PN-ABQ-398

INDEPENDENT POWER IN BULGARIA WORKSHOP

Sponsored by:

U.S. Agency for International Development
Committee of Energy (COE) of Bulgaria
Natsionalna Elekricheska Kompania (NEK)

Borovets, Bulgaria

June 23 - 24, 1993

WORKSHOP AGENDA

INDEPENDENT POWER IN BULGARIA WORKSHOP

June 23 - 24, 1993
Borovets, Bulgaria

Workshop Objectives:

(1) provide overview of U.S. and international experience with independent power;
(2) examine the applicability of independent power in Bulgaria;
(3) identify possible plan for developing the necessary policy, regulatory, and institutional framework for independent power in Bulgaria

Wednesday, June 23rd

Bus leaves Sofia for Borovets: Wednesday, June 23, 7:00 a.m.
Check-in Hotel Rila in Borovets: 9:00 - 10:00 a.m.
Workshop Registration: 10:00 - 10:30 a.m.

10:30 - 11:00	Introductory Remarks:	Nikita Shervashidze (COE) Dianko Dobrev (NEK) Gerald Zarr (USAID)
11:00 - 12:00	Overview of U.S. Independent Power Experience: Electric Utility Perspective, speaker: Rick Woodruff(CMP) Private Developer Perspective, speaker: Peter Lalor (MP)	
12:00 - 12:30	Questions and Answers	
12:30 - 2:00	Lunch, Overview of International Experience with Independent Power, speaker: John Sachs (L&W)	
2:00 - 2:45	Assessment of Independent Power in Bulgaria: Preliminary Findings, speaker: Matthew Buresch (RCG/HBI) and Peter Lalor (CP)	
2:45 - 3:00	Questions and Answers	
3:00 - 3:45	Bulgaria's Power Sector Overview, speaker: Andrej Markov (COE)	
3:45 - 4:00	Questions and Answers	
4:00 - 4:30	Coffee Break	

4:30 - 5:15	Existing Independent Power Practices in Bulgaria, speaker: Bozhan Siromahov (NEK)
5:15 - 5:30	Questions and Answers
5:30 - 7:00	Free Time
7:00 - 9:00	Dinner

Thursday, June 24th

7:30 - 8:30	Breakfast
8:30 - 9:15	IPP Legal Requirements: Power Purchase, Implementation, and other Project Agreements and Contracts, speaker: John Sachs (L&W)
9:15 - 9:30	Questions and Answers
9:30 - 10:15	Financing International Independent Power Projects, speaker: Matthew Burresch (RCG/HBI)
10:15 - 11:00	International Finance Panel, comments and discussion (U.S. investment banker, Bulgarian banker, EBRD, and World Bank)
11:00 - 11:30	Coffee Break
11:30 - 12:15	Review of Generic District Heating Cogeneration Independent Power Project Case Study, speaker: Tsoko Nehrizov (COE) and Matthew Buresch (RCG/HBI)
12:15 - 1:30	Lunch
1:30 - 2:00	Small Working Group Meetings (e.g. developer, utility, banker, & government)
2:00 - 4:00	District Heating Cogeneration Case Study Practice Negotiation Exercise
4:00 - 4:30	Coffee Break
4:30 - 5:30	Workshop Conclusions and Proposed Next Steps

Checkout and Board Bus, June 24th, 5:30 - 6:00 p.m.
Bus leaves Borovets for Sofia, 6:00 p.m.
Bus arrives back in Sofia, 7:30 p.m.

CONFIRMED INVITEES TO BULGARIA INDEPENDENT POWER POLICY WORKSHOP

Borovec, Bulgaria
June 23 - 24, 1993

Committee of Energy (COE)

1. Nikita Shervashidze, Deputy Chairman of COE
2. Lazar Petkanchin, Deputy Chairman of COE
3. Andrey Markov, Head Generation & Distribution *
4. Tzoko Nehrizov, Chief District Heat Department *
5. Boyan Dimitrov, Senior Counsel *
6. Boyko Hristov Nedyalkov, Senior Legal Advisor *
7. Dimitar Bouchkov, Head Foreign Relations Department

National Electric Company (NEK)

8. Dianko Dobrev, President of NEK
9. Ivan Sotirov, Vice President
10. Bozhan Siromahov, Vice President Finance *
11. Krassimir I. Kanev, Head Corporate Finance
12. Krassimir D. Kanev, Head Power Generation *
13. Liulin Radoulov *
14. Dobrinka Dobreva, Head Legal Department
15. Stefan Kanchovski, Expert in R&D Department *

EnergoProjekt

16. Boris Ivanov, Director
17. Vladimir Miladinov *
18. Peter Petrov, Director Hydropower Division
19. Rossitsa Gueorgieva *
20. Stoyan Stoikov, Expert Hydropower Division *

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Council of Ministers (CM)

21. Malina Novkirishka, Senior Legal Advisor in CM *

Parliamentary Commission on Energy

22. Natasha Tacheva, MP, Lawyer
23. Fidel Kossev, MP, economist

Ministry of Finance

24. Simeon Dimitrov, Senior Expert on Power Sector Financing *

Ministry of Environment

25. Liliana Maslarova, Expert Legal Deparment*

Anti-Trust Commission

26. Alexander Milev, Head Legal and Financial Enforcement Mechanisms *
27. Dimiter Stanoev, Member of the Anti-Trust Commission

National Commission on Prices

28. Ivan Ivanov, Head of Department *

Privatization Agency

29. Alexander Bozhkov, Executive Director
(with driver)

Bulgarian Industry Association

30. Dikran Tebeian, Chief Expert for Investment & Privatization

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National Bank of Bulgaria

31. Georgi Alexandrov, Expert on World Bank *

United Bulgarian Bank

32. Penka Nedyalkova, General Director Bank Policy *

World Bank

33. Peter Zhotev *
34. Edward Quicke - Wednesday *

European Bank for Reconstruction and Development (EBRD)

35. Nicholas Stancioff, Deputy Resident Representative *

36. Denka Dobreva, Bulgarian Academy of Sciences *
Institute of Economics

U.S. Agency for International Development & Contractors

37. Gerald Zarr, AID Representative, USAID, Sofia *
38. Robert Archer, Deputy Chief, Energy and Infrastructure Division, Bureau for Europe, AID, Washington D.C. *
39. Lada Stoyanova, Program Specialist, USAID, Sofia *
40. Amanda Kim, AID, Washington D.C. *

41. Matthew Buresch, RCG/Hagler, Bailly, Inc. *
42. Peter Lalor, Commonwealth Power, Inc. *
43. John Sachs, Latham & Watkins *
44. Rick Woodruff, Central Maine Power *

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Cogenerating Industry

44. Yanko Yankov, Deputy Director Energy Part *
Kremikovtsi Corp. (steel mill)

45. Konstantin Krahtov, Director District Heating Company Sofia *

46. Alexander Oboushtarov, Manager District Heating Company Sofia *
Only for the first day.

47. Tsventanka Kambourova, Deputy Manager Finance *
District Heating Company, Sofia

* Confirmed Invitees that actually attended the workshop.

EVOLUTION OF THE INDEPENDENT POWER MARKET IN THE UNITED STATES

By

Peter Lalor

and

Frederick Woodruff

At the

INDEPENDENT POWER IN BULGARIA WORKSHOP

JUNE 23 - 24, 1993

Borovets, Bulgaria

207-623-5906 EXEC/LEGAL CMP 138 P02 JUN 17 '93 12:45

EVOLUTION OF THE INDEPENDENT POWER MARKET IN THE UNITED STATES

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I. INTRODUCTION

Independent power represents the financing, construction, and operation of a power generating facility by a company that is independent from the central electric utility. The independent power producer is usually privately owned and is not subject to utility regulation. It sells power to the utility under the terms of a clearly defined power purchase agreement.

There have been changes in the process for purchasing independent power in the U.S. over the last ten years.

The changes have been driven both by

innovations in regulation of purchasing utilities, and

experience in independent power transactions.

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The changes have had a major impact on

- solicitation
- evaluation
- negotiation
- administration
- utility participation

of independent power contracts

The "U.S." experience is not uniform:

- it varies over more than fifty jurisdictions
- the mistakes are as important as the successes
- need to be selective in applying any specific conclusion to Bulgarian context
- Federal/state jurisdictional complexities generally not relevant to Bulgaria

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II. THE ORIGINAL CONCEPT

"A Brave new world."

In 1978, PURPA (Public Utilities Regulatory Policy Act of 1978) was enacted in reaction to the oil crisis, utility construction programs which favored large central station nuclear units, and increasing environmental concerns.

PURPA gave birth to a protected class of non-utility generation or "QFs" (Qualifying Facilities). PURPA:

* Defined the requirements for QF status.
  Small indigenous renewable resources
  Energy efficiency through cogeneration

* Exempted QFs from utility regulation

* Required utilities to purchase "QF" output

* Established the avoided cost concept as the ceiling price

* Provided measures to prevent utility resistance such as the requirement to interconnect and antidiscrimination statutes

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III. EVOLUTION OF THE CONCEPT

Many utilities resisted the implementation of PURPA. The State of Mississippi even challenged its constitutionality.

Avoided costs became a pivotal issue. PURPA defines avoided costs as those costs that would have been incurred by a utility but for the QF.

Varying approaches to avoided cost interpretation included several which overstimulated the market, caused retail rate problems, and provided excess returns to some developers.

Generous tax credits also contributed to the surplus.

Competitive bidding was introduced in response to the overpayment problems.

As a result of PURPA, the independent power in the form of QF's has blossomed. In the last 10 years, over 2,500 independent power prospects with generating capacity of over 30,000 MW have come into operation.

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The next step in this evolution was The Energy Policy Act of 1992 which:

* Lowered entry barriers to the IPP market by removing utility ownership limitations and PURPA regulation of wholesale generating companies

* Authorized FERC to compel wholesale transmission access

IPPs or independent power producers are now a class of wholesale electricity suppliers who are not burdened with utility regulation and are no longer restricted by artificial qualification requirements.

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IV. POTENTIAL BENEFITS OF INDEPENDENT POWER

The opening of the generation monopoly to independent suppliers had a number of motivations:

* reduce reliance on expensive and unreliable imported fuels through increased efficiency and use of indigenous resources
* utilize renewable resources to displace fossil fuel combustion
* diversify fuel mix (especially by utilizing waste products) and decentralize generation sites
* shift certain project risks (especially construction and operation) to third parties
* establish a competitive market to provide a benchmark for utility rate increase requests
* rapid integration of optimal power technology
* access to broader capital markets

V. UTILITY CONCERNS ABOUT INDEPENDENT POWER

IPPs require long-term binding contracts which can lead to perverse results if, for example:

1) The price is too high relative to the market,

2) New, more competitive, technologies evolve,

3) Power system conditions/requirements change, or

4) Unanticipated project costs make it uneconomical.

Many utilities feel they have paid too much for their purchased power.

Some utilities cost of money has increased as a result of their heavy involvement in IPPs

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With IPPs, the purchasing utility loses control of

1) Project development, including schedule

2) Plant maintenance program and schedule

3) Plant operation and dispatch, and

4) Project long-term viability.

There is an administrative burden associated with insuring that the terms and conditions of each contract is being followed.

<u>Prudency</u>. In some states the utilities' decision to purchase power from an IPP is not reviewed until after the contract is signed.

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Solicitation of IPP proposals may take one of several forms. There is a general, but not exact, correlation of the forms with the progressive evolution of the IPP market. Standard offers were most common in early market phases, followed by competitive negotiations in intermediate market phases, and finally by competitive bidding in more mature markets. These concepts are discussed in greater detail in this section.

