of supply - are explored in this section.

2.2.1 Projected Growth in Power Demand

Electricity consumption in India increased from 55 billion kWh in 1970-71 to 287 billion kWh in 1991-92. The power situation in the country moved from one of surplus in the early sixties to a shortage by the early seventies, and has remained so ever since. As shown in Table 2-1, energy shortages in the past 10 years have ranged fror 6.7 percent to 12.6 percent, with an average peak demand shortage of 16 to 18 percent in 1991. In some states, the peak demand shortage was as high as 30 percent. A recent study by the National Council of Applied Economic Research has attributed a loss of over 3 percent of industrial production to power shortages (ASSOCHAM, 1992).

Table 2-1

Electric Energy Shortage 1980-81 to 1990-91[2]

Year	Shortage (%)
1980-81	12.6
1981-82	10.8
1982-83	9.2
1983-84	10.8
1984-85	6.7
1985-86	7.9
1986-87	9.4
1987-88	10.9
1988-89	7.7
1989-90	7.9
1990-91	7.9
1991(April-June)	8.8

Source: Central Electricity Authority

[2]Electric Energy Shorage in 1991-92 was 8.5%.

A total of 264,000 GWH was generated in 1991 from an installed capacity of 65,000 MW. Until 1991, new capacity additions of an average of 8 percent per year kept rough pace with the increase in demand for new capacity. However, in 1991, a dearth in Government funds limited capacity expansion to only about 3 percent of total capacity. The Eighth 5-Year Plan originally contemplated new installed capacity of 39,000 MW in this five year period (1992-1997), but by the early 1990s the figure was revised to 27,000 MW as a result of the economic crisis of that period, and it has been even more recently revised to 23,000 MW. If the lower figure of 23,000 MW is achieved (and it is doubtful that it will be), the power shortage is likely to be about 6 percent of installed capacity and 20 percent of peaking capacity by 1995 (Aga, 1992).

Projected average growth in demand for power between 1990 and 2005 ranges from 6.5 percent to 10 percent per year, for low and high scenarios, respectively. Table 2-2 compares the Eighth 5-Year Plan's capacity expansion scenarios to India's growing demand for power and electricity by 1994-95.

The government also plans to launch a National Energy Efficiency Program which would coordinate existing programs and identify areas for increased efforts on the energy conservation front, with a view to achieve a targeted savings of 5,000 MW. The commissioning of this study is consistent with the Government's intention to meet the 5,000 MW energy savings goal in the eighth plan.

Table 2-2

Projections of Power Supply and Demand
With Capacity Additions
(1990-91 to 1994-95)

Capacity Expansions of:	39,369 MW	27,189 MW	23,308 MW
ENERGY - Million kWh			
Requirement	359,612	359,612	359,612
Availability	381,737	349,900	337,299
Surplus/Deficit	+ 22,125	- 9,712	- 22,313
Percent	+ 6.2	- 2.7	- 6.2
PEAK LOAD - MW			
Requirement	63,760	63,760	63,760
Availability	58,847	53,152	50,841
Surplus/Deficit	- 4,913	- 10,608	- 12,919
Percent	- 7.7	- 16.6	- 20.3

Source: Central Electricity Authority

2.2.2 Cost of Electricity Supply

According to statistics provided by the Planning Commission, Government of India (GOI, 1992) for all-India, the average cost of operation for the SEBs was 113.1 paise/kWh, with a minimum cost of 65.3 paise/kWh for Kerala State Electricity Board and a maximum of 254.8 paise/kWh for Assam State Electricity Board. These values indicate average (as opposed to marginal) cost of supply.

According to statistics provided by the Government of India, average revenue realised by the SEBs for 1990-91 ranges from 46.2 paise/kWh to 110 paise/kWh, with a mean of 64.3 paise/kWh.

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2.3 ENERGY PRICING

Energy prices have direct relevance to the viability of the ESCO industry, since the success of the industry depends on its ability to produce energy cost savings for customers. Differential pricing between customer classes will further define the most attractive target markets.

2.3.1 Pricing of Fossil Fuels

Coal

In 1990-91, prices of non-coking coal were as shown in Table 2-3.

Table 2-3		
Calorific Value and Price of Non-Coking Coal		
	Calorific Value (kcal/kg)	Price (Rs/tonne)
Long flame coal[1] produced in all states[2]		
Grade A	> = 6,200	427
Grade B	5,600 - 6,200	392
Grade C	4,940 - 5,600	346
Grade D	4,200 - 4,940	280
Other coal produced in all states[2]		
Grade A	> = 6,200	402
Grade B	5,600 - 6,200	367
Grade C	4,940 - 5,600	321
Grade D	4,200 - 4,940	255
Grade E	3,360 - 4,200	203
Grade F	2,400 - 3,360	163
Grade G	1,300 - 2,400	117

Table 2-3		
Calorific Value and Price of Non-Coking Coal		
	Calorific Value (kcal/kg)	Price (Rs/tonne)
Coal produced in Andhra Pradesh (Singareni coal fields)		
Grade C	4,940 - 5,600	363
Grade D	4,200 - 4,940	320
Grade E	3,360 - 4,200	271
Grade F	2,400 - 3,360	205
Grade G	1,300 - 2,400	160
Coal produced in Assam, Meghalaya, Nagaland and Arunachal Pradesh		460

Source: Realisation of Energy Pricing in India: Can Social and Efficiency Objectives be in Harmony? Tata Energy Research Institute, November 1992.

[1]'Long flame coals' may be defined by the parameters laid down in Indian Standard No. IS:770-1964 "General Classification of Coals (Revised).

[2]Excludes Assam, Meghalaya, Nagaland and Arunachal Pradesh

Petroleum and Petroleum Products

In general, petroleum prices are set by Government; major revisions to petroleum prices in recent years reflect the Government's objectives of mobilisation of resources for the petroleum sector or financing the planned development of the country. Price hikes in June 1980, January 1981, March 1983, February 1986, and the most recent one in September 1992 were set largely with the objective of generating financial resources. The goals of improving India's balance of payment position and achieving demand curtailment are also cited as reasons for price increases in some products.

Other price increases, such as those in 1990-91 (in the form of a Gulf surcharge of 25 percent on imports of crude oil and petroleum products) and the recent ones in the Union Budget of 1991-92, reflect the higher costs of imports related to the Gulf crisis and the devaluation of the rupee, respectively.

Selling prices for petroleum products over the period 1990-92 are shown in Table 2-4.

Natural Gas

Prior to January 1987, natural gas prices were fixed in an ad hoc manner and revised from time to time by the gas producing companies on a regional basis. In its report submitted in January 1987, the committee on natural gas pricing set up by the Government of India recommended parity of natural gas pricing with the prices of fuel/feedstock being replaced by natural gas. Furthermore, with the exception of the fertiliser industry, the prices for other consumers were to vary along the HBJ pipeline to account for the costs of transportation. Owing to the centralised subsidy scheme, a uniform price was suggested for the fertiliser manufacturers. Concessional prices were also recommended for the north-eastern region.

Table 2-4

Basic Ceiling Selling Price (Ex-Bombay) for Major Petroleum Products (Rs./Unit)

Products	Unit	9'92	7'91	10'90	3'90
Motor Spirit 83/87	kl	14,413	13,416	11,180	8,944
High Speed Diesel	kl	5,539	4,542	4,542	3,634
Superior Kerosene	kl	2,202	2,202	2,446	1,957
Light Diesel Oil	kl	5,196	4,199	3,817	3,054
Furn Oil (non-fert)	kl	4,989	3,992	3,629	2,903
Furn Oil (for fert)	kl	2,812	1,815	1,650	1,320
Naphtha (non-fert)	mt	6,076	4,415	4,014	3,211
Naphtha (for fert)	mt	3,723	2,726	2,478	1,982
LPG (domestic use)	mt	5,136	4,139	3,449	3,449
LPG (industry use)	mt	12,762	7,051	6,410	5,128

Source: Government of India, Ministry of Petroleum and Natural Gas, *Indian Petroleum and Natural Gas Statistics*, various issues

For the producers, the committee recommended fixing prices on the basis of the cost of production from the South Bassein and the cost of transportation along the HBJ pipeline. However, the prices finally approved by the government were based entirely on the cost of production from the South Bassein.

In March 1989, a committee under the chairmanship of Dr. V. Kelkar was set to look afresh into the issue of natural gas pricing. According to the recommendations of the committee, the price of natural gas to the producers should hvae been linked to the long run marginal cost of production from the South Bassein gas fields, with a 15 percent rate of return on investment. Although the price to consumers should be based on the principle of opportunity cost, the committee recommended uniform price. The transportation cost along the HBJ pipeline was estimated at Rs. 850 per thousand cubic meters and is currently proposed to be uniform along the

HBJ pipeline. For the north-eastern states, concessional prices were again recommended to promote the use of natural gas. The difference between the producers' price and the consumers' price was recommended to be credited to the gas pool account maintained by the department of petroleum and natural gas to be utilised for general development of the gas industry.

The recommendations of the committee have been partially accepted by the government, and natural gas prices for natural gas with a calorific value between 9,000 and 9,500 Kcal per cubic meter have been revised as follows, with effect from 1 January 1992:

- Rs. 1,550 per thousand cubic meters for gas at landfall points and for onshore gas. This price would be revised by Rs. 100 per thousand cubic meters at the end of each year for a period of three years.
- Rs. 850 per thousand cubic meters as transportation cast for gas supplied along the HBJ pipeline. The cost of natural gas along the HBJ pipeline would correspondingly be Rs. 2,400 per thousand cubic meters.
- The cost of gas in the north-eastern region would continue to be Rs. 1,000 per thousand cubic meters, but subject to discounts up to Rs. 400 per thousand cubic meters.

A rebate or a premium would be charged for natural gas with a lower or higher calorific value than the specified range.

2.3.2 Electricity Pricing Policies

Electricity pricing in India lies within the jurisdiction of the SEBs. As per the Electricity (Supply) Act 1948, the Boards were to carry on operations, as far as practicable, without incurring losses. The Boards could, from time to time, adjust their tariffs. The Act did not mention any surplus or rate of return that the Board was expected to earn. The objective of

the pricing policy was to encourage the use of electricity for the growth and development of the country.

In 1978, the Electricity (Supply) Act was amended to make the SEBs more commercially viable and to allow them to earn a net rate of return on their investment. In the amendment, SEBs were empowered to carry out their operations and adjust tariffs so as to ensure that total revenues in any year have such surpluses as the State Governments may specify. In another amendment to the Act in 1980, it was specified that the SEBs should earn a net return of 3 percent on net fixed assets (as measured at the beginning of the financial year), after payment of interest and provisions for depreciation. In practice, however, none of the State Governments impose a mandatory rate of return on the SEBs, and most of the SEBs have been unable to achieve the prescribed rate of return of 3 percent. In fact, a majority of the Boards consistently operate with a negative rate of return, as shown in Table 2-5.

Table 2-5

Rate of Return of Selected Electricity Boards

Board	1985-86	1986-87	1987-88	1988-89	1989-90	1990-91
APSEB	N/A	N/A	+2.51	+1.31	+0.18	+1.20
ASEB	-82.71	-183.12	-38.71	-38.77	-41.92	-41.30
BSEB	-19.00	+0.54	-2.52	-16.81	-17.40	-16.50
GEB	-0.17	+10.72	+1.90	+0.95	-12.64	-15.10
HSEB	-2.15	-90.79	-21.62	-5.83	-15.32	-22.20
HPSEB	-9.66	-42.54	-15.17	-17.20	-12.70	-16.80
KEB	-6.80	-17.22	-21.65	-9.28	-14.60	-16.10
KSEB	+0.10	-1.62	-16.52	-4.39	-2.76	-8.20
MPEB	+4.34	+5.94	+2.98	-0.59	+0.61	+2.60
MSEB	+2.82	+2.90	+2.87	+1.41	+0.48	N/A
OSEB	-2.35	-0.86	-9.73	-4.93	+3.21	+0.60
PSEB	-0.48	-1.26	-0.31	-3.57	-2.48	N/A
RSEB	-5.04	-2.47	-6.04	-4.80	-7.78	-11.70
UPSEB	-6.04	+2.89	+1.82	+0.04	+1.11	N/A
WBSEB	-7.85	-2.34	-8.20	-8.95	-10.24	N/A

Source: Government of India, Planning Commission, Power and Energy Division, *Annual Report on the Working of State Electricity Boards*

The gap between average cost and average tariff is widening. For all-India, per unit revenue losses have increased from 4.13 paise/kWh (0.14 cents/kWh in 1992 dollars) in 1974-75 to 8.67 paise/kWh (0.29 cents/kWh) in 1980-81 and further to 23.9 paise/kWh (0.80 cents/kWh) in 1990-91. Furthermore, the gap between average cost and average tariff is widening.

All SEBs follow a policy of differential pricing in the supply of power to different customer classes. When setting tariffs, the SEBs have to take into consideration the policies and objectives of their State Governments. Tariff levels are often determined more by social and political considerations than financial and economic objectives, resulting in some customer classes

that have tariffs well below the average cost of generation and supply. Table 2-6 indicates the percentage of costs recovered in revenues for each electricity board in 1990-91.

Table 2-6

Cost Recovery by the State Electricity Boards

State Electricity Board	Average Tariff (ps/kWh)	Average Cost of Supply (ps/kWh)	Percent of Cost Recovered
Andhra Pradesh	70.6	72.1	98 %
Assam	94.5	254.8	37 %
Bihar	95.7	140.3	68 %
Gujarat	82.4	105.0	78 %
Haryana	61.6	105.2	59 %
Himachal Pradesh	56.8	95.0	60 %
Jammu and Kashmir	40.2	120.0	34 %
Karnataka	70.0	80.9	87 %
Kerala	56.3	65.3	86 %
Madhya Pradesh	84.8	98.1	86 %
Maharashtra	100.0	114.4	87 %
Meghalaya	50.6	123.3	41 %
Orissa	71.6	76.9	93 %
Punjab	49.9	108.1	46 %
Rajasthan	82.3	113.7	72 %
Tamil Nadu	71.7	112.0	64 %
Uttar Pradesh	77.3	111.9	69 %
West Bengal	99.8	138.6	72 %

Source: Government of India, Planning Commission, Power and Energy Division, *Annual Report on the Working of State Electricity Boards*

2.3.3 Electricity Tariff Structures and Tariffs

Though the SEBs set their own tariffs, the structures of the tariffs are broadly similar. Low voltage customers, with the exception of agricultural customers, are generally charged an average energy tariff for energy consumed. Industrial high voltage customers (large industries, large commercial customers, water supply and traction) are typically levied demand charges as well as energy charges. In addition, the demand rate is based on the maximum demand reached during the billing period (regardless of when the maximum demand occurs).

Electricity prices are lowest for the agricultural sector, with subsidies ranging from 47 to 97 percent. Over the years, the gap between the cost of generation and supply and the average return from the agricultural sector has continued to widen. Throughout India, losses incurred from supply of electricity to the agricultural sector have increased at a compounded annual growth rate of 25 percent during the period 1985-86 to 1990-91. One of the reasons for the decline in the average agricultural tariff since the mid-1970s is the fact that all SEBs gradually changed over from metered supply to a flat rate tariff based on the connected load of the pumpset versus actual consumption. This change was intended to reduce the cost of billing, collection and administrative charges for this sector. The current policy encourages misuse and wastage of electricity, and there are several instances of farmers running small industries on agricultural connection. Moreover, the unmetered supply makes it impossible to measure the distribution losses in the system.

Domestic customers are charged an average energy rate (paise/kWh) for energy consumed. Most utilities have moved from a simple energy tariff and declining block tariffs (prevalent during the 1950s and 1960s to promote electricity consumption among domestic customers) to increasing block tariffs to discourage excessive consumption. However, the

average tariff for the domestic sector continues to be below the average cost in all SEBs. In 1990-91, the average domestic tariff was subsidised more than 50 percent in eight of eighteen SEBs. In 1990-91, the estimated all-India losses from subsidised domestic electricity were Rs 1,056 crores ($US 3.5 billion).

In order to compensate partially for the losses that SEBs incur as a result of agricultural and domestic subsidies, industrial and commercial consumers are typically charged at a rate higher than the average cost of supply to them. Furthermore, when tariffs are revised, proportionally higher increases continue to be passed on to these classes. The SEBs that exhibited the smallest tariff increases from 1985 to 1990 showed commensurately higher tariff increases in commercial and industrial classes.

All boards have power factor correction clauses. For high tension customers, power factor is defined as the ratio of kilowatt hours consumed in a month to the kilovolt ampere hours in the same month. For low tension customers, the power factor is periodically determined by the utility using an instantaneous power factor meter. While most boards have a penalty for low power factor, Gujarat is one board which has an incentive for improving the power factor.

All boards have a fuel adjustment clause in their tariffs which, in most cases, is exercised only for high tension industrial customers.

Some SEBs - Tamil Nadu Electricity Board, Maharashtra State Electricity Board and Gujarat State Electricity Board - have time-of-use tariffs for their high tension industrial customers.

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Average customer class tariffs for the sale of electricity are shown in Table 2-7. Actual 1990-91 tariffs for Tamil Nadu Electricity Board, representative of an average SEB, are provided in Appendix A.

2.4 REFERENCES

Aga, R.D., *Address to the Third Annual Energy Conservation Forum*, Washington D.C., September 29, 1992, Sponsored by United States Energy Association and Johnson Controls Inc.

ASSOCHAM, *Non-Conventional Sources of Energy and Energy Management*, New Delhi, June 1992.

Congress of the United States, Office of Technology Assessment, *Fueling Development Energy Technologies for Developing Countries*, OTA-E-516, April 1992.

Government of India, *Eighth Five-Year Plan Document.*

Tamil Nadu Electricity Board, *Statistics at a Glance 1990-91.*

Tata Energy Research Institute, *An Overview of Energy Demand in India*, New Delhi, 1992.

Tata Energy Research Institute, *Electricity Pricing in India*, New Delhi, 1992.

Tata Energy Research Institute, *Rationalisation of Energy Pricing in India: Can Social and Efficiency Objectives be in Harmony?*, New Delhi, 1992.

Tata Energy Research Institute, *TERI Energy Data Directory Yearbook 1990/91*, New Delhi, 1992.

Table 2-7

Average Revenue Realised by Customer Class (1990-91)
(paise/kWh)

State Electricity Board	Domestic	Commer-cial	Agri-cultural	Industrial			Railway Traction	Out-of-State
				High Tension	Low Tension	Power-Intensive		
Andhra Pradesh	64.2	135.0	4.5	97.4	119.0	120.0	131.0	0.0
Assam	60.0	108.1	50.0	60.4	99.2	--	--	110.0
Bihar	54.6	95.0	9.4	180.0	140.0	--	162.0	51.2
Gujarat	69.1	69.1	21.5	121.0	126.0	--	114.0	71.7
Haryana	56.0	123.0	30.0	116.0	107.0	88.0	--	86.0
Himachal Pradesh	43.5	82.5	20.0	71.6	71.6	71.6	--	46.2
Jammu and Kashmir	30.0	66.7	10.0	40.0	--	--	--	--
Karnataka	69.1	183.0	9.7	125.0	96.4	--	--	--
Kerala	48.7	78.0	22.0	60.0	57.9	54.7	--	--
Madhya Pradesh	20.1	112.7	25.9	97.6	120.0	108.0	158.0	102.0
Maharashtra	71.0	147.0	15.0	114.0	158.0	--	129.0	--
Meghalaya	44.0	68.0	21.0	55.0	55.0	--	--	47.0
Orissa	54.0	102.0	32.0	63.3	77.2	63.0	103.0	--
Punjab	74.5	106.5	7.5	74.8	81.8	79.4	--	70.3
Rajasthan	57.6	110.4	29.5	91.2	109.0	--	--	104.0
Tamil Nadu	57.0	110.3	8.9	106.0	100.0	100.0	108.0	48.0
Uttar Pradesh	65.3	97.2	21.3	118.0	133.0	--	129.0	34.8
West Bengal	58.7	100.4	24.5	80.5	96.1	60.4	89.6	--

Source: Government of India, Planning Commission, Power and Energy Division, *Annual Report on the Working of State Electricity Boards*

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3.0 CURRENT ENERGY EFFICIENCY INITIATIVES

3.0 CURRENT ENERGY EFFICIENCY INITIATIVES

Several initiatives have been taken by the central and state governments, the SEBs, multilateral banks, USAID, and private companies and entrepreneurs for implementing energy efficiency measures. Some of these initiatives are described below.

3.1 GOVERNMENT

3.1.1 Energy Management Centre

The central government has set up an energy conservation cell in the Department of Power, Ministry of Energy, that formulates policy, designs the energy management program, and ensures effective coordination between the different ministries and other organisations. The Energy Management Centre (EMC) is the executive agency responsible for implementing and monitoring energy conservation programs. A joint Indo-UNDP and Indo-European community program of energy audits is also implemented through the EMC.

Activites of the EMC include:

- promoting energy audits and providing recommendations to improve energy efficiency
- organising sector specific campaigns for the main energy consuming sectors (industry, agriculture, commercial, and government buildings)
- conducting training programs in the area of energy conservation for energy managers, supervisors, shop floor workers, and SEB personnel, and
- assisting the energy conservation cell in coordinating energy conservation activities.

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In order to encourage energy efficiency, the central government has introduced the following fiscal incentives:

- 100 percent depreciation in the first year on specified energy conservation equipment
- concessional excise/customs duty on notified energy conservation equipment, and
- soft loan scheme for modernisation and installation of energy conservation equipment.

3.1.2 Petroleum Conservation Research Association (PCRA)

The PCRA is a registered Society under the Ministry of Petroleum and Natural Gas charged with promoting petroleum conservation in India. This non-profit organisation renders free service in four sectors of the economy - industry, transport, domestic, and agriculture.

PCRA offers subsidies up to 50% of the cost of energy audits at industrial plants, limited to Rs. 25,000 per audit. The subsidy is payable only upon satisfactory conduct of the audit and a written commitment for implementing the recommendations of the audit accounting to 50% or more of the identifiable energy saving potential.

PCRA also has a Boiler Modernisation Scheme to replace oil fired boilers operating for the past two or more years, having efficiencies less than 70%, with high efficiency coal-fired or oil-fired boilers. The assistance is in the form of a loan payable in 3 to 5 years, bearing an interest charge of 11% plus a service charge of 0.5 to 1% by oil companies.

3.1.3 Development Financial Institutions of India

The three Development Financial Institutions (DFI) of India - the Industrial Development Bank of India (IDBI), the Industrial Credit and Investment Corporation of India (ICICI), and the Industrial Financial Corporation of India (IFCI) - provide financial assistance to industries which are in corformity with the national priorities as set out in the national development plans. IDBI currently has two schemes offering direct assistance - Energy Audit Subsidy Scheme, and Equipment Finance for Energy Conservation Scheme - for projects with energy saving devices or using renewable energy sources. These schemes are briefly described below:

Energy Audit Subsidy (EAS) Scheme

Under this scheme, assistance is available for preliminary as well as for detailed energy audits. For an approved consultancy, IDBI will bear 50% of the cost of the energy audit, the balance to be borne by the applicant company. The amount of this subsidy is limited to the lesser of Rs. 1 lakh, or 0.05% of the gross fixed assets of the company.

The charges borne by the participating company for the energy audit would be treated as the promoter's contribution for assistance under the Equipment Finance for Energy Conservation Scheme provided the company implements the recommendations of the audit.

Equipment Finance for Energy Conservation (EFEC) Scheme

The broad features of financial assistance available under this scheme are as follows:

- the financing under the scheme will be available in the form of term loans for the acquisition of energy conservation equipment
- the basic rate of interest is 18 to 20% p.a.
- the finance under this scheme is exempt from the convertibility clause,[1] and does not attract any commitment charges
- a minimum promoter's contribution of 30 percent of the cost of the project is required. The charges borne by the industrial concern for the energy audit would be treated as part of the promoter's contribution if the concern adopts the recommendations of the audit
- the term loans would be repayable in 5 years with a moratorium of two years and be secured by a mortgage of the fixed assets acquired under this scheme.

3.1.4 State Government Agencies

Subsidy schemes for energy audits are also in operation at the state level. The Gujarat Energy Development Agency (GEDA) operates an Energy Audit Study Subsidy Scheme under which 50% of the cost of the energy audit study (up to a maximum of Rs. 20,000) is provided as a subsidy. The scheme includes both industrial plants and commercial establishments.

[1]See Section 9 for the definition of a convertibility clause.

A similar scheme is offered by the Tamil Nadu Energy Development Agency (TEDA). TEDA will subsidise energy audits conducted by approved energy consultants to the extent of Rs. 20,000 per audit. The scheme is offered through the Tamil Nadu Electricity Board. Others including Maharashtra Energy Development Agency have similar energy audit subsidy schemes.

3.2 STATE ELECTRICITY BOARDS

The SEB's energy conservation activities have been very limited. Some SEBs have used pricing options for demand side management. Some have set up energy conservation departments, but these have yet to expand their activities as planned.

Pricing

Pricing options for load management have been used in a very limited way by the SEBs. Most utilities have moved from decreasing block tariffs, prevalent in the mid-sixties, to increasing block tariffs, especially for the domestic sector.

Time-of-day pricing, which has been quite successful in shifting load from on-peak to off-peak hours in both developed and developing countries -- has been initiated by only three SEBs in India. Gujarat Electricity Board (GEB) introduced a 10 paise surcharge on peak period consumption by HT consumers. Separate meters were installed to measure consumption during peak periods. However, the GEB reported that there was no significant load leveling achieved by this measure, as the peak to off-peak differential was very small and did not present enough incentive for consumers to shift load. The only benefit to the GEB was the additional revenue earned by the Board. GEB also claimed that as a result of this measure, they were successful in increasing consumers' awareness regarding the increased cost of supply during peak hours.

The other two states which adopted time-of-use pricing are Tamil Nadu and Maharashtra. The Tamil Nadu Electricity Board (TNEB) system had surplus power available during the night hours in the latter half of 1987. TNEB introduced a concessional night time rate, mainly for valley filling in order to make available additional energy to power starved industrial users. The Maharashtra State Electricity Board (MSEB) recently introduced a time-of-day tariff for its HT users for load leveling purposes. MSEB faces a situtation where the evening peak is almost 1.5 times the night time load, requiring the backing down of some of its coal fired thermal plants and necessitating the firing of oil for technical reasons. The rate was introduced only recently and its effectiveness is unknown at this time.

3.3 MULTILATERAL DEVELOPMENT BANKS

The Multilateral Development Banks operate major energy programs mainly devoted to large-scale conventional energy supply projects. Recently, the World Bank has devoted more attention to energy efficiency considerations and has set up a special task force to examine efficiency efforts within the World Bank.

The World Bank's new Global Environmental Facility (GEF) provides an opportunity for additional efficiency projects. The GEF is a pilot program administered by the World Bank and intended to provide grants or concessional loans to developing countries to help implement programs of global environmental protection. One of the areas included in the GEF is limiting emissions of greenhouse gases. This area is particularly related to energy supply and use. Energy efficiency and renewable energy are to be included under certain circumstances.

3.4 UNITED STATES AGENCY FOR INTERNATIONAL DEVELOPMENT

The United States Agency for International Development (USAID) is the main bilateral aid agency of the U.S. government for energy related areas. The goals of the AID Office of Energy and Infrastructure are:

- increased consideration of environmental criteria
- increased technical efficiency and financial performance of energy systems
- greater private enterprise involvement in energy development and management
- expanded use of indigenous energy resources, and
- enhanced availability of energy for sustained rural development.

Some of the projects being supported in India by AID/India include the Program for the Acceleration of Commercial Energy Research (PACER) and the Energy Management Consultation and Training (EMCAT) program.

The demand-side component of the EMCAT program, targeted towards private energy auditors and consultants and industrial customers or associations, provides grants for:

- preparation of detailed project reports on cogeneration and energy conservation
- establishing energy conservation demonstration units
- organising workshops on cogeneration
- training of energy auditors

- providing energy audit instruments to energy auditors
- study tours to the USA for increasing awareness about energy conservation, and
- setting up a model energy service company.

EMCAT also has a supply-side component, administered by the Power Finance Corporation, to increase the efficiency of SEB operations. EMCAT is a six-year, multi-million dollar program that was initiated in 1991.

3.5 MARKET INTERMEDIARIES

Market intermediaries are those organisations which provide engineering and consultation services, products, installation of equipment, and financing of equipment. Manufacturers, engineers and consultants can provide targeted technical expertise for ESCO projects. ESCOs often play an integration role - to bring together the best combination of engineering skills and equipment for every project. ESCOs offer a marketing tool to help sell the products and services of market intermediaries. Market intermediaries typically help identify viable ESCO projects among their existing clientele. ESCOs look for large projects, cost-effective energy savings potential, and capital constrained clients.

Indian engineering and consulting firms have shown both their willingness and ability to provide energy efficiency services. Private Indian financial institutions that provide equipment lease and hire-purchase agreements have also indicated their willingness to participate in the financing of ESCO operations.

Finally, manufacturers of efficient equipment have expressed interest in ESCO joint ventures. A number of high efficiency products are already available in the market, and manufacturers are in the process of forming joint ventures with foreign collaborators to expand their product lines.

An actual example of how an Indian leasing company teamed up with an Indian manufacturer to delivery energy services to a manufacturer of titanium metallic anodes was explained to the study team by this major leasing company, as follows:

EXAMPLE OF A LEASE TRANSACTION BASED ON SHARED ENERGY SAVINGS SCHEME

Company *ABC* is a manufacturer of Titanium Metallic Anodes. These anodes are primarily used in the caustic soda industry where electricity cost is a major component of the total cost of production. The titanium metallic anodes increase process efficiency, resulting in a significant cost reduction.

ABC tried to sell the anodes to Company *XYZ*, a caustic soda manufacturer, on the basis of energy cost savings that would be realised through the use of the anodes. However, *XYZ* was not willing to accept *ABC*'s claim on amount of savings. Therefore, *XYZ* suggested that *ABC* lease the anodes to them for a period of 10 years. In return, *XYZ* would pay *ABC* a lease rent consisting of 2 components. The first component would be a fixed component, and the second would be based on the savings accruing by *XYZ*.

ABC was not in a position to fund his assets for a period of 10 years, and needed a source of financing these assets. *ABC* contacted *TCF*, a leasing company. *TCF* purchased the anodes from *ABC* and leased them back to *ABC*. *ABC* then sub-leased the anodes to *XYZ*.

All three parties were satisfied with the transaction. *ABC* was able to effect a sale, book the income, and remove the assets from the customer's balance sheet. *XYZ* was able to obtain the use of the unproven technology while bearing no risk. For *TFC* this was another good transaction in their line of business. This transaction was unique when it was completed in 1986 because of the sub-lease concept it used, and because the payments were based, in part, on the amount of savings due to the technology.

4.0 POTENTIAL TARGET MARKETS FOR ESCO SERVICES

4.0 POTENTIAL TARGET MARKETS FOR ESCO SERVICES

4.1 KEY TARGET MARKETS

4.1.1 Overview

One of the tasks for the study team was to investigate potential target markets for ESCO services. After investigating the various sectors, the industrial sector was found to be the most attractive near term market for ESCOs. This is because:

- Potential for energy savings is higher in the industrial sector compared to any other sector. Industry accounts for over 50 percent of total electrical energy use, of which there is the potential to save at least 20 percent through cost-effective conservation measures. In the thermal area, which makes up most of the total energy consumed by industry in the form of coal, oil, gas, agricultural waste products, etc., the opportunities for energy savings are even greater.

- There exists a large pool of highly trained engineers and other technical expertise, capable of implementing energy efficient technologies and processes, particularly within the industrial process area. These skills only remain to be applied in a coordinated fashion within an ESCO framework.

- The technology exists in India today to meet the requirements for implementation of energy efficient projects. (This technology often derives from joint ventures with overseas manufacturers).

- Equipment manufacturers, consultants and others have confirmed the existence of numerous industrial projects with simple paybacks of 2 to 3 years in the industrial market.

The commercial sector in India is quite small and may not by itself be capable of supporting a robust ESCO industry. However, the hotel industry subsegment should be targeted along with some commercial office buildings (on an opportunistic basis).

- In addition to standard retrofit measures (lights, energy management systems, controls, etc.), an integrated cogeneration system which can supply uninterrupted power of high quality, hot water, and sufficient steam to run an absorption chiller should be of major interest to hotel operators

- Many office buildings do not have central air-conditioning. Standards for lighting also call for less energy use.

The agricultural sector represents a potential opportunity for the application of the ESCO concept only if certain policy changes can be made with respect to the State Electricity Boards.

The domestic sector is unattractive from an ESCO point of view because the domestic residences are not very energy intensive, and the size of the individual customer is too small to be economic for an ESCO. (In the U.S., ESCO activity in this sector has generally been with the support of utilities.)

In formulating their strategy to penetrate both the industrial and commercial sectors, ESCOs should place significant emphasis on cogeneration of all types.

- Since the ESCO concept is new in India, industrial and commercial facility owners may more readily accept ESCO proposals if they contain cogeneration schemes. This is because power shortages pose an immediate and seriously perceived problem, whereas energy conservation, while it may save money, is not deemed to be "mission critical."

- Energy conservation measures are easier to promote in the context of a total energy service. In India, where electrical interruptions, voltage swings, and supply outages are commonplace, a total energy service would need to deal with these issues in parallel with traditional conservation opportunities.

Another market segment that should provide the ESCO with significant opportunities is the Railway sector. Over 2% of the electricity consumed in 1989/90 was for traction (Nadel, 1991). The end uses that will be affected range from motive power to lighting in shops, stations and other facilities.

4.2 DOMESTIC SECTOR

The domestic sector consumed 14.4 percent of the total electricity in India in 1989/90 (Nadel,1991), and is estimated to grow at an annual rate of 12 percent for the next 10 years. Lighting, refrigeration, fans, air-conditioning, and information services are primarily powered by electricity; cooking and water heating often use electricity. Fans and lighting account for a third each of the total electricity consumed in this sector. Refrigerators consume about 12.5 percent of the total electricity consumed in this sector.

There is significant technical potential for energy conservation in the domestic sector through the following measures:

- efficient lighting systems including high efficiency fluorescent lamps, compact fluorescent lamps, electronic ballasts, and sensors
- high efficiency fans and electronic speed controls
- high efficiency refrigerators
- high efficiency air-conditioners.

While price subsidies do exist for the lower income customer, the tariff structure for the domestic customer is on an increasing block basis. Therefore, the price signals do exist for the larger energy consuming households to conserve energy. Other factors like lack of awareness

of energy efficient products, first cost of equipment, and limited availability of efficient equipment are the reasons for the limited penetration of energy efficiency in this sector. However, the domestic sector is not likely to be a profitable market for ESCOs which operate on the shared energy savings concept for the following reasons:

- the intensity of energy use is low in this sector. For example, lights tend to be used for only 1000 to 1500 hours per year as compared to over 3000 hours per year for the commercial sector. This tends to lengthen the payback of any efficient technology
- there are no programs by electric utilities for energy efficiency in this sector. Typically, U.S. ESCOs operating in the domestic sector perform work under contract to the local utility to deliver energy efficiency
- the size of the individual customer is too small to be economic for the ESCO, because the transaction cost of negotiating a contract with a residential customer is prohibitively high.

However, if the SEBs were to institute DSM programs for the residential sector and contract the work to ESCOs, this sector has the potential to be lucrative for ESCOs.

4.3 COMMERCIAL SECTOR

The commercial sector consumed 5.3 percent of the total electricity consumed in India in 1989/90 (Nadel, 1991). In the commercial sector, the major end-uses are lighting, accounting for 50 percent of the total electric use of this sector, and air-conditioning and ventilation, comprising 40 percent of the total electric use of this sector (Nadel, 1991).

A breakdown of commercial energy use by type of commercial facility is not available. Typically, the energy intensity of commercial buildings in India is low. Therefore, the potential for energy savings is limited. Nevertheless, it seems that there may be some potential for energy

conservation in the hotel and office segments. Further discussion of these segments is provided below.

4.3.1 Hotels

The breakdown of energy sources in hotels is estimated to be 60 percent electric, 23 percent furnace oil and light diesel oil, 8 percent high speed diesel to operate diesel generator sets, and 9 percent LPG for cooking (TERI, 1992). A breakdown of the electric use indicates that HVAC systems account for 50 percent of the connected load, lighting accounts for 20 percent, and hot water, cooking, water treatment, and miscellaneous account for the balance.

Energy conservation opportunities in hotels include:

- efficient lighting systems, including compact fluorescent lamps and lighting sensors
- efficient HVAC systems, including high efficiency equipment and controls
- packaged cogeneration technologies utilising the waste heat for hot water and steam generation for use with absorption chillers
- energy management systems.

Hotels form an attractive market segment for ESCOs because they are energy intensive, have a high load factor, and their decision making apparatus is concentrated, as is their geographic locale.

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4.3.2 Office Buildings

Data on the breakdown on the energy consumption by end-use for offices is not available. A survey of a large government office in New Delhi conducted in 1989 estimated that lighting is the largest end-use, consuming 33 percent; followed by equipment and elevators consuming 22 percent; air-conditioning consuming 17 percent; heating consuming 16 percent; and fans and coolers consuming 12 percent of the total electricity used in the building.

Opportunities for energy efficiency in office buildings exist in:

- high efficiency lighting equipment and systems
- high efficiency fans and cooling equipment
- energy management systems.

Selected office buildings that have central air conditioning and higher energy intensities may be good targets for an ESCO. However, the limited amount of savings realizable per building, because of the low energy intensity in office buildings (compared to U.S. standards), will require ESCOs to target large buildings.

4.4 INDUSTRIAL SECTOR

Among the various energy consuming sectors, the industrial sector accounts for over 50 percent of the total commercial energy consumption (GOI, 1992). Coal is the primary source of commercial energy in this sector, meeting 71 percent of the total energy requirements. Petroleum

products and electricity presently account for 15 percent and 11 percent respectively of the total energy consumed by industries. The share of natural gas is only 2 percent at present, but is expected to increase in the future (TERI, 1991).

A significant portion of industrial energy is used inefficiently, with serious economic and environmental impacts. The industrial sector encompasses a broad range of firms in size and sophistication. Small traditional firms using inefficient and low productivity manufacturing technology are at one end of the spectrum, while large modern firms that have globally competitive manufacturing technologies are at the other end.

There are several factors which make industries a potential target market for an ESCO, as stated below:

- The potential for energy conservation in the industrial sector is estimated to be between 15 percent and 25 percent (EIL, 1992; MKRC, 1992).
- The tariff paid by industry for energy is not subsidised, and therefore, the customer has an incentive to conserve energy
- In addition to being the largest consumer of commercial energy, the number of industrial customers is also large. In 1989 there were over 1,90,000 registered working factories in India. The state-wise breakdown by industry group is given in Table 4-1
- The customer has the incentive to conserve, because as the economy liberalises, industry must become more energy efficient to compete in both the domestic and international markets.

The most energy-intensive industries are primary metals (aluminum, non-ferrous, iron and steel), fertilisers, textiles, cement, secondary metals (iron and steel), and paper. These industry groups are discussed below.

Table 4-1

Breakdown of Total Number of Industries by Type and State: June 1989

INDUSTRY GROUP / STATE	Food Products	Beverages and Tobacco Products	Textiles	Jute Textiles	Wood and Wood Products	Paper Printing Products	Leather and Fur Products	Rubber Plastic Petro-chemicals	Chemicals and Chemical Products	Non-Metallic Mineral Products	Basic Metals and Alloys Products	Metal Products	Non-Electrical Machinery	Electrical Machinery	Transport Equipment	Other Industries	Repair Services
Andhra Pradesh	10,204	462	878	18	2,449	382	35	339	611	1,647	469	431	1,207	328	117	43	301
Assam	901	6	24	4	391	23		27	23	47	49	27	71	5	8		42
Bihar	24,398	125	433	263	2,773	1,720	59	651	1,023	1,820	738	2,065	2,078	327	53	39	2641
Goa	23	12	21		2	14	1	34	18	20	8	14	5	13	14	9	7
Gujarat	1,022	262	2,119	6	782	526	28	753	1,675	1,493	918	1,143	1,347	464	143	484	283
Haryana	475	18	404	1	689	99	24	140	233	627	528	646	434	161	118	69	54
Himachal Pradesh	17	5	9		345	7	1	3	17	12	13	1	13	5	2	7	49
Jammu & Kashmir	120	9	58		72	17	4	8	38	74	60	34	30	32	8	22	32
Karnataka	1,677	173	3,460	2	17	1,480	22	201	381	417	399	321	487	213	75	63	290
Kerala	1,689	72	646	1	2,664	1,128	23	1,311	464	601	316	778	527	181	52	56	850
Madhya Pradesh	2,717	42	624	6	2,856	168	14	148	342	592	430	235	113	151	66	22	128
Maharashtra	2,234	109	4,428	11	3,110	1,160	74	1,161	1,574	1,068	864	1,766	1,604	1,111	298	489	581
Manipur	97		1		31	6		1	1	5	1	2				1	6
Meghalaya	3	1	1	1	15	7			1	2	1					1	9
Orrisa	344	20	57	13	469	54	8	108	35	243	94	148	38	43	12	10	49
Punjab	1,651	20	1,832		1,890	219	22	171	267	235	649	894	1,294		955	62	106
Rajasthan	1,701	26	2,874	1	1,630	1,328	7	256	98	1,764	352	159	158	116	42	63	124
Tamil Nadu	2,615	84	2,514	20	285	881	576	438	1,033	510	658	630	943	387	303	105	615
Tripura	98	1	4	4	97	65	1	6	9	256	7	22	1	5			119
Uttar Pradesh	1,748	64	325	7	41	306	126	178	338	436	581	494	413	275	117	96	191
West Bengal	1,102	33	509	84	357	512	182	493	890	299	880	1,006	745	418	218	151	377
Union Territories	512	40	852	4	197	459	40	544	254	178	448	665	368	644	497	234	245
TOTAL	55,348	1,584	22,073	446	21,162	10,561	1,247	6,971	9,325	12,366	8,463	11,481	11,876	4,879	3,098	2,026	7,099

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Although the industrial sector is a good market for ESCOs from a technical point of view, the ESCO should also consider the financial health of the specific industries it targets. The ESCO target market will most likely be limited to financially sound industries.

4.4.1 Aluminum

Aluminum production is very energy intensive, with energy costs accounting for 40 to 45 percent of the cost of manufacture. Aluminum is manufactured in two stages. In the first stage, alumina is produced from bauxite; in the second stage, the alumina is converted to aluminum. The major process centres and energy type used in each process centre are:

- Bauxite ore crushing - electric
- Digestor - electric and thermal
- Precipitation of aluminum hydrate - electric
- Evaporation of spent liquor - electric and thermal
- Calcination of aluminum hydrate - electric and thermal
- Smelter - electric
- Anode plant - electric and thermal.

Most smelters are old with outdated and inferior technology, which use energy quite inefficiently. Energy conservation potential in the older aluminum plants is estimated to be over 20 percent (Nadel, 1991). Some energy conservation measures that may be applicable are:

- gas suspension calciner

- double digester
- automatic oil system for anode baking
- modification of calciner
- micro-processor based control of cell-voltage and anode effect quenching
- process optimisation by proper monitoring of inplant energy data.

Significant potential for energy conservation exists in the aluminum industry even though there are only seven plants in India (GOI, 1988).

4.4.2 Iron and Steel

There are seven major processes in conventional steel production: preparation of the ore, production of coke, iron making, steel making, casting (continuous casting and primary rolling), forming (or secondary finishing), and heat treating. The primary sources of energy going into the steel plants are coking coal, non-coking coal, liquid hydrocarbons, and electricity (GOI, 1989). The two most energy intensive steps in this industry are the iron making in blast furnaces, and making liquid steel from the hot metal in blast furnaces.

The energy efficiency of steel production varies widely. Integrated steel plants in India, on average, use twice the energy per tonne of crude steel produced as plants in the United States and Japan. Some energy conservation opportunities in the steel industry are listed below:

- automatic ignition of coke oven flare
- top gas recovery turbine

- hot stove waste heat recovery
- basic oxygen furnace (BOF) gas recovery
- double insulation of skids
- coke dry quench
- coke oven automobile combustion control
- sinter heat recovery
- blast furnace bled gas recovery
- BOF gas waste heat recovery.

Electric arc furnaces (EAF), used to manufacture specialty steels and steel from scrap metal, are becoming increasingly important because they are particularly suited to mini-steel plants. EAFs are more economic at a smaller scale than integrated plants using basic oxygen furnaces, and are less capital and energy intensive per unit of output. Since electricity is a major cost in such plants, many conservation measures are already in practice, including: scrap segregation, improved melt-down practices, and standardisation of tapping temperature. Still, several additional measures are available to improve EAF efficiency, as listed below (NPC, 1991):

- oxygen assisted melting
- oxyfuel burner
- scrap pre-heating
- ladle furnace
- eccentric bottom tapping

- computerised control and automation.

Given the large number of plants, and the high electric intensity of these plants, the iron and steel industry is a good target for an ESCO.

4.4.3 Fertilizers

In 1989/90, the fertilizer industry accounted for about 69 percent of all naptha consumption in the country, along with about 41 percent of natural gas, 19 percent of furnace oil, and 29 percent of LSHS/HHS. Relatively small quantities of HSD/LDO were also consumed. In terms of calorific content, natural gas has the largest share of energy consumption in the fertilizer industry.

In India, the production of nitrogenous fertilizers (particularly urea) is higher than that of other types of fertilizers. Nitrogenous fertilizers are also relatively more energy intensive. These plants have also progressively become more energy efficient overtime. However, there are many more energy efficiency improvements possible, as listed below (OTA, 1992):

- purge gas recovery
- synthesis convertor
- molecular sieves
- power recovery turbines
- combustion air pre-heaters
- surface condenser cleaners

- carbon dioxide removal
- use of flare gas
- feedstock saturation.

The large number of plants in India make this industry a good target for ESCOs.

4.4.4 Textiles

The textile industry consumes 9 percent of the total commercial energy consumed in the country. About 80 to 85 percent of its energy needs are thermal, the rest electrical. Coal and furnace oil meet the requirements for process heat. All textile mills, except for those around Bombay, use coal in boilers. An estimated 80 to 90 percent of the electricity used is for motive power for driving pumps, motors, drives, etc. The energy bill of most textile mills accounts for 10 to 15 percent of the total product input costs.

There is substantial scope for energy conservation in the textile industry. Low efficiency boilers, with efficiency levels of 50 to 60 percent, are in operation in a large number of mills. These boilers can be easily retrofitted to increase the overall efficiency of the system. Cogeneration is also possible. Several mills use 60 percent of their required steam below 60 psig, while their boilers generate steam at 150 psig.

The textile industry is a good target for ESCOs because of the large scope for energy retrofit in this industry.

4.4.5 Cement

Electric power, coal and furnace oil are the major energy forms used in the cement industry. The cement industry accounts for over 10 percent of the coal consumed by the industrial sector, and over 6 percent of the electricity consumed by the industrial sector.

The energy required to produce cement varies widely with the type of production process. The two primary manufacturing processes are known as the wet and the dry processes. The wet process is more energy intensive, using 1.5 to 2 times the energy used by the dry process to produce clinker. Most recent capacity additions in India use the dry process. Energy costs are a large part of the total production cost for cement, and were about 39 percent of the total for dry process plants in 1983/84.

Energy efficiency opportunities abound in cement factories (GOI, 1987a). The grinding process used in dry process plants is a very inefficient process. It is possible to conserve over 40 percent of the energy used for grinding. Some technology improvements in grinding are listed below (OTA, 1992):

- high efficiency classifiers
- roller mills
- controlled particle size distribution
- advanced mill internals
- separate grinding of components
- computer control.

Similarly, technology improvements are possible in the other processes used in cement manufacture. Other energy conservation options include waste heat recovery, cogeneration, and the use of variable speed drives on kiln fan motors and other motor drives.

The energy conservation potential, the number of cement factories, and the financial robustness of the cement industry make it an extremely good target for ESCOs.

4.4.6 Paper

Paper making typically consists of five process steps: wood preparation, pulping, bleaching, chemical recovery, and finally paper making. Wood is chipped to small pieces in the wood preparation step. Pulping breaks apart the fibrous components of the wood using either a chemical or a mechanical process. The residue from the chemical pulping process is known as black liquor and is a large source of energy. Bleaching is used to whiten the pulp before making paper. The paper making process deposits the bleached pulp fibres in a sheet on a screen, drains and presses the water from it, and dries the sheet.

The paper industry was estimated to consume 3.4 percent of the total electricity consumed in India in 1990 (OTA, 1992). Medium and low pressure steam is used for pulping, bleaching, and drying. The ratio of steam to electric use in the paper industry is on the order of 85 to 15. Therefore, there is significant potential for thermal energy savings - coal and fuel oil - in this industry.

State-of-the-art technologies that produce an improved product also make substantial energy savings possible. Other conservation measures that can save a significant amount of energy are (GOI, 1987b):

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- efficient motive systems
- efficient boilers
- microprocessor control system for boiler control
- process heat recovery
- use of enzymes in the pulping process
- cogeneration
- generation of electricity using waste fuels.

The paper industry offers significant potential for energy conservation, and therefore is a good target for an ESCO.

4.4.7 Concluding Remarks

Most of the measures identified above have paybacks ranging from one to five years, although a cost-benefit analysis was not done in this study. These measures should be attractive to industry from an economic standpoint. The constraints and reasons for not implementing these measures include the following:

- Major conservation efforts require replacement of equipment and/or process modification, which normally require large investments. Due to shortage of funds and high demand for industrial goods, the industry generally prefer investing in capital expansion rather than energy conservation measure.
- Lack of awareness and commitment to energy conservation.
- Sometimes lack of technical know how and manpower required for implementing energy efficiency projects.

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- Inadequate energy management organization at plant level.
- Lack of clear cut government policies for financing energy efficiency programmes.
- Energy conservation investments are generally not considered as a first priority when the availability of funds is to be directed between production oriented investment and in energy conservation.

While each factor listed above by itself might not be enough to prevent adoption, taken together, these factors pose a calculus of inertia that can be extremely difficult to overcome. The ability to address these factors -- some of which are listed below as well as throughout this Report -- is the central reason why ESCO's can play such a significant role in increasing the adoption of energy efficient technologies. ESCOs help overcome the following barriers:

- Risk aversion of most firms -- Firms lacking in technical sophistication find it difficult to develop the confidence that a given energy conservation technology will generate the energy savings projected. ESCOs offer guarantees that the energy savings will be realized, thereby minimizing or eliminating the risk that owners attach to untried or unfamiliar technology.
- Lack of capital availability -- The company may simply be at the end of its credit line and lack the capital to invest. Alternatively, it may perceive that a big investment in energy efficiency, while smart from a long range point of view, is problematic from a short term financial point of view because it will temporarily lower return on equity and return on assets. Yet another reason is psychological in nature: capital may only be available for investments perceived to be directly linked with business expansion versus improvements in operational efficiency. ESCOs overcome this barrier by supplying and/or arranging the capital financing for up to 100 percent of the project.
- Lack of adequate information and/or internal resources -- Companies struggling to compete in their core business may not have the time or resources to maintain up-to-date knowledge on the best energy conservation techniques and production practices for a given industrial process. In short, end users may simply be unaware of the latest energy efficiency options and/or may lack the internal staff to implement any

improvements not deemed immediately vital to the day-to-day operation of the business. ESCOs specialize in staying current on the best industrial practices worldwide. In short, they know what works, what does not work, and the best way to apply a particular technology in a given situation. Use of ESCOs as an outside resource also preserves the owner's valuable managerial and staff resources needed to run his business.

4.5 AGRICULTURAL SECTOR

Electricity is the main source of commercial energy in the agricultural sector, used primarily for irrigation purposes. There has been a significant change in the energy consumption pattern in this sector, with the share of diesel declining from 33.5 percent in 1980/81 to 10.3 percent in 1990/91. Electricity consumption in the agriculture sector has grown at a high rate of 12.4 percent per annum during the period 1970/71 to 1990/91, and presently accounts for 87 percent of the commercial energy consumption in this sector. Trends in sector-wise power consumption reveal that the share of the agricultural sector has increased from 10 percent in 1970/71 to 25 percent in 1990/91.

The high growth rate of electricity consumption in the agricultural sector may be attributed to the very low price of electricity to this sector, which has led very high levels of inefficiency and waste. Subsidies offered to this sector range from 85 to 90 percent of the cost of electricity. Often, electricity use is not even metered; the customer is charged a flat monthly rate per installed HP of pump motor. The all-India growth rate of electric pumpset installations during the period 1970/71 to 1988/89 was 9 percent. Today, the number of electric pumpsets outnumbered diesel pumpsets, and the latter are now generally used as stand-by.

The extremely low price of electricity to this sector make it an unattractive market for an ESCO operating on the shared energy savings concept. Although the potential exists for significant energy savings, the customer has no incentive to invest in more efficient equipment. However, the same reasoning makes this a profitable sector for the SEBs to make energy efficiency investments possibly with the assistance of ESCOs as delivery agents. When direct installation of energy efficient equipment will save more in energy than the cost of the effort to purchase, install and maintain the energy efficient equipment, U.S. utilities often hire ESCOs to implement such measures on a massive scale, saving tens and even hundreds of megawatts in the process. This same concept can and should be extended to agricultural pumps.

4.6 REFERENCES

Engineers India Limited, Personal Interview, 1992

Government of India, Ministry of Industry, Bureau of Industrial Costs and Prices, *Studies on the Structure of the Industrial Economy, Volume IV, Report on Energy Audit of Cement Industry*, New Delhi, 1987a

Government of India, Ministry of Industry, Bureau of Industrial Costs and Prices, *Studies on the Structure of the Industrial Economy, Volume V, Report on Energy Audit of Paper Industry*, New Delhi, 1987b

Government of India, Ministry of Industry, Bureau of Industrial Costs and Prices, *Energy Audit of Aluminum Industry*, New Delhi, 1988

Government of India, Ministry of Industry, Bureau of Industrial Costs and Prices, *Report on Energy Audit of Integrated Steel Plants*, New Delhi, 1989

Government of India, *Eighth Five-Year Plan Document*, 1992.

MKRC, M.K. Raju Consultants, Personal Interview, 1992

Nadel, Steven et al, *Opportunities for Improving End-Use Electricity Efficiency in India*, International Development and Energy Associates, Inc, November 1991

National Productivity Council, *Report on Review of Power End-Use Efficiencies*, prepared for the World Bank, New Delhi, India, 1991

Office of Technology Assessment, U.S. Congress, *Fueling Development: Energy Technologies for Developing Countries*, OTA-E-516, Washington D.C., 1992

Tata Energy Research Institute, *Tata Energy Data Directory and Year Book - 1990-91*, New Delhi, 1991

Tata Energy Research Institute, *Preliminary Results from Energy Survey of 125 Hotels in India*, New Delhi, 1992

5.0 TECHNOLOGICAL ISSUES

5.0 TECHNOLOGICAL ISSUES

5.1 INTRODUCTION

Technology is one of the major issues that could affect the establishment of ESCOs in India. Although the project team was assured by most of the interviewees that technology is not an issue, and that energy efficient equipment is easily available, there are significant barriers for the cost effective availability of energy efficient equipment in India.

The technological issues discussed below include:

- availability of efficient equipment and skilled staff
- power quality and reliability
- awareness of energy efficient products.

5.2 AVAILABILITY OF EFFICIENT TECHNOLOGY AND SKILLED STAFF

Energy efficiency may be achieved through:

- replacement or retrofit of standard equipment with high efficiency equipment
- process change-out using modern production technologies
- good operation practices by skilled manpower
- efficient design.

5.2.1 Energy Efficient Equipment

Energy efficient products are available in India, albeit not very readily. A partial list of some commonly used equipment and some domestic manufacturers of each is provided in Table 5-1. Some equipment or systems such as occupancy sensors for lighting control, heat pump water heaters, industrial heat pumps, refrigeration heat recovery systems, and engine driven refrigeration systems are not manufactured domestically.

Table 5-1
Partial List of Domestically Manufactured Equipment

TECHNOLOGY	PARTIAL LIST OF DOMESTIC MANUFACTURERS
Heat Recovery Water Heater	Thermax Pvt. Ltd., Pune Incorporated Engineers Ltd., Baroda Process Equipments India, Paonta Sahib
Air Compressors *	Atlas Copco (India) Ltd., Bombay Elgi Equipments Ltd., Coimbatore Ingersoll-Rand (India) Ltd., Bombay
Blowers *	Bajaj Electricals, Bombay Crompton Greaves, Bombay Andrew-Yule & Company Ltd., Calcutta
Air-Conditioners *	Carrier Aircon Ltd., New Delhi Voltas Ltd., Bombay Blue Star Ltd., Bombay
Desiccant Dehumidification	Bry-Air, Delhi
Absorption Chiller	Thermax, Ltd., Pune
Engine Driven Chiller with Waste Heat Recovery	Thermax, Ltd., Pune

TECHNOLOGY	PARTIAL LIST OF DOMESTIC MANUFACTURERS
Electromagnetic & Electronic Ballasts, HPS Lamps, Halogen Lamps, MH Lamps, CFLs, Dimmers, EMS, Photoelectric	Phillips India, New Delhi Bajaj Electricals, Bombay Sylvania & Laxman Ltd., New Delhi Apar Ltd., Bombay
High Efficiency Motors, VSDs	Siemens Ltd., Bombay Crompton Greaves Ltd., Bombay

* No specific high efficiency model manufactured

Efficient equipment is not readily available. Domestic manufacturers are not willing to invest in producing efficient equipment because they are not sure of the demand for the product; but demand will not occur until products are readily available.

The domestic manufacture of efficient equipment is also limited by the availability of raw materials and components. Where efficient equipment is manufactured in India, availability is still a problem because it is generally not stocked by the dealers. The availability of high efficiency motors is a case in point. Special orders for high efficiency motors have to be placed with the factory, resulting in delays in obtaining the equipment. While this may not be a problem for new construction, this level of availability is not adequate for quick replacement of existing equipment when existing equipment fails.

Imported equipment is more expensive than domestic equipment because of the additional freight charges and import duties levied by the government. However, the government recently

reduced import duties on energy efficient equipment making them more affordable and cost-effective.

To the ESCO, the availability of domestically manufactured energy efficient equipment is an important issue, although not a mission critical issue, because ESCOs are capable of identifying and sourcing the required equipment from anywhere in the world.

5.2.2 Modernisation of Production

In addition to using high efficiency, off-the-shelf equipment, substantial energy savings are possible through the change-out of obsolete production technologies with more efficient modern technologies. A few examples of such technologies are: membrane chlor-alkali process technology, thermal storage in cold storage applications, and drying paper with infrared radiation. Such technologies will have to be transferred from abroad, and technical collaborations need to be arranged. The recent liberalisation of import policies makes it easier for such agreements to be put in place.

The ESCO can identify obsolete processes, examine alternative energy efficient technologies, and arrange to import the equipment and transfer the technical expertise to the host.

5.2.3 Skilled Manpower

There is no shortage of technical expertise in India. However, the number of engineers and technicians experienced in energy efficiency issues in India is small relative to the needs of the country. Various interviewees have suggested that significant energy savings are possible

through good housekeeping practices. But good housekeeping is a function of the quality of the personnel operating the equipment.

The efficiency of energy use can be improved by: (i) improving the skills of the engineers and technicians through training programs, (ii) installing hardware controls and reducing the dependence on operators, and (iii) improving O&M practices. A separate discussion on training is provided in Section 12 of this report.

One recommended practice for improving energy consciousness is to install meters to monitor the energy consumption at various locations in an industrial plant, or at various stages of a process. The Energy Manager of the facility will be able to use this information to easily spot inefficiencies and take corrective action. However, the availability and cost of metering equipment is an issue. The ESCO can more easily identify and source the instrumentation required for the monitoring of energy consumption than individual plant energy managers.

5.2.4 Good Design Practices

A systems approach that includes the proper sizing of equipment and energy efficient layouts has to be used in designing plants, giving energy efficiency a high priority. Pinch technology may be used to determine optimum parameters and sizing. All this requires the design/engineering team to spend additional time designing the equipment, specifying efficient equipment, and ensure that the installation of the equipment in done properly.

In existing plants, the engineers do not want to take the risk of specifying technologies that have not been proven in India. The ESCO can provide guarantees on energy savings realisable through the use of such technologies in order to overcome this conservativism.

5.3 POWER QUALITY AND AVAILABILITY

Power quality and availability are major issues that have to be dealt with by the ESCO. Voltage fluctuations of as much as 30% from the nominal 230 volts are possible. This impedes energy efficiency because:

- some equipment operates at lower efficiencies at lower voltages
- some equipment cannot be used at low voltages
- some equipment burn out if components are not robust enough to handle the voltage swings
- equipment must be designed for a wide range of voltage conditions meaning that the efficiency may not be optimum, and costs would be higher
- equipment is oversized to deal with voltage problems, resulting in part-load operation at lower efficiencies
- power stabilisers are used on individual pieces of equipment which consume energy themselves.

In addition, there are severe power shortages in the country as discussed in Section 2. The long-term solution to this problem is to bring electric supply and demand into balance. In the short term, the ESCO has to be aware of these constraints and plan its activities accordingly.

5.4 AWARENESS OF ENERGY EFFICIENT TECHNOLOGIES

The level of awareness of energy efficient technologies and processes in India is low. As in most other countries, consumers are generally oblivious of the equipment that supplies the energy service, and are not interested in information on energy efficiency.

Several organisations in India are addressing this issue through the preparation and dissemination of educational materials. However, the message is very general in nature and does not provide detailed information for specific end-users. It is also not required of equipment manufacturers to provide efficiency information on their products using energy labels. Thus, comparison shopping is not possible.

The general lack of awareness is both a plus and a minus to the ESCO. It will take some effort on the part of the ESCO to educate the client on the benefits of energy efficiency. On the other hand, once the client is educated on the economics of energy efficiency, the ESCO will be in a position to supply all the technical and administrative needs of the client, thus transferring considerable value.

6.0 POTENTIAL OWNERSHIP STRUCTURES FOR ESCO VENTURES

6.0 POTENTIAL OWNERSHIP STRUCTURES FOR ESCO VENTURES

The following section discusses some of the most likely ownership structures for the establishment of ESCOs in India. Each of these potential ownership structures has merit, and addresses various goals of USAID. Of the three, the joint venture is most attractive in terms of both USAID's goal of encouraging U.S. business operations and probability of success from a business standpoint.

Corporate and legal issues for U.S. firms interested in establishing either a wholly-owned subsidiary or collaborating with an Indian firm are addressed in Section 7.

6.1 U.S.-INDIAN JOINT VENTURES

6.1.1 The Benefits of Cooperation

One of the most promising options for initiation of ESCOs in India is the joint venture between a U.S. firm (most likely an existing ESCO) and an Indian firm or firms. Each partner in a joint venture agreement retains its own operations and administration, and a third corporation - the joint venture firm - is established as a separate entity.

The U.S. ESCO brings to the relationship its knowledge and experience in coordinating the various players required for successful ESCO operations, initiating and marketing performance contracts, securing financing, sourcing foreign equipment/manufacturers and establishing monitoring and tracking procedures. Also desired by Indian firms (particularly engineering firms) willing to collaborate with U.S. ESCOs is the transfer of U.S. technological expertise and experience in industrial process energy savings.

U.S. firms may provide foreign exchange capital for funding initial ESCO projects; however, this is unlikely, given the potential risk of an overseas project coupled with a reported glut of lesser-risk, financially viable projects in the U.S., and the availability of Indian capital from private financial institutions (refer Section 8).

Despite the predominant emphasis on the commercial market among U.S. ESCOs, a few U.S. ESCOs have penetrated the industrial sector in such market segments as petrochemical, plastics, steel and automobile manufacturing. Because of their industrial sector experience, these ESCOs would be likely to have the capabilities to transfer the most needed expertise to the Indian ESCO market. Only one of these ESCOs currently has experience in international operations. However, most have indicated a level of interest that spans the spectrum from willingness to consider the international market to serious contemplation and intention to invest internationally. Complete results on the characteristics and attitudes of U.S. ESCOs interviewed regarding investment in India are contained in Appendix B.

Potential Indian joint venture partners include:

- engineering or consulting firms
- energy audit firms
- financial organisations
- construction management firms
- contractors and installers
- state electricity boards
- private power producers

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- equipment manufacturers
- private investors.

Based on research with Indian firms to date, the most likely Indian partners would be found among:

1. consulting engineering, energy auditing/service firms, and management consulting firms with engineering expertise
2. private financial institutions, particularly those with established lease-purchase or hire-purchase divisions
3. Indian or joint venture manufacturers of energy efficient equipment.

Indian engineering, auditing and management consulting firms have indicated the willingness and demonstrated the ability to provide a wide range of marketing and technical support functions, including:

- lending credibility and reputation
- identification of viable prospective clients
- marketing energy efficiency and ESCO services to existing and new clients
- knowledge of customer end uses
- performing feasibility and detailed energy audits
- sourcing and installation of energy efficient equipment
- project management

- technical support and, in some cases, existing expertise in monitoring and tracking energy savings.

In fact, a limited number of firms quite successfully provide all of these services (with the exception of marketing ESCO financing) to their clients now.

Private Indian financial institutions that effect equipment lease and hire-purchase agreements have indicated willingness to participate in the financing of ESCO operations. In the current economic climate, there exists a tremendous amount of competition among leasing firms. ESCO operations offer a new, dynamic opportunity for project financing. Furthermore, in leasing arrangements, where the lessor retains ownership of the equipment, the accelerated depreciation schedule allowed on energy efficient equipment offers highly desirable tax advantages to a profitable lessor.

In a hire-purchase agreement, the client retains ownership of the equipment, thus, a financial institution sourcing a hire-purchase agreement does not realise the same tax advantages as a lease-financier. However, the tax advantages are not lost -- they are simply transferred to the client, allowing re-allocation of the Net Present Value produced by the project between the financier and the client/owner.

Manufacturers of efficient equipment have also expressed interest in ESCO joint ventures with U.S. firms. In addition to the contributions that engineering, audit and management consulting firms would bring, manufacturers may contribute a "value-addition component", i.e., reduction in equipment retail cost mark-up.

6.1.2 Government Encouragement of Foreign Investment

In the past two years, the Indian Government has radically changed its policies and procedures to make India an attractive place for foreign firms to conduct business.

Under present Government policies, the Government has relaxed restrictions to encourage U.S. investment, and to bring joint venture companies on par with predominantly Indian-owned companies. The new Government policy (New Industrial Policy, 1991) allows, for high priority industries, immediate approval for direct foreign investment up to 51 percent foreign equity, increased from 40 percent previously.

A very limited list of eight industries is not open to foreign ownership. These industries include only industries considered strategic to National health and welfare, such as arms production, mining, atomic energy production, and railway transport.

In addition to raising the ceiling on foreign ownership, investment approval processes have been streamlined. In the past, a foreign firm seeking to take part in an equity investment or technology transfer went through a slow and cumbersome process to gain approval from the Indian Government. This process required the consent of numerous government agencies and could involve several years of negotiations.

Since mid-1991, the Indian Government has implemented investment approval procedures that have been subject to regular modification. The new approval process is fast, transparent and without bureaucratic delays, shortening the approval process, in most cases, to a few weeks. The topic of Government encouragement of foreign investment is also discussed in Sections 7 and 9.

6.2 FOREIGN COMPANY

A U.S. ESCO, not registered in India, would be classified as a "foreign company". Foreign companies are allowed to operate without being incorporated in India, with substantially reduced Government paperwork and reporting requirements; however profits are taxed at the rate of 65 percent, as opposed to 45 percent (plus surcharge) for Indian or joint venture firms (refer Section 7.3). Because of the differential tax rate, foreign companies are typically established only for very small operations. Thus, foreign companies have historically not had much presence in India. Most companies have preferred to set up joint venture collaborations with Indian firms, under the prevailing ownership restrictions.

Business, political and personal connections are of paramount importance in doing business in India. This cultural more offers the U.S. firm wanting to maintain 100 percent ownership its greatest challenge. The most obvious solutions would be to enter into a joint venture agreement with a seasoned and well-connected Indian firm, (i.e., retain not more than 51 percent U.S. ownership), or to establish contractual agreements with Indian firms on a project-by-project basis.

6.3 WHOLLY INDIAN OWNED COMPANY

Research with Indian engineering, auditing, and management firms and private financial institutions firms has indicated that all of the key components of ESCO operations exist separately or in various combinations within Indian firms, to a sufficient degree and level of expertise that full Indian ownership of an ESCO is a viable alternative. However, to date, none of the firms has successfully "married" all of the components into a single, functioning entity -- a full-fledged, performance based Energy Services Company.

As indicated above, significant interest in becoming involved in ESCO operations does exist among a variety of firms. Skillful matching of the service provision capabilities (most notably those of engineering/technical expertise with financing capabilities) of Indian firms may be sufficient to instigate the creation of an Indian joint venture firm, or, in the absence of an actual joint venture, establish the business links required to enable one firm to offer full-scale ESCO services -- for example, for an engineering consulting firm to have ready access to private capital, or a financing firm to have ready access to requisite engineering assessment and installation skills.

However, it must be noted that the Indian firms researched to-date overwhelmingly indicated a preference for U.S. rather than Indian joint ventures. At least in part, this reflects their greater comfort in being teamed with a firm that has established a successful track record in the whole range of ESCO operations.

6.4 PRIVATE SECTOR PARTICIPATION IN POWER GENERATION

In order to cope with the massive power shortages foreseen for the 8th Plan, and to fall in line with the general global trend of conforming to a free Market Economy and Privatization, the Government of India decided to liberalise the Power Sector. Accordingly the Electricity Supply Act was amended in 1991 and the following incentives were offered to the Private Sector:

- Debt equity ratio of 4:1.
- Promoters contribution of only 11% in equity.
- 40% of outlay could be from Indian Public Financial Institutions. Private Entrepreneurs to bring in 60% of the resources from sources other than Public Financial Institutions.

- **Up to 100% foreign equity permitted.**
- Import of power equipment permitted with approval of Government.
- Higher rate of return of 5% in place of the previous 2% above the RBI rate.
- Capitalization of interest during construction.
- Higher rates of depreciation.
- 16% post-tax return on total asset base.
- Special appropriation to meet debt redemption obligation.
- Longer duration of license for 30 years instead of 20 years.
- Amendments to Indian Electricity Supply Act 1947.
- Environmental and other clearances rationalized and cell for single window clearances created.
- Introduction of two part tariff for bulk sale of power by the generating companies.
- Rate structure at normative costs and no limit on profits.

Due to the huge losses the State Electricity Boards suffer, they are unable to pay for power purchased from several central generating stations, for coal purchased from the CIL, for railway freight, and for BHEL equipment and spares. Ultimately these amounts due have to be deducted from the plan allocations of the various states in installments over an extended period of time. This has created a financial disarray in one of the priority sectors of the national economy. The unsatisfactory financial position of the Power Sector deters any Private Entrepreneur from entering this sector for the following reasons:

- They are not sure whether they will be able to sell all the electricity produced, particularly during low load night periods.
- They do not know if they will get paid for the power they supply the SEBs.
- Rate of corporate tax (51.75 to 57.50%) is considerably higher than those prevailing in USA.

ESCOs in the U.S. are generally in the business of energy conservation and not power generation, although cogeneration and generation from waste fall within the broad definition of the ESCO. Given the fact that the primary target market for ESCOs in India is the industrial market, it is likely that most Indian ESCOs will want to include cogeneration as part of their delivery capability. ESCOs help reduce the demand for power and thus fulfill the spirit of the new private power policy. Therefore, we feel an ESCO whose energy services include cogeneration should be placed on an equal footing with firms providing only cogeneration. This can be accomplished by allowing ESCOs to bring in 100% foreign equity under the Government's policy for Power Development. However, the ESCO concept is new and the policy has not yet been tested.

6.5 REFERENCES

The results of a series of interviews with U.S. ESCOs and Indian engineering/consulting firms, management consulting firms, energy audit/services firms, private and government financial institutions, and SEBs were used to compile this Section.

A complete listing of organisations interviewed is included in Appendix C.

7.0 CORPORATE AND LEGAL ISSUES

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7.0 CORPORATE AND LEGAL ISSUES

7.1 OVERVIEW OF RECENT REGULATORY REFORMS

India's corporate and legal environment has never been more positive for the establishment of ESCOs in India. Recent Government reforms aimed at introducing a more dynamic and market-based economy have eliminated a number of impediments to the formation of companies and import of equipment, and have even served to encourage corporate investment in energy efficiency measures. In the past year, India has undergone a complete metamorphosis from a heavily regulated, centrally oriented economy to one that is less regulated and encourages foreign investment, particularly in key strategic areas, such as energy resource development and energy efficiency.

India's first economic development plan, known as the Bombay Plan, was developed in 1944 by a group of prominent Indian businessmen. In 1950, a Planning Commission was set up for the purpose of assessing available resources, identifying growth areas and finding ways to augment resources so that growth targets could be met. At this time, India adopted a centrally planned model, in which Government investment was strong in infrastructural and heavy industries, and private capital was expected to play a supportive role. To ensure that private capital flowed into the priority areas defined by the central Government, a complex set of administrative controls was instituted, resulting in the requirement for Government approval for all major investment and economic decisions. During this period, substantial investments by Government and the private sector helped to lay the foundations for a strong industrial base in iron and steel, heavy engineering, and mining.

However, these same policies tended to encourage Government sector inefficiency and isolate Indian industry from world markets. Absence of domestic competition and restricted

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imports with high customs duty strengthened the domestic market for Indian industry, but decreased international competitiveness. Lack of emphasis on research and development and Government licensing procedures restricting free entry to competition made Indian industry technologically weak.

The decade of the 1980s saw the beginning of an economic liberalisation program designed to make the economy more competitive by reducing Government control and allowing market forces freer rein. Following the initiation of these measures, growth in GDP, which had historically averaged 3-4 percent over the previous 40 years, averaged 6.1 percent in the period 1986 to 1990, peaking at 10.5 percent in 1988-89.

However, large problems still existed. Precipitated by the Gulf war, rising inflation, the collapse of the large export market in Eastern Europe and the former Soviet Union, a rising oil import bill, a deficit in Government finances, an adverse balance of trade and large foreign debt ... the country's economic stability was severely threatened by 1991.

It was under this looming economic crisis that the new Government of Prime Minister Rao came to power in June 1991. In response to the problems that existed, the Government undertook a series of steps to both address immediate economic difficulties and lay the foundation for long-term, systemic reform. The reform efforts, initiated in July 1991, encompass numerous policy modifications that have begin to erode India's comprehensive web of trade and investment barriers. The key salient features of the new industrial policy are:

1. **Encouragement of foreign investment.** Under the old policy (the Foreign Exchange and Regulation Act (FERA), 1973), foreign investment and acquisition of technology necessary for India's industrial development would be allowed only on such terms as were determined by the Government of India to be in the National interest. Except for export-oriented firms, foreign ownership could not exceed 40 percent.

   The new Government policy (New Industrial Policy, 1991) allows, for high priority industries, immediate approval for direct foreign investment up to 51 percent foreign equity.

   In addition to raising the ceiling on foreign ownership, investment approval processes have been streamlined. In the past, a foreign firm seeking to take part in an equity investment or technology transfer went through a slow and cumbersome process to gain approval from the Indian Government. This process required the consent of numerous government agencies and could involve several years of negotiations.

   The current policy states that there "shall be no bottlenecks of any kind in [the approval] process". Since mid-1991, the Indian Government has implemented investment approval procedures that have been subject to regular modification. These reforms have, for most applications, shortened the approval process to a few weeks.

2. **Relaxed industrial licensing policy.** Under the old industrial policy, the Government exercised control over investment through industrial licensing: all industries required a license from the Government for expansion of production capacity or for setting up new units.

   The New Industrial Policy has substantially corrected this situation. Licensing has been abolished in all but eight industries, which are considered to be of strategic importance. These include industries which have adverse environmental and health implications and consumer durable industries. Although coal, lignite and petroleum production are included on the restricted list, manufacture of energy consuming commercial and industrial equipment is exempted.

3. **Relaxation of restrictions in import licensing.** Previously the most effective barrier to imports, India's comprehensive and complex import licensing system has been drastically curtailed. Under the former system, some 40 percent of non-consumer goods were restricted, as opposed to 5 percent under the new policy, announced 1 April, 1992.

4. **Reduction in import duties for foreign products.** Prior to the reforms, India maintained some of the world's highest import duties, averaging 120 percent, and, in some cases, exceeding 300 percent. Particularly relevant to ESCOs, import duties on general machinery have been reduced from 80 to 60 percent; while capital goods for coal mining, crude petroleum refining and power projects are assessed a uniform 30 percent duty.

   The Indian Government has indicated an intention to progressively bring import tariffs in line with developing country averages within the next 3 to 4 years, although tariff reduction efforts may be hampered by the central Government's heavy reliance on duties as a source of revenue.

5. **Repatriation and Remittance.** In June 1992, the Government eliminated the blanket requirement that dividend remittances be balanced by export earnings. Remittance of profits earned in India by branches or subsidiaries of foreign firms or companies, to their parent firms or companies outside India is permitted freely after the payment of taxes due on them, subject to the prior approval of the Reserve Bank of India or (in special cases) the Secretariat for Industrial Approvals. However, if profits are retained for more than one year, they are regarded as having been reinvested and their transfer then requires special approvals.

   U.S. capital, invested in India by a U.S. ESCO, is allowed to be repatriated from India, along with capital appreciation, if any, once approvals for foreign collaboration have been met.

Although India is still one of the world's most protected and regulated markets, it has begun a process which should spur growth, enhance economic efficiency and create greater commercial opportunities for foreign firms in general, and ESCOs in particular.

7.2 FORMATION OF A COMPANY

The law relating to both Indian companies and branches of foreign corporations operating in India is enacted in the Companies Act, 1956 (the Act). Provisions of the Act are administered by the Registrar of Companies (ROC) and the Company Law Board (CLB). The Act is currently

being reviewed to ease certain restrictions as part of Government reforms in the regulatory environment.

7.2.1 Private vs. Public Companies

Broadly speaking, companies can be either public or private companies with or without limited liability.

Private Companies

To be incorporated as a private company, a company must restrict the right to transfer its shares, limit the number of its shareholders to 50 (excluding employees or previous employees) and prohibit the subscription of shares or debentures from the general public. A number of concessions are allowed to private companies, and they are substantially less regulated than public companies.

A private company may be deemed to be a public company when:

- 25 percent or more of its paid up capital share is held by one or more corporate bodies
- average annual turnover during the past 3 years exceeds Rs. 100 million
- it holds 25 percent or more of the paid up share capital of a public company, or
- it accepts or renews deposits from the public after making an invitation or by an advertisement.

Such private companies are termed "deemed public companies".

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Public Companies

A public company is defined as a company which is not a private company. Public companies cannot have less than seven members. In a public company, there is no restriction with regard to the maximum number of the public who can acquire the shares or debentures of the company. The shares and debentures may be quoted on the stock exchange and they are freely transferable.

7.2.2 Limited vs. Unlimited Liability

Limited liability can be achieved through a limitation by shares or by guarantee. In a company limited by shares, the personal liability of members is limited to the amount unpaid on their shares. Where members agree to meet liabilities up to a nominated amount, the limitation is said to be by guarantee.

7.2.3 Partnerships

The major differences between a company and a partnership are the following:

- A company is created under the Companies Act. A partnership is created by agreement and is subject to the Indian Contract Act and the Indian Partnership Act.
- A company is an entity distinct from its members. Partners own the property of the firm and assume unlimited liability for the contracts of the firm jointly as well as severally.
- In a partnership, as in a company, shares may be transferred, but the assignee of a partner's shares does not become a partner and is merely entitled to the assigning partner's share of the profits.

- A partnership cannot consist of more than 20 persons (10 in the case of a banking business).
- Partnerships are not restricted to the articles of the Companies Act. Partners may carry on any business as they please so long as it is not illegal.
- No member of a company can wind up the company. A partnership may be dissolved by any partner at any time unless entered into for a fixed period of time. A partnership is also dissolved by the death or bankruptcy of a partner.

7.2.4 Foreign Companies

Companies incorporated outside India which have a place of business in India are termed foreign companies and are required to comply with certain rules under the Act. Liaison and project offices and branches of foreign companies in India are regulated by the Act. Such companies have to register themselves with the ROC within 30 days of establishing a place of business in India. Advantages of establishing a foreign company include significantly reduced Government intervention and reporting requirements; however the primary disadvantage, relative to a company incorporated in India, is a higher corporate tax rate of 65 percent.

Project Offices

Foreign contractors executing contracts in India can operate through a project office, which is similar to a branch office established for the limited purpose of execution of a specific contract. Approval to open a project office is freely available from the Reserve Bank of India (RBI). This mechanism is ideal for companies not wishing to establish a permanent presence. Project offices are well-suited for companies which are in the business of undertaking turnkey construction or installation projects.

Liaison Offices

Foreign companies can also operate in India via a liaison office. However, liaison offices are for overseeing of business interests, promotion of products or exploration; they are not allowed to carry on business or earn any income.

7.2.5 Incorporation of an Indian Company

The first step in incorporation of a company (whether all or any shares are owned by Indian or U.S. citizens/companies is to apply for approval of the company's name with the Registrar of Companies. Once the name has been cleared, two documents - a Memorandum of Association and the Articles of Association - must be drawn up and filed. These documents together form the constitutional framework of the company.

Memorandum of Association

The Memorandum of Association is the company's charter. Its purpose is to lay the foundation for the company, by delimiting its scope of activities and powers. The Act requires this document to lay out specific features of a company's constitution, including:

- The name of the company, with "Limited" as the last word in the case of public companies and with "Private Limited" as the last words in the case of private companies
- The State in which the company's registered office is to be situated
- The main, ancillary, and other objects of the company

- The amount of share capital with which the company is to be registered and its division into shares of a fixed amount (authorised capital).

Any number of objects and powers may be set forth in the Memorandum of Association. Changes to the Memorandum after incorporation are possible, but potentially time-consuming and expensive.

At least seven persons (two, if the proposed company is to be a private company) must subscribe to the Memorandum of Association. Such persons may be non-residents or companies, including foreign companies, provided that prior approval under the exchange control regulations has been obtained. A company may be still be incorporated and domiciled in India even if all subscribers to its Memorandum are foreign nationals.

Articles of Association

Except in the case of a public company limited by shares, all other companies have to register their Articles of Association. The Articles of Association contain rules, regulations and bye-laws for the general management of the company. The Articles of Association constitute a contract between the company and its members, and are binding on the members in relation to the company as well as on the company in relation to its members.

Before the Articles are presented to the ROC for registration, it is advisable to submit the draft Memorandum and Articles of the proposed company to the Registrar for scrutiny and approval.

On presentation of the Memorandum, Articles and ancillary documents, and payment of a registration fee based on the company's authorised share of capital, the ROC issues a Certificate of Incorporation as conclusive proof of registration. The incorporation of a company may take from 4 to 8 weeks.

Special Considerations for U.S.-Indian Joint Ventures

In drafting agreements for U.S.-Indian joint ventures, the percentage of shareholding should be clearly defined. The agreement should specify the type of share capital and the mode of payment for acquiring the shares by all parties concerned.

The joint venture agreement should specify:

1. Number of directors representing respective parties, provision of nominee or alternate directors, and election and replacement of directors

2. Provision for protection of minority interest. Normal law provides that decisions are made by majority vote; however special majority decisions on important issues such as appointment of senior officers, sale of substantial assets, loans by the company to shareholders, choice of auditors, dissolution or liquidation, increase in share capital, transfer of shares, issue of new shares, and changes in the joint venture agreement can be provided for in the agreement.

The joint venture agreement should specify whether the profits of the joint venture company are to be retained or distributed among shareholders. It should lay down a formula or guideline for declaration of dividend. The agreement should provide for the obligations of the parties concerned in case of increase in the requirements of finance by the joint venture company and conversely in case where the funds become surplus.

The joint venture agreement should define the marketing and service delivery area. This is particularly relevant for U.S. firms wishing to establish multiple joint venture agreements with a number of foreign collaborators in different countries. Special provision should be made for use of trade marks and trade names.

As the joint venture firm is normally established on the basis of agreed ratio of ownership between the foreign party and Indian party, it is common to stipulate that no transfer of shares may be made without the consent of the other party. There should be specific provision in the agreement for purchase of shares of one party by the other party wherever a party desires to sell its shares. It is generally provided that when a party desires to sell its shares, it will be obliged to offer the shares to the other party of the agreement first. Method for valuation of shares should also be specified.

Other clauses normally covered in a collaboration agreement include termination of agreement, law applicable (typically Indian law, when the firm is to be domiciled in India), force majeure and arbitration.

Appendix D provides specimens of the Memorandum of Association, Articles of Association and clauses to be considered in joint venture collaboration agreements (the latter extracted from the "Manual on the Establishment of Industrial Joint Venture Agreements in Developing Countries", published by the United Nations).

7.3 TAXATION

The law relating to income tax is enacted in the Income Tax Act of 1961 (the Act). Indian companies are taxable in India on their worldwide income, irrespective of its source and origin. Foreign companies are taxed only on income arising from operations carried out in India, or, in certain cases, income which is deemed to have arisen in India. Deemed income includes royalty fees for technical services, interest, gains from sale of capital assets situated in India (including gains from sale of shares in an Indian company) and dividends from Indian Companies.

The tax year runs from 1 April to 31 March. Tax payments are due in instalments on 15 September, 15 December and 15 March of the accounting year. Tax returns for companies are to be filed by 31 December following the tax year end. Balance of tax is payable before filing the tax return.

7.3.1 Corporate Tax Rates

Tax rates for Indian companies are 45 percent for widely-held companies and 50 percent for closely-held companies. In addition, a 15 percent surcharge on the amount of tax applies if a company's income exceeds Rs. 75,000 (US$ 2,500). Thus, the effective tax rates are 51.75 and 57.5 percent for widely-held (i.e., public companies) and private companies, respectively.

Foreign companies maintaining an office in India pay a substantially higher tax rate of 65 percent on profits. Tax is withheld at the source and estimated by the Indian Tax Office (ITO).

Corporate tax rates are currently under review and may be reduced in the near future.

7.3.2 Taxable Income

In determining taxable income, outlays incurred wholly and exclusively for business purposes are deductible. Some expenses are specifically disallowed, or the amount of deduction allowed is restricted. These include:

- Entertainment expenses
- Interest or other amounts paid to a non-resident without withholding tax
- Corporate taxes paid
- Provisions for expenses not actually incurred
- Indirect general and administrative costs of a foreign head office.

7.3.3 Depreciation Allowances

Depreciation is normally calculated on the declining balance method at varying rates, and is available for a full year, irrespective of the actual period of use, except in the case of assets used for less than 180 days in the year of acquisition.

The Government offers a wide range of tax concessions to investors in order to encourage industrial growth and development, as indicated in Table 7-1.

Table 7-1

Depreciation Rates

Assets	Rates (%)
Building	10-20
Plant and Machinery	25-40
Furniture and Fittings	10-15
Vehicles (other than for commercial use)	20
Pollution Control Equipment	40
Energy Saving Devices	100
Ships	10-20

Of particular relevance to ESCOs is the 100% depreciation for energy saving devices. The list covers a wide range of equipment, including:

- Specialised boilers and furnaces
- Instrumentation and monitoring systems for monitoring energy flows
- Waste heat recovery equipment
- Cogeneration systems
- Electrical equipment
- High efficiency burners
- Other equipment, including automatic micro-processor based load demand controllers.

High efficiency lighting equipment is noticeably absent from the list, however, this may not be a major hindrance, given the probable emphasis of ESCO activities in the industrial sector. A complete listing of energy efficiency devices for which 100 percent tax depreciation is applicable is included as Appendix E.

Depending on the financing and equipment ownership options used for energy efficiency measures, discussed in Section 8, tax credits from energy efficiency equipment depreciation may accrue to a leasing company, ESCO, or to the host facility.

7.3.4 Turnkey Projects

Turnkey projects are generally comprised of the following two elements:

- the supply of plant and machinery
- the erection and commissioning of plant and machinery in India.

Where the activity relating to erection and commissioning plant and machinery is to be carried out by a foreign collaborator in India, the entire income of the project (relating to operations carried out in India) would be liable to tax in India. Where the foreign collaborator does not undertake to erect and commission the plant by himself but confines himself to provide only advice and guidance for the erection and commissioning of the work, and the erection and commissioning is done by an Indian party, the foreign collaborator's income would not be subject to Indian tax.

Where employment of foreign technicians becomes necessary for the erection and commissioning work, such technicians should be taken in employment by the Indian party; they should not represent the foreign collaborator in India.

Foreign companies engaged in construction, erection, testing or commissioning of plant and machinery in connection with turnkey power projects approved by the Government and

financed under an international aid programme, are subject to tax on deemed profit of 10 percent of gross revenues.

7.3.5 Sales Tax

Tax on the sale of commodities is levied by either the Central or State Governments on manufactured commodities being sold for the first time and on imported commodities being sold for the first time in India after import. The rate of tax ranges from 4 to 15 percent, based on the nature of the commodity sold. Sales tax is levied on works contracts in most States, with both the value of contracts subject to tax and the tax rate varying from State to State.

Sales tax is also levied on leased equipment. There is no sales tax on services.

7.3.6 Tax Treaties with the U.S.

The Government of India has entered into agreement with the United States for the following purposes:

- for granting of relief in respect of the income on which tax is paid both in India and in the U.S.; or
- for avoiding of double taxation of income under Indian and U.S. tax laws; or
- for the exchange of information for the prevention of evasion and avoidance of income tax chargeable under the Indian Income-tax Act or under corresponding U.S. law, or investigation of cases of such evasion or avoidance; or
- for recovery of income tax under the Indian and U.S. income tax laws.

This convention is specified in the "Convention between the Government of the United States of America and the Government of the Republic of India for the avoidance of double taxation and the prevention of fiscal evasion with respect to taxes on income", (Notification No. G.S.R. 990(E), dated 20 December, 1990, its various Annexures, Protocols, and Memoranda of Understanding).

The rates of tax for various types of income are specified in Table 7-2 below.

Table 7-2

Tax Rates Under the U.S.-India Tax Treaty

Type of Income	Rates (%)
Dividends	15-25
Interest	20-15
Royalties	10-20
Technical Fees	10-20

7.4 LICENSING AND TARIFFS ON IMPORT OF SELECTED EQUIPMENT

7.4.1 Licensing of Imported Energy Efficiency Equipment

The Government of India, to encourage a strong Indian presence in world-wide markets, has recently relaxed restrictions on importing technologies, drawing and designs. The import policy for 1992-97 allows free import of capital goods without any restriction for use/stock/sale of goods, except for specified goods contained in the Negative List of Imports.

Virtually all energy-efficient equipment is omitted from the Negative List of Imports, and thus is freely permitted to be imported. The Negative List of Imports can be found in Nahbi's *Import-Export Policy and Procedures 1992-97.*

7.4.2 Customs Duties on Energy Efficiency Equipment

Customs duties are imposed on imports at rates specified in the annual Budget. For energy-saving devices, customs duties are generally 40 percent for energy conservation devices, and nil for many solar and renewable energy devices. Appendix E provides detail on customs duty tariffs for specific energy conservation and renewable energy equipment.

7.5 REPATRIATION AND REMITTANCE

7.5.1 Repatriation of Foreign Capital

Repatriation and remittance of foreign capital invested in India in industrial projects are allowed from India, along with capital appreciation, if any. Applications for repatriation of foreign capital in India should be made to the Reserve Bank of India (RBI).

7.5.2 Remittance of Profits and Dividends

The remittance of profits earned in India by branches of subsidiaries of foreign firms or companies, to their parent firms/companies is the U.S. is allowed freely after the payment of taxes due on them, subject to the prior approval of the RBI. If profits are retained for more than one year, they are regarded as having been reinvested and their transfer then requires special

approvals. Applications for remittance of profits should be made to the RBI, through the applicant's bank. A number of accompanying documents are required.

7.6 REFERENCES

A number of good, relatively up-to-date references exist for the establishment of an Indian or U.S.-Indian joint venture firm.

These include:

Agrawal, H.P., *Business Collaborations in India Fifth Edition 1992 - Industrial Procedures and Tax Planning Based on New Industrial Policy of 1991*, Wadhwa and Company Pvt. Ltd, Nagpur, 1992.

Citibank NA and Arthur Andersen & Co, SC, *Doing Business in India*, 1 April 1992.

Nabhi (Board of Directors), *Formation & Management of a Private Company*, Nabhi Publications, New Delhi, August 1992.

US Dept. of Commerce, *India Trade and Investment Update*, August 1992.

Other documents referenced or providing source information in this section include:

Nahbi, *Import-Export Policy & Procedures 1992-97 (As Ammended Upto July 1992)*, 2nd edition, Nabhi Publications, New Delhi, July 1992.

ASSOCHAM (The Associated Chambers of Commerce and Industry in India), *Foreign Investment and Foreign Collaboration Approvals 1991*, published by ASSOCHAM, New Delhi, February, 1992.

Government of India, *Convention Between the Government of the United States of America and the Government of the Republic of India for the Avoidance of Double Taxation and the Prevention of Fiscal Evasion with Respect to Taxes on Income*, Notification No. G.S.R. 990(E), dated 20 December, 1990.

Government of India, *New Industrial Policy, 1991.*

Government of India, *Changes in Procedures for Industrial Licensing*, [Press Note No. 9 (1991 Series)].

Government of India, *Statement on Industrial Policy - Procedures in respect of Foreign Technology Agreements - Press Note No. 10*, [Press Note No. 10 (1991 Series)].