Standard Offers are form contracts, including price schedules, which prospective developers need only sign and return to the utility to create a binding long-term contract. They are administratively the easiest, but

1) they should be limited to smaller projects
   a) which have little impact on system economics or reliability, and
   b) which cannot afford project-specific negotiations with the purchasing utility

2) pricing, as noted above, must be carefully structured to avoid perverse incentives

3) dispatch capability is not economic for smaller projects, so capacity reliability is less certain

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Standard offers were used extensively in the early evolution of many U.S. jurisdictions for large and small projects. However,

4) accurate estimation of "avoided costs" has been a recurring problem

   a) overestimation in some jurisdictions has resulted in oversubscription or overpayment
   b) underestimation in other jurisdictions has resulted in suppressing the market.

Standard Offers using administratively determined "avoided cost" continue to be widely used for small projects satisfying criteria 1(a) and (b) above. Contracts for larger projects result from project-specific negotiations described below.

<u>Competitive</u> <u>Negotiation</u>, in which the utility does not issue any formal bid request, but selects one or more project proposals for detailed contract negotiations (this might include BOT proposals for specific pre-engineered projects) has certain advantages:

1) there is much less administrative burden on the purchasing utility

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selecting prospective projects for negotiation

3) it is particularly well adapted to systems which
   a) have few suitable sites
   b) are considering purchase of significant increments relative to the size of the existing system
   c) for other reasons the purchasing utility needs significant control over the implementation of the independent project

This form is particularly well suited to intermediate phases of independent power development programs for the above reasons, and also because the developers of the project(s) selected for negotiation have greater comfort that the purchasing utility is serious.

However, this form of solicitation also has drawbacks:

4) it does not encourage an active market due to concerns over the fairness of the evaluation and selection process

5) it requires a good working relationship between the utility and the regulatory commission, because there is no objective market discipline on which the regulators can rely for confirmation of competitive price levels.

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Competitive negotiation has been successful in numerous U.S. jurisdictions but is not now as widely used as competitive bidding, by reason of the foregoing drawbacks.

<u>Competitive Bidding</u> can take a variety of forms

1) the utility can identify the type, size and other characteristics of desired generating resource additions, or

2) it can identify a number of MW of incremental capacity needed, then optimize the set of responses meeting the utility's threshold criteria

System (2) is theoretically and practically preferable to system (1), as the pre-selection of generation alternatives limits the flexibility of developers to propose other alternatives which are more cost-effective than the assumptions used by the utility in the optimization. Whether the utility uses system (1) or system (2), it can identify the most promising projects (using the criteria described in the following section) either by:

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3) use of a more or less mechanical "self-scoring" system, or

4) use of a more subjective scoring system, with accordingly greater discretion in the utility.

System (3) imposes great constraints on the purchasing utility's flexibility in selecting beneficial projects; on the other hand, the more subjective systems share the drawbacks of competitive solicitation systems.

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VII. EVALUATION BASICS

"There is no answer in analysis, only information."

Define your objectives in purchasing from IPPs. Typical objectives include:

1) Least net present value cost over the term of the contract

2) Project viability, both short and long-term

3) Fuel, geographic and size diversity

4) Operational control - AGC, economic dispatch, turn-down ratio, maintenance scheduling, etc.

5) Options to advance or retard project development schedule. Buyout options.

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goals. Such criteria may be highly quantitative or qualitative. Examples include:

1) Lowest net present value of total revenue requirements

2) Project viability criteria, such as sponsors experience building and operating plants, sponsors financial capability, site acquisition status, project licensibility, technical feasibility and fuel supply

3) Project impact on local economy and potential for creating jobs

4) Loss of load probability, a large project with a high forced outage rate can jeopardize system reliability and lead to the need for high installed resources

5) Environmental impact, including air and water emissions and waste disposal requirements, and

6) Amount of dump power.

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Put together an interdisciplinary team to evaluate each project. Members of this team should have experience in economics, finance, plant engineering and operatives, power system engineering, licensing and environmental assessment, and power system planning.

The basic tools for project evaluation include:

1) Resource planning optimization models

2) Production cost simulation models, and

3) Risk assessment or decision analysis models.

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"Those who live by the contract, die by the contract."

Negotiation is highly desirable for projects of any significant size. It allows the parties to optimize the needs of the utility and the abilities of the project.

As with any negotiation, know what you want and what you can live with, and, just as important, know your suppliers business as well as he does.

The negotiators must fully understand all of the associated risks and how they are to be shared. A brief list of risks include:

Financial	Operational
Economic	Equipment Failure
Construction	Fuel Supply
Licensing	Fuel Price Escalation

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The purchaser needs an enforceable contract.

* Lowest price that will yield a fair return to the supplier recognizing the risks he is assuming

* Clear performance standards and appropriate penalties for non-performance. Performance standards include:

1) Milestone schedules
2) Capability audits
3) Unit availability
4) Posting of security
5) Maintenance of licenses, etc.

* Penalties that fairly compensate the utility for the damages resulting from non-compliance

* Security in the eventuality of penalties or to protect against over-payment in the early years of the contract

* As much dispatchability and control over unit operations as is feasible

* Clear metering, intermediate and relaying requirements

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THE NEGOTIATION PHASE

The developer needs an enforceable contract.

* clearly defined and technically feasible obligations to perform; reasonable penalties for failure to perform
* fair price
* purchaser obligation to pay if developer meets his obligations
* assurance that return on and of investment capital can be converted and repatriated
* excuses to performance for force majeure events
* fair allocation of risk
* fair process of evaluation and negotiation

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IX. OPERATIONAL CONSIDERATIONS

"Someone's got to be in control."

Seek out contracts that allow economic dispatch wherever possible.

Define need for automatic generation control and be sure that IPPs provide it to the extent needed.

Seek control of maintenance scheduling

Provide for emergency operations

Maximum output during high loads or loss of generation

VAR support during voltage problems

Be sure there are good communication links between central dispatch and the IPP operators.

Be sure that operators of IPPs are trained in all aspects the IPPs operational obligations.

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X. LESSONS LEARNED

"Beauty is in the eyes of the beholder and first impressions aren't always correct."

IPPs can be reliable power suppliers. IPP availability and dependability has not been a serious problem.

We paid too much for our early contracts. You will need to <u>balance</u> the need for high prices to stimulate IPP development against minimizing the price you pay.

Competition works. In the long-run, a fully developed competitive IPP market will produce the least cost power supply.

<u>Negotiate</u>. Both the buyer and seller must fully understand each others objectives and capabilities to fully optimize the project.

Identify and address all of the risks. Be sure that they are appropriately and fairly distributed between the buyer and seller to produce an optimal contract that will be viable over the long-term.

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OVERVIEW OF INTERNATIONAL EXPERIENCE WITH INDEPENDENT POWER

By

John L. Sachs
Partner
Latham & Watkins

At the

INDEPENDENT POWER IN BULGARIA WORKSHOP

JUNE 23-24, 1993

Borovets, Bulgaria

OVERVIEW OF INTERNATIONAL EXPERIENCE WITH INDEPENDENT POWER

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- D. Poland

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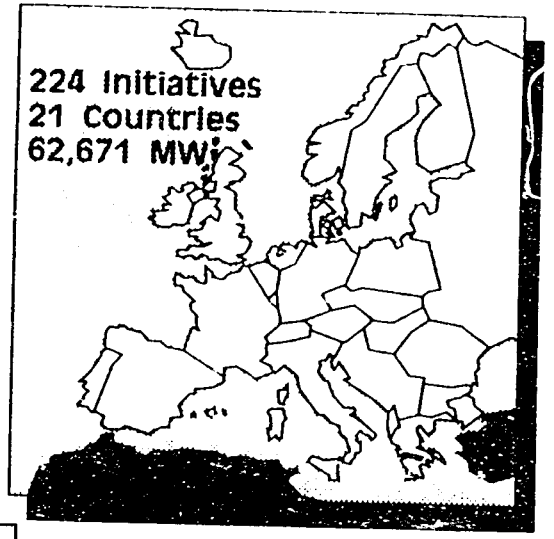
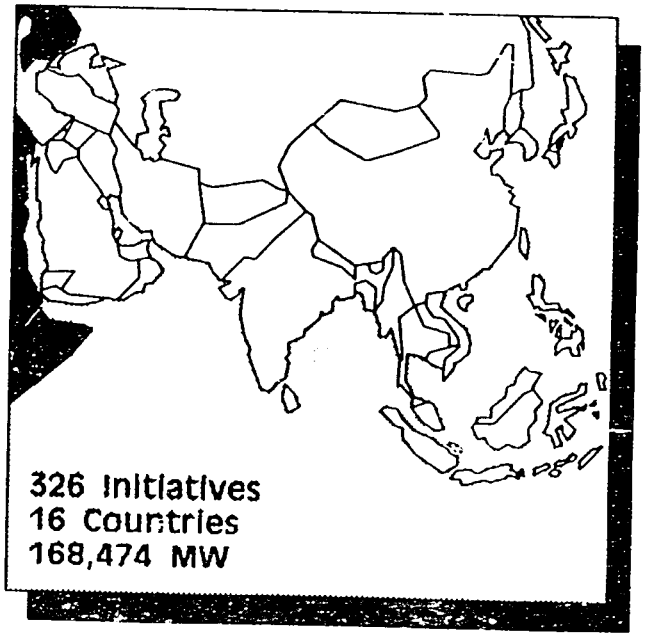
Independent Power Market Abroad



TOTAL

654 Initiatives
68 Countries
272,620 MW



Source: RCG/Hagler, Bailly, Inc., February 1993. Reflects announcements over last 36 months

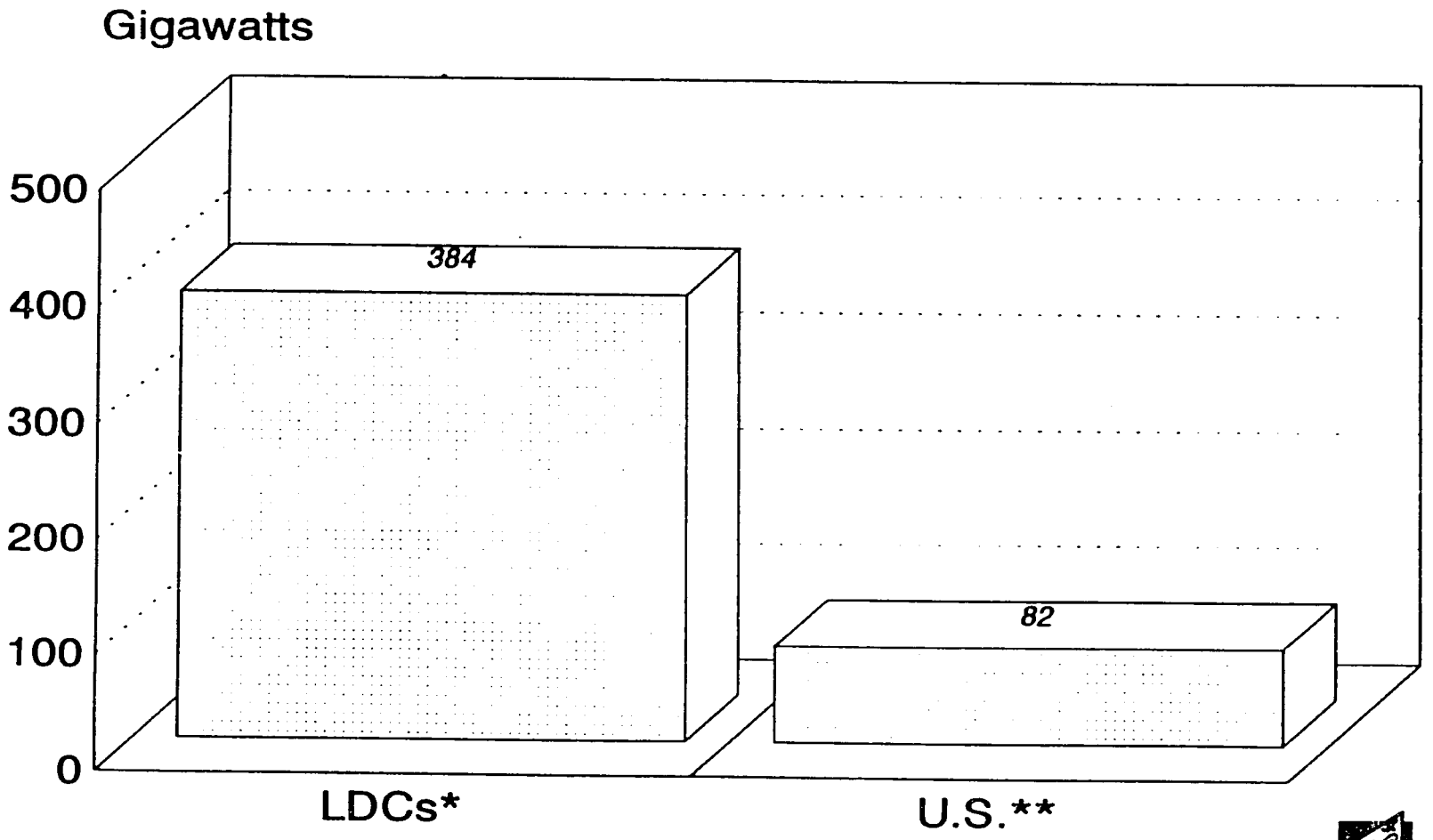
REASONS FOR GROWTH OF IPPs

There are at least three reasons that the number of IPPs has increased dramatically in recent years.

1. The governments of the world cannot borrow enough money to build all of the new capacity that is required so they must rely on private investment.

TOTAL PROJECTED ADDITIONS

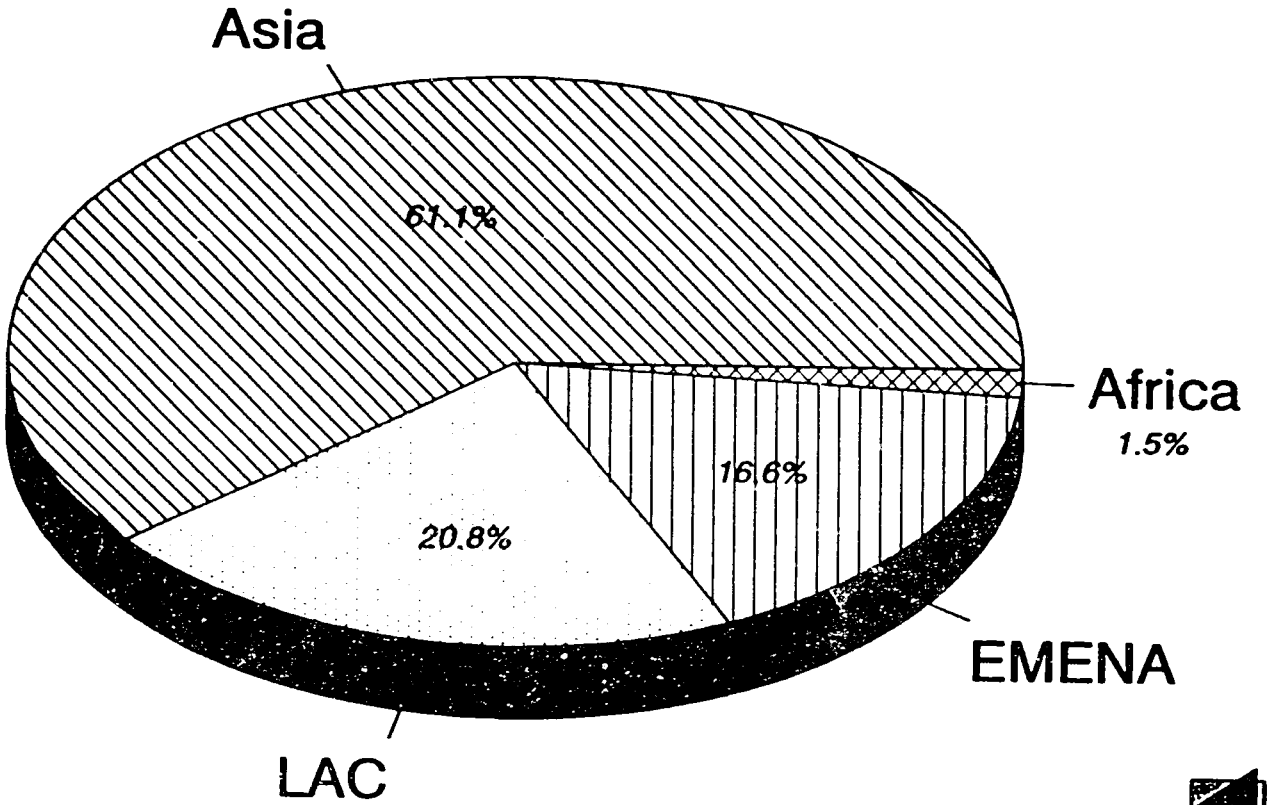
1990 - 2000



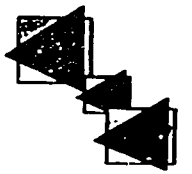
* World Bank, Capital Expenditures for Electric Power in the Developing Countries in the 1990s, pg. i, February 1990.

** DOE, Annual Outlook for U.S. Electric Power 1990, estimates expenditure of $100 - 200 billion.

REGIONAL BREAKDOWN OF LDC
CAPACITY ADDITIONS (1990 - 2000)

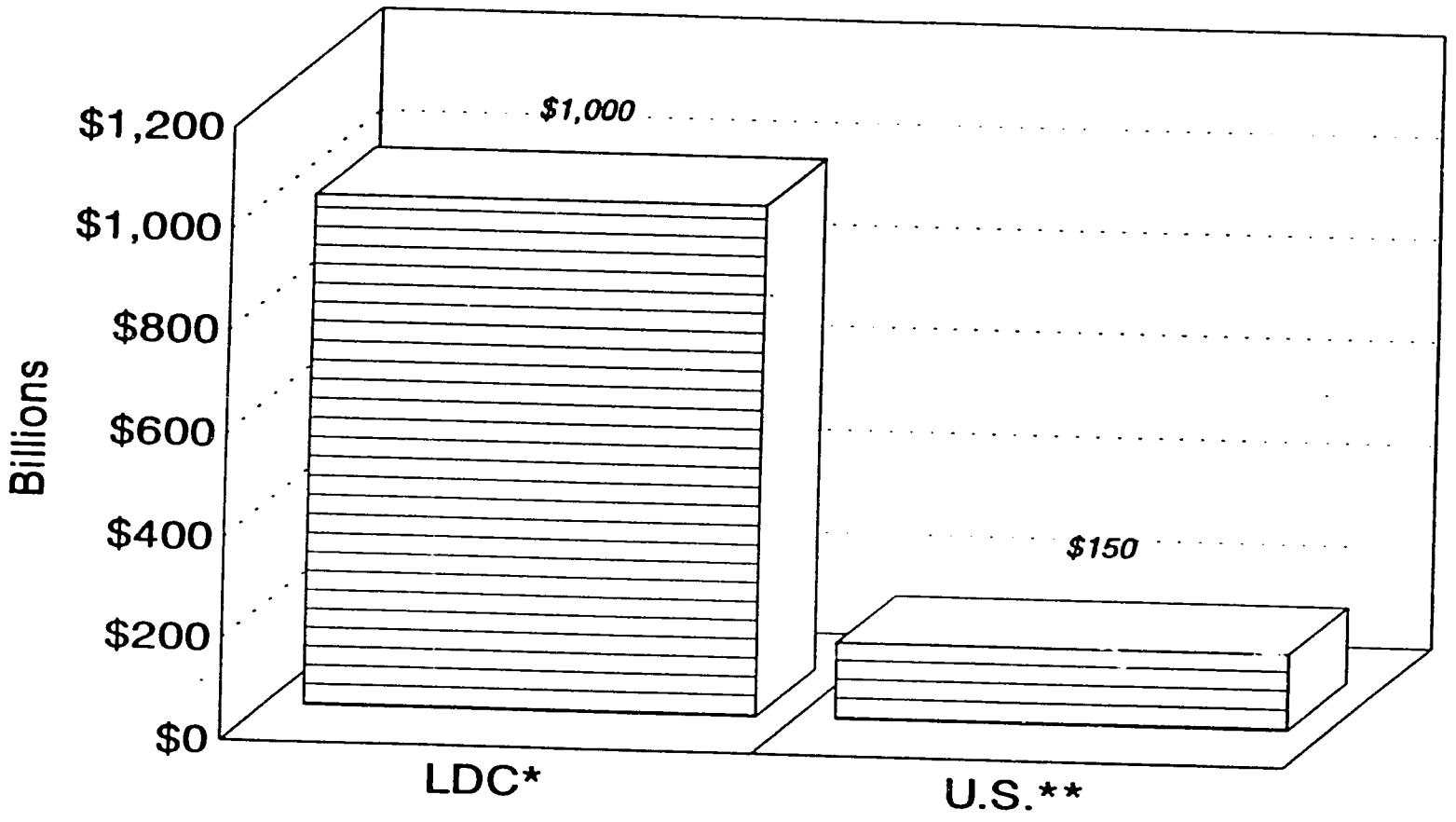


World Bank, Capital Expenditures for Electric Power in the Developing Countries in the 1990s, pg. 13, February 1990.



DOLLAR INVESTMENT NECESSARY

1990 - 2000



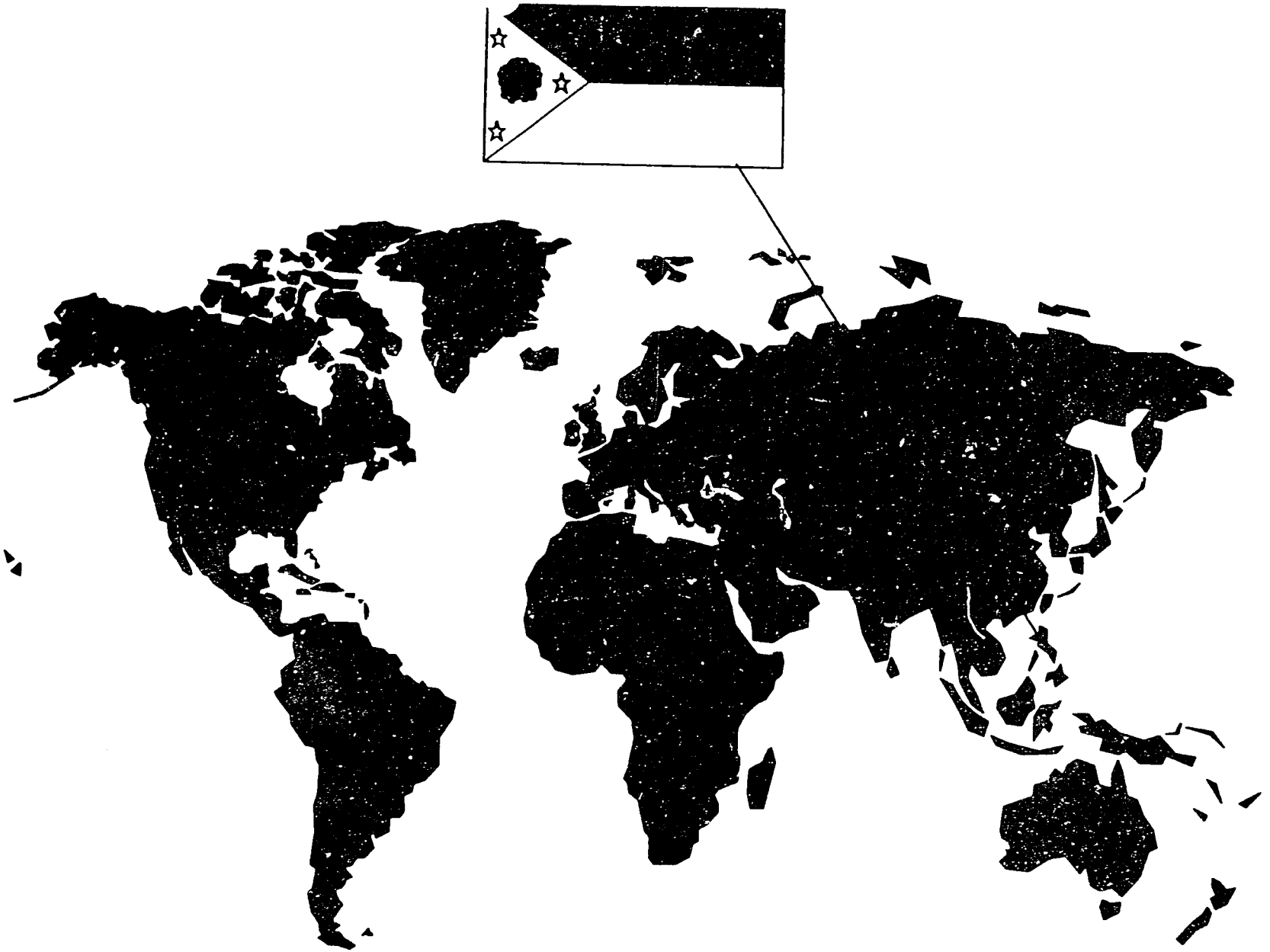
* World Bank, Capital Expenditures for Electric Power in the Developing Countries in the 1990s, pg. I, February 1990.