Government of India, *Statement on Industrial Policy Changes in Procedures for Foreign Investment Approvals*, [Press Note No. 11 (1991 Series)].

8.0 CAPITAL FORMATION: SOURCES AND ISSUES

8.0 CAPITAL FORMATION: SOURCES AND ISSUES

8.0.1 Overview

The ESCO business is capital intensive, even more so when the principal market opportunities are based in the industrial sector. Capital formation for ESCOs is therefore of critical importance, both for initial business development activities as well as long-term project financing and working capital requirements. This section surveys a range of potential sources for capital formation and related issues for the start-up and expansion of ESCO operations in India.

8.1 U.S. ESCOS AS A SOURCE OF CAPITAL FOR ESCOS IN INDIA

In a survey of 10 of the largest U.S.-based ESCOs conducted for this report, most ESCOs were found to be unfamiliar with the nature and status of the current economic reforms in India, or of the large potential market for ESCOs. And while most expressed a desire to learn more about opportunities for ESCOs in India, their interest did not extend to a ready willingness to seriously consider financing the start-up of ESCO operations in India.

According to the executives interviewed, the recent rapid expansion of their respective businesses has absorbed their available debt and equity capital. Most said they are unable to obtain sufficient capital resources to finance all of the attractive opportunities for profitable growth in North America. (Securing expansion financing is difficult for U.S. ESCOs because they do not enjoy easy access to the public debt and equity markets; even the availability of

working capital is constrained due to the stringent lending policies of U.S. banks.) Hence, their collective feeling was that capital for any type of overseas venture must be obtained principally through joint venture partners, government support, or some other financing mechanism stressing in-country capital formation rather than transfer of equity or debt capital from their balance sheets to subsidiary operations.

8.2 PRIVATE U.S. INVESTORS AS A SOURCE OF CAPITAL FOR ESCOS IN INDIA

The availability of investment capital from private venture capitalists and individual investors in the U.S. appears limited. Of the 850 or so professionally managed venture capital firms in the U.S., only a handful have operations in Asia of any type, and of those, investment activities tend to be centered around the manufacture of computers and semiconductors. This fact, in combination with the precipitous reduction in recent years by institutional investors to investments in both existing and new venture capital funds in the U.S. -- eliminates them as a likely source of financing for ESCOs in India.

Once a U.S. ESCO decides to enter the Indian market, it could consider the possibility of raising capital for Indian operations through the sale of equity or other interests on a strictly private placement basis to wealthy private individuals in the United States. Such a private placement effort might logically include expatriate Indians who are familiar with both the improving investment climate in India as well as the activities of U.S. ESCOs. However, for several reasons, such capital formation techniques seem unlikely to generate a great deal of capital for operations in India, at least during the initial stages of development of the ESCO industry in India. First, private placements in the U.S. are scrutinized by the U.S. Securities and Exchange Commission to a sufficient degree to give corporations considerable pause for thought

as to the potential liability and transaction costs involved in the sale of such securities. In fact, most companies in the U.S. are rather conservative when it comes to the placement of new issues, and the start-up of a subsidiary company for the pursuit of activities in India is not culturally consistent with a conservative viewpoint. Second, even if a U.S.-based ESCO decided to float a private placement issue, the chances for its success are limited by the broad spectrum of readily available and comparatively much more liquid investment opportunities available in the United States. Third, even though the regulation regarding the investment and repatriation of profits have been relaxed, there is no demonstrated experience of ESCO operations in India.

8.3 TRADE ALLIES AS A SOURCE OF CAPITAL FOR ESCO PROJECT FINANCING

Equipment manufacturers and other trade allies involved in delivering goods or services to an energy services project (as a subcontractor to the ESCO) have the potential to become a significant source of financing for ESCO projects. In arranging project financing, ESCOs make available and rely upon a strong contract vehicle to rationalize investment costs, benefits and risks between all parties. It is logical to turn to trade allies as a potential source for a portion of the required project capital. The ESCO might even correlate the trade ally's remuneration (share of the savings stream) to some objective measure of performance, e.g., the heat transfer efficiency of a heat exchanger under base case conditions.

While trade allies cannot offer an unlimited supply of such capital, to the extent that a particular trade ally has good or even preferential access to capital, it may actually seek to provide part of the project financing required as a means of competitive differentiation, and/or to obtain potentially higher returns from their investment of risk capital in the project. (See also the "Trade Ally Memorandum of Understanding" in Appendix K. This document suggests

specific language whereby equipment manufacturers, consultants and other companies who add value to an energy services contract can be allowed to invest in the equity of that project.)

8.4 THE OVERSEAS PRIVATE INVESTMENT CORPORATION

The Overseas Private Investment Corporation (OPIC) is the key U.S. federal agency for encouraging mutually beneficial investment by American companies in developing nations. Currently, OPIC programs are available for new business enterprises or expansions in approximately 135 developing countries or areas around the world, including India. As a result of the economic reforms undertaken by the Indian Government, OPIC is showing renewed interest in making investments in India. As evidence of this interest, OPIC has organized a trade mission in India for January of 1993.

OPIC provides direct loans to small businesses and cooperatives; loan guarantees; insurance against certain political risks; and a variety of pre-investment programs. All are designed to reduce the stumbling blocks and risks associated with overseas investment. Projects or investments supported by OPIC must be financially sound, must promise significant social and economic benefits to the host country, and must not adversely impact U.S. employment. As a self-sustaining agency, OPIC has received no public funds beyond its original start-up appropriations, which have been returned to the U.S. Treasury. It has recorded a positive net income for every year of operation, with reserves currently standing in excess of $1.3 billion.

Previously, basic eligibility for all OPIC investments required government approval from the host country. Such approval amounted to a lien on the assets of the host country in the event of certain conditions of default. However, there is a growing trend on the part of developing

countries to eschew such agreements in order to avoid any possibility of increasing future indebtedness. Consequently, OPIC now appears to be considering provision of financing strictly on a project recourse basis.

OPIC's direct loans usually range from $500,000 to $6 million, and are available only for ventures sponsored by or significantly involving U.S. small business or cooperatives. The term "small business" currently applies to industrial companies with sales of less than $142 million, or non-industrial companies with stockholder's equity of less than $48 million. Interest rates generally parallel commercially available interest rates.

Under its loan guarantee program, OPIC will issue a guarantee wherein funding can be obtained from a variety of U.S. financial institutions to cover both commercial and/or political risk. Such guarantees typically range from $2 million to $25 million in size. Interest rates on guaranteed loans are comparable to those of other U.S. Government guaranteed issues for similar amounts and maturity. In addition, OPIC charges the borrower a guarantee fee averaging 2 percent, depending on a project's commercial and political risk. There is no restriction as to the size of a business which can qualify for the guaranty program. Repayment of both direct and guaranteed loans is normally made in equal, quarterly or semi-annual principal payments following a grace period. Maturities generally range from 5 to 12 years.

OPIC's financing for new ventures may extend to, but not exceed, 50 percent of the total project cost. Up to 75 percent of the project cost may be considered for the expansion of a successful, existing enterprise. Investors must be willing to establish a sound debt/equity relationship -- typically in a ratio of 60 percent debt to 40 percent equity.

OPIC recognizes that long-term investments in developing countries may be subject to political uncertainties. To alleviate these uncertainties, OPIC provide three kinds of insurance. Inconvertibility insurance covers investors against the inability to convert into U.S. dollars the local currency received as profits, earnings, or return on an investment. OPIC's insurance also protects against discriminatory exchange rates, but does not protect against devaluation of a country's currency. Expropriation coverage protects an investor against confiscation or nationalization of an investment without fair compensation. It also protects against "creeping expropriation," i.e., a set of actions whose cumulative effect is to deprive investors of their fundamental rights in the investment. However, it seems unlikely that investments in India would be subject to expropriation of any type. Finally, political violence coverage protects an investor against losses due to war (declared or not), revolution, insurrection, and civil strife. An investor may elect to cover loss of business income and/or loss of tangible assets resulting from damage caused by political violence. Since its inception, OPIC has settled 222 insurance claims totalling $470 million. It has denied less than 6 percent of the claims received. (See also Section 9.6.5 -- Bilateral Investment Agreements.)

8.5 INDIAN BANKS AND FINANCIAL INSTITUTIONS

8.5.1 Overview

A robust banking and financial system exists in India which is capable of meeting the debt capital requirements for ESCO project financings and working capital requirements of ESCOs. Of note, the long history of project financing in India by a variety of development banks, multilateral banks and financial institutions has resulted in the creation of a broad spectrum of

project financing instruments. If the project is financially sound, there is a way to get it financed in India.

8.5.2 Recent History of the Banking and Finance System

All major banks were nationalised in 1969, and since that time banking has been tightly controlled by Government. However, the banking sector is now on the threshold of a very significant restructuring process. The Narasimhan Committee, appointed by the Government to suggest financial sector reforms, has made far-reaching recommendations to improve the banking and financial sector. These recommendations have been accepted in principle by the Government and are in various stages of implementation. They include:

- Permission for banks to increase capital through public share offerings
- Reduction in Statutory Liquidity Ratios (SLR) and restrictions on its use as an instrument to finance the fiscal deficit; an increase in interest rate on SLR and Cash Reserve Ratio (CRR) to relate it to the cost of funds
- Removal of Government involvement in operations of banks, with the RBI to remain as the only governing body
- Streamlining of interest rate structure; removal of cross subsidization arising out of high interest rates for industry and low rates for farm and food sectors
- Abolition of branch licensing and policies on nationalisation of banks
- Permission to foreign banks to open branches provided they meet minimum capital requirements
- Permission to allow the formation of private banks in collaboration with foreign banks or as subsidiaries of foreign banks

8.5.3 Structure of the Banking and Finance System

The banking industry can be divided into two major categories: commercial banks and financial institutions. Commercial banks primarily meet the working capital requirements of industry and mobilise public deposits. Financial institutions, which are largely Government owned, provide long-term finance to business, including term financing, project financing, and leasing and hire purchase financing.

Commercial Banks

Commercial banks can be grouped into four subsegments, depending on ownership structure:

- Nationalized banks
- Private banks
- Co-operative banks
- Foreign banks

Nationalization of banks in 1969 resulted in the ownership of all the major banks by Government. Private banks have played a minor role since 1969. There are currently 15 private banks, operating mainly at the regional level. The recent programme of liberalisation of Government policies with respect to banking is expected to greatly accelerate the growth of the private banking sector and enable private banks to compete with the nationalised banks.

Many new foreign banks are expected to enter the market as the liberalisation programme continues. Currently there are at least 24 foreign banks operating in India. Their growth rates and profitability have exceeded that achieved by the other banks. Foreign banks have generally set the trend by offering the most sophisticated services and facilities. The Government has shown a willingness to allow more foreign banks to enter the market, and a number of branch licenses have recently been issued.

Financial Institutions

Financial institutions can be categorized as follows:

- Development banks
- Unit Trust of India
- State level finance corporations
- Insurance companies
- Private sector finance companies (including leasing companies)

Development banks were originally set up to provide term finance for private and public industry at concessional interest rates. With the reform of the banking system, the policy of the development banks to provide subsidized loans is also changing. The entire system is moving closer to a free market system. The development banks include the Industrial Development Bank of India (IDBI), the Industrial Credit and Investment Corporation of India (ICICI) and the Industrial Finance Corporation of India (IFCI).

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[redacted]

The IDBI is the apex financial institution established in 1964 for coordinating and assisting other institutions engaged in financing, and for providing credits and other facilities for the development of the country in line with national priorities. The IDBI has expressed its commitment to make available all of its services and capabilities to energy services companies seeking to obtain financing, either directly on a balance sheet basis, or indirectly via the arrangement of third party financing for the clients of energy services companies. The IDBI has made it equally clear that, consistent with the increasing emphasis on open market competition in the banking sector, it will not consider concessional interest rates for financing energy services projects. Such projects must stand on their own merit and access capital from the financial and capital markets at market rates.

In 1989, the Small Industries Development Bank of India (SIDBI) was established to serve as the principal financial institution for financing small industry. Over 18 percent of the IDBI's loan portfolio was transferred to SIDBI.

The ICICI was set up in 1955 with the assistance of the World Bank and the India Government. The ICICI undertakes medium and long-term lending, investing in equity, underwriting shares and debenture issues, guaranteeing loans, and providing managerial expertise to enterprises. The ICICI has made special efforts to assist new entrepreneurs and projects established in backward areas, and is an important source of foreign currency loans to private and joint sector enterprises in India.

The IFCI is the oldest institution, set up in 1948. Currently it is 50 percent owned by IDBI, with the balance owned by various nationalised banks, insurance companies and co-operative banks. Its primary role is to provide financial assistance to industrial projects in the country, particularly where normal banking accommodation is inappropriate or recourse to

standard capital issue methods impractical. The facilities and services provided by IFCI cover project financing, financial services and promotional services.

Project financing from the IFCI is available to industrial concerns for expansion, diversification, and modernisation programmes in the form of rupee loans, foreign currency loans, underwriting and direct subscription to shares/debentures, guarantees for deferred payments and foreign currency loans, etc. Financial services include:

- Merchant banking and allied services
- Equipment financing, leasing and purchase
- Equipment credit
- Supplier's credit
- Buyer's credit

8.6 LEASING

Third party leasing is an attractive option for smaller ESCO projects involving discrete capital equipment, e.g., efficient heat recovery boilers, chillers, large motors, etc. The reasons are as follows:

- a financing lease provides up to 100% of needed capital on an off-balance-sheet basis; because energy efficient equipment in India qualifies for a 100% depreciation write-off over the first year, this depreciation benefit (if retained by the leasing company, i.e., the lessor) enables the lessor to offer more attractive financing rates to the customer than otherwise obtainable; in contrast to the financing

lease, a hire/purchase lease allows customers to retain the depreciation; even though this impacts customer debt capacity and return on assets and equity, hire/purchase contracts may be more attractive to some customers than getting a lower interest rate via a financing type lease because they (hire/purchase contracts) provide the maximum tax shelter

- in general, even though there are many sources of financing open to smaller companies, smaller companies are less efficient, i.e., less capable of attracting outside capital even for worthy projects because: 1) they have less in-house financial expertise with which to pursue and arrange financings, b) many capital sources prefer larger transactions, and c) the financial stability of smaller companies is of greater concern to financial institutions who gauge the security of the loan or investment (in part) on the likelihood of potential recovery in the event of default or under performance. Consequently, for some asset-based transactions, leasing has been shown to be a fairly efficient source of financing for smaller companies because: a) the paperwork is high standardised, b) the methods of evaluating the transaction from a credit point of view and of recovering in the event of default are also well established, and c) the decision can be reached rather quickly. The ability to access leasing capital "efficiently" outweighs its comparatively higher cost for many smaller firms whose access to less costly forms of capital is "inefficient."

- lease financing instruments are commonly used and well understood in India.

The following example illustrates how lease financing can be used to implement the ESCO shared savings concept for energy retrofit projects in India:

LEASING EXAMPLE

Let us suppose that a small distillery solicits an ESCO to make an energy services proposal. The ESCO's energy audit shows that Rs. 1.0 crore/yr of combined thermal and

electrical savings can be achieved through the application of heat recovery equipment and more efficient boilers. The price to the customer for the energy services needed to create these savings is Rs. 3.0 crore. This includes Rs. 2.4 crore for the equipment itself, with the balance of Rs. 0.6 crore comprised of the costs of design, engineering, ongoing measurement and monitoring of energy savings, and a risk premium and a fair profit for the ESCO.

The ESCO then assists the distillery in obtaining a third party equipment lease to cover just the Rs. 2.4 crore cost of equipment. The present value equivalent of the Rs. 0.6 crore will be recovered by the ESCO in the form of a long-term service contract whose length will equal the term of the equipment lease. In effect, the ESCO will have made a Rs. 0.6 crore equity investment in the project by structuring its compensation on a deferred service contract basis. The service contract is executed between the ESCO and the client, whereas the lease agreement is executed between the client and the leasing company.

The technique of using a companion service contract to cover "soft" project costs is required because the leasing company must collateralize its own bank borrowings with its portfolio of equipment, and banks do not regard soft project costs as recoverable in the event of default by the customer. This approach is also beneficial because it keeps the recorded cost of the equipment to a minimum. Since equipment sales are taxed, minimizing the cost of the equipment provided via an energy services contract minimizes tax payments.

In our example, the ESCO has added significant value to the transaction. First, it effectively made an equity investment of 0.6 crore, or 20 percent of the present value of total lifetime project costs. The leasing company is pleased that compensation to the ESCO is performance-based over the life of the lease, i.e., the ESCO probably won't continue to get paid by the customer unless the customer remains satisfied with the ongoing services provided. Thus the ESCO will be highly motivated to perform the critical services needed to continue to generate energy savings over time.

At its option, the ESCO can add even greater value to the transaction in the form of a minimum guarantee of annual energy savings. While not eliminating other risk factors associated with the transaction, a minimum guarantee of energy savings is perceived as an additional layer of protection by the leasing company. It strengthens the transaction, allowing the leasing company to offer a lease it might not otherwise have been able to provide, or to make a lease available on better terms.

In our example, the ESCO would guarantee that actual energy savings would equal or exceed projected annual savings of Rs. 1.0 crore. If actual savings were less than that amount, the ESCO would pay any difference to the customer. In this way the ESCO would assume the entire performance risk on a direct basis, not just the risk represented by the possible loss of its effective 20 percent equity investment. In practice, if the customer is confident the proposed energy saving technologies will work, and if the economics of the project allow the term of the lease to be set so as to create an adequate safety margin between annual projected savings and lease costs, the customer may decide that a savings guarantee would not be worth the extra cost the ESCO would charge for its assumption of additional risk.

8.7 THE INDIAN CAPITAL MARKETS

While the financial institutions serve the role of providing long-term debt to corporations, and commercial banks provide working capital, equity and some debt instruments are provided on a public basis by India's stock markets. India has the oldest stock markets in Asia, with the first of 20 exchanges having been established in Bombay in 1875. Two-thirds of all trading is done on the Bombay exchange alone, which lists more than 4,000 stocks. On an average day, the Bombay exchange executes 70,000 trades over the allowed two hour trading period to give it one of the highest per hour trading intensities in the world. The other historically important exchanges include Calcutta, New Delhi, Ahmedabad and Madras.

One of the most exciting aspects of the current market liberalisation has been the significant increase in the activities of India's stock markets. Since the Indian Government now believes that foreign investment is better than foreign debt, its policy changes have fueled a veritable boom in the activities of India's capital markets. The Government has recently announced the deregulation of the Indian capital markets to overseas pension funds, enabling them to invest freely in Indian secondary markets. Combined with other policy changes, including the partial convertability of the Rupee, the markets have risen sharply in the expectation of a

substantial increase in foreign investment. Total market capitalisation is now in excess of Rs 1 trillion, accounting for some 20 percent of GNP as compared to just 5 percent ten years ago.

In order to provide a more investor-friendly trading environment, the Government established the Securities and Exchange Board of India (the SEBI), which has been in operation since 1988. Despite the existence of the SEBI, stock scandals have been a recurring phenomenon, with the most recent in April of 1991. Lehman Brothers, which had issued an optimistic report entitled: "The Brightest Tiger of Them All," issued a post-scam report entitled: "Where's the Tiger?" Nevertheless, the combined weight of the reforms have imparted considerable momentum to the capital markets, and it is expected that ESCOs wishing to raise equity by going public on the India exchanges will have ample opportunity to do so.

The requirements for going public are in India are extremely liberal. Although they will probably tighten in the near future, they are expected to remain quite liberal relative to the minimum requirements for going public on the major exchanges of the world. A recent diversification from the traditional stock markets has been the development of the Over the Counter Exchange of India (OTCEI). The OTCEI allows both small and new companies with only Rs 3 million (USD 100,000) to raise finance through public issues at low cost and without delay.

In interviews with executives of several major banks in India, the opinion was expressed that, provided a U.S. ESCO obtained a highly visible and major Indian firm as a joint venture partner, the likelihood of success in floating a new stock issue would be fairly high, even though the new company lacked a track record. This opinion reflects the general condition in the Indian capital markets of scarce supply of new issues and very strong pent-up demand by individual and

institutional investors. This pent-up demand reflects a high savings rate among the middle and upper classes of Indian society.

A typical capital structure for foreign investors wishing to set up subsidiaries in India involves the sale of 26 percent of the available stock to the foreign investor/sponsor, 25 percent to the local Indian partner, and the balance to the public and/or Indian financial institutions such as pension and mutual funds. This structure preserves the controlling interest of the foreign investor. The technology and know-how of the foreign investor can be listed as paid-in capital, and total transaction costs -- including advertising for the new issue and underwriting -- will range from 8 to 10 percent of the issue.

Banks serve in the role of underwriters, and for a major bank to be attracted to perform the service, it is recommended that not less than $1 million in shares be offered. Even this amount is low and presumes that the bank (underwriter) is interested in developing a long-term relationship and is pleased with all the relevant aspects of the business proposition, including business projections, marketing plan, and especially the selection of the local partner. (Note: Section 12 discusses the recommended requirements for structuring a Model ESCO. Several of the recommended requirements, including the use of a large and visible Indian joint venture partner, are specifically included in order to position the Model ESCO to go public on the India exchange within two years of operation.)

9.0 ESCO BUSINESS RISKS AND UNCERTAINTIES

9.0 ESCO BUSINESS RISKS AND UNCERTAINTIES

9.1 OVERVIEW

This section addresses the question of political stability, economic reform, and the labor climate in India, all with respect to the viability of establishing ESCOs in India on a profitable long-term basis and, in particular, attracting U.S.-based ESCOs to the Indian market. The section begins with a synopsis of the perceptions of U.S. ESCOs concerning the factors they consider important for doing business abroad, and a listing of their specific concerns about doing business in India. The balance of the section addresses those concerns and related topics in an effort to substitute fact for perception.

9.1.1 U.S. ESCOs Perceptions of Doing Business in India

In citing the factors that would need to be present in order for a US ESCO to seriously consider doing business in India, almost all of the ESCOs mentioned:

- The need for significant profit potential
- The existence of a large market
- The need for a stable government with a strong legal system
- A strong desire that the language of business be English
- Ease of currency exchange and minimum currency risk
- All relevant elements of the Indian business environment be conducive to financing projects on a stable and long-term basis.

Most U.S. ESCOs said that they had not considered doing business in India, but that they were interested in learning more about the opportunities to do so. Some expressed their belief that better opportunities existed in Central and Eastern Europe. Several said that they did not consider India to be an attractive environment because of the factors of extreme distance from the U.S., and higher than normal political and financial risk. Just one ESCO appeared to be aware of recent policies being pursued by the Indian Government towards major economic reform. This same ESCO felt that the large size of the Indian market, in combination with the existence of serious electric power capacity constraints and the trend towards economic and market liberalization make India an attractive market. The detailed results of the ESCO survey appear in Appendix B.

9.2 POLITICAL, ECONOMIC AND LABOUR CLIMATE

9.2.1 Form and Structure of the Indian Government

India has had a stable democracy since it became independent in 1947. Few developing countries can claim a similarly uninterrupted democratic system of government over the same 45 year period. Politically, India is organised as a Union of States, with a Central Government in New Delhi, the capital, and State Governments for each of 21 States.

India's constitution was greatly influenced by British and American ideals of democracy and freedom. It provides for the Executive, the Legislative and the Judicial branches of Government. The Executive comprises the President, the Vice President and the Council of Ministers. All executive powers are vested in the President of India; however, the President

exercises political functions only on the advice of the Council of Ministers, and acts as the constitutional head.

The Council of Ministers consists of elected representatives and is headed by the Prime Minister, who is the head of the majority party in Parliament. The Council of Ministers is collectively responsible to Parliament. The Union Legislature (Parliament) comprises two houses, the upper house (Rajya Sabha) and the Lower House (Lok Sabha). The functions of the Legislature include the provision of a Council of Ministers, securing information necessary for government, enacting legislation and exercising financial control.

The Judiciary consists of the Supreme Court of India, located at New Delhi, and High Courts located in each State. The judiciary is independent of the Executive and the Legislature. The Supreme Court is vested with powers to determine disputes between the Union and the States, or between States, and to enforce fundamental rights and act as the guardian of the Constitution. All Judges are appointed by the President of India. To maintain their independence, the Constitution provides that judges cannot be removed from office unless impeached by both houses of parliament. India's constitution remains strong, perhaps because it was internally developed rather than externally imposed.

9.3 THE INDIAN ECONOMY

9.3.1 Evolution of the Economic Reform Movement

India's current program of economic reform was initiated to confront a looming economic crisis. Large fiscal and balance of payments deficits had accumulated through the 1980's and had become unsustainable. These macroeconomic imbalances, in combination with the 1990 Gulf

crisis, rising inflation and eroding confidence among external creditors had pushed India to the brink of default. By June 1991, India's foreign exchange reserves had declined to about $1.2 billion, sufficient to cover just two weeks of imports.

Upon taking office in June 1991, Prime Minister Rao's government confronted a balance of payments crisis requiring an immediate infusion of hard currency to forestall default. The Indian economy also required broad reforms measures extending beyond stabilization to address underlying structural deficiencies. In response to these problems, the Indian Government undertook a series of steps to both address immediate economic difficulties and to lay the foundation for long-term, systemic reform. These measures focused on:

- Deficit Reduction -- achieved through cuts in discretionary spending and initiation of tax reform
- Trade and Investment Reform -- to inject greater efficiency and competition into India's highly protected economy, and
- Import Compression -- emergency regulations tightened licensing and financing restrictions for imports and resulted in a 24 percent drop in imports for FY 1991/92.

With considerable determination, in July, 1991, India launched a wide ranging program of economic liberalisation designed to make its economy competitive with the major free market economies of the world. While India is still a highly protected and regulated market, progress towards market liberalisation has been made. India's reforms have already created many new commercial opportunities for foreign firms, and the expectation is that such opportunities will continue to grow and expand.

While India has made real progress in moving towards a free market economy, major difficulties and challenges persist, including:

- Inflation -- ranging from 8.1 percent in 1989/90 to 13.5 percent in 1990/91; currently running around 12 percent
- Growth -- real GDP growth was 2 percent in 1991/92, down from 5.5 percent over the previous year; modest rebound expected in 1992/93 with growth of about 4 percent
- Debt -- currently at about $75 billion (24 percent of GDP) and expected to reach $95 billion by 1995/96
- Balance of Payments -- foreign exchange reserves remain tight, with annual requirements for $3-4 billion in additional borrowing and a debt service ratio of 30 percent; about 27 percent of the government budget is used to cover interest on the national debt; exports must increase 13 percent annually in real terms to cover the interest on India's debt
- Trade -- exports to the former Soviet Union and Eastern Europe, previously 20 percent of Indian exports, have declined by 40-50 percent; improvement in India's trade account during FY 1991/92 was solely the result of severe import compression (24 percent decline in imports during 1991/92)
- Infrastructure -- power shortages, overburdened transport systems and a weak telecommunications network hamper industrial performance and will require substantial financial resources to enable India to create an internationally competitive economy, and
- Public Sector Industries -- inefficient state-owned firms remain a major drain on scarce financial resources.

In spite of these challenges, during the year following implementation of its new industrial policy (also in July 1991), approvals of foreign investment totalled approximately $643 million

compared with just $87 million over the previous year. American firms accounted for approximately 30 percent of investment last year.

9.3.2 Specific Reforms Impacting the Investment Climate for Foreign Firms

The new Industrial Policy has eased or eliminated many of the restrictions which have historically limited foreign investment in India. Specific changes of relevance are as follows:

- Easing of Equity Restrictions -- the foreign equity ceiling for corporations in India has been raised from 40 to 51 percent for most firms, with higher levels permitted for certain critical industries (including power production)

- Streamlining of the Investment Approval Process -- in the past, a foreign firm wishing to take part in an equity investment or participate in a technology transfer went through a slow and cumbersome approval process; this approval process has since been radically streamlined, with any one of three channels available for gaining Government approval:

  - Reserve Bank of India (RBI) -- investment proposals in any one of 34 high priority sectors (which includes energy) are automatically approved by the RBI if the equity investment is no more than 51 percent, and if the amount of the foreign equity investment is enough to cover the foreign exchange requirement needed to purchase foreign goods connected with the investment; prospective investors submit a 17 page application directly to the RBI; the RBI assess applications solely on the basis of whether or not they meet criteria for automatic approval; automatic approval generally occurs in less than two weeks and sometimes one week

  - Special Empowered Committee for Rapid Review of Small Investment Projects -- proposals for foreign investment proposals that do not meet the automatic approval guidelines of the RBI and that involve less than Rs. 3 billion ($100 million) will be reviewed by this committee; membership of the committee will include the Principle Secretary to the

Prime Minister, the cabinet Secretary, the Finance Secretary, and the Secretary of Industrial Development; this committee is expected to meet every two weeks

- Foreign Investment Promotion Board -- for foreign investment proposals which do not meet the RBI's criteria or else exceed Rs. 3 billion in value, a four member Foreign Investment Promotion Board, within the office of the Prime Minister, has been established to: 1) expedite approval of investments which do not meet other criteria but are considered priorities of the government, 2) actively solicit investment by multinationals, and 3) periodically review implementation of the approval process of projects which have been granted government clearance; projects approved by this committee are subject to ratification by the Cabinet Committee on Economic Affairs

- Elimination of Export Performance Requirements -- under the previous investment regime, the Indian Government required investors to make commitments to export a substantial percentage of their production as a criterion for approval of investment; this export requirement has been eliminated

- Elimination of Local Content Requirements -- the requirement for foreign investors to procure ever increasing volumes of indigenous manufacturing inputs has been eliminated

- Facilitation of Technology Licensing Agreements -- previously, all technology transfer agreements involving foreign firms required prior Indian Government approval and placed limits on lump-sum payment and royalty payments, as well as length of the agreement and eligibility for renewal; under the new policy, foreign technology agreements are granted automatic approval in high priority sectors (energy is included) of up to Rs 10 million ($333,000)

- Repatriation of Dividends -- In June of 1992, the Indian Government eliminated the requirement that dividend remittances be balanced by export earnings

- Exchange Controls -- liberalisation of exchange rate policies has led to a partial convertability of the rupee based on a two-tier exchange rate -- hard

currency earners can now sell 60 percent of their earnings to currency traders at market-determined rates (or hold 15 percent in hard currency accounts and sell 45 percent), with the remaining 40 percent is sold to the RBI at official rates. This new exchange mechanism has largely replaced the import licensing system for controlling imports. If Indian firms can earn hard currency from exports or can afford to purchase it on the open market, they are free to import most non-consumer goods. The Indian Government has indicated its intention to shift to full convertability, perhaps as early as the end of 1992

- Impending Changes to the Corporate Tax Code -- it is expected that the corporate tax rate for domestic companies will be lowered to 45 percent from its present level of 51.75 percent by abolition of the income tax surcharge; a further reduction to a level of 40 percent is expected by 1994/95

- Curtailment of Import Licensing Requirements -- India's comprehensive and complex import licensing system has been drastically reduced; under the new system most goods are freely importable and no longer require import licenses; some items remain on a "negative list", such items require an import license but are then importable at market exchange rates; computers valued at less than Rs 600,000 ($20,000) are still on the negative list, and

- Import Duties -- until the reforms took place, India maintained some of the world's highest import duties, averaging 120 percent (and in some cases exceeding 300 percent); See Appendix F for a complete listing of import duties for energy related equipment; in general, import duties are still high, but the Government expects to bring them in line with developing country averages within 3 to 4 years by making up the lost revenue through the greater use of excise and income taxes (only an estimated 2 to 5 percent of India's population pay personal income tax).

9.4 POLITICAL STABILITY IN INDIA

India is embarking on an effective plan to transition from a tightly regulated and State controlled economy to a free market economy. Indeed, of the developing countries now implementing various policies designed to improve their overall efficiency and competitiveness in the free world economy, India stands out as a leader. Nevertheless, recent ethnic strife has deflected some of the attention of the Indian Government away from the implementation of its sweeping economic reforms. The question remains as to how long the Government will be enmeshed in the intricate process of dealing with this ethnic strife, and what affect this may have on the schedule for implementing economic reforms. Continued implementation of reforms is central to the preservation and continued development (of a positive perception) by foreign companies that attractive long-term opportunities to invest and operate in the Indian market do indeed exist.

Some observations on the current perception of foreign investors of the political situation in India may be appropriate. In a recent front page article of the Wall Street Journal, one senior executive of an American multinational in New Delhi was quoted as saying: "... it worries us that a political turn of events may slow down the liberalisation efforts because the government devotes its efforts to something ephemeral and hard to fathom, like Ayodhya" [15 Dec., 1992]. In the same article, another foreign investor expressed concern that after the Ayodhya riots, the Government may be aligning itself with left-wing parties that oppose foreign investment.

Provided the Government manages to continue on its path of economic reform, it seems unlikely that any strongly negative perceptions by foreign companies would persist. It is worth noting that both the ruling party under Prime Minister Rao's ruling Congress Party and the Bharatiya Janta Party (BJP) opposition party support the program of economic reform. While

the BJP appears to have tried to exploit the ethnic conflict to unseat Prime Minister Rao, economic reform is likely to be a focus of Government activity irrespective of which party is in power. In addition to the coherence of the internal call for economic change, worldwide macro economic pressure to become more market oriented following the collapse of the USSR seems to argue for a continuance of economic reform and the strong likelihood of political stability over the long term.

9.5 WORKING IN INDIA

9.5.1 Large and Talented Labour Pool

India has the world's third largest pool of scientific and technical personnel. Most managerial and technical personnel speak English, the common language of business in India, and many have travelled to the U.S. to study or work. These attributes are significant advantages for any foreign company contemplating investment and operations in India. However, despite relatively low wage rates in India, some foreign companies have found the ratio of total labour costs to the production cost of operations is not significantly different than that for operations in higher wage countries. Productivity varies according to the industry.

9.5.2 Problematic Communications and Logistics

Communications and transportation can be both frustrating and problematic in India. While India is linked to most other countries via telephone and telex, the communications system is overtaxed and unreliable. Indian Airlines and Air India provide domestic and international service. Recent opening of the air transportation network to air taxi service has expanded

domestic travel options. Air travel in India is not at par with international standards. India is served by many foreign airlines, including Delta, British Airways, and Singapore Airlines. However, these airlines are not allowed to provide domestic service.

9.5.3 Restrictions on Employment of Foreign Technicians Eased

The July 1991 industrial policy provides for hiring of foreign technical personnel without prior approval. In September of 1992, the Reserve bank announced an increase in the remittable per-diem rate for services of foreign technicians provided by a foreign firm. Technical personnel can now remit up to 75 percent of their monthly net income through authorized currency exchange dealers. Total duration of employment of a foreign technician by any firm is up to 12 man-months per calendar year, with the period of employment of a single technician limited to three months at a time. Employment in excess of three months requires clearance by the Ministry of home Affairs.

9.5.4 Plant Location Requirements Simplified

India has a fairly liberal plant location policy. No approval is required from the Central Government to set up plants in any location other than cities of more than one million in population. In such cities, non-polluting factories may be established outside a 25 kilometer radius. Environmental regulations and local government zoning policies also affect plant location. There is no requirement to employ host country nationals, and previous restrictions on employment of foreign technicians or managers have been eliminated.

9.5.5 Worker's Rights and Related Legislation

Worker's rights are guaranteed under the Indian Constitution. Workers may form or join unions of their choice. Most trade unions are linked to political parties. Politicization of labour has been a problem for domestic and foreign firms in the past, and could continue to pose problems in the future. However, with respect to energy services companies (which would not normally be engaged in manufacturing) such difficulties are unlikely to be an issue.

India has enacted comprehensive legislation governing the employment of labour. This legislation is complex, often failing to protect workers while simultaneously reducing management ability to respond to rapidly changing market conditions. The Government is trying to develop a new labour policy but faces stiff opposition from labour unions and leftist political parties. Anticipated approaches to the problem include making training available in association with redeployment of the labour force to newer and more vital industries, as well as the establishment of a social security network to provide financial support to displaced labour.

Key labour laws currently include the following:

- The Factories Act -- provides for the regulation of working conditions in factories; prescribes minimum standards for working conditions and facilities in relation to handling and storage of materials, discharge of effluent, fire precautions, working hours and other matters.
- The Minimum Wages Act -- empowers the Government to set minimum wages in notified industries
- The payment of Bonus Act -- specifies compulsory payment of bonus to certain categories of workers whose wages do not exceed Rs 2,500 per month; maximum bonus payable under the act is Rs 3,840 per year

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- The Payment of Gratuity Act -- entitles certain categories of workers to receive gratuity from the employer on termination of service; applies to workers whose wages do not exceed Rs 2,500 per month

- The Employees' Provident Fund Act -- requires the maintenance of an employees' provident fund for workers whose wages do not exceed Rs 3,500 per month in certain industries and establishments; the employer and employee are required to make matching contributions of 8.33 percent to 10 percent of the employee's salary to the fund

- The Employees' State Insurance Act -- provides security to workers in the event of sickness, maternity and employment related injuries; applies to certain categories of workers whose wages do not exceed Rs 1,600 per month; requires the employer to contribute an amount equal to 5 percent of the worker's wages to the insurance fund

- Shops and Establishments Act -- has been enacted by several States; regulates working hours, prescribes minimum standards of working conditions and provides for overtime and leave salary payments to workers in certain categories of shops and other establishments, and

- The Industrial Disputes Act -- regulates industrial relations; provides for the just and equitable settlement of disputes through negotiation, conciliation, arbitration or adjudication

9.6 THE LEGAL SYSTEM

9.6.1 Settlement of Disputes

The India court system provides adequate safeguards to protect property and contractual rights. However, India is not a member of the International Center for the Settlement of Investment Disputes nor of the New York Convention of 1955 on the Recognition and Enforcement of Foreign Arbitration Awards.

9.6.2 Expropriation and Conversion of Loans into Equity Share Capital

Since the wave of nationalizations and expropriations in the early 1970's, there have been few instances of direct expropriation in India. Compensation and due process have been observed in all cases. Present Government efforts to improve the investment climate in India argue strongly against the likelihood of future expropriation or nationalisation.

The various financial institutions granting loans to industry typically maintain a provision in their loan agreement which is known as the "convertability clause". This clause allows the financial institutions an option to convert their loan into equity share capital of the borrower company. Exercise of the convertability clause in loan agreements with Government institutions has resulted in increases in public ownership of private firms, an indirect form of expropriation. However, this has not affected U.S. investors, and it has not been widely employed. The Government continues to debate the advisability of retaining the clause at all, and it is possible that this feature of the banking system will be eradicated as part of the continuing wave of economic reform and privatization.

9.6.3 Protection of Intellectual Property Rights

India's legal system offers rigorous protection for acquisition and disposition of all intellectual property rights except product patents for chemicals, pharmaceuticals and food products. Nevertheless, weak enforcement of copyright law, unclear statutes on use of foreign trademarks, and lack of product patent protection led the U.S. Government to initiate an investigation of India's intellectual property practices in may of 1991, under the Special 301 provision of the 1988 Trade Act. In April of 1992, the investigation found progress in all areas except patent protection. As a result, the U.S. withdrew duty free import rights under the

generalised system of preferences for Indian pharmaceutical and chemical products. India remains a priority country under Special 301. India is not a member of the Paris Convention having to do with patent protection.

In 1992, the Indian Government took steps to improve copyright enforcement by establishing a copyright enforcement advisory council to coordinate state government policies, provide training to local enforcement officials and compile nationwide data on copyright offenses. The Government expects to introduce new trademark legislation in early 1993, intended to codify in the statutes existing court decisions on use and protection of foreign trademarks, including service marks. Pending the new legislation, the Government has issued regulations permitting registration of foreign trademarks and eliminating the requirement for hybridization of foreign trademarks with local marks.

9.6.5 Bilateral Investment Agreements

India's only bilateral investment agreement is with the U.S. Overseas Private Investment Corporation (OPIC). Since 1963, OPIC has provided coverage for over 100 U.S. investment projects in India. As the Government steps up efforts to attract foreign investment, OPIC activity is expected to increase. In recognition of this fact, OPIC is organising an investment trade mission to India for January 1993. In April 1992, India became the 113th country to join the World Bank's Multilateral Guarantee Agency. (See Section 8.4 for details of funding available through OPIC.)

10.0 ESCO RELATIONSHIPS WITH OTHER ORGANISATIONS

10.0 ESCO RELATIONSHIPS WITH OTHER ORGANISATIONS

10.1 POTENTIAL ROLES OF STATE ELECTRICITY BOARDS

10.1.1 Introduction

Energy service companies can offer a wide range of services to industrial, commercial, and institutional customers related to the implementation of energy efficiency and load reduction options. The implementation of such options can often be accomplished at costs substantially less than those for constructing new energy facilities. The information gathered during this project from studies of energy efficiency potential in India, interviews with energy auditing, consulting, and engineering firms in India, and discussions with manufacturers of energy efficient equipment, indicates that significant opportunities for improvement in energy efficiency exist in the major consuming sectors. ESCOs can facilitate the installation of energy efficient products, technologies, and equipment, thereby reducing the need for new energy and power. ESCOs, therefore, offer significant benefits to the State Electricity Boards (SEBs) in terms of reduced needs for capital for constructing future power generation facilities. In addition, ESCOs can provide value added service to utility customers that will improve the relationships between the customers and the SEBs.

To take advantage of some of the potential benefits offered by ESCOs, the SEBs should be interested in encouraging the development of an ESCO industry in India, and in cooperating with ESCOs to implement energy efficiency options. The potential roles for SEBs to facilitate and encourage the establishment of ESCOs in India may include the following:

- Assist ESCOs by facilitating relationships between ESCOs and customers
- Employ ESCOs as service agents of the SEB
- Contract with ESCOs for the delivery of specific service needs of the customer
- Engage in performance contracting with ESCOs for the accomplishment of certain demand-side objectives
- Acquire demand-side resources from ESCOs through bidding or performance contracting
- Establish joint venture with ESCOs to participate as a partner in ESCO activities, and
- Establish SEB subsidiaries to operate as ESCOs.

In the United States, utilities have used one or more of the above approaches to encourage and facilitate the operation of ESCOs. However, in India, the concept of ESCOs is very new and no full-service ESCOs are currently operating. Therefore, the concept of cooperative activities between utilities and ESCOs has not been given much consideration by the SEBs.

During this project, the project team interviewed executives of four SEBs to explore their awareness and interest in the concept of ESCOs, and their possible involvement in encouraging the establishment and operation of ESCOs within their jurisdictions. The interviews confirmed the fact that the concept of ESCOs is fairly new and that significant changes in the business philosophy, mission, and perspectives will have to occur before SEBs will actively participate as ESCOs or establish joint ventures with ESCOs. Nevertheless, there is a recognition on the part of the SEB executives of the need and potential for energy efficiency improvement and the possible roles that ESCOs may play in achieving some of this potential. There is also a willingness to consider cooperative activities between the SEBs and ESCOs, to the extent that such activities might benefit both parties.

A key barrier to the participation of SEBs in ESCO activities is the embedded culture and philosophy of utility operating personnel. Generally, utility management views their business as one of building power plants and supplying electricity. The transition from this perspective to that of satisfying customer needs and cooperating with the customer to implement demand-side options may take a long time, as it has with U.S. utilities. However, in view of the energy supply/demand situation in India, it is anticipated that, as ESCOs are established and start operating in India, the SEBs are likely to see the benefits of cooperating with them and may be more willing to consider the types of roles identified herein as appropriate for them to encourage the establishment and operation of ESCOs in their service areas.

We have provided below a brief discussion of each of the potential roles identified above for SEBs.

10.1.2 Assist ESCO Operation by Facilitating Interaction Between ESCOs and Customers

Some of the key elements leading to successful ESCO operation include the ESCO's ability to identify appropriate customers for installation of energy efficient technologies, products, and equipment, and to establish credibility with the customer in order to negotiate the appropriate contractual relationships. The SEBs can provide assistance to facilitate contacts between ESCOs and customers. For example, the SEB may introduce an ESCO to their customers and provide information on the types of services that the ESCO offers. Alternatively, the SEB may pre-qualify one or more ESCOs based on their capabilities and experience, and assist the customer in selecting the best ESCO for its needs. Also, the SEB may provide the information to the ESCO regarding customers who might benefit from the installation of the energy efficient options.

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In all these cases, the SEB will be acting as an advisor to the customer and will take actions only in the best interest of the customer.

10.1.3 ESCO as an Agent of the Utility

The SEBs may benefit significantly from providing information to its customers regarding energy efficient technologies and providing technical assistance in the implementation of such technologies. In such situations, an option for the SEB is to employ the ESCO as an agent of the utility to provide these services. Since the ESCO specialises in knowledge, understanding, and experience with energy-efficient technologies, the ESCO can be hired as a service agent by the SEB to provide a wide range of services to the customer. The benefit of such an arrangement to the SEB is that it can provide information and technical assistance to the customer in an efficient and cost-effective manner, without having to resort to staff additions or a significant amount of training of its own staff.

10.1.4 Contracting with ESCOs for the Provision of Specific Implementation Services

In many cases, it may be in the best interests of the SEB to provide assistance to the customer by installing energy management systems, load control devices, power factor controllers, or energy-efficient options in order to modify customer loads. Many U.S. utilities have found that such demand-side management activities can provide significant short-term and long-term benefits to utilities. The SEB may employ one or more ESCOs as implementation agents to provide such specific installation services. Again, the advantage to the SEB of this approach would be that implementation services would be provided efficiently and cost effectively, without expanding the SEB's own staff or having to provide extensive training to its existing staff.

10.1.5 Performance Contracting with ESCOs

The options identified above involve the ESCO acting as an agent of the utility and being paid for the services provided. An alternative approach for the SEB is to sign performance contracts with the ESCO in which the ESCO will be paid for certain delivered results. For example, the SEB might pay the ESCO a certain amount per kW reduced, because reduction in kW demand will mean a reduction in the need for new generation capacity for the SEB.

10.1.6 Acquire Demand-Side Resources through Competitive Bidding or Performance Contracting

SEBs in India are currently acquiring supply-side resources from independent power producers who will invest their own money in building power plants. A similar approach could be used with ESCOs to acquire demand-side resources through bidding or performance contracting. In a bidding approach, the SEB may issue a competitive solicitation for ESCOs to reduce demand or energy consumption with payments being made upon demonstrated performance. Such "acquisition of demand-side resources" can be conducted in a least-cost planning framework in which the supply-side and demand-side resources are allowed to compete against each other. Use of competetive bidding of this kind in the U.S. has demonstrated that significant demand-side resources can be acquired at costs substantially below those for supply-side resources. Since the payments to the ESCO are based on demonstrated performance, the risk to the SEB will be minimal and contractual provisions can be developed to assure that the demand-side resources are indeed reliable.