** DOE, Annual Outlook for U.S. Electric Power 1990, June 1990, estimates expenditure of $100 - 200 billion.

REASONS FOR GROWTH OF IPPs (cont.)

2. Even if there is no need for new capacity, the increasing concern for the environment requires major expenditures to retrofit existing powerplants, and governments cannot borrow this money either.

3. Many experienced developers looking for opportunities because U.S. and European markets are increasingly competitive.



LEGAL REFORM IN THE PHILIPPINES

The Philippines made the decision to rely on private power in 1987 and first changed the existing law to accommodate the development of IPPs.

Executive Order 215 ended the monopoly of the national utility, NPC, and allowed private generation of electricity by cogeneration and small power projects for sale to NPC.

In 1989, new regulations allowed the private sector to develop major block powerplants.

Finally, in 1990, the Philippine Congress passed Act No. 6957 which authorized private entities to finance, construct, operate and maintain infrastructure projects and offered the following incentives:

- removed foreign ownership limitations;
- permitted repatriation of profits; and
- granted tax holidays.

PHILIPPINES BOT PROJECTS

Plant Name	Developer	Capacity (MWe)	Commercial Operation
Navotas I	Hopewell Holdings	210	Jan. 1991
Navotas II	Hopewell Holdings	100	Apr. 1993
Mindinao I	Tomen/Alsons	58	June 1993
Mindinao II	Tomen/Wartsila	40	Sept. 1993
Batangas	Enron Power	105	May 1993
Bauang	First Philippines Power Corp.	190	Jan. 1994
Subic Diesel	Enron Power	105	Jan. 1994
Pagbilao Coal	Hopewell Holdings	350	Feb. 1996 May 1996
Sual Coal	Under solicitation	900	Jan. 1998
Mindinao Coal	Under solicitation	200	Jan. 1998

Source: National Power Corp. September 1992.

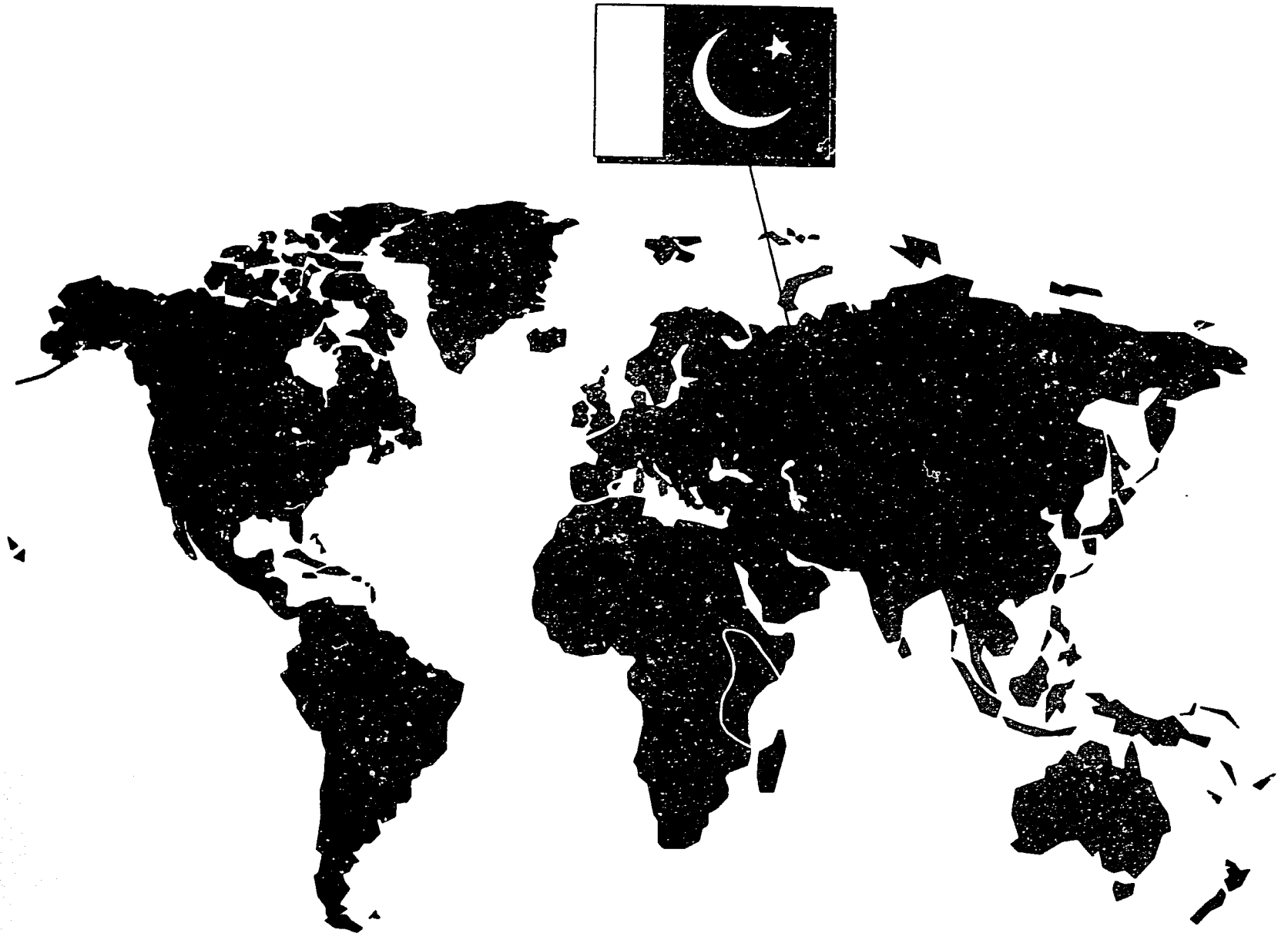
HOPEWELL NAVOTAS PROJECT

The only IPP operating in the Philippines today is the Hopewell Navotas Project, a 200 MW gas turbine facility.

It was completed in 1991 at a cost of US$41 million.

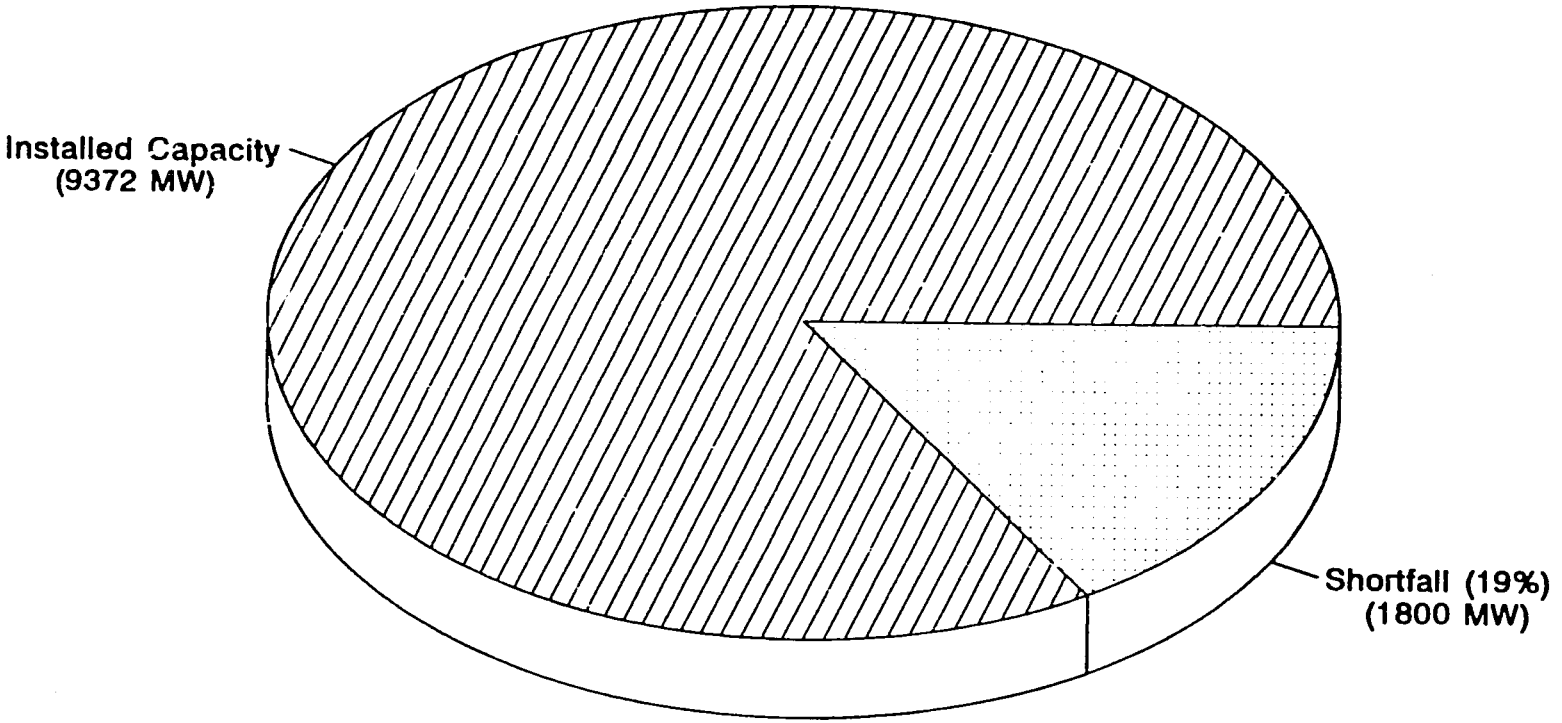
Among the most significant aspects of the project were that:

- NPC provided land and fuel to the developer for the life of project;
- NPC made all payments for power in U.S. dollars; and
- the Government guaranteed all of NPC's payment obligations.