An alternative to the competitive bidding approach is to use negotiated performance contracts with ESCOs. In this approach, the SEB can work with one or more ESCOs to achieve

pre-specified installation of measures and devices, and to obtain the maximum levels of demand and energy reduction with specified payments tied to each type of measure or option. The advantage of the negotiated contracting approach over the competitive bidding approach is the avoidance of "cream skimming" (which refers to the situation where the ESCO installs only certain low-cost options and ignores other cost-effective options which are much more expensive to implement later on).

10.1.7 Establishment of a Joint Venture with ESCOs

Another option available to the SEB is to establish a joint venture with an ESCO for the provision of a wide range of demand-side services. Such a joint venture may benefit the ESCO, the SEB, and the customers. The ESCO may benefit from this joint venture by reducing its marketing and operating costs, and by facilitating the establishment of a relationship with the customer. The SEB may benefit in terms of the increased potential for revenues and profits, as well as the potential for improved customer relations and customer service. The customer may benefit from more cost-effective provision of energy services.

10.1.8 Establishment of Subsidiary Operations to Provide ESCO Services

Finally, the SEB may actually decide to become an ESCO itself and may establish a subsidiary to act as an ESCO with its customers. Several U.S. utilties have established or are considering establishment of ESCO subsidiaries to provide a range of demand-side services to the customers and to increase the potential revenues and profits.

10.1.9 Concluding Remarks

This section has identified progressively more active roles for the SEBs relative to the establishment and operation of ESCOs in their jurisdictions. While it is unlikely that within the next year or two any SEB in India would go to the extent of establishing joint ventures or subsidiaries for ESCO operation, we believe that it is likely that, as the ESCO industry is established in India and demonstrates the benefits of the implementation of energy-efficiency options, the SEBs may consider progressively more active roles with respect to ESCOs. To foster such cooperative activities, it is important that the initial ESCOs that are established in India take a cooperative attitude with respect to working with SEBs and that the SEB management gets educated on the potential benefits of ESCOs and the possible roles that they can adopt in ecouraging the establishment and operation of ESCOs in their jurisdictions.

10.2 RELATIONSHIP OF ESCOS TO INDEPENDENT POWER PRODUCERS

In the last several years, there has been significant activity in India to promote the establishment of independent power producers (IPPs) that will invest in the development of new power generation facilities. These IPPs will sell power generated from their facilities to utilities. Therefore, at first glance, it would appear that ESCOs will compete with the IPPs, since ESCOs will provide demand-side resources, while IPPs may provide supply-side resources. However, there might be opportunities for cooperation between ESCOs and IPPs in the future.

A key element for the successful operation of the ESCOs is the availability of low-cost financing for the implementation of energy-efficient products, technologies, and equipment. IPPs may provide a source of such low-cost capital. Some IPPs may also be investing in cogeneration

systems to provide on-site power to the industrial customer or to the local utility. In U.S. cogeneration applications, it has been shown that the successful design of cogeneration facilities involves careful attention to energy efficiency options within the facility. Therefore, there might be a need for IPPs to cooperate with ESCOs in developing the optimum energy system for a particular industrial plant.

If the SEBs adopt least-cost planning principles and start soliciting competitive bids for supply and demand-side resources, it may make sense for IPPs and ESCOs to cooperate in developing the best combination of demand and supply-side resources to be offered to the SEB under these competitive solicitations. For these reasons, it may be of interest for ESCOs and IPPs to cooperate and possibly develop joint ventures for supplying resources to the SEBs.

11.0 ESCO OPERATIONS AND CONTRACTS

11.0 ESCO OPERATIONS AND CONTRACTS

11.1 OVERVIEW

This section examines the important elements involved in the operation of an ESCO from an ESCOs point of view. The basic concepts surrounding the use and rationale for so-called "shared savings" contracts are defined. With these concepts established, a typical sales cycle is reviewed, followed by an evaluation of the comparative risks and rewards of ESCO contracting to the principal parties involved, including: customers, ESCOs, utilities, market intermediaries, and society in general. (Detailed descriptions of how shared savings contracts work are referenced as an Appendix, together with three sample ESCO contracts.)

11.2 ENERGY SERVICE COMPANY OPERATIONS

11.2.1 The Simple Appeal of Shared Savings

The concept of Shared Savings is simple but very powerful: a customer agrees to pay for a given *result*, in this case energy savings, rather than for products or services which, while they *might* logically lead to the same result, could still fall short of maximizing the likelihood of the desired outcome. ESCOs assume significant risks in linking their compensation directly to results. Such risk creates the highest possible motivation to get the job done.

Shared Savings Contracting of any type is most appealing when the outcome of a particular project is very important, when the path to achieving a given outcome is complex and difficult to evaluate, and when the costs of the effort and associated risks are high. When procuring and implementing energy efficiency resources pose the kind of challenges just described, as they

increasingly do, Shared Savings offers superior benefits to customers, utilities, market intermediaries, and society.

11.2.2 A Definition of Shared Savings Contracting

As applied to energy efficiency, Shared Savings Contracting is defined by the following key attributes:

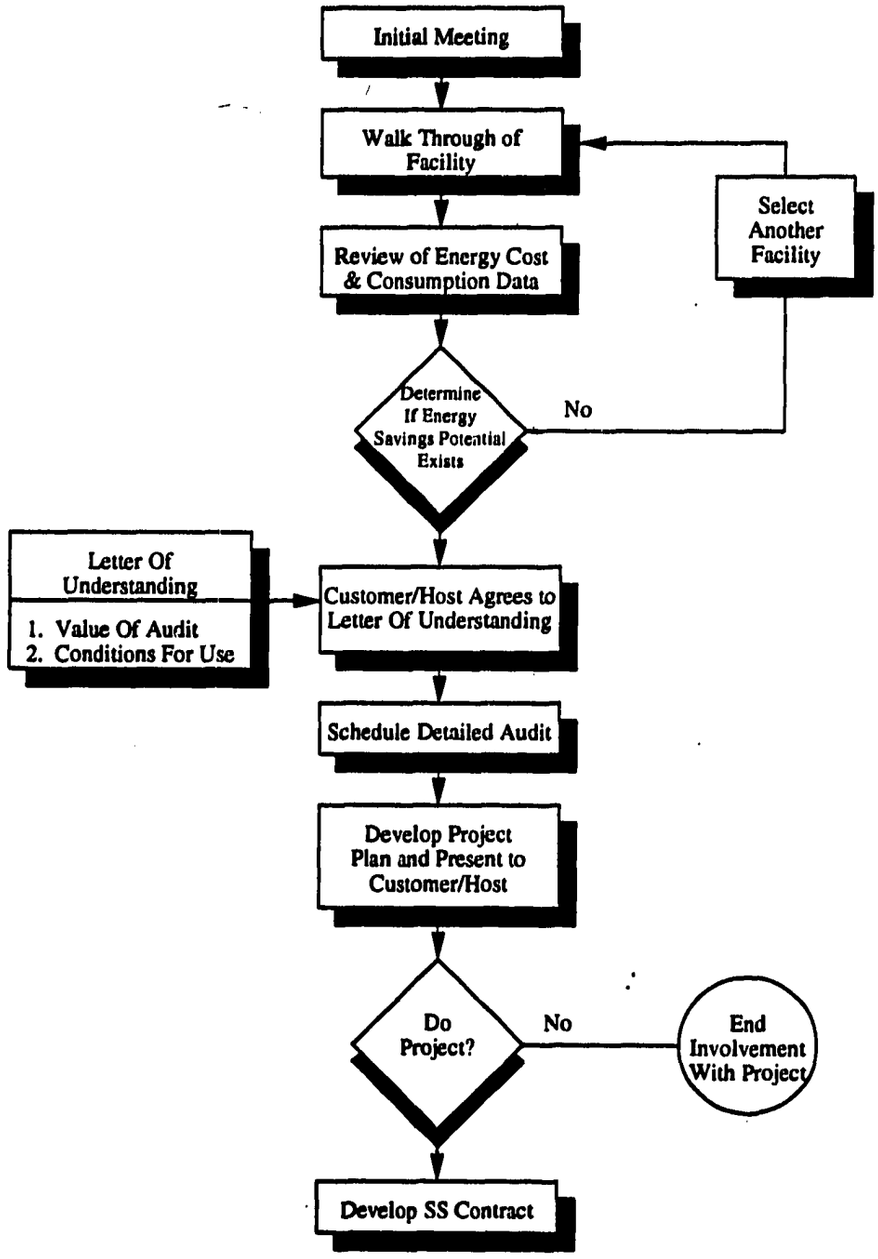
- Shared Savings Contracting offers a complete energy service, including marketing, design, build, finance, and maintenance of the energy management technology
- Shared Savings Contractors offer financing, especially shared savings contracts, where customers pay for energy services from a portion of actual energy savings for a negotiated term
- Shared Savings Contractors get paid based on measured results
- Most of the technical, financial, and maintenance risk is held by the Shared Savings Contractor.

11.2.3 The Typical Sales and Implementation Process for a Shared Savings Based Project

Figure 11-1 illustrates a typical sequence of events as an ESCO pursues the sale and implementation of a total energy retrofit project using a shared savings contract approach. Following initial prospecting efforts, the first meeting takes place with a facility owner or manager. The concepts of Shared Savings Contracting and shared savings are explained, and a request is made to the owner to allow a preliminary walk-through audit of the facility, generally on the same day or soon thereafter. If the energy auditor is very experienced, the walk-through

Figure 11-1

FIRST STAGE OF IMPLEMENTATION



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can provide a good indication of technical feasibility. Of equal importance, the walk-through audit focuses the attention of the facility owner on the process and potential benefits of procuring energy services from a third party Performance Contractor.

As soon as possible, energy consumption data for the facility is obtained, preferably covering three or more years to make energy use and cost trends easier to identify. Combined with data from the initial walk-through, it is possible at that point in time to determine if sufficient energy savings potential exists to warrant a recommendation to proceed with analysis of project feasibility.

The next step in the sequence is to make sure the facility owner is fully aware of his responsibilities under a shared savings contract, and to confirm the expectation of all parties that if one or more sufficiently attractive projects exist, a contract will be negotiated in good faith. Transaction costs are high for Shared Savings Contracting due to the extended decision making process of the owner, expensive legal work surrounding the negotiation of a shared savings contract, the need for credit analysis and credit enhancement, and other factors. As a result, Shared Savings Contractors prefer individual projects of at least $200,000 (Rs 60 lakhs) in size. The larger the better. This is the reason why Shared Savings Contracting is used for the commercial and industrial markets, but not the residential market.

Following the flow diagram (Figure 11-1), Shared Savings Contractors typically ask the owner to sign a non-binding Letter of Intent which states that should the detailed study confirm the existence of cost-effective projects, the owner will enter into a shared-savings contract (or provide his own financing) and proceed with the project. In the event the owner does not want to move forward following submission of the detailed study, his only obligation is to pay for the study. Even though the letter of intent is non-binding, experience shows that its use motivates

the owner's organization to get serious about completing the internal analysis needed to arrive at a decision. From an opportunity cost standpoint, it is better to confirm that the owner's interest is strong before the detailed study is done.

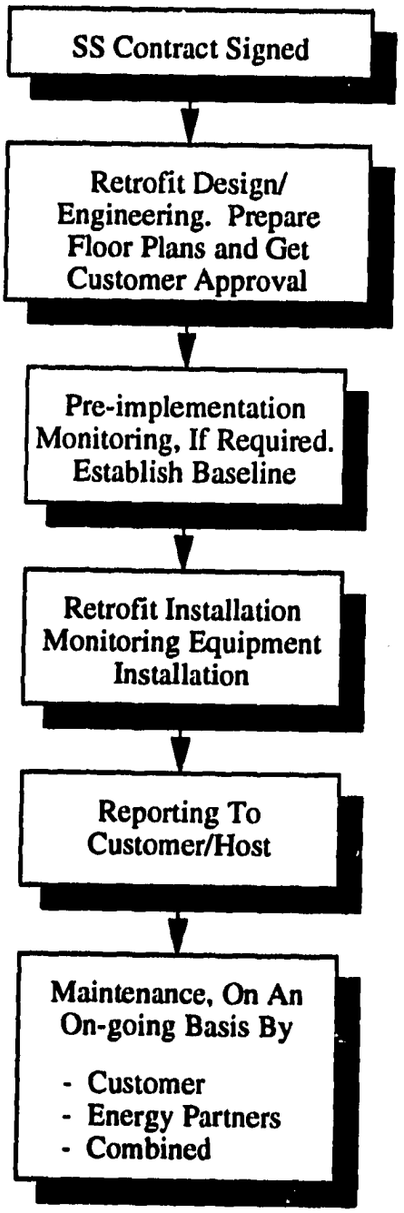
The rest of the steps in Figure 11-1 detail further technical milestones and motivation checkpoints leading up to finalization of a shared savings contract. Although shared savings contracts have become easier to understand over the years, they are still complex instruments requiring lengthy owner review and negotiation. It is likely that neither an owner, nor his legal or tax counsel, will ever have seen a shared savings contract before. This lack of common familiarity with the contract structure adds to the time needed for review and negotiations. One fact is certain: it is essential that both the owner and the Shared Savings Contractor enter into such negotiations in a spirit of good faith. If the solicitors on either side of the table start leading the negotiation process, the costs to executive a shared savings contract escalate dramatically, while the overall goal — collaborative pursuit of energy and cost savings by both parties — suffers sharply. Figure 11-2 details events following the signing of the shared savings contract.

11.3 THE ECONOMICS OF SHARED SAVINGS CONTRACTS

The financial underpinnings of a shared savings contract can be intimidating to owners who are used to looking at projects with simple features and straightforward pricing. Non-economic impacts on building operations such as occupant comfort and safety and other similar factors included in the services provided by Performance Contractors, add to the complexity of assessing whether a proposed deal is fair or not. Performance Contractors can make a profit on any or all of the following:

Figure 11-2

SECOND STAGE OF IMPLEMENTATION



- Mark-up on equipment and materials
- Mark-up on labor (direct and indirect)
- Share of savings
- Maintenance contracts and fees
- Financing.

The economics of a typical shared savings project are presented in Appendix G in the form of a Tutorial. The purpose of the tutorial is to provide a financial overview of the shared savings contract as used by ESCOs to structure project financings. The approach taken in the tutorial is to provide and explain a realistic set of financial assumptions for a "sample project", and then to perform cash flow analysis to see how the economics of the project work. The different financial perspectives of the ESCO and the customer are also explored.

One can quickly see that changing almost <u>any</u> variable in the calculations will have a profound impact on the value of the shared savings contract to both the ESCO and the customer. It should also be noted that the project shown in the tutorial is a somewhat simplified example. Projections of increases or decreases in annual energy costs are not made. Excluded from the calculations is the impact of actual timing of cash flows, which usually occur on a quarterly or monthly basis as opposed to annually. The effect of tax benefits arising from depreciation and the deductibility of interest on the debt is also not considered. Finally, the fact that most ESCO's could fund such a project using a leveraged lease approach versus a combination of debt and equity (as shown) points to the importance of defining all assumptions carefully in any attempt to characterize "typical" ESCO operations.

11.3.1 What Risks are assumed by ESCOs?

While construction costs and future maintenance and monitoring costs are so-called hard costs (if included as part of the ESCOs total package of services), projected income is generally a function of measured energy savings.[1] If the ESCO is wrong and overestimates energy savings, the project will lose money. But the ESCO is locked into doing its best to make the project perform, otherwise its loss only grows worse. On the other hand, if savings were underestimated, the ESCO may earn a higher profit, but this profit is shared with the customer on a shared savings basis.

The ESCO has additional risks as well. Some ESCO's provide a minimum performance guarantee, stating that in the event actual energy savings fall below a given amount (for example, 75% of projected savings), the ESCO will pay the difference lost to the customer below the 75% threshold. Such a minimum guarantee presents a double indemnity situation.

One of the most important risk areas relates to customer behavior. What happens if, in a few years, a new president is named who knows nothing about energy services contracting, and he or she questions the benefits being derived from a shared savings contract negotiated by his/her predecessor? ESCO's must carry costs for ongoing contract administration to minimize future disruptions to their revenue stream when changes in personnel or policies occur with the client.

[1]If lack of baseline data or the complexity of the process make it unrealistic to utilize a "measured savings" approach, a calculated savings approach is used. See Section 11.6, "Cost Avoidance Accounting," for a further explanation of this topic, as well as Appendix G, "Monitoring and Verification."

Suppose the customer decides to move his business or end the shared savings contract for some other reason? In such an event the customer is asked to pay a termination value based on the remaining value of the contract, essentially the stream of payments (in the form of its share of savings) which the ESCO will not receive.

In the worst possible scenario, a customer goes bankrupt. The concept of termination value then generally has limited utility. The central point in considering the ESCO's exposure to risk is that long-term contracts exacerbate all time-sensitive risks, and most of the risks assumed by an ESCO in a shared savings contract are time sensitive. ESCOs must perform a careful analysis of all elements of the project, including technical and business risks, before they proceed to invest.

11.3.2 How ESCO's Minimise Risk

Risk minimisation strategies are discussed throughout this report. A summary of the principal techniques ESCO's use to reduce and control risk is as follows:

- *Use of energy audits and engineering analysis to screen projects* -- Since project economics drive the potential for attractive returns to both ESCOs and participating customers, ESCOs are careful to pre-screen projects from a technical and economic point of view as early as possible. Only projects which appear capable of meeting the ESCO's minimum Internal Rate of Return target are pursued beyond the initial screening phase. (See Section 11.0, especially Figures 11-1 and 11-2. See also Appendix G, which shows how ESCOs model projects before they decide whether or not to build them.)

- *Use of a phased marketing approach* -- A phased marketing approach allows ESCOs to gauge the seriousness of the potential customer before a large amount of capital is invested in performing engineering work.

- *Use of proven technologies and equipment* -- ESCOs are not in the business of pioneering new technologies, although they always seek new applications for proven technologies.

- *Use of fixed-price subcontracts* -- ESCOs generally structure subcontracts on a fixed price basis as a way of transferring part of the risk of project completion to subcontractors. If the work to be subcontracted is very large and complex, ESCOs may seek performance and completion bonds from subcontractors. Normally ESCOs try to avoid such devices since they add to the cost of the project, but larger projects or special risk situations may call for such measures.

- *Providing explicit role definition and performance incentives for ESCO subcontractors* -- Establishing clear roles for subcontractors is the best way to avoid problems in implementation. (See Appendix K.)

- *Proper selection of monitoring strategies and choice of energy savings calculation methodologies* -- Selection of the right mix of monitoring and energy savings calculation methodologies helps ESCOs avoid problems with customers in billing for their share of the savings (See Section 11.6.2.)

- *Use of a shared savings contract and related documents* -- ESCOs always use a detailed contract which defines the expectations, roles, responsibilities and rewards to all parties associated with an energy services project. Negotiating the terms of these contracts carefully is important in minimizing project specific risk. (See Appendices H, I and J for sample agreements.)

- *Pooling contracts, diversification, credit analysis and portfolio management* -- ESCOs try to "average" their financial returns across a number of projects. Like any investor, ESCOs seek to create a prudent mix of their investments across customer types and industries to minimize exposure to a downturn in any single sector of the economy. ESCOs apply the same credit analysis techniques that banks use. This helps them avoid project investments in financially weak organisations whose probability of staying in business and being able to meet its financial obligations to the ESCO over the term of the multi-year contract is too low.

11.3.3 What are the Customer Benefits?

Given the risks incurred by the ESCO, the benefits received by the customer should be viewed in a very positive light. Consider the following summary of customer benefits from our example in the tutorial:

- No initial capital investment — customer receives savings without any capital investment: The shared savings contract may be kept "off-balance-sheet," which means the customer's debt capacity is unaffected
- New equipment — customer receives new equipment which, combined with quality maintenance, improves occupant environment (e.g., indoor air quality, climate control) and/or process (e.g., product quality)
- Potential for follow-on investment — ESCO may make further investment as new technology suggests additional attractive energy savings projects
- Better result — most customers could not and would not achieve an equivalent result in terms of amount of energy savings, initial cost, ongoing cost, or overall quality of the integrated project
- Customer can co-invest — customers are still free to pay part or all of the cost of the retrofit up-front (reducing ESCO risk)
- Customers can exit the transaction easily — customers are free to exit the shared savings contract by paying a fair "termination value."

The customer is exposed to almost no risk but succeeds in improving the value of his business by entering into a shared savings contract. The customer receives other tangible benefits as well. If the ESCO is wrong about the amount of future energy savings, customers who have negotiated a minimum energy reduction guarantee may recover savings below the minimum threshold from the ESCO. The risk/reward ratio for the customer is compelling.

11.3.4 Utility Benefits and Concerns for Shared Savings Contracting

Some or all of the following benefits are available to utilities whose policies encourage ESCOs for DSM delivery:

- Higher perceived benefits of comprehensive energy services delivered to a utility's customers enhances the utility's reputation with those customers
- Rapid implementation of large blocks of DSM resource are possible through the DSM bidding process, thus freeing capacity
- Least-cost approach to implementing comprehensive, reliable DSM fulfills the utility's mandate as a public trust.

11.3.5 Market Intermediaries Benefits from Shared Savings Contracting

Market Intermediaries like energy consulting engineers, mechanical and electrical contractors, product manufacturers, and other specialty contractors also benefit from Shared Savings Contracting in the following ways:

- ESCO's are an important new market channel for energy conservation products and services — ESCO's increase the amount of capital expended on retrofit projects by integrating a number of services ultimately provided by trade allies; ESCO's depend heavily on trade allies to deliver DSM resources
- Participation in higher returns if trade allies are willing to assume some performance risk — some ESCO's have applied the principle of Shared Savings Contracting to market intermediaries by asking them to assume some risk of performance while simultaneously sharing the rewards of superior performance, i.e., in essence, subcontractors willing to operate on a performance basis become equity partners in each project

- Satisfaction deriving from their contribution in implementing the highest possible energy conservation standards — at its best, Shared Savings Contracting delivers the highest possible quality energy management services and DSM resources.

11.3.6 Benefits to Society from Shared Savings Contracting

A great deal has been written about benefits to society from lower energy costs, but we will highlight the most important two benefits:

- Lower energy costs = higher productivity
- Reduced environmental "externalities."

11.3.7 At Their Best, What do ESCO'S do Extremely Well?

It should be noted that while none of the skills ESCO's employ are unique, ESCO's are unusual in their ability to integrate all these skills and apply them efficiently on a scale which is very small compared to the level of scale represented by even a small supply side powerplant project. The following are ESCO strengths:

- Market penetration — ESCO's excel at lead generation and customer selling; they know how to access numerous trade allies in order to gain rapid credibility with owners
- Energy systems analysis and technology integration — ESCO's have learned how to analyze buildings and even some industrial processes as comprehensive thermodynamic systems; this leads to intelligent selection of a comprehensive package of DSM options capable of delivering the greatest energy savings over the longest time period at the least cost

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- Financial, legal, and contract technology — ESCO's perform credit analysis and enhancement, and are experts at financing projects and applying contract technology unique to shared savings contracts

- Rapid mobilization — ESCO's have proven their ability to implement DSM very quickly and efficiently

- Project and quality management — ESCO's are experts at subcontractor selection and have learned how to effectively implement a quality control plan

- Maintaining energy savings — ESCO's have developed cost-effective techniques for measuring, monitoring, and maintaining energy savings over time.

11.4 TYPICAL ESCO CONTRACTS

Appendix H contains a model energy services shared savings agreement which has been specially prepared for conformance with Indian contract-law, tax codes and applicable regulations. In an effort to provide a contract vehicle which is not radically different from contracts encountered by Indian solicitors and tax council on an everyday basis, the language of the sample shared savings agreement has been made to conform as much as possible to that utilized by Indian leasing companies.

Appendices I and J contain standard lease and hire/purchase agreements, respectively. The differences between these two instruments are explained in Section 9. Appendix K contains a sample Memorandum of Understanding between the ESCO and market intermediaries.

All of these contracts and agreements must be viewed as starting points for use by ESCOs in India. It is expected that these documents will be tailored for use with specific clients on a case-by-case basis.

11.5 APPLICABILITY OF SHARED ENERGY SAVINGS CONTRACTS IN INDIA

The concept of shared energy savings, the operation of an ESCO under the shared energy savings format, and the benefits to each of the parties have been described above. The concerns expressed to the study team by the various organisations interviewed for this study included:

- the concept of shared energy savings is new. This will be a major barrier to overcome, and until some successful projects are demonstrated, the ESCO concept will not pick up in India.
- how can the ESCO be assured that the customer would pay for the savings realised by the retrofit? What is the legal recourse that the ESCO can take in such a situation?
- how can the level of savings be determined? What are the monitoring and measurement procedures that will have to be in place to record the baseline and the retrofit energy consumption?

Therefore, the issue arises as to whether shared energy savings is applicable in India. The evolution of shared energy savings contracts in the U.S. required a number of years of fine-tuning before these contracts were commonly accepted. In the Indian context also, shared energy savings contracts will need to be adapted to conform to Indian tax, legal, and business practices. Initially, these contracts should take the form of a Lease Agreement. Lease agreements are common and may be a more acceptable form of contract in India.

While the above points are discussed in other sections of this report, an additional concern not voiced by those interviewed -- but which will nevertheless be an issue for new ESCOs -- is the potential impact on a new ESCO's capital structure resulting from a policy of sole or majority dependence on shared savings versus lease-type energy services contracts. This issue

can be explained as follows: Shared savings contracts can be thought of as a kind of lease contract wherein the ESCO is the lessor and the customer the lessee. The equipment is owned by the ESCO, and the ESCO incurs long term debt in order to finance the long term receivables, i.e., the ESCO's share of energy savings received over the term of the contract. Like a leasing company, the ESCO can choose to carry the long term debt on its books and simply balance that debt against the higher expected value of the periodic payments it will receive over the term of the shared savings contract. But because the ESCO must maintain a debt to equity ratio which will make it credible to a variety of constituents, especially lenders, a debt to equity ratio problem develops as the level of debt shown on the ESCO's balance sheet increases in parallel with its successful business expansion. The problem arises because the earnings booked for a shared savings contract during any single year will be but a fraction of the total expected lifetime earnings of the contract. The longer the term of the contract, the more pronounced is this effect.

One solution to the problem of maintaining an appropriate debt to equity ratio for the expanding ESCO is simply to raise more equity on a regular basis by selling shares of stock. As long as the shares are appropriately priced, existing shareholders should be indifferent to this strategy, and indeed this is a fundamental financing technique. However, during the initial period, when ESCOs are just becoming established in India and lack efficient access to the equity markets, the task of raising equity in this manner may be problematic. For one thing, ESCOs are a new concept in India with no track record, and appraisal efforts aimed at valuing their stock would need to be undertaken without the benefit of "comparables." Valuation of the shares would therefore be difficult, with the result that they could be poorly valued relative to their actual worth. Another problem is simply that implementing a large equity financing in the very early stages of operations adds to the complexity of the start-up process.

Another textbook solution to the above debt/equity ratio problem would be for the ESCO to "sell the paper." Like a leasing company, the ESCO can choose to sell its long term contracts to another party interested in holding long term debt obligations in return for the present value of the payment stream. This lowers the leverage of the ESCO, i.e., it allows the ESCO to book all the expected future earnings of a contract in the current year while retiring the corresponding long term debt. This has the effect of increasing retained earnings (equity), thereby improving or maintaining a prudent debt/equity ratio for the ESCO. However, a major difference between shared savings and lease (or hire purchase) contracts makes the sale of shared savings contracts somewhat more complex than the sale of lease-type contracts, as will be explained below.

Under the terms of a lease, customer payments are fixed, while with a shared savings contract customer payments usually vary because actual cost avoidance varies, i.e., the amount of energy saved fluctuates from period to period together with the value of the energy displaced due to changes in the retail price of energy.[2] Purchasers of the long term debt perceive a significant difference between buying a fixed payment stream not subject to any performance risk versus the purchase of a shared savings contract with a variable payment stream. Therefore it is more difficult to sell shared savings contracts in the financial aftermarket than leasing contracts.

In the U.S., the problem of selling long term shared savings contracts is often addressed either by holding the contract through the construction period (and perhaps for another year or

[2] Note, however, that if a shared savings contract incorporates the use of stipulated (or calculated) values for the amount of energy being saved, and if the cost avoidance calculations also assume a constant future price of energy, then all payments to the ESCO by the customer will be for an identical amount. In such a case, with respect to the predictability of their payment streams, the shared savings contract will be similar to a lease contract. See Section 11.6 for a discussion of cost avoidance accounting.

so until the reliability of the payment stream has been well demonstrated), and then selling-off the paper. Alternatively, the ESCO can sell just a portion of the savings/payment stream to the third party. In the latter situation, the purchaser may agree to buy, say, 70 percent of the payment stream. This leaves the ESCO exposed to an appropriate amount of risk while insulating the leasing company from all expected normal variations in the amount of periodic customer payments. As an additional technique, the ESCO could set aside a reserve pool for guaranteeing any shortfall in periodic payments. This would have the effect of financing the lease with a combination of ESCO equity and capital from the leasing company.

While the above financing techniques can be especially helpful to ESCOs in transitioning through their initial phase of operations, one way to circumvent the entire issue of an ESCO's ability to finance operations from its balance sheet is to introduce third party lease financing right at the beginning of the sales process with customers. In fact, there has been a marked trend towards the use of true third party leasing by U.S.-based ESCOs over the past several years. While the cost of capital to the project is higher and results in lower net distributable benefits between the ESCO and the customer, the fact that most U.S. ESCOs still do not enjoy easy access to low cost institutional capital has forced them to utilise leasing to an increasing degree.

Related to the above discussion in the context of leasing is the availability of the 100 percent depreciation allowance in India for the purchase of energy efficient equipment. This tax incentive will have a highly positive impact on the financing rate available to ESCOs. The benefits of the depreciation allowance will pass through to the ESCO where shared savings contracts are utilised, and to the lease company in the case where true third party leasing is utilised, or to the customer in the event that a hire purchase type lease is utilised. One implication of the depreciation allowance is that a firm wishing to enter the Indian ESCO market might find an interested partner in the form of a leasing company that happens to be well placed

to re-sell the debt instruments to large companies who need to shelter current excess earnings. This technique might work even better where a U.S.-based ESCO establishes a joint venture ESCO in India with a profitable Indian manufacturer of energy efficient equipment. The manufacturer would own a majority share of the leasing company and the joint venture entity a minority share. The majority of the depreciation benefits would therefore pass through to the manufacturer, and the manufacturer could then subsidize the interest rate for the purchase of equipment needed for energy services projects. While third party leasing companies can already apply this type of interest rate subsidy scheme, it is anticipated that certain administrative efficiencies could be obtained if the leasing company were a captive in-house entity. Additionally, a manufacturer of energy efficient equipment would already be familiar with the nature and extent of the risks associated with tying customer payments to the performance of energy saving equipment. [Note: it is not suggested that an ESCO joint venture would only sell the equipment of a particular manufacturer. There are several examples of large U.S.-based ESCOs which, although they are divisions of a Fortune 500 manufacturers, have as their policy the selection of whatever manufacturers' equipment is best suited to producing the highest Net Present Value for the project.]

Having reviewed some of the subtleties related to the selection of contract vehicles and ESCO capital formation, it should be added as a final note that successful ESCOs use a mix of financing techniques as specific conditions and opportunities dictate. The guiding principal is flexibility coupled with discipline in selecting and capitalising projects with attractive risk and reward characteristics.

11.6 COST AVOIDANCE ACCOUNTING

11.6.1. Goals and Objectives of Cost Avoidance Accounting

This section presents an overview of alternative methodologies for monitoring and calculating cost avoidance generated through an energy services project. The principal goal of cost avoidance accounting is to insure a fair allocation of the risks and benefits associated with shared savings (or performance) contracts. A related goal is to use cost avoidance accounting as a managerial tool to pinpoint any problems that may develop with the project as time progresses in order to take early and appropriate corrective action. Both goals should be accomplished so that the costs incurred are a reasonable portion of the total project expenses, i.e., the amount eventually invested in implementing the ideal cost accounting system for a particular project would correspond to that amount which maximized the NPV of the project.

11.6.2. Dsicussion of Three Possible Approaches

Overview

Accounting for the energy expense avoided as a result of the implementation of energy conservation measures in facilities is a critical part of the energy services. This is because accounting for avoided costs determines the energy services company's revenue and/or claims of the client upon cost avoidance guarantees.

Historically, a wide range of approaches have been employed in demonstrating avoided energy costs obtained through energy retrofit. These methodologies fall into three broad categories, namely:

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- Utility Bill Comparison
- Energy Conservation Measure Specific Instrumentation
- Stipulated Calculations/Values.

As we descend this list of methodologies, values of avoided cost are less impacted by variables beyond the control of the energy services company. As we go up the list, values of avoided cost are more greatly influenced by variables which are within the control of the project-host/facility owner.

For example, should a tenant in a commercial office building decide to install a bank of new computers in their space, they might well do it with the knowledge of the building owner, but without this fact being communicated to the energy services company. The result is an increase in the utility consumption in the building, and a decrease in the avoided cost determined by utility bill comparison. This situation is viewed as a constant risk by the energy services company.

At the other end of this scale, for example, the installation of motion detection lighting controls could be agreed by both parties to reduce annual energy consumption by a set (or stipulated) number of kilowatt hours per year. This kilowatt hour value would be the product of the stipulated wattage of fixtures to be controlled, multiplied by the stipulated annual hours of reduced operation of the fixtures. On the basis of its experience and expertise, the energy services company may well have superior ability to ascertain both the wattage of the fixtures and the annual reduction in operating hours. However, if the energy services company overstates these values or fails to install the proper equipment, actual avoided cost would be less than projected.

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All of the above approaches can be workable and fair, depending on the characteristics of the facility to be retrofitted, the characteristics of the specific energy conservation measures to be implemented, the limitations imposed by the availability of historical energy consumption data (as well as the cost of future monitoring), and the detailed mechanics of the particular methodology agreed to by the parties.

Utility Bill Comparison

Utility bill comparison contrasts post retrofit utility consumption, as invoiced by the utility company, to pre retrofit consumption (in a "base" period) and generally multiplies the difference in units of energy consumption by the current unit cost for each utility. Factors influencing this methodology include the frequency and likelihood of changes in the use, occupancy, and operation of the facility, (these can affect both the selection of a "base" period and possible adjustments to consumption figures for changes in occupancy, use or operation) and the effect of weather on the facilities' energy use. The advantages and disadvantages of the utility bill comparison approach include:

ADVANTAGES	DISADVANTAGES
Simple, small number of data sources	The effects of energy conservation measures can be "masked" by unrelated changes in use and occupancy
Since savings come "right off the bill", the figures are often considered more "real"	Adjustments for changes in facility use can be complex and an administrative burden - extensive adjustments can make the figures appear "artificial"

This methodology generally finds application in simple, single-use facilities, with stable histories of facility use and energy consumption. Both simple and complex retrofits can be accommodated by this method.

ECM Specific Instrumentation

With this approach to demonstrating cost avoidance, temperature sensors, event sensors, flow meters, power transducers, and other instruments are more or less directly applied to the equipment or loads affected by the energy conservation measures. The data gathered by these devices is then manipulated and integrated by a building automation computer system or other computer to calculate the actual energy savings produced by individual energy conservation measures. Factors which impact the effectiveness of this approach include the complexity of the energy conservation measures implemented, the accuracy and reliability of the instrumentation equipment, and the validity of the mathematical formulas used in the energy calculations. Advantages and disadvantages for this approach include:

ADVANTAGES	DISADVANTAGES
Separates out the effect of ECM's from other changes in building use and occupancy	Prohibitively expensive except on the simplest of energy conservation measures
Data gathering and calculations are verifiable	Requires considerable administrative manpower to maintain, calibrate, and troubleshoot the instrumentation and calculational software
Due to direct measurement, cost avoidance figures are often considered more "real"	Verification can be time consuming and costly

This methodology generally finds application in industrial environments and large, expensive, and complex projects where a small number of simple retrofits are replicated in great quantity.

Stipulated Calculations/Values

This approach is premised on the fact that both parties possess a high degree of confidence in the effectiveness of a particular energy conservation measure in reducing load. This confidence can be generated in situations where historical energy use data is missing or incomplete, but where a great deal is known about the energy efficiency technology to be installed and both parties are in agreement as to the estimated annual hours of use of the systems/load being retrofitted. This approach consists of establishing set figures or values, or precise formulas, for the calculation of cost avoidance. In the case of a stipulated value, for example, the parties agree that a set number of watts will be saved by a particular lighting fixture retrofit, as for example would be saved by replacing a 200 watt incandescent lamp with a 32 watt compact fluorescent replacement unit. In addition, the parties agree to a stipulated value for the annual operating hours for the fixture (say 8760 hours for a hallway fixture in a college dorm). The calculation of avoided cost simply becomes the watts saved per fixture, multiplied by the number of fixtures, multiplied by the stipulated hours per year, all of which are then multiplied by the current unit cost of electricity (which is taken from the current rate schedules or utility invoices). Similarly, stipulated calculations are formulas that have one or more variables which are measured (say, for example, the final connected electrical load of a high efficiency motor and its hours of operation as recorded by the energy management computer). The calculation of avoided cost is the difference between the original connected load and the new connected load, multiplied by the hours of operation, all of which is again multiplied by the current unit cost of electricity.

The advantages and disadvantages of this approach are:

ADVANTAGES	DISADVANTAGES
Extremely simple - frequently the only variables are either a) measured once at the completion of the installation, or b) are tracked by the energy management computer. Often these figures are more "real" than other methods, especially in complex, unstable environments	Can work to reduce the motivation of the installing contractor to work carefully and accurately
Administrative costs are kept to a minimum	Savings figures are sometimes viewed as "artificial" or "unreal"

This method would generally find use in facilities with constantly changing occupancy or facility use which would otherwise tend to "mask" the use of utility bill comparison, or where a wide variety of conservation measures are being implemented, or where very complex retrofits are being employed and the complexity and cost of instrumentation is therefore prohibitive.

Conclusions

The best technique for measuring energy savings is one that minimizes risk to the ESCO while maximizing credibility with the customer and the Net Present Value of the project. Regardless of which approach or combination of approaches is used, conflicts can arise when changes in production schedules, hours of operation for particular pieces of equipment, and/or changes in weather patterns (or other extraneous factors) cause energy consumption to increase or decrease and obscure the effectiveness of one or more energy conservation measures.

Direct measurement of energy consuming equipment can clearly establish whether such equipment was operated for more or less time than what was assumed under "baseline" operating conditions. If actual operation is different than the baseline case, ESCOs can generally make a simple fractional comparison in order to adjust the measured results for such changes in use patterns. Simple fractional adjustments are easy for the customer to understand and accept.

Adjustments to energy savings calculations which take extraneous variables into account can be done in a more sophisticated and accurate way by using linear regression analysis to establish co-efficients of correlation between the consumption of different types of fuels and occupancy patterns, production patterns, weather conditions, etc. For example, using regression analysis it is often possible to determine from past data the amount of increased heating fuel consumption caused by a given increase in the number of heating degree days for a specific building between two time periods. While the same techniques can be applied to changes for other variables, in all cases this can only be done where the baseline data is sufficiently accurate and other interacting variables can be isolated to produce a high degree of confidence in the coefficient(s) of correlation for a given variable or set of variables.

In the early days of the energy services industry there was heavy dependence on the use of the type of complex linear regression analysis described above. Adjustment factors were then used to modify calculations of cost avoidance in reports prepared for customers. With increasing experience, it became clear that most customers lacked the technical sophistication to understand such "adjustment factors" and were uncomfortable with reports they could not easily understand. Emphasis then shifted to selecting measuring and monitoring approaches and simplified methods of calculating savings which allowed for a more clear cut (although possibly less accurate at times) interpretation of results. Overall, this was a very positive development in the industry.

In the final analysis, unless a particular energy conservation measure can be completely isolated and lends itself to precise and cost-effective monitoring, the results of energy savings calculation methodologies may be subject to some degree of ambiguity when certain macro variables are prone to change, e.g., occupancy patterns, production schedules, weather, etc. Additionally, both the ESCO and the customer must commit to providing accurate and open access to data in order to fairly evaluate the performance of the energy conservation measures over time.

12.0 CONCLUSIONS AND RECOMMENDATIONS

12.0 CONCLUSIONS AND RECOMMENDATIONS

12.1 SUMMARY OF BARRIERS TO ESCO OPERATIONS

The establishment of the ESCO industry depends on the first few ESCOs creating a positive track record for the Industry. This section first introduces general barriers to ESCO operations, followed by barriers specific to U.S. ESCOs.

12.1.1 General Barriers to ESCO Operations

ESCOs are a New Concept:

The newness and unconventional nature of the ESCO concept in India means that energy services contracts will be subject to special review by management. Lack of examples in India where the ESCO concept has worked pose a particular hurdle. Several persons interviewed stated their belief that case studies of ESCO projects implemented in Asia would be more meaningful than case studies from either North America or Europe.

Although the ESCO concept is new, our discussions with various Indian organisations indicates that they consider ESCOs to be a viable business. However, many said they would like to see some proof of the concept before they agree to get involved, either as a host, or as a joint venture with another ESCO. Therefore, emphasis must be placed on getting a small number of demonstration projects on-line quickly in order to provide the legitamacy that derives from successful projects. These projects must be made highly visible through seminars, workshops, and site-visits to foster the growth of the ESCO Industry. The host facilities selected for demonstration projects should be willing to participate in the demonstration projects and share the results with their colleagues. In particular, the host facilities should be willing to present the

results of the demonstration projects at workshops and conferences designed to promote the ESCO industry.

Shared Savings Contracts are a New Concept

Shared energy savings contracts will need to be refined to conform to Indian business practices. The evolution of shared energy savings contracts in the U.S. required a number of years of fine-tuning before these contracts were commonly accepted.

The shared savings contract initially should take the form of a Lease Agreement. Lease agreements are common and may be a more acceptable contract in the Indian context. Over time, the concept of the shared energy savings agreement may become acceptable to both the host and the ESCO. Lease agreements may be between two parties - the Customer and the ESCO, or between three parties - the Customer, ESCO, and a Financial Institution.

Concern among ESCOs of the Indian Legal System

Both US and prospective Indian ESCO joint venture partners have expressed concern over the ability of the Indian legal system to redress grievances in a timely and effective fashion in the event of a contract default by the customer. As one of the interviewees put it, there is a greater tendency for customers in India (compared to the U.S.) to use the court system to defer payment, to default on payment, and/or to use delaying tactics as leverage to renegotiate terms of purchase post contract completion.

ESCOs should work around this problem by initially selecting only established companies as their customers. The initial projects should be conducted with industrial or commercial

organisations that are recognised in India and that have the reputation for being credible and stable organisations, and would therefore not default on their contracts.

High Cost of Financing

Interest rates on borrowings from the development and commercial banks in India currently range from 18 to 21 percent. To the extent that projects are financed with debt, such high interest rates adversely impact project economics and shrink the potential market for ESCO services. High interest rates may also require ESCOs to raise a larger amount of equity funding for both initial capitalisation of the business and ongoing project financing. U.S.-based ESCOs would prefer to limit initial equity requirements because their business activities in the U.S. are already constrained by the difficulty of raising equity capital.

EMCAT, IDBI, and other organisations must agressively pursue the multilateral banks, USAID, OPIC, and other organisations, for long-term low-interest loans for large scale industrial energy conservation projects. The Eighth Five-Year plan proposed the creation of a revolving fund, with an allocation of Rs. 1,000 crores, to finance energy efficient equipment. This fund should be used as a source of low interest loans for energy efficiency.

A longer term solution is the introduction of Least Cost Integrated Resource Planning for electric utilities. This will ensure that demand-side resources are treated on a level playing field with supply-side resources. Funds for energy conservation must be made available at a cost comparable to funds available for large power generation projects, which are generally at a significantly lower interest rate.

Lack of Technical Expertise in Energy Efficiency for the Commercial Sector

In interviews with manufacturers of commercial market energy conservation hardware, we found a shortage of comprehensive HVAC systems knowledge. For the purposes of this report we define *systems knowledge* as the capability to integrate discrete products into a building system or process in such a way as to maximize the efficient utilization of energy by the entire system as a whole, while minimizing life-cycle costs. An inability to apply such systems knowledge results in improper sizing of equipment and overdesign, as well as the general inability to save energy without simultaneously compromising occupant comfort or product quality. ESCOs in the U.S. often utilise the systems engineering capabilities of manufacturers; therefore, a shortage of technical knowhow in this area is a barrier to ESCO operations in India.

In contrast with the modest technical expertise evident in the commercial sector, India's industrial process engineering capability appears to be at parity with the West, even though best engineering practices (from an energy efficiency point of view) have not been applied until recently. Today, the design of new plants involving industrial thermal processes is being implemented with energy efficiency as a major goal. These same capabilities in the area of new design can be utilised for retrofitting existing plants.

The need for training has been recognised, and several training programs are being conducted by various organisations in India. Additionally, we have recommended different training programs for ESCO personnel, market intermediaries, and SEB management and staff in this report.

Energy Price Subsidies keep some End-User Energy Costs Artificially Low

Prices in the agricultural and low-income domestic sectors are heavily subsidized, making any conventional application of the ESCO concept with those segments impossible. However, if we consider that an ESCO customer is defined as the person or organisation that actually pays the energy bill, then the SEBs themselves in conjunction with their respective state governments could be viewed as logical target customers for an ESCO. Because the SEBs lose money on every kWh they sell to the agricultural and domestic sectors, in theory they might be persueded to hire ESCOs for a *direct install* program. For example, ESCOs could resize, repair and/or replace agricultural pumps and be given compensation on projected savings.

An impediment to obtaining SEBs as ESCO customers is the fact that there is little or no history of demand side intervention on the part of the SEBs. Indeed, they currently lack both the energy policy and accounting methodologies which would enable them to understand their true cost of suppling electricity (and hence assess the potential net value of a *direct install* demand side conservation program).

We see no short-term solution to this problem. ESCOs should limit their activities in the residential and agricultural sectors until and unless the SEBs institute demand-side management programs for these sectors, or institute programs to acquire demand-side resources through bidding or performance contracting. However, we do not see this happening at least for the next several years.

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Lack of End-Use Energy Metering and Consumption Data

End-use energy metering is much less widely applied in India than in the United States. Consequently, the availability and reliability of energy consumption data is not as good. This is a problem in-so-far as owners may abstain from entering into an ESCO contract where the performance of the contractor cannot be easily evaluated without metering. This is not a fatal problem, but it will increase project costs and reduce the set of potential customers. Portable metering equipment can be used to establish before and post installation energy consumption for many types of equipment and complex processes. Some processes have highly variable energy consumption characteristics over the course of a year, requiring that data be gathered over an extended period of time. On the other hand, for really complex industrial processes, it is likely that estimated (engineering estimates based on limited metering) versus measured energy savings will be the rule, since so many parameters (in addition to energy consumption) are changing simultaneously, most importantly: output and product quality. Simple end-use monitoring may not be adequate. However, the engineering resources applied to large industrial projects are generally sophisticated enough to help owners develop the confidence in choices based solely on estimated versus measured savings.

When the U.S. ESCO industry was in its early stages, the norm was to measure savings and base all payments on the measured results. However, as ESCOs and clients have gained more experience over time, both parties have elected to select a combination of cost avoidance calculation technologies which maximize the NPV of the project while fairly allocating costs and benefits. This has meant a gradual trend towards the use of calculated or "stipulated" energy savings methodologies. Often, a project makes use of a combination of calculated and actual measured energy consumption in order to meet the goal of maximizing project NPV. This topic is discussed in greater detail in Section 11.6, "Cost Avoidance Accounting."

12.1.2 Barriers Specific to U.S. ESCOs

In addition to the general barriers to the establishment of ESCOs in India, U.S. ESCOs would have other issues to consider before deciding to open operations in India.

High Corporate Tax Rate

The tax rate for "foreign companies" is 65 percent on corporate profits, withheld at source. The effective tax rate on corporate profits in India for "Indian companies" is 51.75 percent (57.50 percent for closely held companies). This is considerably higher than U.S. corporate tax rates and will be viewed as a negative factor by U.S. companies.

Due to the high tax rate on foreign companies, it is generally recommended that the company be registered in India, making it an Indian company. This will significantly reduce the tax liability, but the trade-off may be increased paperwork.

Inflation

Inflation in India is running about 8 to 12 percent per year. This will be negatively viewed but may not be considered to be a major disincentive to ESCOs as long as project economics can support a compensating increase in targeted return on equity.

Small Commercial Sector Market

India's commercial sector is quite small, both in comparison to the U.S. commercial market and to the amount of energy consumed by India's industrial segment. Standard design

practices in India call for much less space conditioning and lighting compared to the United States. A greater emphasis on keeping initial building costs down accounts for India's lower energy usage per square foot of building space. However, this sector is projected to grow rapidly with significant potential for energy consumption in the future.

ESCOs in India will probably need to pursue the industrial market as their primary market, while targeting commercial projects on a selective and opportunistic basis. Because most U.S. ESCOs lack broad experience in the industrial market, the small size of the commercial market in India is a barrier to most U.S. ESCOs who might contemplate a joint venture or a wholly owned subsidiary. Initially, only those ESCOs with industrial experience may want to venture into India.

12.2 RECOMMENDATIONS FOR EMCAT

The following activites are recommended for EMCAT:

Provide Financial Assistance for the Start-up of an ESCO

Provide financial assistance in the form of a grant or a loan for the start-up of an ESCO. This assistance would be used for the first two years of operations, and would support extensive staff training both in India and the United States, as well as the development of initial projects, including: identification and screening of projects, selection of 5 to 10 attractive candidates, and negotiation of energy services agreements. The ESCO would partially finance some of these costs, and would undertake the following activities:

- Organization
- Start-up
- Recruitment
- Training
- Mobilization of Staff
- Prospect Identification
- Project Screening
- Project Selection
- Detailed Audits
- Contract Negotaition
- Design and Engineering
- Project Management
- Financing
- Monitoring and Evaluation

Establishment of Fund to Buy-down Interest Rate on Initial Projects

EMCAT should consider providing a small fund for the purpose of buying down the effective interest rate on the first 5 projects implemented by the ESCO. This would serve to incentivise companies willing to work with an ESCO even though ESCOs lack performance history in India.

Conduct Workshops to Disseminate the Results of this Study

Two to four workshops should be held in India and the U.S. to disseminate the findings of this Study with the objective of increasing the number of ESCO market intermediaries and ESCOs entering the emerging energy conservation industry in India.

Conduct Workshops to Disseminate the Results from the Initial ESCO Projects Partially Funded Under EMCAT

Workshops should be held in three or four cities in India and several major cities in the US once four or five ESCO projects have been completed. These workshops will highlight the results of the first projects. The target audience should include potential end-users as well as ESCO market intermediaries and potential new ESCO entrants.

Assist in Information Dissemination

As energy services integrators, the health and ultimate success of the ESCO industry in India depends to a great degree on the availability and quality of a wide variety of intermediaries and ancilliary resource inputs. EMCAT should therefore consider investing in the those parts of the energy services infrastructure which are the weakest, as follows:

- **Energy Information and Technical Assistance Center**

  This Center would serve a valuable role in coordinating the worldwide acquisition and dissemination of energy efficiency case studies, information on commercially viable efficient technologies, etc. Handbooks, guidebooks, and other media would be written and disseminated by the Center to consultants and end-users, effectively leveraging the world-wide know-how of energy services providers while educating local end-user decision-makers on the benefits and availability of energy reduction services and technologies.

- **Comprehensive Database for End Use Energy Consumption**

  Lack of comprehensive and current energy consumption data is a major deterrent to consultants, equipment manufacturers, and especially ESCOs, all of whom rely on such data to plan business strategies and allocate scarce resources effectively. The availability of such information in a useful form would assist a wide variety of ESCO

market intermediaries in rationalizing increases in their investment in energy conservation related business activities in India.

- **Feasibility Studies/Demonstration Projects in Targeted Energy Conservation Technologies**

  Examples of such studies/demonstrations may include:

  - Energy Management and Control Systems (especially for hotels and large office buildings)
  - Low Temperature Refrigeration Energy Efficiency (especially targeted at the food processing, food storage and dairy industry)
  - Large Variable Speed Drive Applications (targeted at heavy industry)

- **Technology Transfer Program**

  This Program would fund the identification of needed energy conservation technologies and identify sources in the US interested in forming joint ventures and partnerships with Indian companies. For example, there is currently poor availability of sophisticated control software for low temperature refrigeration applications as well as appropriate sensors and control devices. Under this program, overseas companies with the needed technology would be identified and introduced to Indian companies, and assistance would be provided in negotiating license or other joint venture agreements.

12.2.2 Recommended Action Plan for IDBI

Following the completion of this report and review by IDBI, we recommend that IDBI take the following actions in coordination with those activities recommended for EMCAT:

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Assist in the Creation of Financing Instruments for ESCOs

Capital formation will continue to be a central issue in building and maintaining a robust energy services industry in India. IDBI should therefore commit itself to acting as a central force in facilitating appropriate types of capital formation for energy conservation projects originated by ESCOs. In part, this would take the form of long-term collaboration with ESCOs regarding the design of financial instrumentalities designed to help make ESCO projects more easily financed by the public and private investment community. For example, creative approaches to the pooling of instruments in order to decrease transaction costs associated with raising capital and reduce financial exposure and risk via portfolio management -- are two examples of ways in which IDBI could assist the emerging ESCO community. This is not a recommendation for IDBI to provide capital using such instruments, although that possibility should not be excluded provided such instruments are competitively structured with appropriate risk and reward characteristics for IDBI. Rather, the focus of this action step is for IDBI to commit the expertise of its staff in a meaningful and ongoing fashion to creatively and aggressively assist in the development of constantly improving capital formation techniques and instrumentalities to help fuel the growth of the emerging ESCO industry.

Solicit and Channelise Low-Cost Financing

Aggressively solicit and facilitate the chanelling of low cost large scale financing for energy conservation projects. (especially with: WB, USAID, ADB, OPIC, etc.). We understand that the World Bank has already provided low interest loans for renewable energy projects in India.

Provide Qualifying ESCOs Access to a Line of Credit

Consistent with normal free market business practices, IDBI should make available to qualifying ESCOs a working capital line of credit which can be drawn upon by ESCOs for use on a project by project basis.

Assist in Helping ESCOs Establish Advanced Credit and Industry Analysis Procedures

One of the most important risk mitigation techniques ESCOs employ is to perform a credit analysis on prospective customers and their industry. New ESCOs are unlikely to have the depth of experience or knowledge of local resources necessary to implement such analysis at the proper level of sophistication and in a timely and cost effective manner. IDBI should assist ESCOs by making staff resources available on a consultative basis to review an ESCO's operating plan for completing such analysis. Based on perceived deficiencies, IDBI should suggest procedural changes, identify private sector resources to help augment ESCO credit analysis resources, and/or offer direct training to ESCO personnel.

Prepare a Report on the Financial Results of ESCO Investments in Projects Over the First Two Years

In order to facilitate recognition of ESCOs as an attractive investment opportunity, an independent analysis of financial returns of early investments made by ESCOs should be completed by IDBI in cooperation with the ESCO(s). While investors can turn to the market for valuation of public stocks and to various rating agencies for larger private project investments, no such independent agency viewpoint has been available for ESCOs in the United States. Lack of such independent financial review has kept the U.S. industry from growing at an even faster

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rate by limiting its access to the large scale institutional capital markets. IDBI's independent report would be used to confirm (if appropriate) the attractiveness of investments in ESCOs, as well as verify the benefits to participating customers. Results would also be used to help ESCOs make appropriate changes in their approach to pursuing energy services in order to maximize future ESCO effectiveness and profitability. IDBI should work with ESCOs to develop a format for such a report so as to maximize its acceptance by the investor community with respect to content, format, etc., while avoiding onerous reporting demands on participating ESCOs.

Assist in Gaining the Cooperation of the SEB's and ESCOs in Working Together in the Pursuit of Common Goals

IDBI should use its position and credibility to initiate and facilitate long-term productive interaction between SEBs and ESCOs. IDBI should establish a forum wherein SEBs and ESCOs would meet on a regular basis, exchange information and views on their respective goals, plans and resources, identify areas of mutual interest, and hopefully enter into cooperative activities. Such cooperative activities could significantly benefit the SEB's, ESCOs, and most especially the customers they share. No well defined forum currently exists within either a voluntary or regulatory framework.

12.3 TRAINING RECOMMENDATIONS

This project has identified a number of Indian organisations that have demonstrated expertise in certain elements of an ESCO operation. For example, a number of firms are currently providing energy auditing services, design and engineering services for energy-efficiency options, financing services for implementation of energy-efficiency options, etc. However, there are currently no full-service ESCOs operating in India. To encourage the

development of an ESCO industry in India, we recommend that comprehensive training program be developed for Indian ESCO personnel, covering the key elements of the establishment and operation of an ESCO business. We recommend that such a training program consist of two major parts: classroom-type training and practical training through a study tour of U.S. ESCOs.

The classroom-type training will cover a period of two weeks and can be held in India or in the U.S. The training will address the four major elements of an ESCO operation:

- Technical
- Management
- Marketing and Sales
- Financing.

The technical component of the training will cover methods, techniques, and software for energy auditing and identification of appropriate energy-efficient products, equipment, and technologies; and an overview of the relevant state-of-the-art technologies for commercial and industrial applications.

The management component will focus on the business issues, such as organisational structure, business operations, legal and contractual matters (including typical agreements between an ESCO and its customers), etc.

The marketing and sales component will address topics such as methods and techniques for identifying prospects, qualifying prospects, making presentations, identifying and informing key decision-makers, negotiating the energy services agreement, and "closing the deal".

The financing component will provide information on the various financing methods and options, including sources of financing, financing costs, advantages and disadvantages of various financing methods, etc.

All components will include a number of illustrative examples and case studies in addition to the theoretical elements. The classroom type training will consist of a combination of formal instruction (lectures and presentations), discussions, and question and answer sessions, in a workshop format, plus "homework", independent study, and reading assignments.

The second part of the training program for ESCO personnel will be a study tour of U.S. organisations to obtain some practical hands-on training and experience with ESCO operations. We recommend such a study tour be for a period of two to four weeks and should include site visits to the following organisations:

- The National Association of Energy Services Companies (NAESCO) in Washington, D.C.
- Visits to leading energy services companies, such as EUA/Cogenex, Sycom, Johnson Controls, and HEC Energy
- Visits to utilities who have encouraged or cooperated with ESCOs in the implementation of energy-efficiency options. Examples include Public Service Electric & Gas Company in New Jersey, Pacific Gas & Electric Company, Southern California Edison Company, and New England Electric System
- Visits to organisations that can provide information on commercial and industrial energy-efficient options, such as:
  - Lawrence Berkeley Laboratory
  - Electric Power Research Institute
  - American Council for an Energy Efficient Economy
  - General Electric Company Lighting Efficiency Center

- U.S. Department of Energy.

Initial discussions with these types of organisations have indicated their willingness to host Indian ESCO personnel to provide practical background and training on energy-efficient technologies and on ESCO operation.

In addition to the specific classroom training and study tours for the Indian ESCO personnel, we recommend that two other types of short training courses be developed. The first one of these is a briefing to the management and staff of the SEBs. The other one is a training course for market intermediaries, such as engineering firms, auditing firms, equipment manufacturers, consultants, and financing organisations.

The training course for SEBs should be designed to provide information to SEBs on the potential role and benefits of ESCO operations in their service areas and the possible cooperative opportunities and roles that SEBs can play in fostering the establishment and operation of ESCOs. We propose this training course be a two-day program. The first half-day of this program will be focussed as an executive briefing to the top management of the SEBs. The remaining day and a half will address the key issues in more detail and will be designed for the next level management and staff of the SEBs.

The training course for market intermediaries will also be a two-day program and will address the cooperative opportunities for these organisations to work with energy services companies to implement energy-efficient technologies, equipment, and products. Again, the first half-day will be targeted at the top managements of these types of organisations, with the remaining day and a half focusing on the issues of concern to the next level management and staff.

Preliminary outlines of the following recommended training programs are provided in Appendix L:

- ESCO Training Program - Two weeks in India or U.S.
- ESCO Study Tour to U.S. - Two week program
- ESCO Study Tour to U.S. - Four week program
- Two-Day ESCO Training Seminar for SEBs
- Two-Day ESCO Training Seminar for Market Intermediaries.

12.4 REQUIREMENTS OF A MODEL ESCO AND DEMONSTRATION PROJECTS

The establishment of an ESCO industry in India can be significantly enhanced by providing the seed funds for the establishment of a Model ESCO, and the funding of a series of projects that will successfully demonstrate the applicability of the ESCO concept in the Indian situation.

12.4.1 Requirements of Model ESCOs

To achieve the maximum benefit and impact, the Model ESCO should be selected to satisfy the following criteria:

12.2 Recommendations for a Model ESCO and Demonstration Projects

While the opportunities for ESCOs as discussed above are significant, the barriers which must be overcome in realizing them are formidable -- and cannot be minimized. Consequently,

a "Model ESCO" should be fostered in India to achieve the following primary objectives: i) pioneer the development of near-term practical solutions to the initial barriers identified in this report (as well as those which may not have been identified), ii) establish clear and early credibility for the ESCO concept by successfully completing a range of contracts with carefully selected customers, and iii) serve as a valuable point of reference for domestic entrepreneurs, market intermediaries, foreign ESCOs and others, who -- with the aid of a working business model and a receptive market deriving from a bevy of satisfied customers -- will succeed faster and ultimately to a greater degree in establishing the energy services business concept in India.

The ideal Model ESCO would manifest the following characteristics:

- It would be a joint venture between an experienced U.S.-based ESCO and an Indian firm. In particular, the U.S.-based ESCO would have industrial experience, and should have strong capabilities as an integrator of market intermediaries appropriate to the industrial market. It should have strong financing and marketing know-how, since these two attributes are key success factors in the ESCO business. In point of fact, few U.S.-based ESCOs have much industrial process experience, so the integration capabilities of the ESCO may need to compensate for this deficiency.

- The Indian joint venture (JV) partner should have high recognition in the industrial segment, which is the principal target market. This will help minimize the JV's marketing costs. The Indian JV partner should also be capable of generating significant value-added margin from its products and/or services. It would not be effective, for example, if such a partner were a high-priced manufacturer with a limited product line and undifferentiated fabrication and system design capability. A low cost producer of a wide spectrum of closely related heat transfer products possessing significant value-added design, engineering and fabrication capability would represent an opposite (and preferred) Indian candidate for JV partner. Similarly, a large, world-class engineering firm with solid experience in designing processes which minimize energy consumption in all the major energy consuming industries would also be an excellent JV

partner candidate. There are a number of candidates capable of meeting these criteria in each of the preceding example categories.

- Because of the long cycle time involved in securing ESCO contracts, the JV should possess adequate resources to vigorously persist in its efforts to crack open the market over a period of at least two years. To this end, both the U.S. ESCO and the Indian partner must demonstrate a strong commitment. A measure of this commitment should be the willingness of the JV to emphasize organizational development and information transfer versus short-term profitability over the first two years. Few ESCOs in the U.S. can presently afford to maximize business development goals at the expense of short term profitability, so this poses a constraint that must be addressed.

- It is impractical to expect foreign management to be effective for any sustained period of time in helping to manage the launch joint venture. The distance and time barriers dictate that personnel in the JV must be thoroughly trained to prosecute the business in India with minimal to no support after a four month period, and autonomously after no more than a 6 month period. Thus, the ability of a U.S. ESCO to implement a comprehensive human resources training program over a very short period would be an important ingredient in maximizing the speed and total impact generated from support of such a model ESCO.

- Through careful planning, the JV should initially structure itself in such a way so as to maximize its chances of successfully gaining access to the public capital markets in India within two years. There are two quite practical reasons for this: first, the industrial market is extremely capital intensive due to the scale and sophistication of the process technology involved. Expansion of the Model ESCO beyond an early pilot stage will therefore require serious capital strength. The cost of capital thus obtained is also an issue since the supply of capital at attractive rates can be used as a further inducement to gain the participation of potential customers. This is particularly true of the smaller industries whose plants are simultaneously the least efficient and who do not enjoy favorable access to capital markets. It is worth noting that restrictions on the qualifications required to gain access to the public markets in the U.S. mean that few U.S. ESCOs currently have such favorable access (or experience in gaining it).

Therefore, if at all possible, the Indian JV partner should be a well recognized public company.

Positioning the JV to go public implies that it will have successfully secured an increasing number of contracts, demonstrated its ability to manage projects to completion, and generated profits from operations (although not necessarily historical profitability for the company as a whole). To achieve such a record of margin-producing growth within 18 to 24 months will require a strong start and a diversity of staff skills; this underscores the need for a bold commitment to organizing and staffing the JV appropriately at the outset.

The second reason for positioning the JV to gain access to the public markets is simply that the effective tax rate on public enterprises is much lower, 51.75 percent versus 57.5 percent for a closely held private domestic company. For a U.S. JV partner, the 51.75 percent value is already a formidable barrier from a global perspective. For example, Czechoslovakia, another attractive market from an energy services perspective, is lowering its effective corporate tax rate to 45 percent (down from 55 percent) this January. By further comparison, the corporate tax rate in the U.S. is only 40 percent, which represents combined federal and state taxes.

12.4.2 Requirements of Demonstration Projects

To achieve the maximum benefit and impact, the demonstration projects should be selected to satisfy the following criteria:

- The projects should demonstrate significant energy savings to the host facilities
- The projects should be conducted with industrial or commercial organizations that are recognized in India and that have the reputation for being credible and stable organizations

- The projects should have relatively short implementation times, approximately six months to one year

- The selected projects should encompass a mix of energy efficient technologies. Examples include cogeneration, energy management systems, efficient lighting technologies, efficient motors, etc.

- The group of demonstration projects selected should also represent a mix of different types of industrial and commercial facilities

- The technologies and facilities selected for demonstration should maximize the potential for the transferability of experience to Indian industry and business

- The projects should offer maximum opportunities for participation of various market intermediary organizations, such as engineering firms, auditing firms, equipment manufacturers and suppliers, financing organizations, etc.

- The projects should demonstrate the possibilities for cooperation with the SEBs. To the extent possible, they should be conducted in service areas of SEBs that have expressed interest in fostering the ESCO industry

- The host facilities selected for demonstration projects should be willing to participate in the demonstration projects and to share the results with their colleagues. In particular, the host facilities should be willing to present the results of the demonstration projects at workshops and conferences designed to promote the ESCO industry

- The demonstration projects should be designed to utilize technologies, products, and equipment that are either readily available for domestic markets or can be manufactured locally in the near future

- To the extent feasible, demonstration projects should encompass different types of financing arrangements that might be appropriate in the Indian context.

APPENDIX A1

TAMIL NADU ELECTRICITY BOARD TARIFFS

1990-91

5122-R2

Abstract of Tariff Rates with effect from 1.9.91

Category of Service	Rate per KWH (In Paise)		Maximum Demand Charges per KVA/Month (Rs.)
	Madras Metropolitan areas	Non Metropolitan areas	
H.T. SUPPLY – TARIFF			
I. Registered factories, Tea estates, Textiles, RailwayTractions, Fertilisers, Salem Steel Plant, Caustic Soda, Calcuim Carbide Aluminium Potassium Chlorate and all other industrial establish - ments.	140	130	75
II. Recognised educational institutions, Hostels run by recognised educational institutions, Govt. hospitals, actual places of public worship, orphanages, public libraries, water works, public lighting and such other institutions declared by the Govt. from time to time.	110	100	50
III. Licensees			
45% on total power consumption.		75	50
Remaining 55% of power consumption.		100	50
IV. Lift irrigation Co - Operative Societies for agriculture	15	15	-
District livestock Farm, Chettinad	25	25	-
V. Supply to Pondichery State :	Shall be at the Thermal Station I rate charged by Neyveli Lignite Corporation to the TNEB plus 2.5 paise per KWH as wheeling charges plus 4% on the energy wheeled towards transmission loss.		
VI. Public Sewerage works by Govt. Local bodies, Laboratories, Research Institutes, Studios and Cinema theatres.	130	120	75
VII. All categories of consumers not covered under High Tension Tariffs I to VI	150	140	75

Abstract of Tariff Rates with effect from 1.9.91

Category of Service	Rate per KWH (In Paise)		Monthly Minimum Current Consumption Charges per Service (Rs.)
	Madras Metropolitan areas	Non Metropolitan areas	
L.T. SUPPLY -- TARIFF			
I. Domestic Purposes for lights and fans including radios and power loads. Cottage industries with a connected load not exceeding 5 HP. Handlooms in residences of handloom weavers, Public conveniences maintained and run by local bodies and such other organisations as are specified by the Govt. from time to time.			
A) Fixed Charges:			
a) Single phase service :			
i) 100 KWH for 2 months	No fixed charges		
ii) Others	Rs. 4 per service for 2 months		
b) Three phase service :	Rs. 10 per service for 2 months		
B) Energy charges			
i) For consumption upto 50 Kwhr bimonthly	55	55	Rs. 4/ - per Service
ii) For consumption from 51 to 100 Kwhr bimonthly	65	65	Rs. 4/-per Service
iii) For consumption from 101 KWhr to 600 KWhr bimonthly	90	90	Rs.4/-per Service
iv) For consumtpion of 601 KWhr and above bimonthly	140	140	Rs.4/- per Service
II. Public Lighting	105@	90$	Rs.10/-per Service
III. Public water supply system	100@	85$	Rs.10/- per Service
IV. Power loads (Industrial and non-industrial including factory lighting) Cottate industries with connected load exceeding 5 HP.			
A) Fixed charges			
a) Single phase service :	Rs.20 per service for two months.		
b) Three phase service :	Rs.40 per service for two months.		
B) Energy charges			
Upto 1500 units for 2 months	160	150	Rs.15 per KW or part thereof*
Above 1500 units for 2 months	185	175	on connected Load.

@ For Municipalities and Corporation areas
$ For Village Panchayats, Town Panchayats and Townships
* Or the fixed charges whichever is higher.

Abstract of Tariff Rates with effect from 1.9.91

Category of Service	Rate per KWH (In Paise)		Monthly Minimum Current Consumption Charges per Service (Rs.)
	Madras Metropolitan areas	Non Metropolitan areas	
L.T. SUPPLY -- TARIFF			
V. Agriculture		No charge	
VI. Huts in village Panchayats, houses constructed under NRET, ELEHF, THADCOand Kamarajar Adi Dravidar Housing Scheme and huts in Town Panchayats in Kanyakumari district alone		No charge	
VII. Recognised educational institutions, Hostels run by recognised educational institutions, hostels run by Adi Dravidar and Tribal welfare and Backward Classes dept.Govt.hospitals, actual places of public worship, orphanages, public liberaries, Chief Minister's Nutritious Noon Meal Scheme Centres, Home for Destitutes & Old people and such other institutions declared by the Govt.			
A) Fixed charges:			
a) Single phase services:	Rs.10 per service for two months		
b) Three phase services:	Rs.20 per service for two months		
B) Energy charges	125	120	Rs.10 per service*
VIII. Laboratories, Reserach Institutions, Studios and cinema theatres			
A) Fixed charges:			
a) single phase service:	Rs.10 per service for two months.		
b) Three phase service:	Rs.20 per service for two monhts.		
B) Energy charges	170	160	Rs.10 per service*
IX. All categories of consumers not covered under low Tension tariff I to VIII above			
A) Fixed charges:			
a) Single phase service:	Rs.10 per service for two months		
b) Three phase service:	Rs.20 per service for two months		
B) Energy Charges			
Upto 200 units for 2 months	185	175	Rs.15 per service*
Above 200 units for 2 months	195	190	Rs.15 per service*

* or the fixed charges whichever is higher

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APPENDIX A2

KARNATAKA ELECTRICITY BOARD TARIFFS

1992

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KARNATAKA ELECTRICITY BOARD

Board Secretariat,
Cauvery Bhavan,
Bangalore - 560 009

NO. KEB/B10/21/1992-93

Dated, 18th July 1992

NOTIFICATION

In exercise of the powers conferred under section 49 and 79(j) of the Electricity (Supply) Act 1948, the Karnataka Electricity Board have revised the Tariffs as hereunder for the supply of Electrical Energy consumed from the first meter reading date falling on or after 18.7.1992.

The prevailing Electricity Tax shall continue to apply.

ELECTRIC POWER TARIFF - 1992

GENERAL CONDITIONS

1. Initial supply of power is subject to the execution of agreement by the consumer in the prescribed form, payment of prescribed deposits and compliance of terms and conditions as stipulated in the "Electricity Supply Regulations" at the time and the continuation of power supply is subject to the compliance of the said Regulations as amended from time to time.

2. The tariffs are applicable to only one point of supply unless otherwise agreed to by the supplier.

3. The Board does not bind itself to connect any installation unless the consumer guarantees an annual or monthly minimum (ie., line minimum) revenue as the case may be for the supply of electrical energy. such consumers are required to pay the power charges or the line minimum charges whichever is higher, calculated on monthly or annual basis as the case may be except as otherwise provided for in the tariff schedule.

The line Minimum Charges shall be limited to initial period of agreement.

4. The tariffs in the schedule are applicable to power supply within Karnataka and do not include taxes and other charges levied/leviable by the State Government/KEB from time to time.

5. The Tariffs are subject to revision or levy of surcharges, fuel adjustment charges and other operational expenses as may be decided from time to time.

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6. For the purpose of these tariffs, the following conversion table would be used.

1Hp = 0.746 Kw.

7. The billed amount shall be rounded off to the nearest rupee ie., the bill amount of 50 paise and above shall be rounded off to the next rupee and amount less than 50 paise will be ignored.

8. Use of power for temporary illumination in the premises already having permanent supply is limited to a maximum of three Kw for marriages, exhibitions in hotels, sales promotions etc., at applicable permanent power supply tariff rates. Temporary tariff rates will be applicable in case the load exceeds 3 Kw.

PART-1

HIGH TENSION SUPPLY

(Applicable to bulk power supply at High Voltage)

General Conditions

1. Billing Demand

(a) The billing demand shall, during unrestricted period, be the maximum demand recorded during the month or 75% of the contract demand, whichever is higher.

(b) When the Board has imposed demand cut of 25% or below conditions stipulated in (a) above shall apply.

(c) When the demand cut is in excess of 25%, the billing demand shall be the maximum demand recorded or 75% of the restricted demand, Whichever is higher.

(d) During unrestricted power supply (no power cut) period, if the actual maximum demand recorded exceeds the contract demand, such excess will be charged at twice the normal rate. During power cut period, if the actual maximum demand recorded exceeds the demand entitlement, such excess will be charged at rates as prescribed by the Board from time to time.

(e) During the periods of disconnection, the billing demand shall be 75% of contract demand or 75% of the demand entitlement that would have been applicable, had the installation been in service whichever is less. This

provision is applicable only if the installation is under disconnection for the entire billing month.

(f) During the period of energy cut, the consumer may get his demand entitlement lowered, but not below the percentage of energy entitlement (e.g., Incase the energy cut entitlement is 40% and the demand entitlement is 80%, the refixation of demand entitlement cannot be lower than 40% of the contract demand.)

(i) The billing demand in such cases shall be the "Revised (opted) Demand Entitlement" or the recorded demand, whichever is higher. Such option for reduction of demand entitlement is allowed only once during the entire span of that particular "Energy Cut Period". However, the consumer can opt for a higher demand entitlement upto the level-permissible under the demand cut notification and the benefit will be given effect to from the next meter reading date. Once the consumer opts for enhancement of demand which has been reduced under clause (f), no further revision is permitted during that particular energy cut period.

(ii) In case, the energy cut is revised, the facility for reduction or enhancement can be exercised by the consumer as indicated in the previous paras. The reduced demand entitlement will automatically cease to be effective when the energy cut is revised.

(iii) For the purpose of rounding off, billing demand of 0.5 KVA and above will be rounded off to the next higher KVA and billing demand less than 0.5 KVA ignored.

2. Power Factor (PF)

(i) In the event of the PF recorded or calculated goes below 0.85 lag, a surcharge of 1 ps/unit consumed will be levied for every duction of PF by 0.01 below 0.85 lag.

(ii) The power factor will be determined upto 3 decimals and then rounded off to the nearest second decimal as per regulation 25.00 of Electricity Supply Regulation 1988.

3. Rebate for supply at high voltage

If the consumer is availing power at a voltage higher than 13.2 KV, he shall be entitled to a rebate as indicated below.

Supply Voltage	Rebate
(a) 33/66 KV	1ps/unit of energy consumed
(b) 110 KV	2/ps unit of energy consumed
(c) 220 KV	3 ps/unit of energy consumed

The above rebate will be allowed only in respect of new installations and also for installations converted from 11 KV and below to 33 KV and above from the date of such service for a period of 5 years and is not admissible to existing installations which have already been allowed H.V. Rebate for a period of not less than 5 years. The above rebate is applicable only on the consumption of normal energy entitlement made available to the consumer and is not applicable on any other energy allotted and consumed, if any, viz., (1) High Cost Energy, (2) Night Energy, (3) D.G.P. Energy,

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(4) Wheeled energy, (5) Any energy allotted extra over and above normal entitlement and (6) Excess energy consumed beyond the normal entitlement. The above rebate is not applicable for Railway Traction (H.T.6).

4. Fuel Adjustment Charges etc:

Adjustment of Fuel Escalation charges and other increases due to operational expenditures etc., will be made by the Board as and when required, which shall be recovered in addition to the rates specified in the H.T. Schedule of rates from all H.T. consumers, except HT-3 category.

TARIFF SCHEDULE - HT-1

(Public water supply and Sewerage Pumping Installations).

APPLICABLE to Water Supply and Sewerage Pumping Installations belonging to Bangalore Water Supply and Sewerage Board, Karnataka Urban Water Supply and Sewerage Board, other local bodies, State and Central Government.

RATE SCHEDULE

Demand Charges :	Rs. 60/- per KVA per month of Billing Demand
PLUS	
Energy Charges :	100 Paise per unit for all the units consumed in the month.

NOTE : 1. The above tariff is applicable even if the existing supply is at 4.6/2.3 KV.

2. Energy supplied to residential quarters and colonies availed as bulk supply will be charged at HT-2 tariff rates. No reduction in the demand recorded in the main H.T. metering cubicle will be allowed.

TARIFF SCHEDULE -HT-2

(Industrial, Non-industrial, Commercial and Non-commercial)

Applicable to Industries, Factories, Workshops, Universi-

ties, Educational Institutions, Charitable Institutions, Government and Private Hospitals, Nursing Homes, Research and Development Centres, Industrial Estates, Milk Dairies, Rice Mills, ROller Flour Mills, Railway Workshops, News Papers, Multi-storey Buildings, Commercial Complexes, Cold Storage Plants, Cinemas, Hotels, Boarding and Lodging houses, Defence Establishments, Amusement Parks, Telephone Exchanges, Race-course, Turf Club, TV Stations, All India Radio, Railway Stations, Airport, KSRTC Bus stations, All offices, Banks, Film Studios, All Residential Colonies both dependently and independently serviced.

RATE SCHEDULE

Demand Charges : PLUS	Rs. 75/- per KVA per month of Billing Demand
Energy Charges :	135 Paise per unit upto 1 lakh units consumed in the month.
	150 paise per unit above 1 lakh units and upto 2 lakhs units consumed in the month
	160 paise per unit for balance of units consumed in the month.

NOTE : 1. The above tariffs are applicable even if the existing supply is at 2.3 KV/4.6 KV.

2. Energy supplied may be utilised for all purposes associated with the working of the installation such as offices, stores, canteens, yard lighting, water pumping and advertisement within the premises.

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3. Energy can be used in the factory for construction, modification and expansion purposes also.

TARIFF SCHEDULE - HT-3

(Irrigation and Agricultural Farms, Lift Irrigation Societies, Lift Irrigation Schemes and Horticultural Nurseries).

RATE SCHEDULE

Demand Charges :	NIL
Energy Charges :	Rs.250/- per H.P per annum of connected load.

NOTE : 1. In the case of installations newly serviced during a calendar year, the annual minimum charges shall be proportionate to the number of days of supply during the calendar year, reckoned from the date of service.

2. These installations are to be billed on quarterly basis.

TARIFF SCHEDULE - HT-4

(Rural Electric Co-operative Societies)

RATE SCHEDULE

Demand Charges :	NIL
Energy Charges :	40 paise per unit for all the units consumed in the month.

TARIFF SCHEDULE - HT-5

(Temporary Power Supply)

RATE SCHEDULE

Demand Charges :	Rs.150 per KVA per month of contract demand
PLUS	
Energy Charges :	300 paise per month for all the units consumed in the month.

NOTE : The conditions stipulated in Electricity Supply Regulations will have to be complied with before supply is arranged.

TARIFF SCHEDULE -HT-6

(Railway Traction)

RATE SCHEDULE

Demand Charges :	Rs. 60 per KVA per month of Billing Demand
PLUS	
Energy Charges :	150 paise per unit for all the units consumed in the month.

PART-2

LOW TENSION SUPPLY

(3 phase and single phase supply)

TARIFF SCHEDULE -LT-1(a)

(Bhagya Jyothi AND Kutir Jyothi)

Applicable for houses belonging to economically weaker sections.

RATE SCHEDULE

Energy charges : Rs. 2.50 per installation per month.

NOTE : In addition to the above, the Bhagya Jyothi consumers shall pay the monthly installments towards recovery of service main charges as prescribed by the Board from time to time.

TARIFF SCHEDULE -LT-1(b)

(Domestic and Non-Commercial Lighting)

Applicable to residential houses and also to houses used for residential purposes but a portion of which is used for a) Hand loom weaving, b) Silk rearing and reeling and artisans having motors upto 200 watts, c) Consultancy in (i) Engineering, (ii) Architecture, (iii) Medicine, (iv) Legal matters, (v) Accountancy and Income tax, (vi) Astrology, d) Job typing, e) Branch post

office, f) Gold smithy, g) Chawki rearing centre, h) Beauty Parlour, i) Tailoring, j) Dhobis, k) Paying guests 1) personal computers.

It is also applicable to a) houses and schools for the handicapped, destitutes and orphans, b) rehabilitation centres, c) mosques, temples, churches, ashrams, mutts, and religious/charitable institutions, d) hospitals, dispensaries and health centres run by the State and Central Governments and Charitable institutions, e) jails and prisons, f) schools, colleges, educational institutions run by the State Government, Central Government and Local Bodies, g) seminaries, h) hostels, i) guest houses/travellers bungalows run by the State and Central Governments. j) public libraries, k) hand operated printing presses, l) farm and farm houses.

RATE SCHEDULE

Fixed Charges :	Rs.10 per installation
PLUS	for 2 months
Energy Charges :	55 paise per unit upto 50 units
	65 Paise per unit from 51 units to 100 units
	75 paise per unit for the balance units.

NOTE :
1. Whether an institution is charitable or not will be decided by the Karnataka Electricity Board and its decision shall be final.
2. Besides lighting, electricity can be used under this schedule for fans, TVs, Radio Receivers, Water

pumps not exceeding 500 watts, Refrigerators and other small house hold appliances.

3. The sanction of electricity under this tariff is limited to 1 Kw in respect of domestic installation only For other category of consumers under this tariff the limitation of 1Kw does not apply.
4. Use of power within the consumer's premises for temporary purposes for bonafide domestic use is permitted subject to the condition that the total load of the installation on the system does not exceed the sanctioned load.

TARIFF SCHEDULE -LT-2(a)

(Non-commercial, combined lighting and heating)

Applicable to residential houses having mixed loads and also to houses having mixed loads of lighting and heating used for residential purposes but a portion of which is used for (a) Handloom weaving, (b) silk rearing and reeling and artisans using motors up to 200 watts, (c) consultancy in (i) Engineering, (ii) architecture, (iii) medicine, (iv) legal matters, (v) income tax (vi) accountancy, (vii) astrology, (d) job typing, (e) tailoring, (f) post office, (g) gold smithy (h) Chawki rearing, (i) beauty parlours (j) paying guests (k) personal computers, (l) hand operated printing presses.

It is also applicable to a) houses, schools and hostels for the handicapped, aged, destitutes and orphans, b) rehabilitation centres, c) mosques, temples, churches, ashrams, mutts, and religious and charitable institutions, d) hospitals, dispensaries

and health centres run by the State and Central Governments and Charitable institutions including X-ray units, e) jails and prisons, f) schools, colleges, educational institutions run by the State Government, Central Government and Local Bodies, g) Seminaries, h) hostels, i) guest houses/travellers bungalows run by the State and Central Governments. j) water supply installations and yard lighting for bonafide use of residential complexes/residences, independently serviced, (k) lifts independently serviced in residential complexes, (l) silk rearing houses, (m) farm house.

RATE SCHEDULE

Fixed Charges : PLUS	Rs. 5 per Kw or part there of sanctioned load subject to a minimum of Rs.15 per month.
Energy Charges :	100 paise per unit upto 200 units 150 paise per unit above 200 units and upto 400 units 200 paise per unit for the balance of units.

TARIFF SCHEDULE -LT-2(b)

(For private professional and unaided educational institutions)

RATE SCHEDULE

Demand charges : PLUS	Rs. 5 per Kw or part thereof of sanctioned load subject to a minimum of Rs.15 per installation per month

Energy Charges :	150 paise per unit upto 200 units 200 paise per unit above 200 units, upto 400 units 250 paise per unit for the balance units.

NOTE :

1. A rebate of 25 paise per unit will be given for the hostels meant for handicapped, aged, destitutes and orphans, rehabilitation centres run by charitable institutions or by non-profitable organisations.

2. Use of power within the consumer's premises for temporary purposes for bonafide domestic use is permitted subject to the condition that the total load of the installation on the system does not exceed the sanctioned load.

3. The laboratory installations in educational institutions are allowed to instal connected machineries upto four times their sanctioned load. The fixed and minimum charges shall however be on the basis of sanctioned load.

4. Where it is intended to use floor polishing and such other portable equipments temporarily in premises having permanent supply, such equipment shall be provided with an earth leakage circuit breaker of adequate capacity.

5. Besides lighting and heating, electricity under this schedule can be used for fans, televisions, radios, refrigerators and other house-hold appliances

including domestic water pumps and air conditioners.

6. The sanction of electricity under this tariff is limited to 3 KW in respect of domestic installations only. For other categories of installations covered under this tariff as well as for (a) lifts (b) water pumping and (c) yard lighting in residential complexes/residences separately serviced under this tariff, the limitation of 3 Kw does not apply.

TARIFF SCHEDULE-LT-3

(Commercial Lighting, Heating and Motive Power)

Applicable to Nursing homes, shops, stores, hotels, bars, banks, Kalyana mantapas, clubs, cinemas, restaurants, theatres, Boarding and Lodging houses, petrol bunks, service stations, offices, stud farms, Race courses, computer centres, Computer Training Schools, Photographic Studios, Photo copiers, colour laboratories , private guest houses and messes, clinics, Railway installations excepting workshops, KSRTC bus stations, film studios, X-ray installations, battery charging units,Tyre vulcanising centres, Film recording and dubbing studios, Disc Antenna installations, Telephone exchanges, Auto garages, ice cream parlours, commercial complexes, lifts of commercial complexes, petrol, diesel and oil storage plants, dry cleaners, T.V. Stations, Micro-Wave stations and All India Radio.

RATE SCHEDULE

Fixed charges : PLUS	Rs.10 per Kw or part thereof subject to a minimum of Rs.10 per installation per month.

Energy charges :	250 paise per unit for all the units consumed in the month.

NOTE:

1. Besides lighting, heating and motive power, electricity can also be used for yard lighting and air-conditioning in the premises.

2. Capacitors shall be installed in accordance with Regulation 24.00 of the ESR. If during the rating of an installation PF is found to be less than 0.85 lag, a surcharge of one paise per unit for every reduction of PF by 0.01 below 0.85 shall be levied from the billing month following the expiry of the 3 months of the notice given by KEB until such time additional capacitors are installed and notified to the KEB.

3. If the capacity of capacitors provided is found to be less than what is stipulated in regulation 24.00 of ESR during inspection, the power factor will be computed and surchage as provided in note-2 above will be levied.

TARIFF SCHEDULE-LT-4

(Agriculture & Water Supply)

TARIFF SCHEDULE -LT-4(a)

(Irrigation Pumpsets, Lift Irrigation Schemes/Societies)

Applicable to (a) Agricultural pumpsets including sprinklers,

(b) Pumpsets used in (i) Nurseries of Forest & Horticultural Depts. (ii) Plantations, (iii) Grass Farms and gardens).

RATE SCHEDULE

i) Upto and inclusive of 10 HP :	Free power supply subject to clearance of arrears.
ii) Above 10 HP :	50 paise per unit for all the units consumed, subject to a minimum of Rs. 130/- per HP per annum.

NOTE:

1. Free power supply for IP sets of 10 HP and below will be allowed subject to the condition that the arrears are cleared and will be admissible from the date of clearance of arrears. Otherwise IP sets up to and inclusive of 5 HP will be billed at Rs.50/- per annum per HP and IP sets above 5 HP and upto and inclusive of 10 HP will be billed at Rs.60/- per HP per annum until arrears are cleared.

2. The energy supplied under this tariff should be used for only pumping water to irrigate their own lands as mentioned in the IP set application/water right certificates.

3. A rebate of 2 paise per unit will be allowed if capacitors are installed as per Regulation 24.00 of ESR for LT-4(a) (ii) Tariff.

4. The motor of an IP set installation can be used with an alternative drive for other agricultural operations like sugarcane crushers, coffee pulping etc., with the approval of the Board. The installation will then be

metered separately during the period of alternative use and will be billed at temporary tariff rates.

5. In case of metered IP sets, the entire consumption during the period of alternate use will be billed at temporary tariff rates.

6. The consumer is permitted to use the energy for lighting the pump house, well and the farm house upto a limit of 40 watts per pumpset.

7. The water pumped for agricultural purposes may also be used by the consumer for his bonafide drinking purposes and for supplying water to animals, birds and fish farms maintained by him in addition to agriculture.

8. Installation with IP sets of 10 HP and below will be billed on half-yearly basis until clearance of arrears and those with IP sets of above 10 HP on quarterly basis.

TARIFF SCHEDULE-LT-4(b)

(Water Supply and Sewerage Pumping Installations)

(i) Village/Town/Mandal Panchayat/Interim Mandal Panchayats/Town Municipalities and Organisations run on charitable basis.

Minimum charges :	NIL
Energy Charges :	50 paise per unit for all the units consumed in the month.

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(ii) City Municipalities/Municipal Corporations/State and Central Government/APMC yard installations:

Energy charges : 75 paise per unit for all the units consumed in the month subject to a minimum of Rs.25 per Kw of sanctioned load per month.

(iii) Water Supply installation in residential Layouts:

Minimum Charges : NIL
Energy Charges : 100 paise per unit for all units consumed in the month

TARIFF SCHEDULE-LT-4(c)

(Private Horticultural Nurseries)

Energy Charges : 50 paise per unit for all the units consumed subject to a minimum of Rs.130 per HP Per annum, irrespective of connected load.

TARIFF SCHEDULE -LT-5

(Industrial, Non-Industrial & Motive Power including lighting)

Applicable for supply to industrial units, work shops, poultry

farms, sugarcane crushers, coffee pulping, cardamom drying, mushroom raising installations, flour and huller, rice mills, wet grinders shops, milk dairies, laundries, ice-cream manufacturing units, coffee roasting and grinding, cold storage plants, ice-manufacturing units, bakery product manufacturing units, railway workshops, drug testing and manufacturing laboratories, printing presses, garment manufacturing units, bulk milk vending booths, swimming pools belonging to local bodies, all educational institutions, tyre-retreading units, stone crushers, chilly grinders, phova mill, pulverizing mills, docoticators, iron-oxide and red-oxide crushing units, Crematorium.

RATE SCHEDULE

Fixed Charges : Rs.10 per HP per month of sanctioned load.
PLUS
Energy Charges : 120 paise per unit for all units consumed in the month.

NOTE:
1. Electricity can also be used for lighting, heating and air-conditioning the premises.
2. In the case of welding transformers, the connected load shall be taken as (a) Half the maximum capacity in KVA as per the nameplate specified under - IS 1851 or (b) Half the maximum capacity in KVA as recorded during rating by KEB, whichever is higher.
3. The laboratory installations in educational institutions are allowed to install connected machineries upto 4 times their sanctioned load, The fixed and the

minimum charges shall however be on the basis of sanctioned load.

4. Capacitors shall be installed in accordance with Regulation 24.00 of the ESR. If during the rating of installations, PF is found to be less than 0,85 lag, a surcharge of one paise per unit for every reduction of PF by 0.01 below 0.85 shall be levied from the billing month following the expiry of the 3 months of the notice given by KEB until such time the additional capacitors are installed and notified to the KEB.

5. If the capacity of the capacitors provided is found to be less than what is stipulated in Regulations 24.00 of ESR during inspection, the power factor will be computed and surcharge as provided in Note-4 will be levied.

6. All installations with a sanctioned load of more than 50 HP shall be provided with additional meters to record lighting consumption. For the purpose of billing, the consumption of both the meters shall be taken together and charged at the above rate.

TARIFF SCHEDULE-LT-6

(Street Lights/Public Lighting)

Applicable to public street light/park lights maintained by Local Bodies, Central and State Government, APMC and Traffic Signals.

Also applicable to street light/public lights of (a) Residential Campus of Universities (b) Other Educational Institutions (c) Housing colonies approved by Local Bodies/Development Authorities (d) Religious Institutions.

RATE SCHEDULE

(a) For Village/Mandal/Interim Mandal/Town Panchayats/ Town Municipalities.
Rs.150 per Kw per month of connected load.

(b) For other street lights:-
Rs.250 per Kw per month of connected load.