Pakistan Load Shedding

(11,172 MW Maximum Peak Demand)



HUB TIMELINE

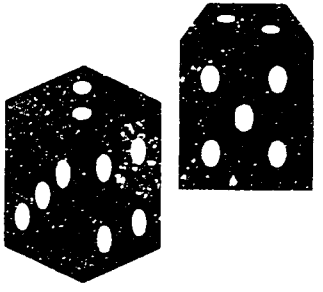
1985
Invitation

LOI's
Issued
1987

Earnest Negotiation
February 1989

Key Agreements
December 1989

Rebid TKC
1990



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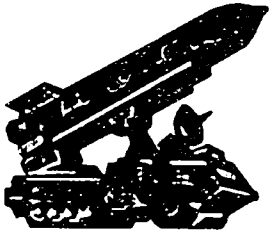
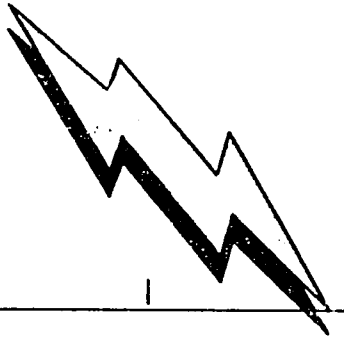
HUB TIMELINE

Bank
Diligence
1990

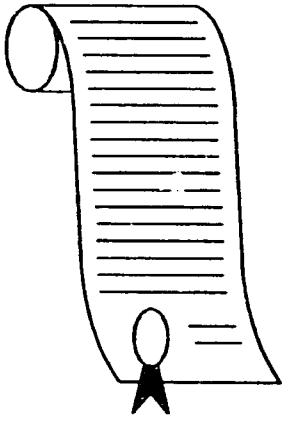
Gulf War
Feb. 1991





Shariat
Decision
Nov. 1991

Final
Agreement
Aug. 1992



Groundbreaking
Sept. 1992

FINISH

PROPOSALS IN PIPELINE
BY FUEL TYPE

	NUMBER	TOTAL MW
Oil	4	2182
Hydro	3	116
Coal	2	1206
Gas	2	549
Solar	1	300
TOTAL	12	4353

FUTURE RESTRUCTURING OF ENERGY SECTOR IN PAKISTAN

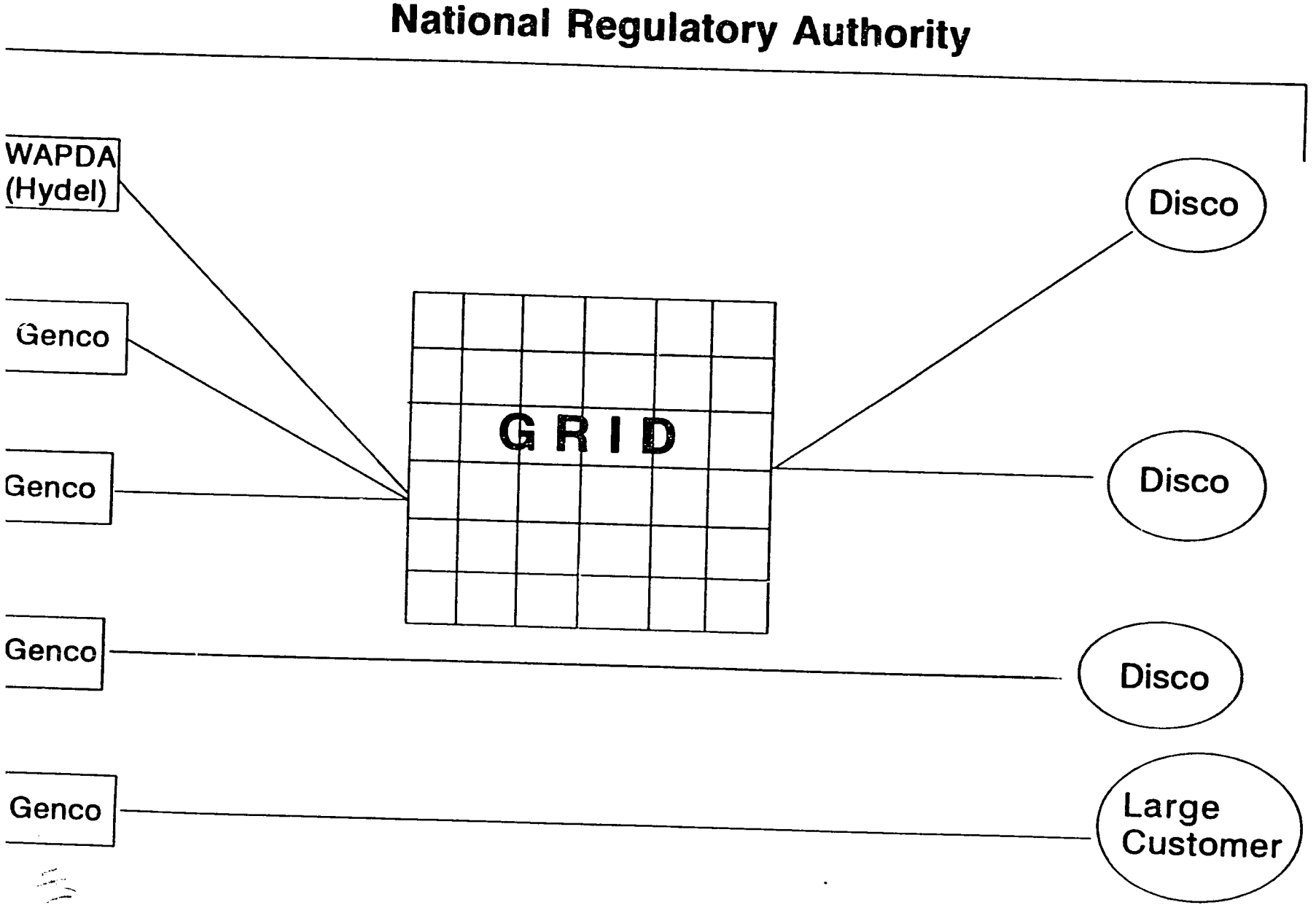
It is important to note that all of this interest in IPPs in Pakistan was generated without any change in the law.

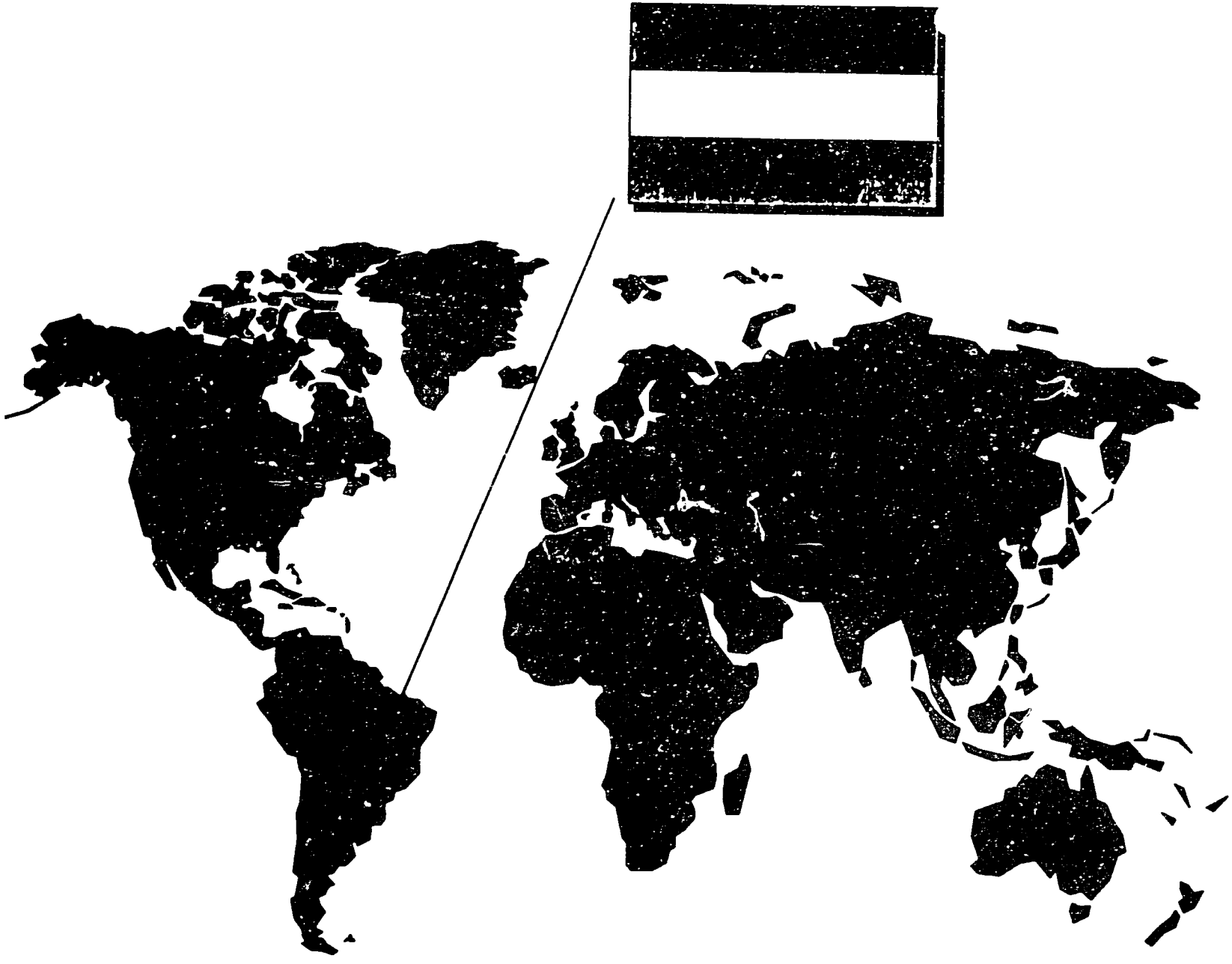
Only after three years of work on the Hub Power Project did the Pakistani Government begin to consider restructuring the industry and creating a new regulatory structure.

The plan is to disaggregate and privatize generation, privatize the existing distribution companies and to permit directe sales from generators to distribution companies and large customers.

A new national regulatory authority will also be established to regulate prices and other terms of those continuing monopoly services such as transmission, to license plants and to approve purchases and mergers with possible anti-competitive effects.

NEW ENERGY SECTOR





ARGENTINA AND PRIVATIZATION

In the 1980's, Argentina was in very poor condition:

- suffering from hyperinflation of 5,000% per year;
- recently lost a war with Great Britain over the Falkland Islands; and
- making the transition from a military to a democratic government.

A new government took power in 1989 and corrected the situation by stabilizing the economy, deregulating commerce and the financial markets, and privatizing many government-owned corporations.

More specifically, the Argentine Government passed several laws which permitted the transfer ownership of government-owned utilities to the private sector.

In just 3 years, Argentina has completed the privatization of 3,115 MW of existing powerplants, 26% of the total installed capacity in Argentina.

ARGENTINA POWER PROJECT PRIVATIZATIONS

Powerplant	MWe	Fuel	Sales Price (Million $)
Puerto	1009	gas/oil	92
Costanera	1260	gas/oil	Unknown
Alto Valle	97	gas	22
Guemes	245	gas	87
Pedro de Mendoza	67	gas/oil	Unknown
Dock Sud	211	gas/diesel	Unknown
Sorrento	226	gas/oil	Unknown

PRIVATIZATION PROCEDURE

The Argentine Government requested bids for each of these powerplants.

The bids were evaluated primarily on the basis of price and the technical/managerial skills of the bidders.

In many cases, the winning bidder agreed to assume outstanding debt relating tot he powerplant and to make investments in the repair of the powerplant.

The Government has not sold more than 90% of any powerplant; at least 10% has been retained for employee ownership.