NOTE:

1. The street lights in notified areas and industrial areas/estate will be billed under this tariff.

2. In case of villages covered under KEB Electrification programme, fluorescent fittings will be provided by KEB.

3. In all other cases, the entire cost of fitting including brackets, clamps etc. and labour for replacement, additions and modifications shall be met by the organisations making such a request. Labour charges shall be paid at the standard rates fixed by KEB for each type of fittings.

4. Lamps, fittings and defective components of fittings shall be supplied by the consumer for replacement.

5. Fractions of Kw shall be rounded off to the nearest quarter kilowatt for billing purposes and the minimum billing being for 0.25 Kw.

TARIFF SCHEDULE-LT-7

(Temporary Power Supply)

RATE SCHEDULE

Energy Charges : 300 paise per unit consumed.

NOTE:
1. All conditions regarding temporary power supply as stipulated in Electricity Supply Regulations shall be complied with before service.
2. Charges indicated in the Electricity Supply Regulations in respect of certain categories of temporary supply shall continue to hold good.

By Order,

sd/-
(Md. ISMAIL)
Additional Secretary,
K.E.B.

The Rates of Electricity Tax on Units of energy consumed prevailing is given below.

	TARIFF SCHEDULE	Tax Rate prevailing in Paise per Unit
1.	HT-1	10
2.	HT-2	10
3.	HT-3	5
4.	HT-4	Nil
5.	HT-5	10
6.	HT-6	Nil
7.	LT-1(b)	7
8.	LT-2 (a) & (b)	5
9.	LT-3	10
10.	LT-4 (a) (i)	Nil
	LT-4 (a) (ii)	5
	LT-4 (b) (ii) & (iii)	5
	LT-4 (c)	5
11.	LT-5	10
12.	LT-6 (a) & (b)	Nil
13.	LT-7	10

APPENDIX B

INTERVIEWS OF U.S. ENERGY SERVICE COMPANIES

The following U.S. Energy Service Companies were interviewed to gauge their interest in starting operations in India:

A&C Enercom
Central Hudson Enterprises
CES/Way
Co-Energy Group
DMC Services
Energy Masters Corporation
HEC Energy Services
Johnson Controls
Kenetech Energy Management
Proven Alternatives
Sycom Enterprises.

A brief discussion of each company's business characteristics; their current overseas operations, including future plans; their characterisation of attractive overseas market opportunities; their thoughts on India as a potential market opportunity; and, barriers seen by them in establishing an operating company in India, is provided in the following pages.

ESCO BUSINESS CHARACTERISTICS

ESCO	Size of Firm			Year Firm Started	Types of Projects		Types of Financing Offered
	No. of Employees	$ Revenues	# Projects		Target Market Segments	Target Technologies	
ESCO A	NA	>$50 M/yr	~100 per yr	1982 (ESCO div)	• Education, gov't, hospital, office	• 50% lighting retrofit • 10% HVAC controls • Mechanical/electronic HVAC retrofits	3rd party w/multiyear guarantee (mostly). All types offered. True shared savings de-emphasized.
ESCO B	NA	$75-125 M/yr[1]	15-20 active	1984	• Education, military, industrial (petro-chemical) "A bit of everything"	NA	Package financing; Oppenheimer, Sally Mae, Eurodollars, Deuchmarks
ESCO C	~40	NA	>20 MW via utility contracts	1986[2]	• Commercial • Industrial (some) • Institutional • Government	• Lighting (mostly) • Motors • HVAC • EMS Maintenance on most contracts	• Leases • Debt (mostly) • 3rd party arrangements
ESCO D	70	NA	30 active	1982	• Office • Hospital • University • Government	"Everything other ESCOs do" water conservation	• Leases • Pay from savings • Guaranteed financing
ESCO E	1,000	$60 M/yr	100 active (mostly utility)	1978	• Residential • Commercial (large C/I limited)	• Lighting • HVAC Projects: information, incentives, direct installation	None

[1]Based on expected value due to recently signed contract.

[2]Entered into a limited partnership with a utility and an engineering firm in 1990.

ESCO	Size of Firm			Year Firm Started	Types of Projects		Types of Financing Offered
	No. of Employees	$ Revenues	# Projects		Target Market Segments	Target Technologies	
ESCO F	130	NA	NA	1991	• Industrial focus (all markets but single family residential)	NA	• Shared savings • Installment sales • Turnkey • Purchase price (with or w/o utility $)
ESCO G	60-65 (ESCO div)	$5 M/yr in services $10 M/yr construction	35 (in 1991) 50 active	1975	• Retail chains • Schools • Hospitals • Office • Industrial (plastics, gas, petrochemicals)	• EMS • VAV conversions • Building envelope • Temp. controls • Chiller/boiler retrofit • Industrial troubleshooting	• Shared savings (public) • Guaranteed savings (private)
ESCO H	11	$25 M (in 1992)	30 (since 1984)	1984	• Education • Government (will work in all markets)	• Lighting • HVAC • Thermal storage • Cogeneration	• Bonded contracts/payment bond
ESCO I	7	$5 M/yr	20 active	1982	• Large C/I	• Lighting • HVAC • Cogeneration	• Shared savings • Leases • Installment sales
ESCO J	40	$30-40 M (since 1989)	~75 active	1989	• Large C/I (steel, automobile) • Institutional	• Lighting • Motors (others proprietary)	• Shared savings • Debt financing • Lease
ESCO K[3]	NA	NA	NA	NA	NA	NA	NA

NA = Not Available

[3]Recently purchased by a Utility Holding Company.

CURRENT/FUTURE ESCO OVERSEAS OPERATIONS

ESCO	*Current Overseas Operations*	*Plans for Future Overseas Operations*
ESCO A	Italy, Netherlands, UK (all performance contracting)	Plans for expansion
ESCO B	Portugal (joint venturing with a firm in the European Community since early 1991)	Yes
ESCO C	None	Developing plans for Eastern Europe, Latin America, Asia; USAID projects
ESCO D	Not directly; do have co-marketing relationships (i.e., supply engineering) with partner in Latin America and Eastern Europe	Yes, Canada, Latin America, Eastern Europe with partner
ESCO E	Yes, Canada	Yes
ESCO F	No	Maybe; very interested
ESCO G	No	No; very interested and feels that ESCOs will have to enter overseas markets in the long run to maintain leadership.
ESCO H	No (just Hawaii)	No
ESCO I	No	No
ESCO J	No	Considering Europe
ESCO K	Yes (locations not specified)	Yes

ESCO CHARACTERIZATION OF ATTRACTIVE OVERSEAS MARKET OPPORTUNITY

ESCO	*Opinions On Attractive Overseas Market Opportunity*
ESCO A	Not (yet) available.
ESCO B	• Profit potential • Stable government that is friendly with U.S. • Favorable investment climate • A real need
ESCO C	• Reasonable sized market; "critical mass of density" • High energy rates, serious capacity constraints • Growing economy • Tolerance/encouragement by the local utility, local equipment sources • Political stability
ESCO D	• Customer pays on a progress basis, not a performance basis
ESCO E	• English speaking • Stable government • Relatively close to U.S. • Ease of currency exchange
ESCO F	• Availability of large projects ("not $10,000 jobs")
ESCO G	• Security - no currency risk, no political risk • Utility involvement (to subsidize parts of projects) • Minimal up-front marketing/organizational expense
ESCO H	• Need multiple projects (after first job) so that start-up costs can be absorbed
ESCO I	• Legal system that facilitates ESCO business ("American legal system")

ESCO CHARACTERIZATION OF ATTRACTIVE OVERSEAS MARKET OPPORTUNITY

(Continued)

ESCO	*Opinions On Attractive Overseas Market Opportunity*
ESCO J	• "Financiability" • Laws that allow for long-term agreements • Large C/I customer base • Educated population • Limited supply of electricity combined with high demand • English-speaking
ESCO K	• Market need • Unique ESCO strength to establish position in new overseas market (e.g., speak the language) • Prior ESCO joint venture experience in that country

INDIA - A POTENTIAL MARKET OPPORTUNITY FOR U.S. ESCOS?

ESCO	*Thoughts on India as a Potential Market Opportunity*
ESCO A	Not (yet) available.
ESCO B	Has considered India. Has had extensive talks with OPIC and AID. As discussions progressed, saw better opportunities in the European Community.
ESCO C	Has considered India. Views India as a strategic market in the long term. India is seen as a very large market with serious capacity constraints on energy and a distorted pricing structure. Recent trends toward market liberalization is good.
ESCO D	Has not considered India.
ESCO E	Has not considered India. Do not view India as a good business environment. It is remote, exotic, and poses problems with travel time/logistics and currency.
ESCO F	Has not considered India, but open to it.
ESCO G	Has not considered India. Not familiar with energy situation.
ESCO H	Has not considered India, but feels that market opportunity hinges on guarantees, financing, and project organization (i.e., use Indian contractors and U.S. firm to oversee projects). Engineers in India are viewed as very qualified. Need good equipment in India to support project.
ESCO I	Has not considered India; feels there is currently a tremendous opportunity in the U.S. India is viewed as a high political and financial risk.
ESCO J	Has considered India; feels that financing in India is very difficult and that currently, there are so many opportunities here in the U.S. Noted that the Indian Government would have to be involved in the financing — not regional utilities who have bad credit ratings.
ESCO K	Has considered India and feels significant market opportunities exist. Chosen not to enter India because of limited resources, and the robust nature of the U.S. market. Has no contacts in India; it's a totally different business.

Note: All of the ESCOs interviewed were enthusiastic about learning more about opportunities in India, though some seemed interested on a more intellectual basis.

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OBSTACLES TO ADDRESS IN ESTABLISHING A JOINT VENTURE BETWEEN U.S. ESCO AND INDIAN FIRM

ESCO	Barriers to/Suggestions for Joint Venture Establishment
ESCO A	Not (yet) available
ESCO B	• "Most ESCOs in the U.S. are doing well enough here so they are not interested in reaching out."
ESCO C	• Need to streamline import licensing (to the extent that it would be necessary) • Need tariff waiver (or at least a discount) on imported energy efficiency equipment • "Day-to-day" operation would drive you crazy
ESCO D	• "We are a very conservative company. It has taken us until now to expand to Canada."
ESCO E	• Stability of government • Currency exchange and repatriation • Language barrier • Time/distance barrier
ESCO F	• Trade barriers • Institutional barriers
ESCO G	N/A
ESCO H	• Personality problems - need mutual respect • Must result in good return • Must be able to move money back and forth • Need economically stable end-users who will stay in business

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OBSTACLES TO ADDRESS IN ESTABLISHING A JOINT VENTURE BETWEEN U.S. ESCO AND INDIAN FIRM

ESCO	Barriers to/Suggestions for Joint Venture Establishment
ESCO I	• Language and cultural barriers • Legal relationship barriers
ESCO J	• Need repatriation of profits • Logistics barrier • Hard to finance (credit risk) • Working in Indian currency is a barrier • Communication barrier
ESCO K	• Language barrier (but "engineers in India do speak English") • Cultural barriers • Not easy to get paid • Financing barriers, different tax laws and project accounting • Logistics barrier • Risk-reward scenario is different • Driving force for energy savings is different

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APPENDIX C

LIST OF ORGANISATIONS INTERVIEWED

U.S. ORGANISATIONS

Energy Service Companies

A&C Enercom
Central Hudson Enterprises
CES/Way
Co-Energy Group
DMC Services
Energy Masters Corporation
HEC Energy Services
Johnson Controls
Kenetech Energy Management
Proven Alternatives
Sycom Enterprises

INDIAN ORGANISATIONS

Electricity Boards

Delhi Electric Supply Undertaking
Karnataka Electricity Board
Maharashtra State Electricity Board
Tamil Nadu Electricity Board

Manufacturers

Apar Ltd.
Blue Star Ltd.
Crompton Greaves Ltd.
Frick India Ltd.
General Electric Company of India
Industrial Boilers
Lloyd Steel Industries Ltd.
Phillips India
SOM Industries
Sri Aerocool

Technicorm Chemie
Thermax Ltd.

Consultants

Anco-Arjay Systems Private Ltd.
Belgundi Group/Fusion Energy Technologies Pvt. Ltd.
Desein Private Ltd.
Engineers India Ltd.
Gill Maritime Consultancy
Lotus Energy Systems
M.K. Raju Consultants Private Ltd.
National Productivity Council
Sigma Consultants Ltd.
Tata Consulting Engineers
Yagna Fuel Services

Financial Institutions

Bayswater Finance Ltd.
Citibank
Industrial Development Bank of India
Sundaram Finance
Twentieth Century Finance Corporation Ltd.

Other Organisations

Associated Chambers of Commerce & Industry of India
Confederation of Indian Industry
Energy Management Center
Secretary of Power and Industry, Maharashtra Government
Urja Research Foundation

End-Users

Bharat Heavy Electricals Ltd.

Mysore Breweries Ltd.
Wheels India Ltd.

INTERNATIONAL ORGANISATIONS

World Bank
Asian Development Bank

APPENDIX D

SPECIMEN DOCUMENTS/CLAUSES FOR COMPANY FORMATION

The following specimens are provided in this appendix for reference purposes:

1. Specimen of Memorandum of Association, taken from: Nabhi (Board of Directors), *Formation & Management of a Private Company*, Nabhi Publications, New Delhi, August 1992.

2. Specimen of Articles of Association, taken from: Nabhi (Board of Directors), *Formation & Management of a Private Company*, Nabhi Publications, New Delhi, August 1992.

3. Specimen Clauses in Joint Venture Agreement, taken from: Agrawal, H.P., *Business Collaborations in India Fifth Edition 1992 - Industrial Procedures and Tax Planning Based on New Industrial Policy of 1991*, Wadhwa and Company Pvt. Ltd, Nagpur, 1992.

SPECIMEN OF MEMORANDUM OF ASSOCIATION

(Memorandum of Association of a Company can be in any one of forms in Table B, C, D & E in Schedule I of the Companies Act, as may be applicable. A specimen of Memorandum based an Table B i.e. Company having share capital is given below)

MEMORANDUM OF ASSOCIATION
OF
XYZ PAPER MILLS PRIVATE LIMITED

(i) The name of the company is XYZ PAPER MILLS PRIVATE LIMITED.
(ii) The Registered office of the company will be situated in the UNION TERRITORY OF DELHI.
(iii) The objects for which the company is established are :

(A) Main Objects

1. To carry on the business of manufacturers of and dealers in all kinds and classes of paper, board, and pulp including writing paper, printing paper, absorbent paper, newsprint paper, wrapping paper, tissue paper, cover paper, blotting paper, filter paper, antique paper, ivory finish paper, coated paper, art paper, bank or bound paper, badami paper, brown or butt paper, cloth lined paper, hand made paper, drawing paper, craft paper, carbon paper, sensitised paper, hard board, plywood board, mechanical pulp, sulphite pulp and all kinds of articles in the manufacture of which in any form of paper, board or pulp is used.

(B) Objects Incidental or Ancilliary to the Attainment of Main Objects

1. To acquire and take over all or any part of business, property, plant and mechinery and any other assets and liabilities of any person, firm or company or any business which this company is authorised to carry on.
2. To carry on any other business, whether manufacturing or otherwise, which may seem to the company capable of being conveniently carried on in connection with the above or calculated directly or indirectly to enhance the value or render profitable any of the company's properties or rights.
3. To acquire by purchase, lease, exchange, or otherwise, lands, buildings, easements, any hereditaments of any tenure or description and any estate or interest therein and any rights over or connected with land and to retain the same for the purpose of the company's business.
4. To manufacture, import, export, buy, sell, exchange, alter, improve, manipulate, prepare for market and otherwise deal in all kinds of plant, machinery, apparatus, tools, utensils, substances materials, and things necessary or convenient for carrying on any business.
5. To amalgamate with any company having object altogether or in part similar to those of this company.
6. To expand the company's activities by opening branches and or by appointing agents in India and any foreign country.
7. To start agencies, shops in different part of India and elsewhere as the Board of Directors may decide for the sale and distribution of the products of the company or for the expansion of the business.

8. To supervise and control the business of any other company, or companies having objects similar to its own.
9. To enter into partnership or into any arrangement for sharing profits or losses, or into any union of interest, reciprocal concession or co-operation with any person or company carrying on or engaged in or about to carry on or engage in any business transaction which this company is authorised to carry on to benefit this company.
10. To purchase, take on lease, or in exchange hire or otherwise acquire any immovable or movable property, machinery, plant, stock-in-trade, patent right and any rights which the company may think necessary with reference to any of these objects.
11. To sell, improve, manage, develop, exchange, lease, mortgage, dispose of, or otherwise deal with all or any part of the property and rights of the company.
12. To sell or dispose of any, or all of the undertaking of the company or any part thereof for such consideration as the company may think it.
13. To promote any company or companies for the purpose of acquiring all or any of the property, rights, and liabilities of this company or for any other purpose to benefit this company.
14. To enter into any contracts, agreements, or other dealings in the nature of technical collaboration or otherwise for the more efficient conduct of the business of the company and also arrange for purchase, or supply of machinery from any part of the world on credit or for cash or on deferred payment terms.
15. To pay all or any cost, charges and expenses, preliminary and incidental to the promotion, formation, establishment and registration of the company.
16. To invest and deal with the money's of the company not immediately required upon such securities and in such manner as may from time to time be determined for implementing the main objects.
17. To lend and advance money or give credit to such persons and upon such terms and conditions as the company may think fit, provided the company shall not carry on business of banking within the meaning of Banking Regulation Act, 1949.
18. To undertake and execute any trust, the undertaking of which may seem to the company desirable, either gratuitously or otherwise.
19. To draw, make, accept, discount, execute and issue of bills of exchange, promissory notes, bills of lading, warrants, debentures and other negotiable or transferable instruments or securities.
20. To provide for the welfare of the employees or ex-employees of the company and their families dependents either by grant of money, pension allowances or in any other manner whatsoever.
21. To purchase or otherwise acquire, settle, improve and cultivate forests, lands, and properties of any tenure whatever with a view to producing cultivating, growing timber bamboo or other wood.
22. To pay for any properties, rights, or privileges acquired by the company either in shares of the company or partly in cash or otherwise.
23. To subscribe, contribute or grant money for any national charitable benevolent, public, general or useful object or fund for any exhibition but not amounting to contribution to any political party under any circumstances.
24. To employ and/or engage engineers, mechanics, electricians, technicians as may be required for carrying on the business of the company.
25. To appoint agents, sub-agents, dealers, sub-dealers, distributors for selling the products manufactured and dealt with by the company.

(C) Other Objects

26. To carry on all or any of the business of manufacturers, importers, exporters, stockists and otherwise, dealers in all kinds of chemicals, organic and inorganic including acids,

alkalies, calcium carbonate aniline, manure fertilisers, soda, soda-ash, dry ice, catechu and other chemicals synthetic or otherwise.

27. To carry on the business of plantation and manufacturers of and dealers in all kinds of tea, coffee, cocoa and other food beverages and preparations.

(iv) The liability of the members is limited.

(v) The authorised share capital of the company shall be Rs. 10,00,000 (Rupees ten lacs) divided in 10,000 (Ten thousand) equity shares of Rs. 100 (Rupees One hundred) each.

We, the several persons, whose names, addresses are subscribed are desirous of being formed into a company in pursuance of this Memorandum of Association and we respectively agree to take the number of shares in the capital of the company set opposite our respective names :

Names, addresses, description and occupations of the subscribers	*Signature of Subscriber*	*No. of shares taken by each subscriber*	*Signature of the witnesses and their addresses, description & occupation*
1. Sh. X s/o. Sh. B. Karol Bagh, New Delhi-5 Business	Sd/-	10 (Ten) Equity shares	
2. Sh. Y s/o Sh. D Karol Bagh, New Delhi-5 Business	Sd/-	10 (Ten) Equity shares	Sd/- Sh. A s/o Sh. C Chartered Accountant New Delhi
3. Sh. Z s/o Sh. F. Patel Nagar, New Delhi Rtd. Bank Executive	Sd/-	10 (Ten) Equity shares	
	Total	30 (Thirty)	

Dated : 19th August, 1990
New Delhi.

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SPECIMEN OF ARTICLES OF ASSOCIATION

[There is no prescribed format of the articles of association of private company. A model incorporating virtually all the aspects required to be covered in the Articles is given below]

ARTICLES OF ASSOCIATION
OF
XYZ PAPER MILLS PRIVATE LIMITED

1. **Interpretation.**

"The Act" : means the Companies Act, 1956 or any other modification thereof.
"Section" : means the relevant section of the Act.
"Seal" : means the common seal of the Company.
"Board" : means the Board of Directors of the Company.
"Persons" : includes corporations, associations and firms as well as individuals.

Unless the context otherwise requires, words or expression contained in these regulations shall bear the same meaning as in the Act or any statutory modification thereof in force on the date at which these regulations become binding on the Company.

TABLE 'A' EXCLUDED

2. The regulation contained in Table 'A' in the First Schedule to the Companies Act, 1956 shall not apply to this Company.

SHARES

3. The authorised share capital of the company is Rs. 10,00,000 (Rupees ten lacs only) divided into 10,000 (ten thousand) equity shares of Rs. 100 each.

4. **Rights Attached to Preference Shares**

The preference shareholders shall in priority to all other shares be entitled to fixed cumulative preferential dividend out of profits of the company at the rate determined by directors at the time of issue.

5. **Rights Attached to Equity Shares**

Subject as aforesaid and to the rights of the holders of any other shares entitled by the terms of issue to preferential payment over the equity shares in the event of the winding up of the company, the holders of the equity shares shall be entitled to be repaid the amount of capital paid up credited as paid up on such shares, and all surplus assets thereafter shall belong to equity shares in proportion to the amount paid at the commencement of winding up.

6. **Redeemable Preference Shares**

The directors of the company shall have power to issue Preference Share which may be at the option of the company, liable to be redeemed.

7. **How Shares to be Issued**

The shares taken by the subscribers to the Memorandum of Association shall be issued by directors. Subject as aforesaid, the shares shall be under control of the directors who may allot and issue the shares of such persons as the directors think fit.

8. Commission for Subscribing Shares

The company may pay a commission to any person for subscribing shares in the company, if the commission shall be paid out of capital, the statutory conditions and requirements shall be observed and complied with and the commission shall not exceed 5% on the shares subscribed.

9. No Shares/Debentures to be Offered to Public

The company is a private company and accordingly—

(a) no invitation shall be issued to the public to subscribe for shares of the company.
(b) the number of the members of the company shall be limited to fifty (This number does not include persons who are employed with the company and the members who are no more employed with company but still members of the company).
(c) The right to transfer the shares is restricted.

10. Receipts of Joint Holders of Shares

If two or more persons are registered as joint holders of any share, any one of such persons may give effectual receipts for any dividends or other moneys payable in respect of such shares.

11. Registered Members Entitled to Share Certificates

Every member within three months after allotment of shares shall be entitled to receive one certificate under the seal for all the shares registered in his name specifying the number of shares and amount paid up thereon; provided that in case of joint holders, the company shall not be bound to issue more than one certificate to all joint holders and delivery of such certificate to any of them shall be sufficient delivery to all.

12. New Certificate May be Issued

Subject to the provisions of the Companies (Issue of Share Certificates) Rules, 1960, if any share certificate is defaced, worn out, destroyed or mutilated or lost, it may be renewed on such evidence being produced and in any case on payment of such sum not exceeding one rupee.

LIEN

13. Company to have Lien on Shares

The company shall have first and paramount lien upon all shares for all moneys (whether presently payable or not or called or payable at fixed time) in respect of that shares and the company shall have lien on all money presently payable by a shareholder.

CALLS ON SHARES

14. Calls

The directors may from time to time make call upon the members in respect of any money unpaid on their shares and each member shall be subject to receiving at least 14 day's notice specifying the time of payments, pay to the company at the time or times of payment so specified.

15. Revocation of Call

A call may be revoked or postponed at the discretion of the board.

16. Interest on Calls

(i) If a sum called in respect of a share is not paid before or on the day appointed for payment thereof the person from whom the sum is due shall pay interest thereon

from the day appointed thereof to the time of actual payment at 12% per annum or at such lower rate, if any, as the board may determine.

(ii) The board shall be at liberty to waive payment of any such interest wholly or in part.

17. Forfeiture

In case of non-payment of such sum, all the relevant provisions as to payment of interest, forfeiture or otherwise shall apply as if the sum had become payable by virtue of call duly made and notified.

TRANSFER OF SHARES

18. Transfer

No share shall be transferred to a person other than a member unless no member is willing to purchase such share or shares at the fair value thereof. Before a sale to a person other than a member is made in consequence of no member being willing to purchase the same, the written permission of the board to transfer the shares to a person other than a member shall be taken.

19. No Transfer to Minor

No transfer shall be made to minor or person of unsound mind.

20. Fee or Registration of Transfer

No fee shall be payable to the company in respect of transfer or transmission of any shares in the company.

FORFEITURE AND SURRENDER OF SHARES

21. Call or Instalment not Paid Notice may be Given

If a member fails to pay any calls on the day appointed for payment thereof the board may, at any time thereafter, during such time as any part of the call or instalment remaining unpaid, serve a notice on him requiring payment of such amount on the call as is unpaid together with any interest which may have accrued.

22. The Notice Aforesaid Shall

(a) Name a further day (not being earlier than the expiry of 14 days from the date of service of notice) on or before which payment required by the notice is to be made; and

(b) State that in the event of non-payment on or before the day so named the shares in respect of which the call was made will be liable to be forfeited.

23. If Notice not Complied Shares may be Forfeited

If the requirements of any such notice as aforesaid are not complied with, any share in respect of which the notice has been given, may at any time thereafter, before the payment required by the notice has been made, be forfeited by a resolution of the Board to that effect.

24. Forfeited Share become Property of Company

Any share forfeited shall be deemed to be the property of the company and the directors may sell or otherwise dispose of or annul the forfeiture thereof upon such conditions as they think fit.

25. Liability of Forfeiture

Any member whose shares have been forfeited shall cease to be a member in respect of the forfeited shares, but shall notwithstanding the forfeiture, be liable to pay and shall forthwith pay to the company all calls, instalments and expense owing upon or in respect of such shares at the time of the forfeiture until payment thereof and interest at 12% per annum and the director may enforce the payment thereof, if they desire.

26. Surrender of Shares

The directors may accept the surrender of any shares as may be permissible in law.

27. Validity of Sales in Exercise of Lien and After Forfeiture

Upon any sale after forfeiture, surrender or for enforcing lien in purported exercise of the power herein given the directors may cause the purchaser's name to be entered in the register of members in respect of the shares sold and the purchasers shall not be bound to see the regularity of the proceedings or to the application of the purchase money and after his name has been entered in the register in respect of shares, the validity of the sale shall not be impeached by any person and the remedy of any person aggrieved by the sale shall be in damages only.

ALTERATION OF CAPITAL

28. The company may from time to time by ordinary resolution increase the share capital by such sum to be divided into shares of such amount, as may be specified in the resolution.
29. The company may by an ordinary resolution
    (a) consolidate and divide all or any of its share capital into shares of larger amount than its existing shares;
    (b) sub-divide its existing shares or any of them into shares of smaller amount than is fixed by the memorandum subject nevertheless to the provisions of clause (d) of sub-section (1) of section 94;
    (c) cancel any shares which, at the date of the passing of the resolution, have not been taken or agreed to be taken by any person.
30. The company may, by special resolution, reduce in the manner required by Act
    (a) its share capital
    (b) any capital redemption reserve fund, or
    (c) any share premium account.

GENERAL MEETING

31. Extraordinary General Meeting

All general meeting other than annual general meeting shall be called extraordinary general meeting.

32. When Extraordinary General Meeting to be Called

(a) The Board, may whenever it thinks fit, call an extraordinary general meeting.
(b) If at any time they are not within India, directors capable of acting who are sufficient in number to form a quorum, any director or any two members of the company may call an extraordinary general meeting in the same manner as nearly as possible as that in which such a meeting may be called by the Board.

(c) **Annual General Meeting:** The first Annual General Meeting of the company shall be held within 18 months from the date of its incorporation and thereafter once at least every year at such time (not being more than 15 months after the holding of the last annual general meeting and not latter than six months from the expiry of the financial year) at place as may be fixed by directors and such place may be other than the registered office of the company subject to Section 166(2) of the Act.

(d) **Notice of General Meeting:** A General Meeting including Annual General Meeting may be called after giving a notice of 7 clear days.

PROCEEDING AT GENERAL MEETING

33. Quorum

No business shall be transacted at any general meeting unless two members at least are present in person at the time when meeting proceeds to business.

34. Voting

Subject to any right or restriction for the time being attached to any class of shares :

(a) on a show of hands, every member present in person shall have one vote, and

(b) on a poll, the voting right of members shall be as laid down in Section 87 of the Act.

35. No member shall be entitled to vote at any general meeting unless all calls or other sum presently payable by him in respect of shares in the company have been paid.

BOARD OF DIRECTORS

36. Number of Directors

Until otherwise determined by the company in general meeting the number of directors shall not be less than 2 and not more than 7 which shall not include technical or expert directors if any.

37. Qualification Shares

The qualification of directors other than expert or technical director, shall be holding of equity shares in the company at least of nominal value of Rs. 100 full paid up in his own name, which if not already held, shall be acquired within 2 months of the appointment.

38. The first directors of the Company shall be :

(i) Shri X
(ii) Shri Y
(iii) Shri E

The above named two directors Sh. X and Sh. E shall be permanent directors and the first director Shri Y shall be the Managing Director and none of the permanent directors shall be liable to retire by rotation subject to the provisions of Section 284 of the Act.

39. Quorum

The quorum for a meeting of the Board of Directors shall be one-third of its total strength (Any fraction contained in that one-third being rounded off as one) or two directors, whichever is higher. Provided that where at any time the number of interested directors exceeds or is equal to two-third of the total strength, the number of remaining directors who are not interested shall be quorum during such time.

40. **Meeting Fee**
    (a) Every director of the company shall be paid such fees for board's meeting attended by him as may be fixed by Board of Directors from time to time.
    (b) In addition to the fees payable to them in pursuance of sub-clause (a) above, the directors may be paid all travelling and hotel expenses incurred by them in connection with the business of the company and in attending the Board's meetings from any place in India or abroad.
    (c) The managing director, chairman, or any director, or technical director, shall be paid such remuneration, furnished house, car and other benefits as may be fixed by the board from time to time, subject to provision of Section 314 of the Act.

41. The business of the company shall be managed by the directors who may pay all expenses incurred in registering the company and may exercise all such powers of the company which are not forbidden by the Companies Act or by Memorandum and Articles of Association. No regulation made by the company in the general meeting shall invalidate any prior act of the directors which would have been valid if the regulation had not been made.

42. **Office or Place of Profit**
    A director may hold any office or place of profit in the company in conjunction with his directorship and may be appointed thereto on such terms and remuneration as may be determined by the company subject to provisions of Section 314.

43. **Chairman of the Board Meeting**
    The Chairman of the Board of Directors shall take chair at the board's meeting but if there be no such chairman or he/she be not present the directors present shall choose one of their number to be chairman of such meeting.

44. The meeting of the Board of Directors shall be held once at least in every three months and at least four such meetings shall be held in a year as required by Section 285.

45. All acts done by any meeting of the Board or a committee thereof or by any person acting as a director shall, notwithstanding that it may be afterward discovered that there was some defect in the appointment of any one or more of such directors or of any person acting as aforesaid or that they or any of them were disqualified be, as valid as every such director or such person had been duly appointed and was qualified to be a director.

46. No director shall be disqualified by his office as such from contracting with the company either as vendor/purchaser or lender or otherwise nor shall have any such contract or arrangement entered into by or on behalf of the company with any company or partnership or with any director shall be member or otherwise interested be so avoided nor shall any director so contracting be so liable to account for to the company for any profit realised by such contract or arrangement by reason only of such director holding that office or of the fiduciary relation thereby established, but the nature of interest must be disclosed at the meeting of the directors at which the contract or arrangement is determined if the interest then exists or in any other case at the first meeting of directors after the acquisition of his interest.

ALTERNATE DIRECTOR

47. The Board of Directors may appoint an alternate director to act for a director during his absence for a period of not less than 3 months from the State in which the board meetings are ordinarily held. An alternate director shall not hold office for a period

longer than permissible to the original director in whose place he has been appointed and shall vacate office on return of original director to such State.

MANAGING DIRECTOR

48. The directors may from time to time appoint one or more of their body to the office of managing director or wholetime director in such terms and such remuneration whether by way of salary or participation in profit or partly in one way and partly in another as they may think fit.

49. The managing director shall not be liable to retirement by rotation and shall not be reckoned as a director for the purpose of determining the rotation or retirement of director but subject to the same provision as to resignation and removal as the other directors of the company and he shall *ipso facto* and immediately cease to be the managing director if he ceases to hold the office of director for any cause.

50. The managing director shall, subject to the supervision of the Board of Directors have power to do all acts, matters, things deemed necessary, proper or expedient for carrying on the business of the company and the power to make such investment of company's fund and sign all contract and to draw, sign, accept, endorse and negotiate on behalf of the company bills of exchange, promissory notes, hundies, cheques, draft, government securities and instruments.

CHAIRMAN

51. The directors may appoint a chairman of the company for whole time or otherwise and on such terms and conditions as the board thinks fit from time to time.

AUDIT

52. Once at least in every year the accounts of the company shall be audited by Chartered Accountants whose duties and powers shall be regulated in accordance with the provisions of the Companies Act, 1956 or any statutory modification thereof, for the time being in force.

SEAL

53. (a) The directors shall provide a common seal for the purpose of the company and shall have powers from time to time to destroy the same and substitute a new seal in lieu thereof and the directors shall provide for the safe custody of the seal.
    (b) The seal shall not be affixed on any instrument except by and in the presence of at least two directors who shall sign every instrument on which seal shall be affixed by them.

INDEMNITY

54. The chairman, directors, managing director, auditors, secretary and other officers for the time being acting in relation to any affairs of the company and their heirs, executors and administrators respectively shall be indemnified out of the assets of the company from and against all suits, proceedings whether civil or criminal, costs, charges, loss, damages, expenses which they or any of them shall or may incur or sustain by reason of any act done or committed in/or about the execution of their duty in their respective offices or trusts except such (if any) as they shall incur or sustain by or through their own wilful neglect or default respectively subject to the provisions of Section 201 of the Act.

Name, addresses, description and occupation of the subscribers	*Signature of Subscriber*	*No. of shares taken by each subscriber*	*Signature of the witnesses and their addresses, description & occupation*
1. Sh. X s/o. Sh. B. Karol Bagh, New Delhi-5 Business	Sd/-	10 (Ten) Equity shares	
2. Sh. Y s/o Sh. D Karol Bagh, New Delhi-5 Business	Sd/-	10 (Ten) Equity shares	Sh. A S/o Sh. C Chartered Accountant, New Delhi
3. Sh. Z s/o Sh. F. Patel Nagar, New Delhi Rtd. Bank Executive	Sd/-	10 (Ten) Equity shares	
	Total	30 (thirty)	

Specimen Clauses in Joint Venture Agreement

Specimen Clauses in Joint Venture Agreement*

1. FORMATION OF JOINT VENTURE COMPANY

1. Local and Foreign (or else Local alone) shall take all necessary steps for the incorporation of a (type of corporation to be formed) Corporation under the laws of (jurisdiction of incorporation), which said corporation shall be hereinafter referred to as the 'Joint Company'.
2. Local and Foreign (or else Local alone) shall cause the Joint Company to be duly organized in accordance with the terms of this Agreement, with (name for the documents of incorporation under the law of the jurisdiction of incorporation, such as "Statutes", "Letters Patent of Incorporation", "Memorandum and Articles of Association" etc.), which in the English translation shall read in substantially the form in Schedule attached hereto.
3. The costs of incorporating the Joint Company shall be borne equally (or according to some other formula) by Foreign and Local.
4. If any of the provisions contained in the said Schedule should not be approved by the appropriate authority for inclusion in the documents of incorporation of the Joint Company, then the parties agree to make such amendments thereto as shall be acceptable to the said appropriate, authority without altering their purpose or intention, or failing such amendment, to take all such other steps and do such other things, including the execution of any other agreements as may be necessary, to achieve the interest and purpose of such of the provisions as may not have been found acceptable by the said appropriate authority.

2. PAYMENT FOR EQUITY PARTICIPATION

In payment for the shares of the Joint Company to be acquired by Foreign (Local) at the time of the incorporation of the Joint Company (or, within—days after the incorporation of the Joint Company), Foreign (Local) shall assign and transfer to the Joint Company:

1. Cash: (amount) in cash.
2. Machinery and Equipment: all the machinery and equipment set forth in

* These clauses have been extracted from "the Manual on the Establishment of Industrial Joint Venture Agreements in Developing Countries" published by United Nations.

Schedule—annexed hereto, which said machinery shall become the sole property of the Joint Company, free and clear of all liens, charges and claims of any kind whatsoever.

3. Land: the absolute title, free and clear of all liens, charges and claims of any kind whatsoever, to the real property and all buildings and other structures thereon, including all fixtures, equipment and machinery located therein, situated at (municipal address), which said real property, buildings, structures, fixtures, equipment and machinery are more specifically described in the Schedule annexed hereto.

4. Industrial Property:

   (a) Assignments: Patents: Foreign's entire right, title and interest in and to all unexpired patents and patent applications theretofore issued or assigned to or filed by Foreign anywhere in the world to the Licensed Products or to the production, manufacture or use thereof (a list of such patents and patent applications here to fore issued or assigned to or filed by Foreign being set out in the attached Schedule), together with all rights which Foreign then has to apply for patents in the territory on inventions relating to the Licensed Products or to their production, manufacture or use, and including all of Foreign's rights with respect to patents which may thereafter issue anywhere in the territory or any such patent applications and with respect to divisions, patents of addition, continuation, renewals, re-issues and extensions of all such patents, patent applications and patents which may issue on such patent applications;

      (ii) Trade Marks and Trade Names: Foreign's entire right, title and interest in and to all rights in the territory which it then has to all of the following trade marks and trade names, namely: (to all the trade marks and trade names set out in the attached Schedule);

   (b) Licences: Foreign shall enter into a Licence Agreement with the Joint Company in the form as set out in Schedule—hereto annexed, under which said Licence Agreement the Joint Company shall become the exclusive licensee for the world for all unexpired patents and patent applications of Foreign for the Licensed Products or to the production, manufacture or use thereof, together with all rights which Foreign then has to apply for patents in the territory on inventions relating to the Licensed Products or to their production, manufacture or use, and including all of Foreign's rights with respect to patents which may therafter issue anywhere in the territory or any such patent applications and with respect to divisions, patents of addition, continuations, renewals, re-issues and extensions of all such patents, patent applications and patents which may issue on such patent applications;

   (c) Sublicences: Foreign's entire right, title and interest in and to all rights in the territory which it then has under patents owned by others relating to the Licensed Products or to their production, manufacture or use, a list of Foreign's present rights under such patents being set out in the attached Schedule.

5. Technical Data: Foreign's entire right, title and interest in and to the use in the territory of all Technical Data which Foreign is then entitled to use anywhere in the world; and thereafter during the term of this Agreement, Foreign shall assign and transfer promptly to the Joint Company any and all rights in the territory with respect to Technical Data relating to the Licensed Products and all other products being manufactured by the Joint Company, which Foreign shall acquire during such term incidental or relating to such products;

   Foreign shall take all such action and shall execute all such documents as the Joint Company may deem necessary or desirable to effect, perfect or confirm, record or otherwise, the transfers and assignments to the Joint Company referred to above, including, without limitation, the full and complete disclosure to the Joint Company of Foreign's Technical Data, and lists of Foreign's distributors and customers for all of the Licensed Products and other Products produced or sold by Foreign which may be similar to the products manufactured or sold from time to time by the Joint Company;

   In the above Sections, the term "Technical Data" shall mean formula, inventions, whether or not patentable, secret processes and technical information relating to the products and to the production, manufacturing, engineering and test data, specifications, application instructions, information regarding uses, raw materials and methods for controlling and analysing quality, and sample copies of advertising and publicity materials, except that information received in confidence from others or information forbidden to be disclosed by virtue of any law or governmental regulation restricting the dissemination of such information shall not be included.

3. DECISIONS BY BOARD OF DIRECTORS—

A. Simple majority:

All decisions of the Board of Directors shall require an affirmative vote of at least (number–it should be half of the total number of directorships plus one) directors.

Or

B. Special majority:

All decisions of the Board of Directors shall require an affirmative vote of at least (number—it should be half of the total number of nominees of the partner with the largest number of nominees on the Board, plus one for each of the other partners) directors.

AND/OR

C. No casting vote:

The Chairman shall not have a casting or second vote in the event of a deadlock.

4. DISTRIBUTION OF PROFITS

A. The parties hereto recognize that their own and the best interests of the Joint Company will be best served by taking all reasonable steps to ensure the

Note: Indian Government does not normally allow adjustment of share capital against equipment or know-how fee transferred by the foreign party to Indian Joint Venture Company.

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expansion of the production facilities of the Joint Company as rapidly as market conditions permit, and to this end, agree to retain sufficient earnings in the Joint Company before distributing profits to the shareholders, as shall be reasonably required in the circumstances to provide for such expansion and for the other requirements of conducting the affairs of the Joint Company according to sound business practices.

OR

B. Before any profits of the Joint Company shall be distributed as dividends to the shareholders thereof—per cent of each year's net after tax profits shall be set aside to meet the capital and other requirements of the Joint Company.

5. GRANT OF LICENCE

1. The Licensor shall make available to the Licensee without charge and as required by the Licensee all such technical data and information as shall be necessary for the Licensee to manufacture, sell and service the licensed products and all products relate thereto.

2. If the Licensee shall desire technical assistance in connextion with the manufacture, sale, application or servicing of the licensed products and all products related thereto, the Licensor shall make available to the Licensee the services of trained personnel for and during such periods as the Licensee shall reasonably require.

3. Representatives of the Licensor and the Licensee shall from time to time consult with each other regarding research, production, sales, servicing, advertising and promotion pertaining to the manufacture and sale of the licensed products, and including all developments and improvements in respect thereof, and the Licensor shall do all such things as shall be necessary to supply all the technical data and information and technical assistance in respect thereof as the Licensee shall request in accordance with the terms of the two preceding paragraphs.

6. GRANT OF SUB-LICENCE

The Joint Company shall have the right to assign the benefits to this Agreement, and to sub-licence the rights to the trade names and trade marks, to such other parties and upon such terms and conditions as it shall in its absolute discretion determine, provided, however, that it remains responsible to Foreign for its obligations hereunder and provided that such assignment or sub-licence shall apply only to the designated territory.

7. TRADE MARK

1. Foreign hereby grants to the Joint Company the right during the continuance and subject to the provisions of this Agreement to use each and every of the trade marks and trade names upon or in connection with the authorised products manufactured and/or assembled by or on behalf of the Joint Company within the territory and which comply with the relative standards, and the Joint Company agrees that it will use the trade marks and trade names upon or in connection with all authorised products so manufactured and/or assembled.

2. The right of the Joint Company to use the trade marks and trade names as aforesaid is an exclusive right for the whole of the territory.

8. GRANT OF TECHNICAL ASSISTANCE

1. Foreign shall furnish to the Joint Company detailed plans, specifications, blueprints and other data and information sufficient to enable a qualified contractor or contractors to construct production facilities at (address of site in host country) capable of producing (quantity) per year of (list products), which said production facilities shall be capable of being altered, added to or expended in an economical fashion so as to increase the production of the above said products or to adopt the facilities for the production of other related or similar products as the business exigencies of the Joint Company may from time to time require, and shall be of the latest, most modern and most economical design, and shall be capable of producing the said products in the most efficient and economical fashion.

2. Foreign hereby warrants and guarantees that the said production facilities shall satisfy all the above requirements.

9. INSTALLATION OF PLANT & MACHINERY

Foreign shall furnish to the Joint Company all the necessary technical assistance to assemble and install the equipment and machinery in the plant so that it will function in the manner required in the specifications.

10. MAINTENANCE FACILITIES

Foreign shall furnish to the Joint Company all the technical data, information and assistance necessary to ensure the effective operation and maintenance of the machinery and equipment, including:

(a) A list of recommended plant spares;

(b) Lubrication and maintenance manuals;

(c) Detailed operating instructions;

(d) Detailed manuals indicating the construction and assembly of each model and type of machinery and equipment;

(e) Instructions regarding start up and shutdown.

11. OPERATION OF FACILITIES

Foreign shall furnish to the Joint Company technical assistance and advice on all aspects of plant operations including but without limiting, the generality of the foregoing;

(a) Scheduling, material specifications and ordering, and production techniques relating to the manufacture of the products;

(b) Quality control and production planning;

(c) Methods, studies and other industrial engineering activities in connection with the organization, planning, training of personnel, and development of operating practices and procedures to obtain the most efficient use of the production facilities;

(d) Recommended safety procedures.

12. TESTING FACILITIES

1. The Joint Company shall not be required to accept the plant or production

facilities until such time as it shall be wholly satisfied that the said production facilities are capable of producing the required products in the required quantities.

2. Accordingly, before such acceptance, representative samples of each type of product to be produced by the Joint Company shall be sent to (name of independent testing agency or firm; or to Foreign's main production plant) for testing to ensure their compliance with the required standards and specifications and that they have been constructed in a good and workmanlike manner, and the Joint Company shall have been furnished with a guarantee and warranty of the satisfaction of such conditions.

13. RESEARCH AND DEVELOPMENT

Foreign shall during the term of this Agreement, provide to the Joint Company all technical information and assistance as shall be necessary to keep the Joint Company aware of current with, and able effectively to use, the latest development in technology applicable or relating to the manufacture, sale or use of the products to be produced by the Joint Company.

14. TRAINING

Foreign hereby undertakes to provide training and technical assistance to the Joint Company upon the following terms and conditions:

1. (a) Prior to the start-up of production, Foreign agrees to accept for training up to (maximum number) operating employees of the Joint Company at its plant located (site of Foreign's plant) for periods of at least months each.

   (b) It is understood that the maximum number of such employees to be trained by Foreign at any one time shall be—and that they shall be made familiar with all operational and technical aspects of production as relate to or are similar to the production operations to be undertaken by the Joint Company.

   (c) The Joint Company shall have no obligation to pay for the costs of such training, other than to pay for their travelling expenses to and from (Foreign's Country) and their salaries, if any.

   (d) Foreign will use its best efforts to assist in arranging for immigration visas for such trainees and in finding suitable living accommodations at reasonable prices for such trainess while they shall be in (Foreign's country).

2. For a period prior to the start-up of production and during the initial operating period, which initial operating period shall not last longer than—days, Foreign agrees to provide to the Joint Company:

   (a) One qualified production supervisor, and—assistants, all of whom shall be graduate engineers, who, besides their responsibilities in respect of readying the plant and operating facilities for the start-up of production and the initial operating period, shall assume responsibility for training all the operating employees of the joint Company in their operating functions.