POWER PRICING IN ARGENTINA

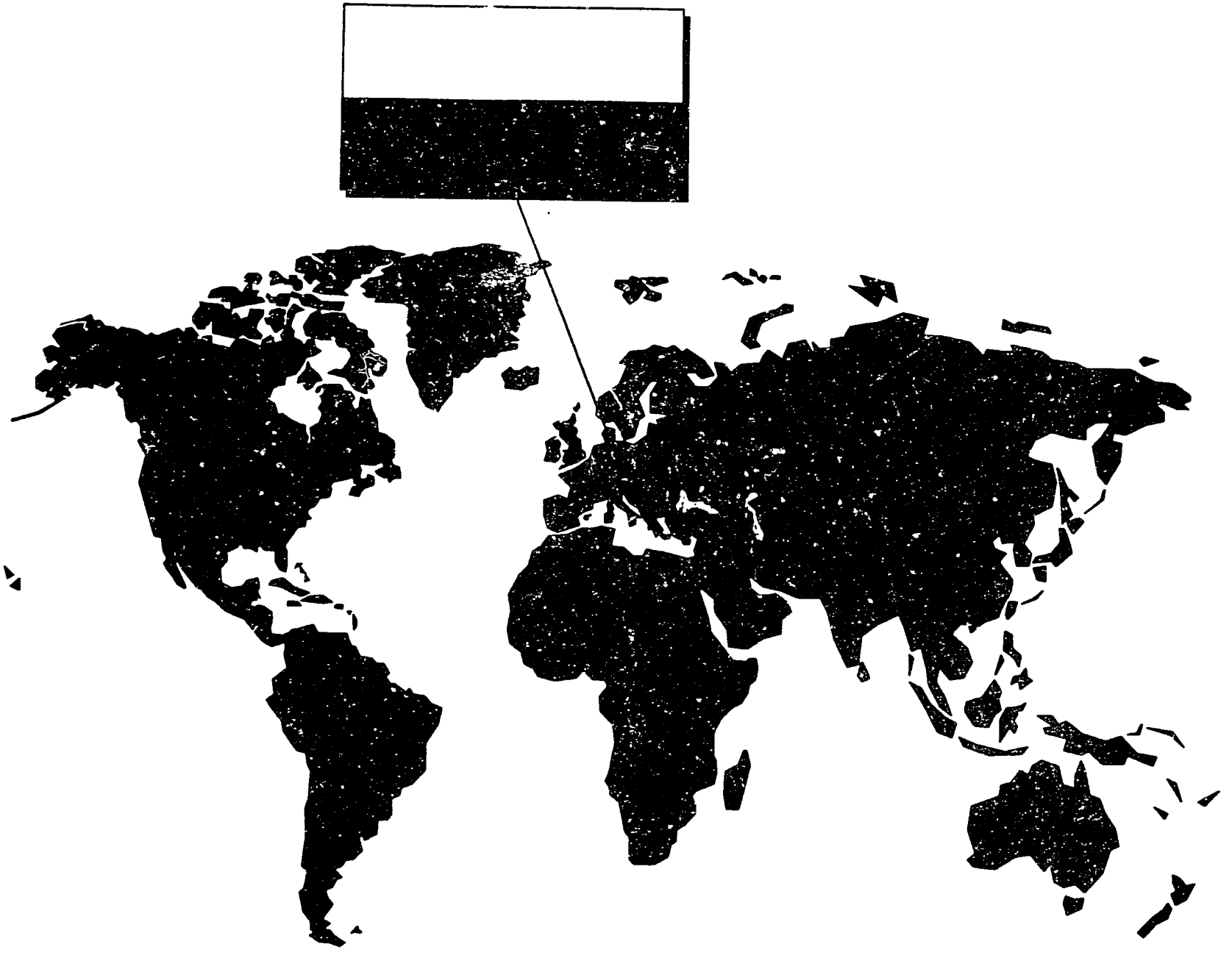
At the same time, Argentina instituted a new system for power pricing based on separate spot and bulk contract markets.

Generating companies are entering into long-term contracts with large industrial customers.

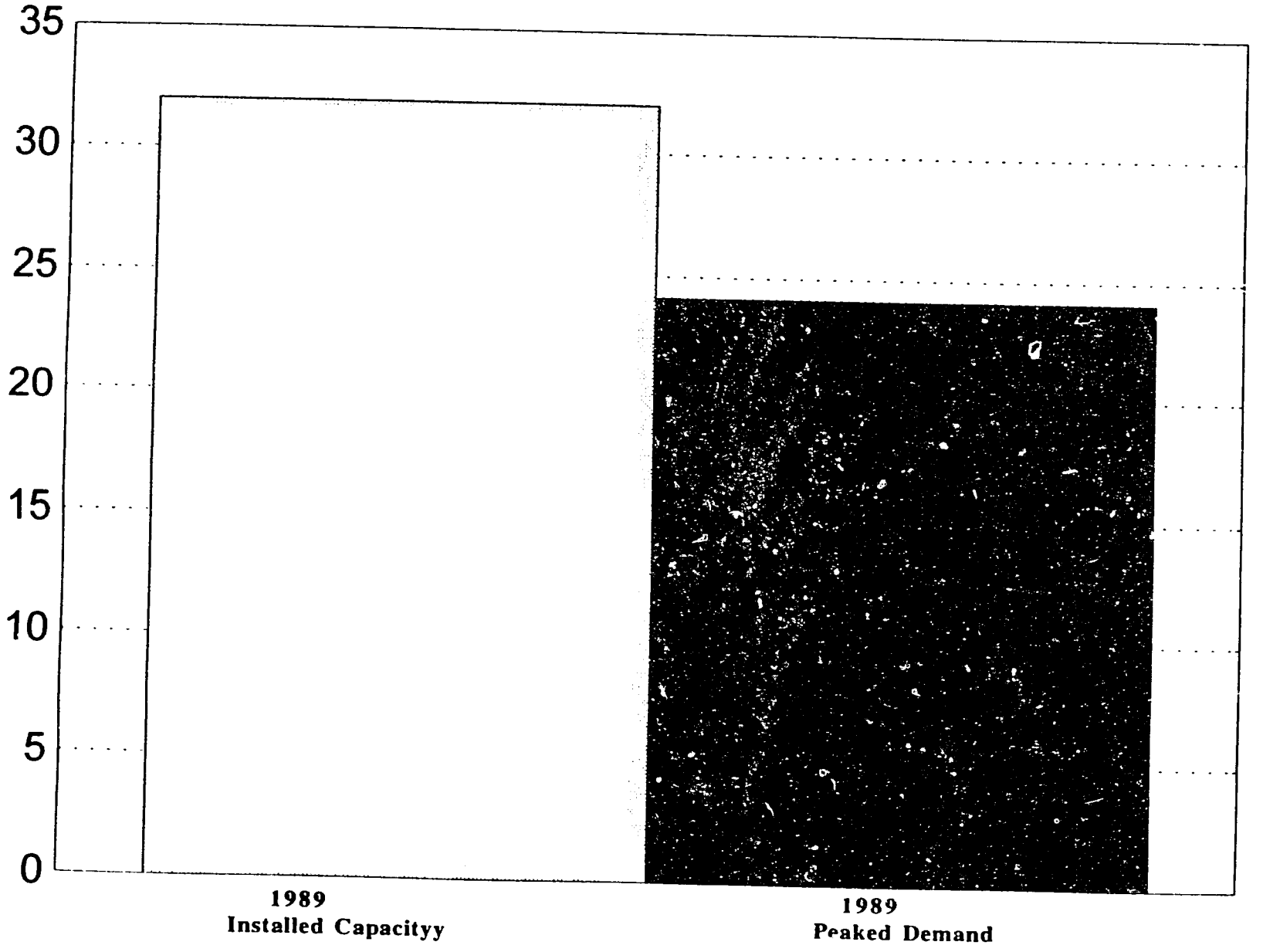
The remaining power is sold on spot market where prices are based on the mean fuel cost of the most expensive unit in operation and the cost and probability of a loss of load at any given time.

The spot market will account for most power sales in the next few years.

Long-term contracts are expected to dominate as the system matures, and the spot market will be limited to contingency service and surplus power.

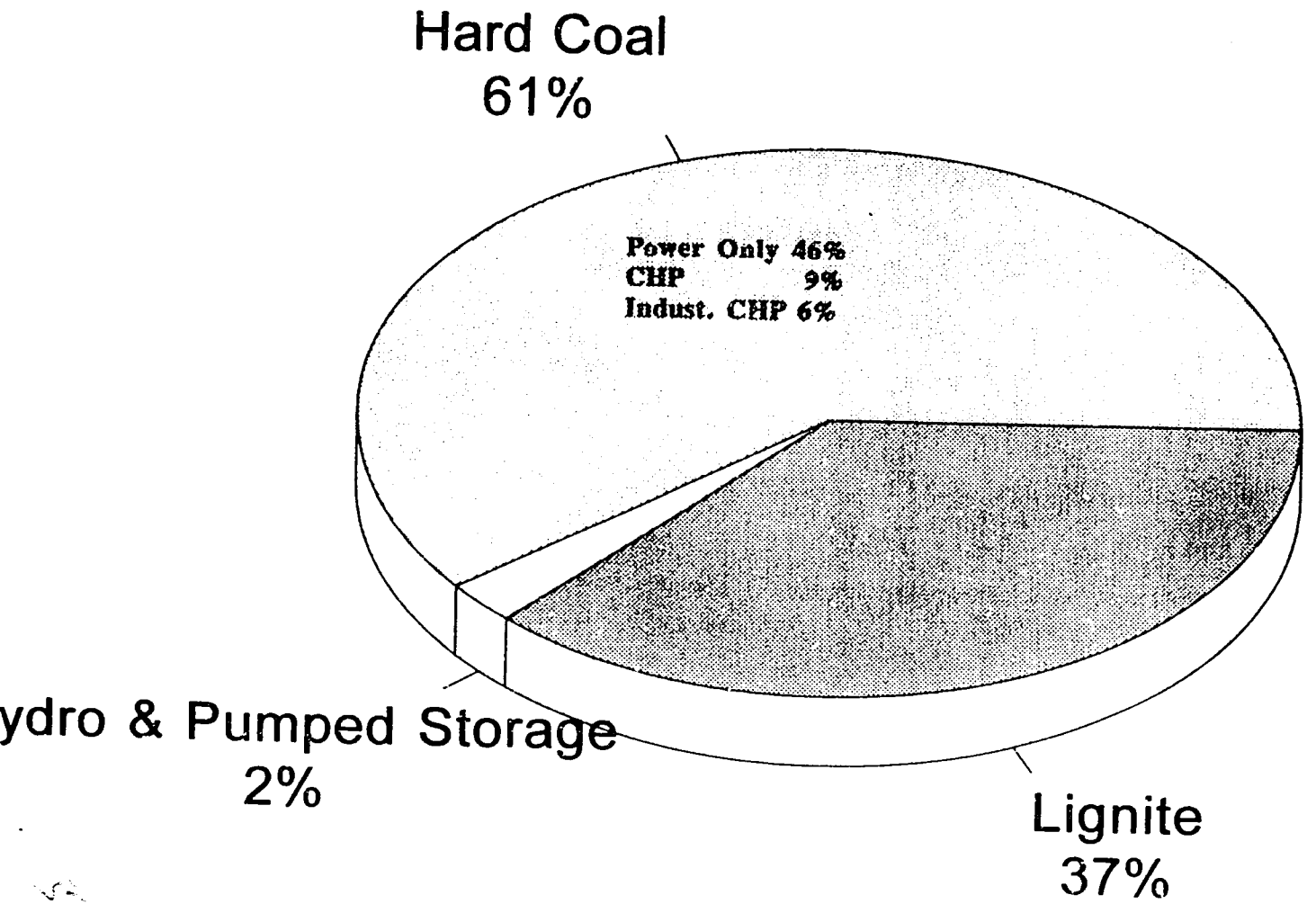


POLAND EXCESS CAPACITY



POLAND POWER GENERATION

1989 FUEL USE



POLISH ENERGY SECTOR BEFORE 1990

Until 1990, two government agencies had responsibility for the entire energy sector in Poland.

- The Power and Brown Coal Board owned all the power generation companies, the electricity distribution companies, the lignite mines and related equipment manufacturers, engineering firms, and maintenance organizations.
- The Hard Coal Board operated all of the hard coal mines.

None of these facilities carried any debt and none paid a significant return on equity.

Coal prices and retail electricity prices were heavily subsidized.

POLISH ENERGY SECTOR AFTER 1990

In 1990, both Boards were liquidated.

- the mines and generators were spun off as separate entities
- several generators have already been transformed into joint stock companies.
- a new joint stock company known as the Polish Power Grid Company was formed to (a) own and operate the transmission system and the pumped storage plants; (b) purchase power from the generators; and (c) dispatch the power stations.

And the subsidies for coal and retail electricity prices have been substantially reduced so prices are approaching international levels.

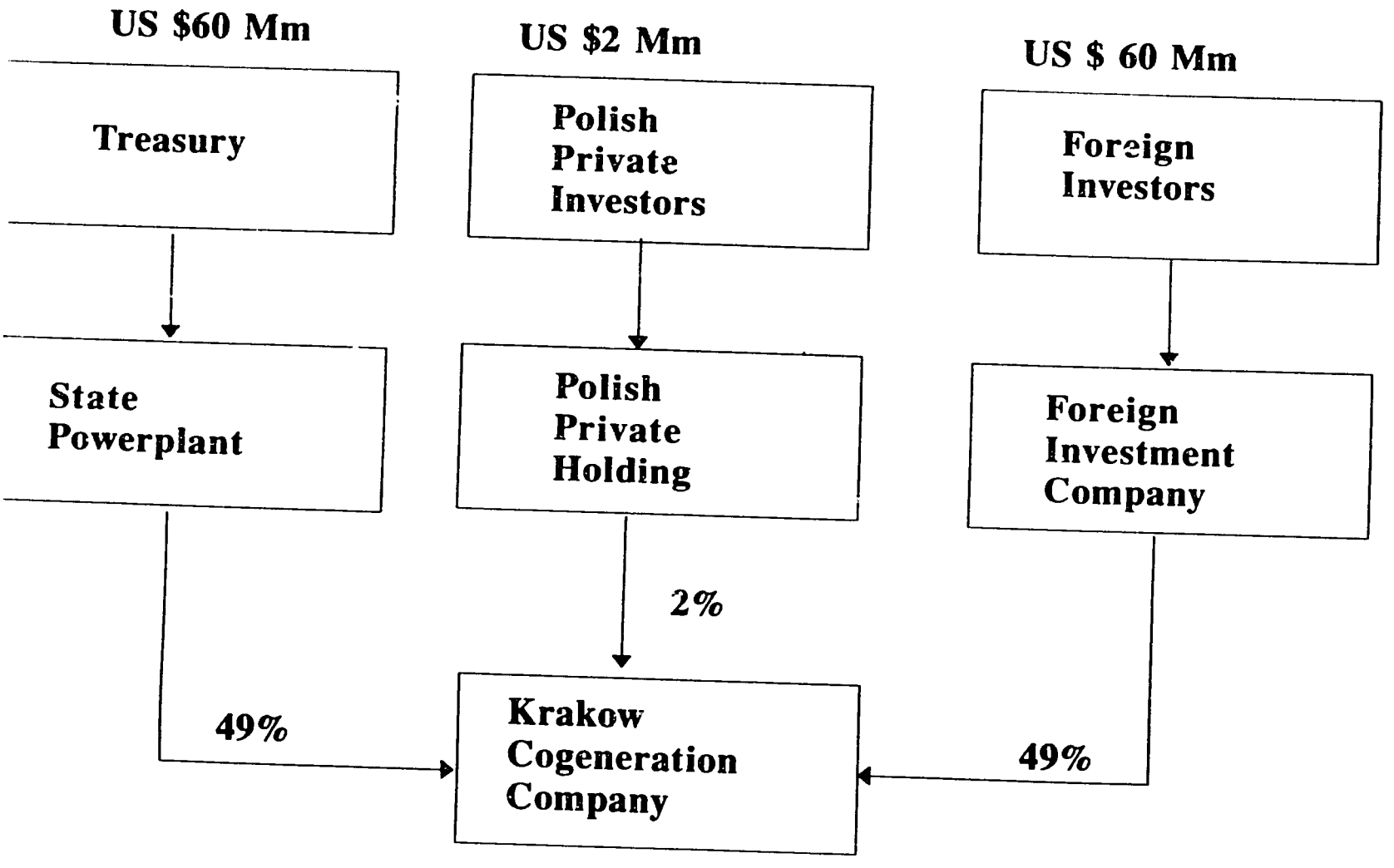
TRANSFORMATION OF POLISH POWERPLANTS

In order to finance the rehabilitation and environmental-retrofitting of existing facilities, Government began to encourage private power in 1991.

Several joint stock generating companies have been negotiating with foreign partners to form joint ventures.

One of the first is Krakow-Leg, the third largest CHP plant in Poland (capacity of 450 MWe and 1400 MWt) which provides 85% of district heat to city of Krakow.

KRAKOW COGENERATION COMPANY STRUCTURE



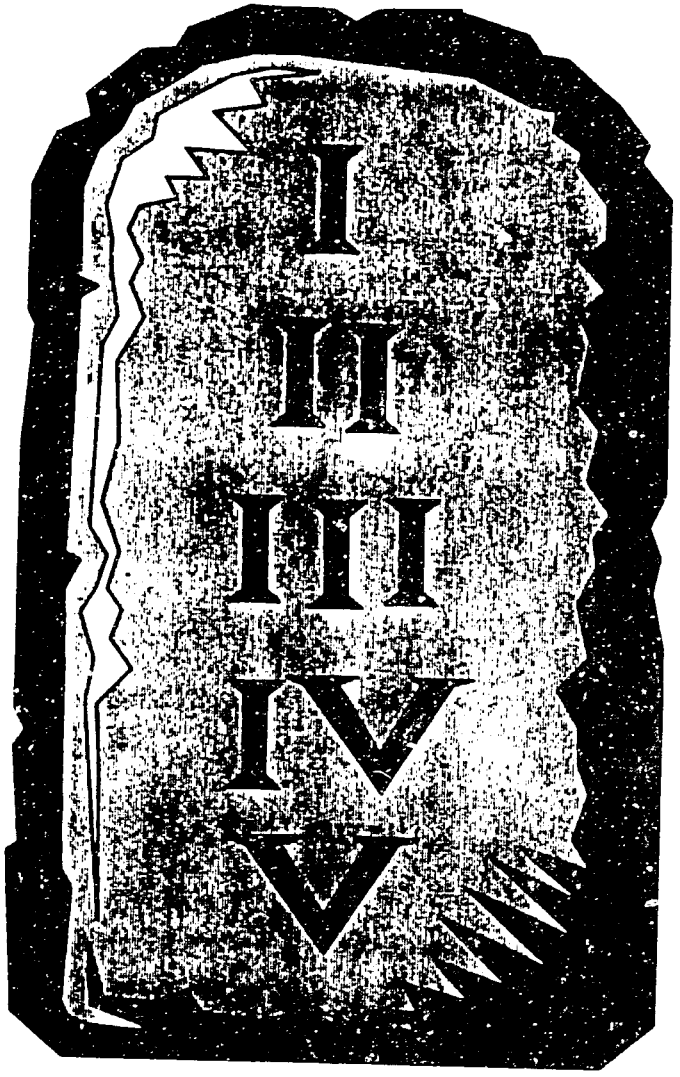
POLISH JOINT VENTURES			
Powerplant	Fuel	Type	MWe
Krakow-Leg	Coal	CHP Rehab	450
Patnow II	Lignite	Power Only Rehab	400
Gorzow	Gas	New CHP	50
Chorzow	Coal	CHP	195
Lublin	Gas	New CHP	50-100
Dolna Odra	Coal	Power Only Rehab	400

MAJOR ISSUES IN EASTERN EUROPE

These projects have each confronted several major issues that may well appear elsewhere in Eastern Europe:

- Valuation of existing assets;
- Uncertainty of prices throughout sector;
- Possible changes in law; and
- Availability of Government guaranties.

TEN COMMANDMENTS



TEN COMMANDMENTS

1. Thou Shall Not Underestimate
2. Thou Shall Organize
3. Thou Shall Field A Good Team
4. Thou Shall Downplay The LOI
5. Thou Shall Prepare In Advance
6. Thou Shall Be Consistent
7. Thou Shall Not Covet Thy Neighbor's Money
8. Thou Shall Divide Risks
9. Thou Shall Not Dawdle
10. Thou Shall Trust Thy Developer

ASSESSMENT OF INDEPENDENT POWER IN BULGARIA: PRELIMINARY FINDINGS

by

Matthew Buresch

RCG/Hagler, Bailly, Inc.

at the

INDEPENDENT POWER IN BULGARIA WORKSHOP

Borovets, Bulgaria

June 23 - 24, 1993

ASSESSMENT OF INDEPENDENT POWER IN BULGARIA: PRELIMINARY FINDINGS

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I Introduction: Assessment Objectives

II International Independent Power Experience and Implications for Bulgaria

III Overcoming Bulgaria's Barriers to Independent Power

IV The Market Potential for Independent Power in Bulgaria

V Project Prioritization and Selection

VI Status of Policy & Institutional Framework for Independent Power

VII Suggested Approaches to Policy & Institutional Development

VIII Recommendations: The Simultaneous Project and Policy Development Strategy

I INTRODUCTION: ASSESSMENT OBJECTIVES

The objectives for performing this assessment of independent power in Bulgaria is fourfold:

- Summarize the U.S. and international experience with independent power and lessons learned for Bulgaria;
- Perform a preliminary assessment of the independent power market potential at central power, cogeneration, and small power facilities;
- Evaluate the policy, regulatory, and institutional framework for independent power;
- Suggest both policy and project development strategies for attracting private capital in Bulgaria's power sector.

These issues are addressed in different presentations at this workshop. This presentation will focus primarily on the last three points.

II INTERNATIONAL INDEPENDENT POWER EXPERIENCE AND IMPLICATIONS FOR BULGARIA

The extensive experience with independent power in the United States and in many countries in Asia, Latin America, and Europe provides the following lessons:

- The 15 year US experience has resulted in a major role for IPPs: in 1992, 62% (or 3,848 MW) of all new capacity went to IPPs; as of 1991, 3,000 projects or more than 40,000 MW of installed capacity have been developed as IPPs;

- Independent power is taking off in over 60 countries worldwide; of a projected 542 GW capacity additions outside North America between 1993 and 2000, IPPs could claim as much as 80 to 115 GW;

- The key elements for attracting private capital into the power sector involves offering independent developers a (1) fair price and (2) fair terms in the context of a (3) fair process for project selection;

- Establishing a mature IPP market takes time; in the US, for instance, the market did not begin to take off until 5 years after passage of the PURPA law. International projects are also slow to develop.

III OVERCOMING BULGARIA'S BARRIERS TO INDEPENDENT POWER

Independent power in Bulgaria faces clear barriers that will complicate the process of attracting private capital in the power sector:

- **Difficult economic structural adjustments**
- **Declining power demand and unreliable capacity**
- **Insufficient utility financial performance**
- **Inadequate policy and institutional framework**
- **High level of commercial risk**

Despite these challenges, a clear strategy for developing independent power could yield the desired result of attracting private investment and developers in Bulgaria's power sector.

OVERCOMING BULGARIA'S BARRIERS TO INDEPENDENT POWER

Various positive conditions and trends in Bulgaria could enable independent power generation in the coming years:

- **Economic adjustment developments**
- **Investment opportunities in existing capacity**
- **Projected New capacity needs**
- **Independent power policy developments**
- **Electric utility financial improvements**

Recognizing the difficult economic conditions, sources of financing can be found, if the policy and project framework is properly structured.

IV THE MARKET POTENTIAL FOR INDEPENDENT POWER IN BULGARIA

Potential power projects that could attract foreign investors are:

- Industrial Cogeneration: Rehabilitate or repower major industrial cogeneration projects;
- District Heating Cogeneration: Rehabilitate or repower major district heating plants;
- Coal-Fired Power Plants: Rehabilitate or repower existing coal-fired power plants;
- Hydro Power: Develop mini or major hydro sites;
- New Generation: Construct a new combined cycle gas or coal-fired power plant

Feasibility analysis of some of these projects is already underway, and a priority ranking of these projects will be included in the least-cost plan under development.