   (b) One qualified individual who will assist in the recruitment and hiring of the necessary employees and in the development of personnel and labour relations skills in the Joint Company.

(c) The Joint Company agrees to reimburse to Foreign all expenses in respect of such individuals, including their salaries, travel expenses and living expenses while in (host country), provided that such expenses, inclusive of all taxes but exclusive of travel to and from (host country), shall not exceed—per man per month.

(d) Local agrees to use its best efforts to arrange for their immigration visas into (host country) and suitable accommodation while they should be in (host country).

3. (a) The Joint Company shall be entitled, from time to time, and as it shall consider necessary, to require Foreign to send to (host country) such personnel or individuals as it shall consider necessary to assist the Joint Company in finding solutions to any of its problems and in training employees of the Joint Company to cope with such problems.

(b) The Joint Company shall reimburse to Foreign the expenses of such employees for the period during which they shall be absent from their regular business duties with Foreign, including their travel to and from the (host country) by economy fare air passage, their salaries and their living expenses, provided that the total of such expenses including all taxes but excluding the said air passage, shall not exceed—per man per month.

4. During such time as said personnel supplied by Foreign shall be rendering technical assistance and training to the Joint Company, they shall not be regarded as employees of the Joint Company, for any purposes nor shall Foreign make any claim on behalf as such personnel arising from accident or any other cause.

15. RESTRICTION ON SALE OF SHARES

Foreign and Local agree that neither will sell, transfer, assign, mortgage, pledge or otherwise encumber or deal with any or all shares of the capital stock of the Joint Company without the prior written consent of the other, except as is hereinafter provided and provided that this provision shall not apply to transfer of directors' qualification share so long as the beneficial ownership of such shares is retained by Foreign or Local as the case may be.

16. BUY-SELL ARRANGEMENT

A. Complex Agreement

1. Either Foreign or Local (hereafter in this clause called the "offeror") shall have the right at any time–after–years from the execution of this Agreement by notice in writing (hereinafter called the "original notice") to the other to offer to sell to the other (hereafter in this clause called the "offeree") all but not less than all of the outstanding shares of the Joint Company then owned by the offeror at a price and terms to be specified in the original notice, provided, however, that the price shall be payable on the "closing date", as hereinafter defined, and the balance shall be payable in no more than (number) annual instalments and provided further that the original notice shall provide that the offeree shall have the right to elect to sell to the offeror all of the shares of the Joint Company then owned by the offeree at the price and then on the terms set forth in the original notice.

2. Within 90 days after receipt of the original notice the offeree shall advise the

offeror by notice in writing (hereinafter called the "notice of election") whether the offeree accepts the offer of the offeror to sell all but not less than all of the outstanding shares of the Joint Company owned by the offeror or elects to sell to the offeror all of the outstanding shares of the Joint Company owned by the offeree.

3. If the offeree does not advise the offeror by notice in writing within the said period of 90 days as hereinbefore provided then the offeree shall be deemed to have accepted the offer of the offeror to sell all but not less than all of the shares of the Joint Company owned by the offeror in accordance with the terms of the original notice.

4. The purchase and sale of the shares of the Joint Company resulting from acceptance or deemed acceptance by the offeree of the offer of the offeror to sell contained in the original notice as aforesaid or the election by the offeree to sell to the offeror all but not less than all of the shares of the Joint Company owned by the offeree or the offeror, as the case may be as aforesaid, shall be completed on a date (hereinafter called the "closing date") not later than—days after receipt by the offeror of the notice of election, or if the offeree does not deliver a notice of election as aforesaid—days after receipt of the original notice by the offeree, at which time the nominees of the party whose shares are to be sold (hereinafter called the "vendor") shall resign as directors, officers and employees of the Company and the other party who is purchasing the vendor's shares (hereinafter called the "purchaser") shall and will pay to the vendor the price or the portion thereof set forth in the original notice by cash or certified cheque.

   If, on the closing date, the vendor shall fail or refuse to complete the transaction, the purchaser shall have the right on payment of the purchase price (or the portion thereof then due) to the credit of the vendor in any chartered bank in the city of (name of city) and on giving notice thereof to the vendor to execute and deliver all such transfers, resignations and other documents and instruments which may be necessary or advisable in order to complete the transaction and the purchaser is hereby irrevocably appointed attorney of the vendor for and in the name of and on behalf of the vendor to execute and do any deeds, transfers, conveyances, assignments, assurances and things which the vendor ought to execute and do under the covenants herein contained.

   If, on the closing date, the purchaser shall fail or refuse to complete the transaction, the vendor shall have the right to purchase the purchaser's shares and on payment to the purchaser of an amount equal to 75 per cent of the purchase price, to execute and deliver all such transfers, resignations and other documents and instruments which may be necessary or advisable in order to complete the transaction and the vendor is hereby irrevocable appointed the attorney of the purchaser for and in the name of and on behalf of the purchaser to execute and do any deeds, transfers, conveyances, assignments, assurances and things which the purchaser ought to execute and do under the convenants herein contained.

   It is understood and agreed that neither party hereto shall make or assist in making any application to wind up the Joint Company after an original notice shall have been delivered pursuant to the provisions of this section.

Appendix E

ENERGY SAVING DEVICES ON WHICH 100% DEPRECIATION IS ALLOWED

- Specialised boilers and furnaces

  - Ignifluid/fluidised bed boilers
  - Flameless furnaces and continuous pusher type furnaces
  - Fluidised bed type heat treatment furnaces
  - High efficiency boilers (thermal efficiency higher than 75 percent in the case of coal fired boilers, and 80 percent in the case of oil/gas fired boilers)

- Instrumentation and monitoring systems for monitoring energy flows

  - Automatic electrical load monitoring systems
  - Digital heat loss meters
  - Micro-processor based control systems
  - Infra-red thermography equipment
  - Meters for measuring heat losses, furnace oil flows, steam flows, and electrical energy and power factor meters
  - Maximum demand indicator and clamp on power meters
  - Exhaust gases analysers
  - Fuel oil pump test benches

- Waste heat recovery equipment

  - Economisers and feed water heaters
  - Recuperators and air pre-heaters
  - Heat pumps
  - Thermal energy wheels for high and low temperature waste heat recovery

- Cogeneration systems

  - Back-pressure pass out, controlled extraction, extraction-cum-condensing turbines for cogeneration along with pressure boilers
  - Vapour absorption refrigeration systems
  - Organic rankine cycle power systems
  - Low inlet pressure small steam turbines

- Electrical Equipment

  - Shunt capacitors and synchronous condenser systems
  - Automatic power cut off devices (relays) mounted on individual motors
  - Automatic voltage controller
  - Power factor controller for air conditioning motors
  - Solid state devices for controlling motor speeds
  - Thermally energy efficiency stenters (i.e., those requiring 800 or less kilocalories of heat to evaporate one kilogram of water)

- Burners

  - 0 to 10 percent excess air burners
  - Emulsion burners
  - Burners using air with high preheat temperature (i.e., above 300 degrees Celsius)

- Other equipment

  - Wet air oxidation equipment for recovery of chemicals and heat
  - Mechanical vapour recompressors
  - Thin film evaporators
  - Automatic micro-processor based load demand controllers
  - Coal based producer gas plants
  - Fluid drives and fluid couplings
  - Turbo charges and super charges.

Appendix F

CUSTOM DUTIES ON ENERGY SAVING DEVICES

A basic duty of 35 percent, and an auxilliary duty of 5 percent are levied on the following energy conservation measures:

1. Flameless furnaces for reheating and heat treatment applications
2. High velocity recirculating furnaces for reheating and heat treatment applications
3. Low excess air burners (below 10% excess air)
4. Fuel oil emulsion burners
5. Regenerative burners for applications in forging and heat treatment furnaces
6. Self-recuperative burners (burners using pre-heated air)
7. Flat flame burners
8. Heat pipes for extracting heat from low temperature fluids and gases
9. Heat pumps for space heating, water heating, and cooling applications
10. Free ball bucket steam traps with no links/hinges
11. Automatic micro-processor based load demand controllers for efficient load management
12. Microprocessor based combustion control system for boilers
13. Light sensitive time switches for street light controls
14. Micro-processor based automatic anode over-potential controllers in caustic, chlorine and aluminium industries
15. Micro-processor based universal programmable timers for continuous and batch processes, such as in tyre industry and rayon
16. Heat recovery system imported by Cooperative Dairy Plants
17. Any special devices including electric generators and pump running on wind energy.

There are customs duties exemptions for certain specified goods connected with solar and other natural energy, as noted below:

1. Flat plate solar collectors

   1a. Black continuously plated solar selective coating sheets (in cut lengths or in coils) and fins and tubes

2. Concentrating and pipe type solar collectors

3. Solar cookers

4. Solar water heaters and systems

5. Solar air heating sytems

6. Solar low pressure steam systems

7. Solar stills and desalination systems

8. Solar pumps based on solar thermal and solar photovoltaic conversion

9. Solar power generating systems

10. Solar photovoltaic modules and panels for water pumping and other applications

11. Solar crop driers and systems

12. Wind mills and any specially designed devices which run on wind mills

13. Biogas plants and biogas engines

14. Agricultural and municipal waste conversion devices producing energy

15. Equipment for utilising ocean waves energy

16. Ocean thermal energy conversion systems

17. Parts consumed within the factory of production of such parts for the manufacture of goods specified in the above

18. Solar photvoltaic cells.

Sources:

Central Excise Rules, 1944 and Government of India, Ministry of Finance (Department of Revenues) Notification No. 120/81-Central Excises, dated 15 May, 1981; and Notification No. 205/88-C.E., dated 25.05.1988 as amended by Notifications No. 277/88-C.E., dated 04.11.1988; No. 112/89-C.E., dated 31.03.1989; and No. 143/89-C.E., dated 19.05.1989.

Appendix G

TUTORIAL ON SHARED SAVINGS FINANCING

1.1 Overview

The purpose of this tutorial is to provide a financial overview of the shared savings contract as used by ESCOs to structure project financings. The approach taken is to provide and explain a realistic set of financial assumptions for a "sample project", then to perform cash flow analysis to see how the economics of the project work. The somewhat different financial perspectives of the ESCO and customer are also explored. Readers should first be familiar with the concepts of debt amortization, Net Present Value and Internal Rate of Return.

1.2 Review of Assumptions for the Sample Project

Referring to the chart labeled "Sample Project Assumptions and Inputs", the following is an explanation and discussion of the assumptions which apply to the project:

Total kW Installed -- This is the amount of peak load electrical energy reduction achieved, as expressed in kilowatts. In practice, the energy reduction for the project might consist of a mix of thermal and electrical energy savings, or just thermal energy savings alone. In this project, all forms of energy savings have been standardized to electrical units for simplicity of presentation.

Cost Per Installed kW -- This is the average cost to achieve one unit of energy reduction; the unit is in kW and the currency dollars. Projects are typically comprised of multiple energy conservation measures, each of which can be viewed as delivering a given amount of energy reduction for a specific cost per unit of energy saved. For example, the average cost to install energy efficient lighting in the U.S. might be $800/kW of reduced peak demand, while the average cost to achieve one kW of reduced peak demand utilizing high efficiency refrigeration

technology might be twice that amount. (Values are for illustration only. Actual costs are case-specific and vary widely.) The average (weighted) cost per kW of total reduced demand for all retrofit measures has been calculated for the Sample Project as $950/kW.

Customer's Share of Installed Cost -- In the Sample Project, the Customer is not providing any of the capital for the design, engineering or installation of the equipment; all of it is being paid for by the ESCO. However, as an option, funding for the project could be split between the customer and the ESCO. In that case, the customer would seek to retain a proportionately larger share of the energy savings, and/or negotiate a reduction in the term of the contract.

Annual O & M (% of installed cost) -- The equipment installed by the ESCO must be properly repaired and maintained if the energy savings are to remain constant over the life of the contract. O & M refers to Operations & Maintenance costs, and they are often expressed as an annual percentage of the initial capital cost. In this case, annual O & M costs are expected to be approximately 5 percent of the capital cost of the project. Technologies vary in terms of their O & M requirements, and these costs can comprise a significant percentage of the total project investment and impact project economics accordingly.

Share of O & M Paid by Customer -- Sometimes it is more efficient for the customer's staff to provide some or all of the O & M requirement. While the ESCO (or his service agent) can respond to an emergency repair call, the customer's staff is usually located on-site, thus response-time (and money) is saved. When the technical requirements of maintaining the equipment demand skills or tools not in the possession of the customer's staff, the ESCO or its agent must complete such repairs or maintenance. Consistent with this reasoning, in the Sample Project, the customer is assuming responsibility for 75 percent of the cost of maintaining the equipment while the balance will be paid by the ESCO.

Monitoring & Verification (% of installed cost) -- Shared savings contracts require special attention to the issue of evaluating the true energy savings which have been generated by the equipment and/or improvements in operations or processes. When possible, these savings are measured directly. When direct measurement is impossible or not beneficial, perhaps because the process is too complex, or there is no historical database from which to draw "before" and "after" comparisons, then a calculated approach to determining energy savings is frequently used. Both the direct measurement approach and the calculated approach require the expenditure of time and money. Such costs are categorized under the heading of Monitoring and Verification, shown in the Sample Project as an annual expenditure and expressed as a percentage of the initial installed cost. Often the direct measurement and calculated approaches are used in combination to produce an optimum degree of confidence in the energy savings values consistent with reasonable cost. What constitutes "reasonable" is often the subject of much discussion between the ESCO and the customer.

KWH Savings Per KW -- In addition to knowing how much peak demand savings have been achieved, to calculate total energy savings one needs to know the period of time over which the demand reduction is obtained. In this example, the value of 5,000 kWh means that, over the course of the year, a peak demand reduction of 526 kW will be achieved during a total of 5,000 hours. Since there are 8,760 hours in a year, the Sample Project exhibits an effective energy conservation "load factor" of 0.57 (5,000/8,760). The higher the load factor, the better the economics of the project. Because industrial companies frequently operate on a multiple shift per day basis, energy conservation investments in the industrial market can be especially attractive.

Dollar Savings Per KWH Saved -- This is the value per unit of energy saved, in this case 7.3 cents per kilowatt hour.

Percent of Savings Given to Customer -- In this Sample Project the customer retains 22 percent of the energy savings. There are no fixed percentages which customers or ESCOs require. The split of savings between ESCOs and customers is based on their relative perception of value. Each contract is negotiated accordingly.

Contract Term -- Shared savings contracts typically range from 5 to 10 years in duration. Usually both the ESCO and the customer perceive increased risk as being associated with longer contracts. However, ESCOs may seek long-term contracts when the customer is especially creditworthy and the risk of default through financial insolvency very low. For this reason, public sector contracts in the U.S. tend to be 10 year (or longer) contracts. Projects with attractive simple paybacks make possible shorter contracts. Upon expiration of the contract, ownership of the equipment reverts to the customer and the customer receives 100 percent of the savings from that point onward.

Energy Escalation Rate -- The price for energy paid by the customer usually varies over time, sometimes significantly. In the context of a shared savings contract, energy price fluctuations introduce potential risks and benefits which must be allocated between the ESCO and the customer. In the Sample Project, the price of energy over the life of the contract is assumed to be constant, as indicated by the zero escalation rate factor. Assuming, for the sake of illustration, that the actual future price of energy increases during the term of the Sample Project, the customer would receive additional value. This is because, while the ESCO's share of savings is based on the constant value of 7.3 cents per kWh (as written into the contract), the customer's real cost of energy would be higher, therefore his true avoided cost would be higher. Conversely, if the price of energy drops instead of rises, the customer is still required to pay the ESCO a calculated share of savings which is based on a then higher value than the real savings.

In the early 1980's, it was popular to assume that energy prices would continue to increase over the life of a shared savings contract. Escalation factors of 6 to 8 percent per annum were not unusual. By the mid 1980's, when energy prices leveled off and even began to decline, some ESCOs went out of business for the sole reason that the economics of their project portfolio were heavily dependent on the assumption of constantly increasing energy prices.

As a result of the early negative experience of ESCOs with overly optimistic projections of future energy prices, today it is uncommon for ESCOs to assume anything other than a constant future price for energy. However, many variations and potential advantages to both ESCOs and customers are possible in allocating the risks and benefits of "floating" approach to energy prices. Caps can be placed to limit up-side and/or down-side exposure for either or both the ESCO and customer. It is also theoretically possible to energy futures contracts by which can offset the ESCO's exposure to a portfolio of shared savings contracts with floating energy prices.

The issue of energy escalation rates is particularly relevant for any ESCO considering operations in India, for two interrelated reasons. First, energy prices have been maintained below free market prices in all market segments. Many hold the view that real energy prices are likely to increase significantly in the near future due to the worsening national capacity shortage coupled with a perceived policy trend toward encouragement of market-based pricing. Second, the inflation rate in India has been running between 8 and 12 percent over the last several years, with interest rates for corporate borrowers ranging from 16 to 21 percent as a result. The ESCO Discount Rate which ESCOs use in calculating financial returns (discussed below) must therefore take this inflationary situation into account. ESCOs who might ordinarily seek to obtain a 30 percent IRR on the equity portion of their investment will likely feel the need to adjust their hurdle rate upward by 6 to 10 points to adjust for the Indian inflationary environment. The

impact of such an adjustment would be to sharply reduce the number of economically feasible ESCO-type projects.

One possibility for partially offsetting the problem of inflation in limiting the economic size of the market would be for ESCOs to return to the use of an energy escalation rate greater than zero, albeit much more cautiously than a decade ago. The customer would need to agree to assume most or all of the energy price fluctuation risk.

Debt Financing Term -- This is the length of time over which the debt portion of the investment capital for the ESCO project is amortized. Under a shared savings contract, this debt is the obligation of the ESCO. The Sample Project assumes full amortization of the loan over a period of time equal to the term of the contract; in this case, 10 years.

Interest Rate On Long Term Debt -- Long term debt is the permanent debt financing component of the project. It is distinguished from short term or construction debt. Interest rates for long term debt normally are less than that for short term debt by at least several percentage points. Markets for placement of long term debt for shared savings contracts exist in the United States, although they are small and inefficient.

Interest Rate On Construction Debt -- During the period of time when the energy savings equipment is being designed and installed, there exists the risk that the ESCO will be unable to complete the installation phase due to technical, financial or other difficulties. Consequently, sources of debt financing distinguish between pre and post installation risks, and assign differing discount rates to the associated short or long term debt.

ESCO Discount Rate -- ESCOs must take all risks into account, including the risk of inflation as explored above, and assign a discount rate for use in calculating the expected NPV and IRR for the project. In the Sample Project, the discount rate is 15 percent, which is typical for a U.S.-based project in the current environment.

Customer Discount Rate -- The concept of project IRR has no meaning for customers when ESCOs provide one hundred percent of the capital for the project, (this is because any capital received by the customer would represent an "infinite" return against zero investment). However, customers can calculate the NPV deriving from their share of the benefits they expect to receive from the project. Like the ESCO, the customer evaluates its opportunity cost of capital as well as the risks in the project which threaten to erode the value of the expected future benefits. It then assigns its own discount factor (or hurdle rate) to the project, and calculates the expected NPV.

Inflation Rate -- In the Sample Project proformas, the Inflation Rate variable is restricted in its application to computing the expected future nominal cost of O & M. In this case, the costs of O & M are expected to increase yearly by 5 percent. ESCOs and customers often try to eliminate some of the guesswork in calculating such costs by negotiating multi-year fixed price service contracts.

Percent Equity to Debt Financing -- Whenever possible, ESCOs seek to leverage their capital resources by securing debt financing to augment scarce equity resources. In a classic shared savings contract there is no recourse to the customer for repayment of the debt. The ESCO's balance sheet stands as collateral for repayment of the debt along with assignment of cash flows from the shared savings contract. The ESCO views its share of the energy savings as an asset.

Recently, there has been increased utilization of true third party financing for ESCO-type projects, especially in the form of lease capital. With the lease structure, the ESCO may provide a guarantee that the energy savings received by the customer will equal or exceed the monthly lease payment which must be paid by the customer to the lease company. With a third party lease, the ESCO would not generally provide any equity or debt for the project, only short term construction financing. In some cases, lease capital may even cover short term construction financing requirements. The principal difference to the customer between third party lease capital and capital provided from ESCOs via classic shared savings contracts is that the lease is reflected on the customer's balance sheet and represents a definite financial obligation to the lease company.

1.3 Analysis of Project Economics

The chart labeled "Sample Project Economics" shows an initial investment of $500,000 by the ESCO for design and installation of energy saving equipment. The customer contributes zero capital in this example. Customer Bill Savings are consistent with all of the preceding assumptions. In calculating the Project Economics, all of the required O & M costs are deducted from the line labeled Customer Bill Savings in order to yield Project Cash Flows. Net Cash Flow equals the sum of yearly cash flows after O & M costs are taken into account, minus the initial $500,000 investment ($1,106,000 - $500,000 = $606,000).

Each of the future annual cash flows is worth less in present value terms, and so is discounted using a 15% discount factor. This factor is identical to the ESCO discount rate (and is higher then the 12% customer discount rate). The ESCO discount rate is used to produce a conservative interpretation of the fundamental value of this project as an investment. The sum

of the PV of Future Cash Flows produces an NPV of $315,000, while generating a corresponding IRR of 30.4 percent.

Having arrived at a value for the project, the investment risk and rewards must be divided between the ESCO and the customer. The relative value of the project as perceived by the ESCO and the customer can then be interpreted. First we will examine the project from the ESCO point of view.

1.4 Analysis of ESCO Project Economics

The chart labeled "Sample ESCO Economics" refers to the same project, but introduces ESCO considerations and evaluates the value of the project to the ESCO by taking these considerations into account. Revenues (or ESCO Share of Savings) equal 0.78 of $192,000, or $150,000 per year. In practice, all revenues and costs would be reflected on a monthly basis, which would result in a slight increase of the NPV and IRR for the project. Returning to the analysis, the ESCO's share of O & M costs in the first year are $6,000 (all numbers are rounded), and first year Monitoring and Verification costs are $6,000. This produces Cash Flow Before Financing of $137,000 in the first year.

Thirty percent or $150,000 of the required $500,000 in investment is provided by the ESCO in the form of equity, the balance of $350,000 is provided from fully amortized debt. Following debt repayment of $81,000 per year, post financing Project Cash Flow is determined. The Net Cash Flow of $384,000 is simply the sum of yearly post financing cash flow minus the initial equity investment of $150,000.

Equally important to Net Cash Flow is the Cumulative NPV, obtained by summing the PV of all future cash flows (discounted at the ESCO hurdle rate of 15 percent). The expected NPV value of this project to the ESCO is therefore $122,000, corresponding to an IRR of 34.9 percent on equity. Note that the use of financial leverage has raised the ESCO's IRR for the project considerably beyond the 30.4% IRR which the project might otherwise produce with an all equity approach to financing.

1.5 Analysis of Customer Economics

Referring to the chart labeled "Sample Customer Economics", the customer's Revenues or Share of Savings equal $42,000 in the first and subsequent years based on an assumed constant price of energy. The customer pays 75 percent of O & M costs, equivalent to $19,000 in the first year, which escalate at 5 percent per year. Cash Flow Before the Financing in this example is the same as Cash Flow because the customer has not provided (and therefore has not financed) any part of the project investment. Net Cash Flow of $187,000 is the sum of the customer's yearly share of savings.

The PV of All Cash Flows simply discounts the Net Cash Flow line at the customer's discount rate of 12.0 percent. It follows that the cumulative NPV is the sum of the PV of future All Cash Flows, and equals $111,000. Since the customer did not make any capital investment in the project, the IRR from the customer's point of view is either infinite or not applicable.

1.6 Comparison of Risk and Rewards to the ESCO and the Customer

While most of the ongoing O & M costs are covered by the customer, the ESCO has assumed 100 percent of the much larger investment capital risk. Yet the expected NPV for the customer is nearly as large as that for the ESCO -- $111,000 versus $122,000. The basic appeal of the shared savings scheme to customers is apparent.

SAMPLE PROJECT ASSUMPTIONS AND INPUTS

		Inputs	
TOTAL KW INSTALLED	=	526	kW
COST PER INSTALLED KW	=	950	$/kW
CUSTOMER's SHARE OF INSTALLED COST	=	0	%
ANNUAL O&M (% of installed cost)	=	5.00	%
SHARE OF O&M PAID BY CUSTOMER	=	75	%
MONITORING & VERIF. (% of installed cost)	=	1.25	%
KWH SAVINGS PER KW	=	5,000	kWh
UTILITY BILL SAVINGS PER KWH SAVED	=	7.3	c/kWh
% OF SAVINGS GIVEN TO CUSTOMER	=	22	%
CONTRACT TERM	=	10	Yrs
ENERGY ESCALATION RATE	=	0	%
DEBT FINANCING TERM	=	10	Yrs
INTEREST RATE ON LONG TERM DEBT	=	19.0	%
INTEREST RATE ON CONSTRUCTION DEBT	=	17.0	%
ESCO DISCOUNT RATE	=	15.0	%
CUSTOMER DISCOUNT RATE	=	12.0	%
INFLATION RATE	=	5.0	%
% EQUITY TO DEBT FINANCING	=	30.0	%

SAMPLE PROJECT ECONOMICS

CASH FLOWS (000's)

	YEARS	1	2	3	4	5	6	7	8	9	10	TOTAL
INVESTMENT - TOTAL	500											500
ESCO	500											500
CUSTOMER												
CUSTOMER BILL SAVINGS		192	192	192	192	192	192	192	192	192	192	1,920
SHARE OF SAVINGS - CUSTOMER		42	42	42	42	42	42	42	42	42	42	422
SHARE OF SAVINGS - ESCO		150	150	150	150	150	150	150	150	150	150	1,498
TOTAL O&M COSTS		25	26	28	29	30	32	33	35	37	39	314
PROJECT CASH FLOWS	-500	167	166	164	163	162	160	159	157	155	153	1,106
NET CASH FLOW	606											
NET PRESENT VALUE	-500	145	125	108	93	80	69	60	51	44	38	315
CUMULATIVE NPV	315											
INTERNAL RATE OF RETURN	30.4 %											

SAMPLE ESCO ECONOMICS

CASH FLOWS (000's)

YEARS		1	2	3	4	5	6	7	8	9	10	TOTAL
REVENUES		150	150	150	150	150	150	150	150	150	150	1,498
ANNUAL O&M		6	7	7	7	8	8	8	9	9	10	79
MONITORING & VERIF. (% of cost)		6	7	7	7	8	8	8	9	9	10	79
CASH FLOW BEFORE FINANCING		137	137	136	135	135	134	133	132	131	130	1,340
EQUITY FINANCING	150											
DEBT FINANCING	350											
DEBT REPAYMENT		81	81	81	81	81	81	81	81	81	81	806
PROJECT CASH FLOW	-150	57	56	55	55	54	53	52	52	51	50	384
NET CASH FLOW	384											
NET PRESENT VALUE	-150	49	42	36	31	27	23	20	17	14	12	122
CUMULATIVE NPV	122											
INTERNAL RATE OF RETURN		34.9 %										

CUSTOMER ECONOMICS

CASH FLOWS (000's)

YEARS		1	2	3	4	5	6	7	8	9	10	TOTAL
REVENUES		42	42	42	42	42	42	42	42	42	42	422
ANNUAL O&M		19	20	21	22	23	24	25	26	28	29	236
CASH FLOW BEFORE FINANCING		23	23	22	21	19	18	17	16	15	13	187
EQUITY FINANCING												
CASH FLOW		23	23	22	21	19	18	17	16	15	13	187
NET CASH FLOW	187											
NET PRESENT VALUE		21	18	15	13	11	9	8	6	5	4	111
CUMULATIVE NPV	111											
INTERNAL RATE OF RETURN		N/A %										

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Appendix H

ENERGY SERVICES AGREEMENT

(On Non-Judicial Stamp Paper of Appropriate Value)

ENERGY SERVICES AGREEMENT

This AGREEMENT is made this ____ day of _____, ____, by and between _____, having its principal place of business at _____ (hereinafter called the "Owner" which expression, where the context permits, shall include its successor in title) of the one part, and _____ having its registered office at _____ and principal place of works at _____ (hereinafter called the "Customer") of the other part.

WITNESSETH as follows:

1. **Equipment**: The Owner shall design, engineer, procure, and install, at its own expense, the energy efficiency equipment (the "Equipment") as described and specified in Exhibit A. Equipment shall be installed in those facilities and at those locations owned by the Customer and indicated in Exhibit B (the "Facilities"). Upon the successful delivery and installation of the Equipment at the Facilities, the Owner shall deliver to Customer an Equipment Acceptance Certificate (the "Acceptance Certificate") in the form attached hereto as Exhibit C, to be acknowledged and countersigned by Customer as verification of Customer's acceptance of said Equipment installation. Failure of Customer to acknowledge and countersign the Acceptance Certificate within fifteen working days (15 days), or to provide his definite written notification indicating the reason(s) as to why the Acceptance Certificate has not been endorsed, shall be deemed automatic acknowledgement/endorsement and acceptance of said Equipment installed. The equipment so entrusted to Customer shall remain the property of the Owner.

2. **Energy Savings Methodology:** Annual energy cost savings ("Savings") shall be calculated as defined in the Energy Savings Methodology attached hereto as Exhibit D.

3. **Consideration:** The Customer shall make payments monthly (the "Monthly Payment") to the Owner for a term of _____ months. The Monthly Payment shall be equal to the product of:

   (A) x (B) x (C) where

   (A) = % (the "Savings Percentage"),

(B) = Annual Savings, as defined by the Energy Savings Methodology ("ESM") described in Exhibit D, and
(C) = 1/12 (one-twelfth).

In any case the minimum monthly payment shall not be less than _____ per month which for sake of convenience may be termed as lease money, even though it forms a part of the said "Monthly Payment".

4. **Equipment Maintenance:** The Customer agrees to operate and maintain the Equipment in good repair at its own expense. During the term of this Agreement, the Owner shall provide equipment to replace all defective Equipment items, and the Customer shall remove and dispose of all defective equipment and install the new equipment items in their place, which replacement equipment shall become part of the Equipment for the purposes of this Agreement. The Owner may provide Customer with a replacement inventory of equipment to be stored at the Customer's Facilities and Customer shall provide secure rent free space at the Facilities for the storage of such replacement equipment, which shall also remain the property of the Owner.

5. **Equipment Installation:** The Owner shall be responsible for, and Customer shall use its best efforts to assist the Owner in obtaining all necessary permits and approvals for installation of the Equipment. The Owner shall coordinate the installation with Customer so as to minimize any disruption of Customer's operations. The Customer shall not alter, add to or modify the Equipment without the prior written consent of the Owner. Any such approved alterations, additions and/or modifications shall become part of the Equipment entrusted for the purposes of this Agreement.

   The Owner shall have no responsibility and shall bear no cost regarding hazardous materials found in the Facilities during performance of its work. If lighting ballasts are removed which contain PCB's, such ballasts will be stored at Customer's premises and final responsibility for disposal will remain of the Customer's. The Owner will, at Customer's request and acting as Customer's agent, assist in arranging for disposal on behalf of Customer and the costs of such disposal, including reasonable handling fees, will be paid for by Customer. In handling any of Customer's hazardous materials and/or assisting in arranging for disposal of such materials, the Owner shall not take title to such materials.

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6. **Access:** Customer shall provide mutually satisfactory rent free space for the installation and operation of the Equipment in the Facilities. Customer shall provide access to the Facilities to the Owner and its subcontractors and agents during normal business hours and other reasonable hours as required to install, inspect, adjust, repair, maintain and, in event of default as defined in Section 11, below, repossess, the Equipment.

7. **Billing and Collecting:** The Monthly Payments as per Section 3 above shall be paid monthly beginning on the first of the month following the "Commencement Date". The Commencement Date shall be the first day of the month following the month in which Customer delivers the Acceptance Certificate to the Owner. The Monthly Payments shall be payable without notice or demand at the office of the Owner or its assigns (or other place as the Owner may designate from time to time). Monthly Payments shall be deemed late if paid after the 15th of each month in which a payment is due. Late payments shall carry a penal rate of interest of two percent (2%) per month that shall accrue and be payable on all unpaid balances which are due over 15 days past.

8. **Term and Termination:** The Term of this Agreement shall be for _____ months. It shall begin with the execution hereof and shall terminate upon the earlier of (a) payment by Customer of all Monthly Payments for the entire term as indicated above, or (b) exercise by Customer of Customer's termination right as indicated below. This Agreement is non-cancellable by the Customer, except that the Customer may terminate this Agreement anytime after the first anniversary of the Commencement Date by paying the Owner a sum (the "Termination Value") equal to the greater of (a) the then current fair market value of the Equipment, or (b) the applicable value as indicated on the Termination Value Schedule, Exhibit E. Upon payment of the Termination Value, this Agreement shall terminate and the Customer shall be entitled to own the Equipment AS IS, WITHOUT WARRANTIES, EXPRESS OR IMPLIED, INCLUDING WARRANTIES OF FITNESS FOR ANY PARTICULAR PURPOSE OR FITNESS FOR THE USE CONTEMPLATED BY THE CUSTOMER, and on such transfer the Equipment shall not be subject to any lien or encumbrance created by or arising through the Owner. The Customer's obligations under this Agreement are not contingent upon continued operations of the Customer and shall continue in full force and effect despite the closing of such operations by the Customer.

9. **Ownership of the Equipment and the Premises:** The Owner shall own the Equipment throughout the term of this Agreement unless it is purchased by Customer pursuant to Section 8 above. The Customer shall at Customer's expense protect and defend the title of the Owner in the Equipment and shall at all times keep the Equipment free and clear from all levies, attachments, liens, security interests, mortgages, pledges, encumbrances

and charges or other judicial process of every kind whatsoever and shall give the Owner immediate written notice of the existence thereof and shall indemnify and hold the Owner harmless from any loss or damage caused thereby. Customer agrees to execute or cause to be executed any financing statements required to protect or secure the Owner's title in the Equipment and shall obtain written waivers of any right or interest over the Equipment in a form acceptable to the Owner from the mortgagee of the Facilities, if applicable. The Equipment is and shall at all times remain the property of the Owner. The Customer warrants that it owns the Facilities. The Customer shall notify the Owner one hundred twenty (120) days prior to the sale of the Facilities to a third party and, in the event of such a sale, Customer shall, at the Owner's option, either (1) cause the buyer of the Facilities to sign an agreement with the Owner so as to assume all the Customer's obligations for the remaining term hereunder or (2) pay to the Owner the then applicable Termination Value as per Section 8 above.

10. **Insurance and Loss or Damage to the Equipment**: At all times during the term of this Agreement the Customer shall maintain in full force and effect, at its own expense, casualty and liability insurance on the Equipment owned by the Owner for an amount at least equal to the then applicable Termination Value as per Exhibit E. Customer shall provide a certificate of insurance to the Owner naming the Owner as the insured and loss payee for its interest in the Equipment. The insurance policy shall provide for at least thirty (30) days advance written notice to the Owner before cancellation or material modification thereof.

The Customer shall bear the entire risk of loss or damage to the Equipment regardless how arising. The Customer shall immediately notify the Owner of the occurrence of any loss of or damage to the Equipment. In such an event, Customer shall: (A) continue to make Monthly Payments; and, (B) the Owner will, at the Customer's option, either (i) replace, at the Customer's sole expense after utilizing the proceeds of any insurance claims associated with such Equipment loss or damage, the damaged Equipment with equipment of equal value and energy efficiency as the Equipment, whereupon such replacement equipment shall be substituted in this Agreement by appropriate acknowledgement and endorsement by the Customer and become a part of the Equipment for the purposes of this Agreement, or (ii) the Customer may pay to the Owner the then applicable Termination Value, or (iii) in the event of damage, destruction, loss or theft of a portion of the Equipment, the Customer may pay the prorata portion of the then applicable Termination Value of such Equipment, in which case the Owner will recalculate the value of the Equipment and provide it to the Customer for working revised Monthly Payment on a prorata basis for the remaining Term of this Agreement.

11. **Default and Remedies Upon Default:** Each of the following events or conditions shall constitute an "Event of Default" by the Customer:

    (a) failure to make payment to the Owner after thirty days of issue of Registered notice or notice delivered against acknowledgement;

    (b) if any representation or warranty furnished by Customer in this Agreement proves to be a gross misrepresentation or purposefully misleading in any material respect when made;

    (c) institution of any winding up proceeding of bankruptcy or insolvency against Customer, appointment of a trustee or receiver by the Court for the assets of the Customer or similar proceedings, or the filling of any execution proceedings against assets involving claim of over Rs._____ ;

    (d) The Customer otherwise makes defaults on this Agreement after 30 days of issue of Registered notice or notice delivered against acknowledgement;

    In an Event of Default by Customer, the Owner shall have the right to (a) terminate this Agreement and receive from the Customer the then applicable Termination Value, plus all the outstanding payments, and also reasonable costs of collection, including but not limited to attorney's fees and court costs, (b) repossess the Equipment, in which case the Customer shall provide access to the Facilities during normal business hours for this purpose, and (c) pursue any other remedy at law or equity which the Owner may have, at its option.

    The Owner's obligations hereunder are contingent upon the Customer's successfully obtaining necessary permission for installation of the Equipment, wherever required.

12. **Taxes and Fees:** The Customer shall be responsible for payment of all taxes and other charges of any kind which are at any time lawfully payable assessed or levied on any payments due to the Owner under this Agreement. The Customer shall provide documentary evidence of any such payments, and shall reimburse the Owner amount for the same if the Owner has to make such payments during the Term of this Agreement.

13. **Assignment:** The Owner may assign all or any part of its rights herein to any party without notice or prior consent of the Customer for the purpose of financing the Equipment. The Customer agrees that the Owner's assignee will have the same rights and remedies that the Owner now has got under this Agreement. In the event that the Owner

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ceases business operations, for whatever reasons, the Customer agrees to fulfill all its obligations hereunder for the benefit of, including making all payments due hereunder to, the Owner's assignee(s). The Customer agrees to cooperate with the Owner in executing such instruments which may reasonably be required for financing purposes. The Customer agrees not to transfer, sell, sublease, assign, pledge, or encumber the Equipment or any rights under this Agreement without prior consent of the Owner.

14. **Representation and Warranties:** Each party represents and warrants to the other that:

    (a) It has all requisite power, authority, licenses, permits, and franchises, corporate or otherwise, to execute this Agreement and perform its obligations hereunder; and

    (b) this Agreement has been duly executed and delivered for it by the signatories so authorized, and it constitutes legally valid and binding obligation.

15. **Indemnification:** The Customer agrees to indemnify and hold harmless the Owner from and against any and all losses, damages, injuries, claims, demands and expenses including any and all attorney's fees and legal expenses, arising from or caused directly or indirectly by any actual or alleged use, possession, maintenance, condition (whether or not latent or discoverable), operation, location, delivery or transportation of any item of the Equipment. The Customer and the Owner agree to indemnify, defend and hold each other harmless from any and all claims, actions, costs, expenses, damages and liabilities, including reasonable attorney's fees, arising out of, connected with or resulting from negligence or misconduct of their employees or other agents in connection with their activities within the scope of this Agreement insofar as any such loss or claim is not covered by available insurance proceeds. The provisions of this section shall survive the termination of this Agreement with respect to any claims based on facts or conditions which occurred prior to such termination.

16. **Contract Performance Guarantee:** As contract security, the Customer shall furnish a Performance Bank Guarantee from a scheduled Bank in the form accceptable to the Owner, to guarantee the faithful performance of this Agreement in accordance with its terms and conditions. The guarantee amount shall be equal to ten percent (10%) of the value of the Equipment installed by the Owner at the Facilities of the Customer. The guarantee shall be valid till expiry of 90 days of the Term of the Agreement. The guaranteed amount shall be payable to the Owner without any condition whatsoever.

17. **Settlement and Arbitration:** Any dispute or differences arising out of or arising in connection with this Agreement, shall to the extent possible be settled amicable between the parties. If, however, any dispute or difference remaining unresolved, whether arising during the tenure of the Agreement or after its Term or whether before or after the termination, abandonment, or breach of the Agreement, shall be referred to arbitration. Each party shall be entitled to nominate its Arbitrator. The decision of the Arbitrator/Umpire shall be final and binding on the parties. The arbitration shall be conducted in accordance with the provisions of Indian Arbitration Act, 1940.

    Notwithstanding refernce of any dispute to the arbitration, the parties shall continue to perform this Agreement with due diligence till its Term and Termination is over.

18. **Notices:** All "Notices" to be given by either party to the other shall be in writing and must be delivered by certified or registered mail, acknowledgement due, or nationally recognized overnight delivery service, addressed as follows:

    To the Owner:

    _____

    _____

    Attention: _____

    To the Customer:

    _____

    _____

    Attention: _____

    or such addresses as either party may hereinafter indicate by Notice to the other. Notices are deemed delivered or given and become effective after two (2) days of mailing if mailed as aforesaid, and upon actual receipt if otherwise delivered.

19. **Miscellaneous:** This Agreement shall be governed and construed under the laws of India. In the event that any clause or provision of this Agreement or any part thereof shall be declared invalid, void or unenforceable by any court having jurisdiction, such invalidity shall not affect the validity or enforceability of the remaining portions of this Agreement. The failure of the Customer or the Owner to insist upon the strict performance of the terms and conditions hereof shall not constitute or be construed as a waiver or relinquishment of either party's right to enforce thereafter the same in accordance with this Agreement in the event of a continuing or subsequent default on the part of the Customer or the Owner.

IN WITNESS WHEREOF, the parties hereto through their authorised representatives subscribe their signatures and seal to this instrument on the date, month, and year mentioned above, at _____ (place)

CUSTOMER: _____
SIGNED BY: _____
TITLE/DESIGNATION: _____
SEAL: _____

OWNER: _____
SIGNED BY: _____
TITLE/DESIGNATION: _____
SEAL: _____

WITNESS NAME: _____ _____
WITNESS ADDRESS: _____ _____
_____ _____

EXHIBITS

Exhibit A:	Equipment Details
Exhibit B:	Facilities Description with name of Equipment Installated
Exhibit C:	Equipment Acceptance Certificate
Exhibit D:	Energy Savings Methodology
Exhibit E:	Termination Value Schedule

APPENDIX I

MODEL LEASE AGREEEMENT

(Courtesy: 20th Century Finance Corporation Limited)

20TH CENTURY

LEASE AGREEMENT

LESSOR:	LESSEE:
LEASE AGREEMENT NO.	EFFECTIVE DATE

LEASE: The Lessor hereby agrees to lease to the Lessee and the Lessee hereby agrees to take on lease from the Lessor subject to the terms of this Lease Agreement No.: _____ (hereinafter referred to as the agreement) the diverse machineries (hereinafter referred to as the 'Equipment') described in the Lease Summary Schedule/ Schedules annexed to be annexed hereto. As and when the Equipment is leased to the Lessee, the Lessee shall further execute, from time to time, Supplementary Lease Schedules in favour of the Lessor pertaining to the Equipment and disbursal made by the Lessor in relation thereto. Each such Supplementary Schedule shall be deemed to form an integral part of this Agreement as if the same were annexed hereto or set out herein in extenso.

PERIOD OF LEASE : The Lessee shall take the Equipment for its use on lease for the terms specified in the Lease Summary Schedule hereunder written. The Lessee shall have the option to renew the lease of the Equipment for further periods as may be decided upon by the Lessee subject, however, to the proviso that such further extension of the lease period shall not have any one renewal exceed 5 years at a time. Such periods for which the lease is renewed are hereinafter referred to as Secondary Lease Period(s). The Lessee shall pay to the Lessor lease rentals at the rate applicable to the Secondary Lease Period(s) specified in the Lease Summary Schedule herein written, the other terms and conditions of the renewed lease remaining the same as contained in this Agreement for the Secondary Lease Period(s) also.

RENTAL : In consideration of the above, the Lessee shall pay to the Lessor, Lease rent at the rate specified in the Lease Summary Schedule hereunder written without abatement for the entire period of lease. Such lease rent shall be payable by the Lessee to the Lessor or to Lessor's designated Bankers at Bombay, for and on behalf of the Lessor, under advice to Lessor and such payments shall be deemed to be payment to the Lessor and shall fully discharge the Lessee from its obligations hereunder to pay lease rentals to the Lessor. The lease rent shall be due and payable on the first day of each _____ The Lessee will pay on demand, as late charge, an amount equal to two percent (2%) per month of each instalment of lease rent or part thereof that remain unpaid, the late charge being calculated from the date the lease rent was due and payable.

WARRANTIES : The Lessee has made the selection of Equipment based upon its own judgment prior to the purchase thereof by the Lessor and expressly declares that it has not relied upon any statements or representations made by Lessor. The Lessor makes no express or implied warranties including those of merchantability or fitness for particular use of the Equipment and hereby disclaims the same. Save as otherwise provided in this Agreement, the Lessor shall not be responsible for any repairs, service or defects in the Equipment or the operation thereof.

MANUFACTURERS WARRANTIES : The Lessor agrees that the Lessee shall be entitled to the benefits of the warranties provided by the manufacturers/suppliers of the Equipment. Any performance guarantee provided by the supplier shall be in the joint names of the Lessor and the Lessee and shall be enforceable by the Lessor or the Lessee or both of them. For this purpose, the Lessor if so requested by the Lessee, shall authorise the Lessee for enforcing due performance by the supplier of the Equipment for any warranties or performance guarantees relating to the Equipment.

TITLE, IDENTIFICATION, OWNERSHIP OF EQUIPMENT : Save as otherwise provided in this Agreement, no right, title or interest in the Equipment shall pass to the Lessee by virtue of these presents. The Lessee shall at no time contest or challenge the Lessor's sole and exclusive right, title and interest in the Equipment. The Lessor may require plates or markings to be affixed to or placed on the Equipment, indicating the Lessor's interest therein and the interests of its Bankers. The Lessor and the Lessee hereby confirm that their intent is that the Equipment shall at all times remain the property of the Lessor. The Lessee also agrees and undertakes not to sell, assign, sublet, pledge, hypothecate or otherwise encumber or suffer a lien upon or against the Equipment or remove the Equipment from the factory or office or site where originally put to use or located, without the prior consent of the Lessor in writing, which consent the Lessor agrees will not unreasonably withhold. Conditioned upon the Lessee's compliance with and fulfillment of the terms and conditions of this Agreement, the Lessee shall have the right to have exclusive peaceful possession, operation and use of the Equipment for the full term of the lease and any renewals thereof. The Lessor will not be responsible for the working of the equipment.

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EQUIPMENT IN TRANSIT : The Equipment hereunder leased, will be delivered by the manufacturers/suppliers to the location specified by the Lessee. The Lessor shall not be responsible for any damage incurred to the Equipment prior to or during delivery. Prior to the despatch of the Equipment, the Lessee shall ensure that transit insurance on the Equipment being despatched is provided by the supplier naming the Lessor as Loss Payee. Alternatively, the Lessee shall at its cost obtain such insurance naming the Lessor as Loss Payee. In the event of damage to the Equipment in transit, the Lessee shall be solely responsible for all loss and damage and rectification of such damages and shall effect payment of lease rentals on the damaged Equipment notwithstanding the costs and delays attendant to the repairs of the above. In the event, the Lessor agrees to refund any Insurance claim received by the Lessor forthwith to the Lessee.

DELIVERY AND DISBURSEMENT : The Lessor will request the manufacturers/suppliers to effect delivery on or before the date of commencement of the rentals, but if, for whatever reason delivery is not effected by the manufacturers/suppliers by that date, Lessor shall not be liable for any loss suffered by the Lessee thereby. Lease rentals shall be deemed to commence from the date of disbursement of the Purchase Price of the Equipment to manufacturers/suppliers excluding any retention money or any amounts payable on installation or commissioning of the Equipment to the manufacturers/suppliers and all charges and obligations thereto shall be payable and enforceable as if the delivery of the Equipment had been effected on that date. This will be accepted as constructive delivery of Equipment to the Lessee. It is expressly understood by the parties hereto that disbursement by the Lessor shall be made only when duly authorised by the Lessee. In the event that the Lessee causes cancellation of or instructs the Lessor to cancel a Purchase Order/Contract with the supplier of the Equipment or the Lessee shall refuse or be unable for any reason to accept delivery, the Lessor shall be entitled to terminate the Lease of the aforesaid Equipment and the Lessee shall pay to Lessor on demand all costs, charges, expenses, damages incurred by the Lessor arising out of such an action of the Lessee.

The Lessee agrees to bear all Bank/Demand Draft charges relating to payments to the suppliers.

INDEMNITY : The Lessee agree to comply with all laws and regulations relating to transportation, possession, operation and use of the Equipment and assumes all liabilities including injuries to or death of persons arising from or pertaining to the transportation, possession, operation or use of the Equipment. The Lessee does hereby agree to indemnify and keep indemnified and hold safe and harmless the Lessor against all such liabilities and also against loss of Equipment by seizure by any person other than the Lessor for any reason whatsoever or resulting from any legal process instituted by any person other than the Lessor, provided that such indemnity shall not apply to such loss as has arisen or arises due to any act, lapse, fault, or other causes on the part of the Lessor. The indemnities contained in the paragraph shall survive the termination of this Agreement, in so far as they pertain to events/occurrences that transpired during the period of the lease and any renewals thereof. Any fees, taxes or other charges legally payable by the Lessee in relation to the possession and use of the Equipment and which is paid by the Lessor in the event of the Lessee's failure to pay shall at the Lessor's option become immediately due from the Lessee to the Lessor.

INSPECTION : The Lessor or a representative of its designated Bankers shall have the right from time to time during the normal business hours on any working day with prior notice in writing to the Lessee to enter upon the Lessee's premises for the purpose of confirming the existence, condition and proper maintenance of the Equipment.

REPAIRS, LOSS & DAMAGE : During the term of the lease and any renewal thereof, the Lessor shall not be called upon to keep the Equipment in good repair, condition and working order and the Lessee at its own cost and expense will keep the Equipment in good repair, condition and working order. All parts, mechanisms and devices or any replacements made by the Lessee to the Equipment shall immediately be deemed part of the Equipment for all purposes thereof and shall become the property of the Lessor, without any payment for such parts, mechanisms, and devices from the Lessor.

In the event, any item Equipment is lost, stolen or destroyed or damaged beyond repair for any reason, the Lessee shall promptly pay to the Lessor the amount of lease rentals that remain unpaid, including any renewal options contained herein, or entered into pursuant to this Agreement, whereupon Lessor will transfer to Lessee without recourse of warranty all of Lessor's right, title and interest if any, in such item. The Lessor shall in such event, refund to the Lessee any insurance claims subsequently received by the Lessor.

INSURANCE : The Lessee shall for the benefit of and on behalf of the Lessor obtain and maintain for the entire term of this Agreement at its own expense insurance against normal risks and such other risks of loss as are customarily insured against on the type of Equipment leased hereunder and by businesses in which the Lessee is engaged in for such amount, provided however, that the amount of insurance against loss or damage to the Equipment shall not be less than the original cost of the Equipment. Alternatively the Lessor shall have the right to insure the equipment as aforesaid for which purpose the Lessee shall provide the Lessor with particulars of the location of the Leased Equipment and the type of risks which would be required to be covered under the Insurance Policy. In such event the Lessee shall reimburse the insurance premium and other costs and expenses to the Lessor.

Each Insurance Policy will be in the joint names of the Lessor and the Lessee and note the names of the Lessor and its designated banker as Loss Payees. The Lessee shall furnish to the Lessor a Certificate of Insurance or other satisfactory evidence that such insurance coverage is in effect. All insurance premium should be borne and paid by the Lessee during the term of this Agreement. It is further agreed between the parties hereto that in the event of the Lessee not furnishing evidence of insurance cover within a period of 15 days from the date of installation of the Equipment, the Lessor may in its absolute discretion arrange such insurance cover as may be needed without any prior notice to the Lessee. In such an event, it is agreed between the parties hereto that the cost of such insurance taken by the Lessor or the amount of premium paid by the Lessor shall be forthwith reimbursed by the Lessee.

ORDER PLACEMENT : It is agreed between the parties hereto that orders for individual items of Equipment under this Agreement shall be placed forthwith by the Lessor at the instance of the Lessee. In the event of undue delay in receiving such instruction for placement of orders beyond 60 days from the date of this Agreement the Lessor shall reserve the right to review this Agreement.

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COMMITMENT FEES : A schedule of disbursements to suppliers shall be mutually agreed upon by the parties hereto based on representation by the Lessee on estimated delivery schedule of Equipment. In the event of such disbursement schedule not being adhered to for any reason whatsoever, Lessor reserves the right to levy commitment fees calculated @ 1% per annum of undisbursed amount.

MISCELLANEOUS:

(a) During the term of this Agreement, the Lessee will provide to the Lessor annual audited accounts of the Lessee within six months of the closing of the financial year. The Lessee will also provide to the Lessor unaudited financial statements semi-annually within 2 months of the close of the 6 months period.

(b) The Lessor hereby covenants that subject to any hypothecation created or to be created thereon by the Lessor in favour of its Bankers for any loan or other financial facilities granted or to be granted to the Lessor by such bankers the Equipment is the absolute property of the Lessor and undertakes not to sell or transfer the same to any party except to hypothecate, mortgage, or create a charge in favour of a Bank or a Financial Institution or Trustees for Debentureholders, if any, in a form satisfactory to the Banker, Financial Institution or Trustees for the Debentureholders. The Lessor shall inform the Lessee of any such mortgage, hypothecation.

(c) The Lessee irrevocably agrees that the lease amount/rentals will be increased by any incremental taxes whether Sales Tax or Excise Duties or any other related and consequential charges levied on this transaction now or hereafter as also by any increase in the Purchase Price of the asset in the intervening period between placement of the order and its acceptance and the eventual delivery of the Equipment.

(d) The Lessee further agrees that at no time during the period of this Lease Agreement which lease period is noncancellable, will the Lessee attempt or cause to capitalise the leased Equipment on Lessee's Balance Sheet and the Lessee and the Lessor agree that ownership of the Equipment during the term of the lease including any renewal thereof shall vest with the Lessor.

(e) The Lessor hereby undertakes to satisfy all the necessary conditions with regard to payment of any money or sums the Lessor may obtain from any Bank of Financial Institution on the security of the leased Equipment and any failure on part of the Lessor in regard to such obligations shall not prejudice the Lessee's right in pursuance of these presents. The Lessee hereby undertakes to make the payment of lease rentals mentioned in these presents to such Bank or Financial Institution as may be designated by the Lessor, independent of the Lessor's authorisation. If the lessee is required to pay the lease rentals to such Bank or Financial Institution, pursuant to a valid demand made on the Lessee by such Bank or Financial Institution the Lessee undertakes to make such payments to such Bank or Financial Institution, as per the terms of this Agreement. In such an event all such payments made by the Lessee to the said Bank or Financial Institution will constitute payment to the lessor towards dues under this Agreement, and will constitute a sufficient discharge of all obligations of the Lessee under this Agreement. The Lessor agrees to inform its Bankers/Financial Institution and obtain their confirmation to the same.

(f) The Lessor and the Lessee concur that this Agreement has been entered into on the basis on inter alia the financial condition of the Lessee. In the event of a material adverse change in financial condition of the Lessee during the period of this Agreement the Lessor reserves the right to review the Agreement, or require the Lessee to provide such security for payment of lease rentals as may be stipulated by the Lessor or its Bankers and the Lessee shall bear all costs and expenses arising out of such review of this Agreement.

(g) The Lessee hereby agrees to provide annually, certificates regarding the depreciation eligibility of the Equipment, and that the Equipment is in good working order and condition and also that the Equipment is in physical possession of the Lessee.

(h) The lease rentals payable under this lease agreement will have priority over lease rentals payable under lease agreements entered into by the Lessee subsequent to date of this agreement.

(i) The lease will be automatically renewed at a lease rent of Rs.1.00 per Rs.1000/- per month after expiry of 60 days from the last date of rental payment mentioned hereinafter or in any Supplementary Lease Schedule signed under this agreement.

(j) The lessee will inform the Lessor about other lease agreements signed by the Lessee subsequent to the signing of this agreement.

SURRENDER : Unless the lease is renewed as per the terms of this agreement, upon expiration on earlier termination of the lease, the lessee shall deliver to the Lessor the said Equipment at the place at which it is located in good working order and condition, normal wear and tear resulting from the proper use of the Equipment excepted. Upon such surrender of the equipment, the Lessor reserves the right to dispose off the assets in any manner as the Lessor may deem fit, subject however to the fact that the Lessor reserves the right to appoint the Lessee as its Agent for such disposal.

EVENTS OF DEFAULT :

As event of default shall occur hereunder if the Lessee:

(a) fails to pay any of the lease rentals or part thereof or other payment required hereunder when due and such failure continues for a period of 14 days after written notice is sent to the Lessee; or

(b) fails to effect insurance cover of the Equipment, or fails to pay insurance premia as and when due or fails to reimburse the same to the Lessor if paid by the Lessor; or

(c) fails to perform or observe any other covenant, conditions or agreement to be performed or observed by it hereunder or in any other document furnished to the Lessor in connection herewith, and such failure or breach continues unremedied for a period of 14 days after written notice is sent to the Lessee; or

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(d) without the Lessor's consent, sells, transfers, parts with possession or sublets or encumbers or creates any lien on or endangers any item of Equipment; or

(e) shall commit an act of bankruptcy or become insolvent or bankrupt or make an assignment for the benefit of creditors, or consent to the appointment of a Trustee or Receiver, or either shall be appointed for the Lessee or for a substantial part of its property without its consent or bankruptcy reorganisation or insolvency proceedings shall be instituted by or against the Lessee, voluntary or otherwise; or

(f) shall suffer an adverse material change in the financial condition from date hereof, and as a result thereof, Lessor deems itself or any of its Equipment to be insecure; or

(g) shall be in default under any other Lease Agreement at any time executed with the Lessor or has been declared to have been in default by any Bank or Financial Institution.

REMEDIES : Upon the occurrence of any event of default and at any time thereafter, the Lessor declare all sums due and to become due hereunder for the full term of the lease including any renewal thereof, immediately due and payable and upon the Lessee failing to make the said payment within 14 days thereof, Lessor may, at its sole discretion do any one or more of the following:

(a) Upon notice to the Lessee terminate this Agreement and all Schedules executed pursuant hereto:

(b) demand that the Lessee return all Equipment to the Lessor at its own risk and expense, in the same condition as delivered, ordinary wear and tear excepted, at such location as the Lessor may designate and upon failure of the Lessee to do so within 14 days from the date of demand, enter upon premises where such Equipment is located and take immediate possession of and remove the same, all without liability to the Lessor or its Agents for such entry or for damage to property or otherwise, the Lessor may detach and dismantle the Equipment from any part of the freehold or process machinery to which it may be affixed without the written permission of the Lessee;

(c) sell any or all the Equipment at a Public or Private Sale with or without notice to the Lessee or otherwise dispose off, hold, use, operate, lease to others or keep idle such Equipment, all free and clear of any rights to the Lessee and without any duty to account to the Lessee for such action or inaction or for any proceeds with respect thereto in the event that the Lessor sells the Leased Equipment at a public or private sale, the sale proceeds (net and clear of all taxes and costs) shall be adjusted against the arrears of rentals including late Payment charges and the balance lease rentals then remaining unpaid. Any excess/deficit of sales proceeds as compared to the outstanding rentals will be refunded/recovered from the Lessee.

(d) by written notice to the Lessee, require the Lessee to pay to the Lessor (as liquidated damages for loss of a bargain and not as a penalty) on the dates specified in such notice, an amount (plus interest at the prevailing maximum lending rate of the banks for the period until receipt of the said amount) equal to all unpaid lease rental payments which in the absence of a default would have been payable by the Lessee hereunder for the full term hereof including any renewal thereof; or

(e) exercise any other right or remedy which may be available to it under the applicable law.

In addition, the Lessee shall be liable for all legal fees and other costs and expenses resulting from the foregoing defaults of the exercise of the Lessor's remedies, including repossession of any Equipment.

No remedy referred to hereinabove is intended to be exclusive, but each shall be cummulative and shall be in addition to any other remedy available to the Lessor at law. The Lessor reserves the right to appoint its Bankers or Financial Institution as its Attorney or Agent for the purpose of enforcing its rights and remedies under this Agreement.

WAIVER : Any expressed or implied waiver by the Lessor of any default shall not constitute a waiver of any other default by the Lessee or a waiver of any of the Lessor's right. All original rights and powers of the Lessor under this Agreement will remain in full force, notwithstanding any neglect, forbearance or delay in the enforcement thereof by the Lessor, and the Lessor shall not be deemed to have waived any of the Lessor's rights or any provision of this Agreement or any notice given hereunder unless such waiver be provided in writing by Lessor and any waiver by the Lessor of any breach by the Lessee of this Agreement shall not be deemed a waiver of any continuing or recurring breach by the Lessee of this Agreement.

NOTICES: Any notice or demands required to be given herein shall be given to the parties hereto in writing and by either Registered Post Acknowledgment Due or by hand delivery at the addresses abovementioned or at such other addresses as the parties hereto may hereafter substitute by written notice given in the manner prescribed hereinabove.

The Agreements and Contracts executed between parties hereto pursuant to this Agreement cannot be cancelled or terminated except as expressly provided herein. The Lessee hereby agrees that Lessee's obligations to pay all lease rentals and any other amounts owing hereunder shall be absolute and unconditional. This Agreement cannot be amended except in writing and shall be binding upon and to the benefit of the parties hereto, their permitted successor and assigns.

The captions in this Agreement are for convenience only and shall not define or limit any of the terms hereof.

It is agreed by and between the parties hereto that this Agreement shall be subject to the exclusive jurisdiction of the Courts of Greater Bombay.

By execution hereof the signers hereby certify that they have read this Agreement including the schedules hereto, and that they are duly authorised to execute this Agreement on behalf of the parties hereto.

This Agreement executed at this day of 19

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LEASE SUMMARY SCHEDULE

AGREEMENT NO. TCFC/ /92

1. Lessor	:	20th Century Finance Corporation Limited
2. Lessee	:	
3. Type of Equipment	:	
4. Lease Tenor	:	months
5. Lease Value	:	Rs.0,00,000/-
6. Lease Management Fee	:	1% of the Agreement Value payable on execution of this Agreement.
7. Depreciation Eligibility	:	As per Income Tax Rules
8. Lease Rentals Structure	:	Rentals provided hereunder are Rupees per month per Rs.1000 of asset cost. These rentals are net of any applicable taxes & duties. Any such taxes & duties which become applicable would be borne by the Lessee. The rentals indicated hereunder will be charged on the total cost of the asset.
First 36 months	:	Rs. 00.00
9. Notice of Disbursement	:	The Lessee shall give a minimum of 15 days notice to the Lessor prior to the disbursement from the date of signing the Agreement
10. Finance Charges	:	For all disbursements in a particular month, the billing will commence from the first of the following month. Finance charges will be charged @ 24.00 % per annum from the date of disbursement to the end of the month in which disbursements are made.
11. Repairs & Maintenance	:	The Lessee at his cost shall provide for on-going maintenance of the leased assets to keep it in good condition, normal wear and tear excepted.
12. Insurance	:	The Lessee at his cost shall provide for appropriate insurance of the leased assets, designating Lessor and/or its nominees as Loss Payees.

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13. Payment Terms	:	All rentals are payable QUARTERLY in advance at par in Bombay
14. Interest Variation Clause:		The above rentals are based on the mininmum short-term lending rates of commercial banks which is at 19.00% (net of all taxes) per annum. For every 1.00 % change thereof,the lease rentals will stand increased/decreased by Rs. 0.25 per month per Rs.1,000/- of asset cost. However such variation shall be subject to a minimum lending rate of 18.00 % per annum. This variation is applicable only for the first 60 months of the lease tenor. Additional Government levies, if any, will be entirely to the lesseee's account.

For 20th Century Finance Corporation Ltd.

Authorised Signatory

For Lessee Name

Authorised Signatory

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20th Century

Supplementary Lease Schedule/Indemnity Certificate

Lessor : 20th Century Finance Corporation Ltd.
Regd. Off. : 502, Raheja Chambers, 213, Nariman Point, Bombay-400 021.
Head Off. : 25/26, Maker Chambers III, Nariman Point, Bombay-400 021.

Lessee :

Master Lease Agt. no. :
Master Lease Agt. Dt. :
Lease Schedule no. :
Effective Date :
Final Date :
Period :

The terms of this lease for each item of Equipment covered by this Schedule as specified below will commence on the Effective Date detailed hereinabove and shall continue for the stipulated period. As lease rentals for the Equipment covered by this Schedule, Lessee hereby agrees to pay to the Lessor the rentals specified hereinbelow. All lease rentals shall be paid without notice or demand and without abatement, deduction, set-off of any amount whatsover at :

Rate per Rs. 1000/- per month	Rental Amount	Period	Due on	Total Rentals

INTEREST VARIATION CLAUSE

These rentals are based on the minimum commercial bank lending rate of p.a. For every change thereof the rentals shall change by Rs. per month per thousand for the first months subject to a minimum lending rate of p. a.

SCHEDULE REFERRED TO HEREINBEFORE

"A" Purchase Order Number/ "B" Supplier Name/ "C" Description of Equipment	Invoice Value/ Supp. Location	Advance/ Asset location	Net. Disbursement

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The items of Equipment specified overleaf are hereby leased on the terms specified herein and this Schedule shall be deemed to become a part of and subject to the terms and conditions of the Master Lease Agreemant no. referred overleaf.

Lessee further confirms to the Lessor that the equipment more fully described overleaf has been delivered, installed and put to use.

Lessee further Confirms that the said equipment has been examined and/or tested and is in good operating order and condition and is satisfactory to the Lessee. Lessee also confirms that the said Equipment complies with all the terms of the Purchase Order placed by the Lessor, which Purchase Order has been approved of by the Lessee.

Lessee hereby agrees to hold the Lessor harmless against non-performance of the above equipment, if any and further agrees to look solely to the manufacturer/his selling agent for the performance of all guarantees and warranties with respect of the said Equipment.

Irrespective of the performance of the said Equipment, the Lessee agrees unconditionally to honour the terms of this Schedule and the Master Lease Agreement referred to overleaf and further confirms that it will continue to make rental payments & Sales Tax in the normal course of its business

Lessee acknowledges that the Lessor is neither the Manufacturer nor the Distributor of the said Equipment and that the Lessor has no control, knowledge or familiarity with the condition, capacity, functioning, fitness for particular use or other characteristics of the equipment, Lessee having made the selection of the Equipment and its supplier in its sole discretion. This Supplementary Schedule shall not be considered to alter, construe or amend any of the terms of the Master Lease Agreement referred to overleaf.

By execution of the Schedule hereof, the Signor hereby certifies that he has read this Schedule along with details of the said Equipment fully described overleaf and that he is duly authorised to execute this Schedule.

For 20th Century Finance Corpn. Ltd.

For Lessee

Authorised Signatory

Authorised Signatory

APPENDIX J

MODEL HIRE - PURCHASE AGREEMENT

(Taken from: Vinod Kothari, Lease Financing & Hire-Purchase, 3rd Edition, Wadhwa and Company, Pvt. Ltd., Nagpur, India, 1991)

MODEL DOCUMENTATION

I

MODEL HIRE-PURCHASE AGREEMENT : PROPERTY VESTING AUTOMATICALLY ON EXPIRATION OF PERIOD OF HIRE WITH POWER TO HIRER TO DETERMINE:—

Parties. AN AGREEMENT made the ..... day of ..... 19..... BETWEEN (owner) of (address, etc.) (or having its registered office at (address)) (hereinafter called the owner, which expression shall where the context so admits include the owner's successors in title) of the one part and (hirer) of (address, etc.) (hereinafter called the hirer) of the other part.

WHEREBY IT IS AGREED as follows :

1. **Agreement for hire.**—The owner will let and the hirer will take on hire upon the terms and conditions hereinafter mentioned the goods more particularly described in the schedule hereto.

2. **Price.**—The cash price of the goods (which are let as second-hand goods) is Rs. ..... and the hire-purchase price is Rs. .....

3. **Commencement and duration of hiring.**—Subject to the provisions of clause 20 hereof the hiring shall commence on the date of this agreement and shall continue until determined as hereinafter provided.

4. **Payment.**—(1) The hirer having prior to the execution of this agreement paid to the owner the sum of Rs. ..... in consideration of the option to purchase hereby granted shall (subject to the provisions of clause 11 hereof) pay to the owner the balance of the said hire-purchase price amounting to Rs. ..... by ..... instalments of Rs. ..... each (and a final instalment of Rs. .....) the first such instalment to be paid on the .....day of ..... and each subsequent instalment on the ..... day of each succeeding month.

(2) Punctual payment of each instalment shall be of the essence of this agreement and the hirer shall be deemed to have repudiated this agreement if any instalment or part hereof shall remain unpaid for more than seven days after becoming due.

(3) All sums payable to the owner under this agreement shall be paid to him at (address) or at such other address as the owner may from time to time specify. Payments made by post shall be at the risk of the hirer.

(a) **Other obligations of hirer : Punctual payment.**—punctually pay all sums specified in clause 4 hereof;

(b) **Interest on overdue instalments.**—pay to the owner interest on overdue instalments at the rate of ..... per cent per annum until payment hereof such interest to run from day to day and to accrue after as well as before any judgment;

(c) **Repair.**—keep the goods in good and in serviceable repair and condition and replace all missing, damaged or broken parts with parts of equal quality and value and in default of so doing permit the owner to take possession of the goods for the purpose of having repairs carried out and repay to the owner the full cost of such repairs. The owner shall have a lien on the goods until such repayment but exercise of such lien shall not prevent the accrual of instalments of hire-rent hereunder;

(d) **Pay all charges, etc., and in default permit owner to pay and recover.**—punctually pay all registration charges, licence fees, rents, rates, taxes and other outgoings payable in respect of the goods or the use thereof or in respect of any premises in which the goods may from time to time be placed or kept and produce to the owner on demand the last receipts for all such payments, and in the event of the hirer making default in payment under this sub-clause the owner shall be at liberty to make all or any of such payments and to recover the amount thereof from the hirer forthwith;

(e) **Permit owner to enter and inspect.**—permit the owner and any person authorised by him at all reasonable times to enter upon the premises in which the goods are for the time being placed or kept for the purpose of inspecting and examining the condition of the goods;

(f) **Keep the goods in the hirer's possession.**—keep the goods at all times in his possession and control and not remove the same from India (or as the case may be) without the consent in writing of the owner;

(g) **Notify owner of altered address or whereabouts of goods.**—notify the owner of any change in the hirer's address and upon request by the owner promptly inform the owner of the whereabouts of the goods;

(h) **Indemnify owner against loss of or damage to goods.**—indemnify the owner against loss of or damage to the goods or any part thereof from whatever cause arising and whether or not such loss or damage results from the negligence of the hirer;

(i) **Keep goods free from distress, etc.**—punctually pay for all work done to the goods and for spare parts and accessories thereto and keep the goods free from any distress execution or other legal process;

(j) **Not to sell or otherwise dispose of the goods.**—not to sell, assign, let, pledge, mortgage, charge, incumber or part with possession of or otherwise deal with the goods or any interest therein or in this agreement or the option to purchase herein contained, or create or allow to be created any lien on the goods whether for repairs or

otherwise and in the event of any breach of this sub-clause by the hirer the owner shall be entitled (but shall not be bound) to pay to any third party such sum as is necessary to procure the release of the goods from any charge, incumbrance or lien and shall further be entitled to recover such sum from the hirer forthwith;

(k) **To insure.**—immediately after the signing of this agreement insure the goods and keep the same insured during the continuance of the hiring against loss or damage by accident, fire and theft to the full replacement value thereof with some insurance company to be approved by the owner under a comprehensive policy of insurance free from restriction or excess in the joint names of the owner and hirer (or name of the hirer bearing an endorsement recording the owner's interest in the goods) and stating that no payment is to be made to the hirer under the policy until the owner's interest has been discharged and in default of the hirer so doing the owner may insure as aforesaid and recover the cost thereof from the hirer forthwith. The hirer hereby irrevocably appoints the owner his agent for the purpose of receiving all monies payable under the said policy (which monies shall be applied as provided in clause 8 hereof) and giving a discharge therefor;

(l) **Pay insurance premiums.**—punctually pay all premiums payable under the said policy and produce the receipts for such payments to the owner on demand and do everything necessary to maintain the said policy in full effect and not do anything whereby the said policy will or may be vitiated;

(m) **Obtain all consents, etc., for use of the goods.**—obtain all necessary licences, permits and permissions for the use of the goods and not use the goods or permit the same to be used contrary to law or any regulation or byelaw for the time being in force;

(n) **Pay all legal and other expenses.**—pay the owner all expenses (including legal costs on a full indemnity basis) incurred by or on behalf of the owner in ascertaining the whereabouts of, taking possession of, preserving, insuring and storing the goods and of any legal proceeding taken by or on behalf of the owner to enforce the provisions of this agreement.

6. **Promissory note or bill as collateral security.**—The hirer has given (or will at the request of the owner give) by way of collateral security a promissory note [or has accepted (or will at the request of the owner accept) by way of collateral security a bill of exchange drawn on the hirer by the owner] for the outstanding balance of the hire-purchase price and in the event of the hirer making default in payment of any sum due under this agreement the owner shall be entitled to transfer or negotiate the said note (or bill) and the transferee or holder shall take the said note (or bill) free from equities and defences as a holder in due course. Neither the taking of such note (or bill) nor the transfer or negotiation thereof shall suspend or prejudice the remedies of the owner under this agreement. The hirer hereby waives presentment and notice of dishonour by the owner or by any holder of the said note (or bill).

7. Loss, theft, destruction of or damage to goods.—Where the goods are lost, stolen, destroyed or damaged by the negligence or wrongful act of a third party the hirer shall immediately notify the owner thereof and shall not compromise any claim without the consent of the owner and shall allow the owner to take over the conduct of any negotiations (except in relation to claims of the hirer for personal injuries, loss of use of the goods or loss of or damage to the property of the hirer unconnected with the goods) and shall at his own expense take such proceedings (in the hirer's sole name or jointly with the owner) as the owner shall direct, holding all sums recovered (together with any monies received by the hirer under any policy of insurance taken out by hirer pursuant to the provisions of this agreement) on trust for the owner and paying or applying as the owner directs such part thereof as is necessary to discharge the hirer's liability to the owner at the date of such payment and to compensate the owner for the loss, theft or destruction of or damage to the goods any surplus being retainable by the hirer for his own benefit.

8. Application of insurance monies.—(a). If any of the goods shall be damaged during the currency of the hiring and in the opinion of the insurers it is economic that such damage be made good all insurance monies payable under the said policy shall be applied in making good the said damage.

(b) If any of the goods shall be lost, stolen, destroyed or damaged to such an extent as to be in the opinion of the insurers incapable of economic repair the insurance monies payable under the said policy shall be applied in the order following, that is to say :

(i) in paying to the owner the unpaid balance of the hire-purchase price together with any interest and other sums payable by the hirer under clause 5 hereof; and

(ii) in paying any surplus to the hirer.

If after payment of the said insurance monies to the owner under the said policy any part of the hire-purchase price and interest or other monies payable under clause 5 hereof remains unpaid the same shall forthwith become payable by the hirer and thereupon this agreement shall come to an end and subject to the rights of the insurers therein title to the goods shall vest in the hirer. Subject as aforesaid the loss, theft or destruction of or damage to the goods shall not discharge this agreement or affect the hirer's liability for payment of instalments hereunder.

9. Termination by hirer.—The hirer may at any time before the final payment hereunder falls due determine this agreement by (giving .....days' notice in writing to the owner and) delivering up the goods to the owner at (address) or at such other address as the owner may have previously specified in writing.

10. Termination by owner by notice.—(1) If the hirer shall make default in payment of any of the sums payable hereunder or shall fail to observe or perform any of the other terms and conditions of this agreement whether express or implied or if the owner shall on any reasonable ground consider himself insecure the owner may, without prejudice to any pre-

existing liability of the hirer to the owner, by notice in writing to the hirer determine this agreement and thereupon this agreement and the hiring hereby constituted shall for all purposes determine and thereafter the hirer shall no longer be in possession of the goods with the owner's consent and subject to the provisions of clause 11 hereof and any pre-existing liabilities of the hirer hereunder neither party shall have any right against the other.

(2) **Automatic termination in stated events.**—If the hirer shall commit an act of bankruptcy or have a receiving order made against him or shall make any arrangement with his creditors or any assignment for the benefit of such creditors or if distress or execution shall be levied or threatened upon any of the hirer's property or any judgment against the hirer shall remain unsatisfied for more than fourteen days or if the hirer shall abandon the goods then this agreement shall automatically and without notice determine and thereafter the hirer shall no longer be in possession of the goods with the owner's consent and subject to the provisions of clause 11 hereof and any pre-existing liabilities of the hirer hereunder neither party shall have any rights against the other.

11. Hirer's liability on termination.—Upon the termination of this agreement pursuant to clause 9 or 10 hereof the owner may without notice retake possession of the goods and for that purpose by himself his servants or agents enter upon any land or premises on or in which the goods are or are believed by the owner to be situated and the hirer shall upon such termination return to the owner all registration books and certificates, policies and certificates of insurance and licences in relation to the goods and shall pay to the owner the hire-purchase price of the goods less the aggregate of

(1) the sums previously paid under the agreement;

(2) the sums due under the agreement (including any sums recoverable from the hirer under clause 5 hereof) up to the date of termination;

(3) the net proceeds of sale of the goods if repossessed and sold or if not their value as determined by a dealer appointed by the owner; and

(4) a discount for the acceleration of payment computed according to the direct ratio or 'rule of 78' method.

For the purposes of this clause 'the net proceeds of sale' shall mean the proceeds of sale after deducting the cost and expenses of repossession, storage, insurance and sale.

If the net proceeds of sale of the goods repossessed and the amount paid by the hirer pursuant to this agreement exceed in the aggregate the amount of the hire-purchase price (with interest on overdue instalments and other sums payable by the hirer under clause 5 hereof) the excess shall be repaid to the hirer.

12. Responsibility for articles left in or attached to goods and right of sale.—The owner shall not be responsible for any article or property (whether of the hirer or otherwise) left in or attached to goods repossessed by the owner. Any article or property so found may be sold or otherwise disposed of by the owner after one month from service on the hirer of

notice in writing of the owner's intention to sell unless the said article or property shall have been previously collected by the hirer, and the net proceeds of sale or disposition shall be credited to the hirer against any liability of the hirer to the owner under this agreement or if there is no such liability shall be paid to the hirer. The hirer shall indemnify the owner against any claims by a third party to or in respect of any article or property so sold or disposed of as aforesaid.

13. Transfer ownership to hirer.—If the hirer (having meanwhile duly observed and performed all the terms and conditions of this agreement whether express or implied) shall pay to the owner such sums under clause 4 hereof as shall with the sum paid for the option to purchase amount in the aggregate to the hire-purchase price and shall also pay all sums payable to the owner under clause 5 hereof this agreement and the hiring thereby constituted shall determine and the hirer shall become the absolute owner of the goods but until such time the goods shall remain the sole property of the owner and the hirer shall be a mere bailee thereof :

Discount for acceleration of payment.—Provided that the hirer shall be at liberty to accelerate payment(s) under this agreement and in the event of his paying before the due date such sum or sums as may be necessary to vest the ownership of the goods in him pursuant to this clause the hirer shall be granted a rebate equivalent to the portion of the finance charge attributable to the period of the agreement remaining unexpired at the date of such payment computed according to the direct ratio or 'rule of 78' method.

14. It is hereby agreed and declared

(1) **Preservation of owner's common law rights.**—that the terms and conditions contained in this agreement in favour of the owner shall be in addition to and not in substitution for the terms and conditions implied in favour of the owner under a hire-purchase agreement at common law except in so far as such implied terms and conditions are inconsistent with the terms and conditions of this agreement;

(2) **Exclusion of conditions, warranties, etc.**—that any liability the owner might otherwise incur and any right or immunity the hirer might otherwise possess in respect of any conditions, warranties or representations relating to the condition of the said goods or to their merchantable quality or suitability or fitness for the particular or any purpose for which they are or may be required whether such conditions, warranties or representations are express or implied, and whether arising under this agreement or under any prior agreement or in oral or written statements made by or on behalf of any person in the course of negotiations in which the hirer or his representative may have been concerned prior to this agreement, are hereby excluded:

(3) **Exclusion of liability for failure to correspond with description.**—that the owner shall not incur any liability to the hirer nor shall the hirer be entitled to rescind this agreement if the goods delivered by the owner to the hirer do not correspond to their description as contained in this agreement:

(4) **Exclusion of liability for defects.**—that no liability shall attach to the owner either in contract or in tort for loss, injury or damage sustained by reason of any defect in the goods whether such defect be latent or apparent on examination and the owner shall not be liable to indemnify the hirer in respect of any claims made against the hirer by a third party for any such loss, injury or damage;

(5) **Dealer and supplier, etc., not agents of owner.**—that no dealer or supplier through whom this agreement was negotiated or by whom the goods were supplied or any person in the employ of any such dealer or supplier is or is to be deemed the agent of or acting on behalf of the owner for any purpose and no liability is to be attached to the owner for any conditions, warranties or representations made by such dealer or supplier or person in the employ of such dealer or supplier.

15. Assignment of owner's rights.—The owner shall be entitled to assign the benefit of this agreement or any right of the owner hereunder including the licence conferred on the owner to enter upon premises and inspect and/or repossess the goods and any assignment of the benefit of this agreement by the owner shall be deemed to include an assignment of the owner's rights to enter premises and to repossess the goods.

16. Accessions and renewals, etc.—In this agreement the goods shall include all additions and accessions thereto and all replacements and renewals thereof whether made before or after the date of this agreement.

17. Deemed date of receipt of notice served on hirer.—Any notice required or permitted to be given to the hirer under this agreement shall be deemed to have been validly given if served on the hirer personally or sent to him by prepaid post to or left at the address of the hirer stated in this agreement or at the hirer's existing or last known business or private address. Any such notice sent by post shall be conclusively deemed to have been received by the hirer within forty-eight hours after the time of posting.

18. Certificate as evidence of hirer's indebtedness.—A certificate signed by the manager of the principal or any branch office of the owner as to the amount due from the hirer under this agreement at the date of such certificate shall be *prima facie* evidence that the amount so certified was in fact due from the hirer at the date of such certificate.

19. Effect of indulgence, granting of time, etc.—No relaxation forbearance delay or indulgence by the owner in enforcing any of the terms and conditions of this agreement or the granting of time by the owner to the hirer shall prejudice affect or restrict the rights and powers of the owner hereunder nor shall any waiver by the owner of any breach hereof operate as a waiver of any subsequent or any continuing breach hereof.

20. Suspension of commencement of agreement.—This agreement shall not commence unless and until it has been signed by or on behalf of the owner and the hirer has paid any deposit prescribed by law.

As Witness etc.

SCHEDULE

(Particulars of the goods sufficient to enable them to be identified)

[Signatures of owner or (if a company) authorised agent, and of hirer]

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Appendix K

MEMORANDUM OF UNDERSTANDING FOR COOPERATIVE EFFORTS BETWEEN [ESCO] AND [TRADE ALLY] IN THE PURSUIT AND EXECUTION OF ENERGY SERVICES BUSINESS

3B

I. PURPOSE

This Memorandum shall serve as a record of the mutual interest and intent of _____ _____ (hereinafter referred to as "ESCO") and _____ [hereinafter referred to as "Trade Ally"], to cooperate in pursuit of the profitable sale and delivery of services and products offered by each company to the emerging energy services market in India. This document shall also serve to define the nature of the working relationship between ESCO and _____. This relationship shall be nonexclusive except as may be specifically defined in Section IV.

II. CONTEXT, PHILOSOPHY AND GOALS OF THE RELATIONSHIP

The technical, financial, and geographic scope of the energy services industry require that ESCO work very closely and on a long-term basis with a wide range of companies around the world, each of which offers value-added capabilities important in the delivery of energy services to utilities and their customers. ESCO therefore seeks out the most dedicated, ethical and technically qualified companies positioned to provide such valuable products and services, and enters into cooperative marketing, technical and financial relationships beneficial to both parties.

III. DESCRIPTION OF ESCO'S BUSINESS

ESCO offers a full range of services and products related to energy efficiency improvement for commercial, industrial, and institutional facilities. ESCO provides a broad range of engineering, contracting, and financial skills in designing and implementing environmentally acceptable end-use technologies for energy efficiency improvement.

IV. RESPECTIVE ROLES OF ESCO AND TRADE ALLY

ESCO shall perform the following:

1) Act as the project integrator or developer. Coordinate one or more Trade Allies to achieve successful completion of the energy services project(s).

2) Assist in marketing the combined energy services capabilities of ESCO and TRADE ALLY. Refer potential energy services clients to TRADE ALLY.

3) Provide and/or arrange the equity and debt capital required to finance energy services projects.

4) Perform the credit analysis, financial modeling, energy accounting, and customer billing required for energy services projects.

5) Provide training to selected personnel of TRADE ALLY. in the methodologies required to succesfully capture, design, install, service and maintain total energy services projects.

TRADE ALLY shall perform the following:

1) Assist in marketing the combined energy services capabilities of ESCO and TRADE ALLY. Refer potential energy services clients to ESCO and assist in the sales process.

2) Provide key expertise and energy efficient products to ESCO and its clients, including but not limited to such products as _____.

3) As projects progress, TRADE ALLY shall proactively suggest where and how ESCO and TRADE ALLY might improve their individual and/or collective performance.

4) At its option, TRADE ALLY may seek to provide part of the equity investment required to finance any project in which they are a providing services and/or materials. The amount of any such investment shall not exceed that amount which ESCO shall in its sole discretion allow. Such determination of possible project equity investments by TRADE ALLY shall be made by ESCO on a project by project basis.

V. RESPECTIVE RIGHTS AND OBLIGATIONS OF ESCO AND TRADE ALLY

1) The relationship between ESCO and TRADE ALLY is based on mutual cooperation and consent. Either party may elect to discontinue the general relationship at any time, for any reason. However, the commitments and restrictions imposed on the actions on the parties with respect to Section IV amount to a subcontracting relationship, and shall survive any general dissolution of this relationship.

2) Each party shall identify and hold accessible a corporate officer or other key executive as a point of high level communication between both companies. The point of contact for ESCO is _____. The point of contact for TRADE ALLY is _____.

3) At the completion of each project, the parties agree to participate in an evaluation process coordinated by ESCO for the purpose of analyzing our collective performance and deriving ways to improve future performance. Areas of possible improvement might include, but not be limited to: cost reduction, quality improvement (of the energy study, energy report, and proposal documents), and development of better approaches to marketing selling and engineering.

4) On an ongoing basis, the parties shall inform one another of any potential conflicts of interest as may arise in the course of their respective business activities with other energy services companies, utilities and clients.

5) The parties agree to meet on a periodic basis as needs and opportunities dictate to assess progress in meeting mutually established goals and to plan for new business activities.

6) The parties agree to adhere to the highest ethical standards in the conduct of their overlapping business interests, and to hold in the highest regard the interests of utilities and their clients.

7) The parties agree to specifically create and share in writing their respective plans for achieving a high level of Quality Assurance for the work conducted by each as part of their joint project activities.

8) The parties agree to amend any part of this agreement on the mutual consent of both parties, with particular attention paid to keeping current those activities defined in

Section IV. A copy of this Memorandum and all potential future amendments will be provided by ESCO to TRADE ALLY. These records should be kept accessible for reference and guidance in the conduct of cooperative business activities.

The parties being in agreement with the above, this Memorandum of Understanding is hereby executed on this _____ day of _____ , ____.

For ESCO:	For Trade Ally:
_____	_____
Name of Corporate Officer	Name of Corporate Officer
Title of Corporate Officer	Title of Corporate Officer

Appendix L

RECOMMENDED TRAINING PROGRAMS

Preliminary outlines of the following recommended training programs are provided in this Appendix:

- ESCO Training Program - Two weeks in India or U.S.
- ESCO Study Tour to U.S. - Two week program
- ESCO Study Tour to U.S. - Four week program
- Two-Day ESCO Training Seminar for SEBs
- Two-Day ESCO Training Seminar for Market Intermediaries.

TWO-DAY TRAINING COURSE FOR

MARKET INTERMEDIARIES

Preliminary Outline

Day	Topics	
	Morning	Afternoon
1	Executive Briefing - What is an ESCO? - Need for ESCOs - Potential Role of ESCOs - Typical Services Provided - ESCO Operations - Relationships to Market Intermediaries - Opportunities for Cooperation - Potential ESCO Market in India	Efficient Technology Options - Lighting - Motors - Process - Cogeneration - EMCS - Power Quality Target Markets for ESCOs - Industrial - Commercial - Agricultural/Other
2	Business and Legal Issues - Organization - Marketing - Contract Negotiation - Financing - Implementation - Monitoring Typical Energy Services Agreements - Shared Savings - Leasing - Installment Purchase - Other Critical Success Factors for ESCOs	Relationships Between ESCOs and Market Intermediaries - Cooperative Marketing - Provision of Services - Joint Ventures - Other Establishing an ESCO in India - Business Structure - Ownership - Capitalization - Organization - Financing - Marketing - Management - Joint Ventures

ESCO STUDY TOUR
FOUR-WEEK PROGRAM
Preliminary Outline

No. of Days	Location	Activities
3	Washington, D.C.	Visits with NAESCO, DOE, ACEEE, IIEC, Local ESCOs, U.S. AID, World Bank, EPA, etc.
2	San Francisco Bay Area	Visits with LBL, EPRI (industrial program), PG&E, CIEE
2	Los Angeles	Visit to Southern California Edison Customer Technology Applications Center (CTAC) and Southern California Gas
1	Chicago	Visit to Gas Research Institute
1	Cleveland	GE Lighting Center
1	Troy, NY	RPI Lighting Efficiency Center
3	SRC Offices in Milwaukee or Rochester	Audits of Commercial and Industrial Facilities
7	ESCO Offices	On-Site Practical Training on ESCO Operations, Including Field Visits

ESCO TRAINING PROGRAM

Preliminary Outline

Day	Topics Covered	
	Morning	Afternoon
1	Background and History of ESCOs Need for ESCOs Potential Role and Benefits of ESCOs in India ESCO Operations in Other Countries	Energy Supply/Demand in India Energy Needs for Economic Development Need for Energy Efficiency Market Barriers to Efficiency Improvement
2	Current Environment for ESCOS - Market Intermediaries - Government Agencies - Bilateral and Multilateral Financing Organizations Target Markets for ESCO Services	Overview of ESCO Operations - Organization - Marketing - Implementation - Financing - Management
3	Energy-Efficient Technologies - Lighting	Technologies (Continued) - Energy Management Systems - Power Quality
4	Technologies (Continued) - Efficient Motors	Technologies (Continued) - Efficient Process Technologies
5	Energy Auditing - Need - Approach - Procedures	Analysis of Energy Efficiency Options - Identification - Assessment of Costs - Payback Analysis
6	Typical Energy Service Agreements - Shared Savings - Pay from Savings - Leasing - Installment Purchase	Typical Agreements (continued) - Terms and Conditions - Legal Issues - Risks/Contingencies
7	Financial Issues - Financing Services - Financing Costs - Financing Terms - Financial Returns	Financial Analysis - Examples and Case Studies of Typical Projects Using Different Financing Options
8	Marketing ESCO Services - Identifying Targets - Prospecting - Screening - Assessing Potential	Marketing ESCO Services (Continued) - Credit Checking - Negotiation - Closing the Deal

Day	Topics Covered	
	Morning	Afternoon
9	Establishing an ESCO in India - Business Structure - Ownership - Capitalization - Organization	Establishing an ESCO (Continued) - Financing - Marketing - Management - Joint Ventures
10	Operating an ESCO in India - Overcoming Market Barriers - Relationships with SEBs - Relationships with Marketing Intermediaries - Relationships with Customers	Factors Influencing Success of ESCOs - Organizational - Technical - Financial - Marketing - Other

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ESCO STUDY TOUR
TWO-WEEK PROGRAM
Preliminary Outline

No. of Days	Location	Activities
2	Washington, D.C.	Visits with: - NAESCO - DOE - ACEEE
2	San Francisco Bay Area	Visits with: - LBL - EPRI (Industrial Program) - PG&E
1	Cleveland or Troy, NY	GE Lighting Center or RPI Lighting Efficiency Laboratory
2	SRC Offices in Milwaukee or Rochester	Commercial and Industrial Audits
3	ESCO Office	Visit to a Selected ESCO to Obtain Practical Knowledge and Experience with ESCO Operations (Including Field Visits)

TWO-DAY ESCO TRAINING SEMINAR FOR SEBs
Preliminary Outline

Day	Topics	
	Morning	Afternoon
1	Executive Briefing - What is an ESCO? - Need for ESCOs - Potential Role of ESCOs - Typical ESCO Operation - Benefits to SEBs - Benefits to Customers - Opportunities for Cooperation - What SEBs can do	Efficient Technology Options - Lighting - Motors - Process - Cogeneration - EMCS - Power Quality Target Markets for ESCOs - Industrial - Commercial - Agricultural/Other
2	Business and Legal Issues - Organization - Marketing - Contract Negotiation - Financing - Implementation - Monitoring Typical Energy Services Agreements - Shared Savings - Leasing - Installment Purchase - Other Critical Success Factors for ESCOs	Relationship Between ESCOs and Utilities - ESCO as an Ally - ESCO as a Utility Agent - ESCO as a Partner - ESCO as a Competitor - ESCO as a Resource Provider Bidding and Performance Contracting - Approaches - Advantages - Limitations Fostering Cooperation Between SEBs and ESCOs