POWER PROJECTS FOR INDEPENDENT POWER CONSIDERATION

Preliminary Estimates: May, 1993

Power Facility Name	Existing Installed Capacity (MegaWatts)	Potential New or Repowered Capacity (MegaWatts)
Thermal Power Plants		
Maritsa East 1	200	200 – 250
Maritsa East 2	1,245	1,245 – 1,455
Martisa East 3	840	840
Varna	1,260	1,260
Russe	400	400
Bobov Dol	630	630
District Heating Cogeneration Plants		
Sofia	125	689
Kostov	186	870
Pernick	155	130
Plovdiv	60	260
Avram Stoianov	30	54
Pleven	36	295
Shumen	18	160
Industrial Cogeneration Plants		
Burgas	220	1,082
Kremikovtzi	60	486
Svishtov	60	
NHK Plevin	60	
Vidan	60	
Chimco Vratsa	60	284
Stara Zagora	48	720
Hydro Power Plants		
Danube River		400
Gorno Arda		175
Sredna Vacha		100

Source: World Bank G7 Study Draft; Energoproekt

Table 7

V PROJECT PRIORITIZATION AND SELECTION

The procedure for evaluating power project investments should utilize a rigorous Integrated Resource Planning (IRP) process. Key evaluation factors are the type of power required (peak, intermediate, or base load) and the installed and levelized costs. Based on the experience in other countries, the potential ranking could be as follows:

- Demand-side management investments
- Industrial/district heating cogeneration rehabilitation or repowering
- Thermal plant rehabilitation or repowering
- New combined cycle cogeneration power
- New high-head hydro power

By applying an economic ranking of potential power investments, COE and NEK can ensure that the projects that they tender for private development will fit into their overall least cost expansion plan.

ESTIMATES OF INSTALLED AND LEVELIZED COSTS FOR DEMAND SIDE AND GENERATION SUPPLY OPTIONS		
	INSTALLED COST ($/KW)	TOTAL LEVELIZED COST (¢/KWH)
Demand Side Management Bids		3.2-6.5
Combustion Turbine	275 - 500	11-16
Diesel Generator	375 - 1,005	9-26
Combined Cycle	500 - 800	5-6
Pulverized Coal w/ Flue Gas Desulferization	1,420 - 2,410	6-9
Atmospheric Fluidized Bed Combustion	1,600 - 2,600	6-8
Wood Fired Steam	2,700	7-8
Conventional Hydro	1,945 - 3,300	N/A

Source: Central Maine Power, Stone & Webster, Electric Power Research Institute, RCG/Hagler, Bailly, Inc., 1993

VI STATUS OF POLICY & INSTITUTIONAL FRAMEWORK FOR INDEPENDENT POWER

The existing policy and institutional framework in Bulgaria is undergoing major changes. The key issues that need to be addressed are:

- **Lack of Energy Legislation**
- **Need for Implementing Regulations**
- **Inadequate Legal Recourse**
- **Unclear Institutional Priorities**
- **Insufficient Project Review Process**

A preliminary assessment of the power sector institutions and the energy bill currently being drafted indicates that a potentially favorable policy and institutional framework is under development.

VII SUGGESTED APPROACHES TO POLICY & INSTITUTIONAL DEVELOPMENT

The Government of Bulgaria, the COE, and NEK will need to continue their progress in establishing the necessary policy, regulatory, and institutional framework for independent power. Some of the necessary activities are already underway. Overall suggestions are summarized below:

- Strengthen Legislation: Strengthen components of energy and other legislation to facilitate independent power;

- Establish Regulatory Institution: Establish an independent regulatory institution that addresses independent power and ensures staffing by qualified regulators;

- Draft Regulations: Develop and publish detailed regulations based on the energy law;

- Establish Information Clearinghouse: Establish a central information clearinghouse for Independent Power (IPP) developers;

- **Implement Integrated Resource Planning:** Use Integrated Resource Planning to establish long run marginal cost and power purchase pricing to guide project selection;

- **Define Government Guarantees Offered:** Establish consistent policy regarding government guarantees and agreements relating to such issues as utility performance, fuel supply, etc.;

- **Define Solicitation Process:** Establish the policy for soliciting independent power;

- **Train Negotiations Team:** Establish and train a multi-disciplinary review and negotiation team;

- **Prepare Standard Small Power Contracts:** Provide standard offer contracts for small renewable and cogeneration projects;

- **Prepare Terms for Large Power Contracts:** Provide standard non-price terms for large projects.

Some of the necessary activities that are being implemented are electricity pricing reform, energy legislation drafting, IRP analysis, and project feasiblity assessment.

VIII RECOMMENDATIONS: THE SIMULTANEOUS PROJECT AND POLICY DEVELOPMENT STRATEGY

While all elements of the policy and institutional framework described above are necessary in order to enable an active long term independent power market, not all components are essential to develop the initial projects.

- Independent power projects can potentially move forward in an incomplete policy and investment framework.
- In fact, experience in other countries (such as the Philippines, China, and Argentina) has shown that promoting specific projects early on can in fact help refine the policy development process.

In the uncertain investment climate that now exists in Bulgaria's power sector, the Bulgarian government, COE, and NEK, however, may need to agree to certain concessions in terms of power price and guarantees to attract the first IPP developers.

A SIMULTANEOUS PROJECT AND POLICY DEVELOPMENT STRATEGY

In order to implement a parallel policy and project development strategy, the following priority elements of the policy and institutional framework need to be developed early on in order to ensure that any proposed independent power projects have a minimum necessary institutional and contractual framework:

- Establish a consistent policy regarding government guarantees of utility performance;
- Establish and train a multi-disciplinary review and negotiations team;
- Provide standard non-price terms for large, central, hydro, or cogeneration projects;
- It may be desirable to also prepare standard offer contracts for small renewable and cogeneration projects.

These basic elements provide the initial framework for attracting private capital in the power sector. Nonetheless, continuing to make progress on the entire strategy will be important for creating a mature IPP market.

BULGARIAN ELECTRIC ENERGY SECTOR - PRESENT AND FUTURE

Prepared by Andrey MARKOV

Head, Department of Electric Production

and Electric Supply

Committee of Energy

The report on the potential of independent electric energy producers in Bulgaria, prepared by RCG/HBI and delivered to you by Mr. Bouresh contained a detailed and extensive review of the electric energy sector in Bulgaria. This to a great extent has eased my task, because I do not intend to repeat what has already been said about electric energy industry. This would not be necessary. I would rather draw your attention, and this was the preliminary aim of this report, to some specific matters connected with the electric energy system, which for some reasons were barely commented, or not commented at all. In this way I hope to achieve a more complete picture of the present state and to outline even better the future trends of development of the electric energy sector in the country. At the same time, the conditions and possibilities for the independent energy producers in Bulgaria will be defined more clearly and logically.

From the stand point of today it is seen that for decades the economy of the country has been directed to energy consuming industries and technologies, which has caused continuous growth of energy consumption. Energy consumption of the gross national product (GNP) significantly exceeded those in the countries with market economy. For this reason intensive building of new generating capacities was required. While the installed capacities in the energy system amounted to 8,810 MW in 1980, they were already equal to 11,309 MW in 1988, and reached 12,074 MW with the introduction of Unit 6 in the Kozloduy atomic power plant in 1991. At the same time the gross domestic production of electric power, which amounted to 34.8 TWh in 1980, reached its peak in 1988 with 45.0 TWh produced, and the gross consumption amounted to 49.2 TWh. And all this in a country with scarce own energy resources, importing near 80% of them, mainly from the ex-Soviet Union, including electric power.

The energy ties with Russia and Ukraine continue at present. The existing thermal electric power plants using imported coal are designed to burn anthracite coal from the Donbas field in fluid slag emission boilers. Natural gas flows over the only gas pipeline from Russia. The electric power system of Bulgaria operates in parallel with those of the ex-socialist countries, within the United Energy System. The nuclear fuel is supplied from Russia.

The efficiency of energy use at the planned economy was only formally an objective of the energy strategy. The unrealistically low price of energy resources, including those of electric energy, invariably state-subsidized, did not stimulate their efficient use. A confirmation of that inappropriate policy is the significant share of heating electric power in the total consumption - a fact confirming by itself the extremely inefficient use of primary resources.

The recent few years marked a decline in the electric energy consumption. However, this is due to the recession in industry, while there has been an increase of consumption in everyday life, the commercial and service sphere, mainly for heating purposes. This is confirmed by the circumstance that at a GNP decline of 28.4% from 1988 to 1992, the decline in electric energy consumption was 23% for the same period.

In spite of the multiple increase of electric energy price, it still remains more attractive than oil products of heating (gas oil, propane-butane). And there is a considerable part of the population that has no other option for technical reasons (e. g. lacking even chimneys in residential buildings).

The significant share of electric energy for heating causes additional peaking of the load diagram at certain hours of the day during the heating period. This can explain the preservation of peak loads of the system in the range from 7,000 to 7,100 MW in the recent few winters, regardless of the total decline of electric consumption.

The specificity of the load diagram requires greater maneuverability (flexibility) of the energy system, which is insufficient and generates a number of problems at present. Only water power capacities can be successfully used for load diagram control. This proves to be insufficient, since these are merely 10 to 12% of the generating capacities, because of the limited quantities in their water basins. Technical solutions have to be sought in order to increase the energy system maneuverability using thermal power plants and due to the fact that at certain moments the atomic capacities operating in basic mode amount to 35 to 45% of the generating capacities in the system.

It is also important to note that the existing thermal power plants have different records of operation. Some 20% of them have been operated for more than 25 years, and some 30% - for 20 to 25 years.

With the cooperation of the Trading and Development Agency (TDA) and Agency of International Development (AID) of the United States, as well as the European Community through the PHARE program, extensive investigations have been carried out on all thermal and water power plants in Bulgaria. These investigations will result in relevant assessments and recommendations related to the future of each one of them.

The stated above also implies the logical definitions of part of the main guidelines in the future development of the electric energy sector in Bulgaria. The government policy conducted by the Committee of Energy and the remaining institutions concerned in the business will be directed to the implementation of a number of vital issues for the country, which are connected to energy industry, among them the achievement of:

1. Greater energy-related independence
2. More rational and efficient use of primary and secondary energy resources
3. Optimal structure of generating capacities in the energy system, which should allow for minimum production costs of electric energy production
4. Greater maneuverability and reliability of the energy system
5. Ecologically compliant energy production
6. Favourable conditions for the conversion of the electric energy to the grounds of market economy.

For the achievement of greater energy-related independence of the country, priorities will be granted to local energy resources for electric energy production, where economic efficiency has been proved. The electric energy production based on local lignite and brown coal, water and atomic energy will retain its share against the background of declined electric power consumption. The implementation of projects for utilization of combined steam-gas cycles in some of the existing heating and factory power plants will increase the share of natural gas in electric energy production. Simultaneously, projects of direct gasification of households of entire greater or smaller settlements will be implemented. One of the forecasted versions of electric energy consumption has been developed even at the assumption that 450,000 households will

be gasified by year 2000. Generally, redirecting part of the natural gas quantities mainly consumed by industry so far, will lead to positive restructuring of the energy balance, increasing the energy efficiency, creating an alternative and competitor to heat supply, and in electricity production - introducing highly maneuverable peak-moment electric capacities. Through the reconstruction of some existing power plants (Varna, Rousse), or through the construction of new thermal capacities on imported coal, appropriate technologies can be selected, allowing the use of a wider range of imported coal available on the international market. One of the most-attractive for this purpose is the ecological coal from Indonesia. with ash content of 1 to 2% and sulphur content below 0.3%. There is also a theoretical possibility, still to be proven, to use a mix of local high sulphur content coal and low sulphur content imported coal without the need of building expensive sulphur-purifying facilities (FGD).

The efficiency of energy production and energy consumption will be promoted as a national policy and will be one of the main duties and functions of the Committee of Energy. A detailed program consisting of individual projects for rehabilitation or replacement of existing capacities will be developed on the basis of extensive studies of operating power plants, in order to increase their potential, on the one hand, and to improve their efficiency, on the other hand. At the same time, a series of projects will be implemented in heat supply industry for reducing the heat losses over the heat transfer networks. The implementation of other programs for reducing the heat losses in residential facilities is forthcoming. The introduction of new advanced technologies and restructuring of part of the industry will also reduce the energy consumption in the GNP. The relation between efficiency and ecology is unambiguous. Reduced energy consumption means reduced environment pollution.

The priorities at the implementation of projects related to rehabilitation and reconstruction of the existing capacities or building new ones will be adopted by the principle of minimum costs, which will allow the creation and use of optimum structures of the generating capacities in the energy system, leading to minimum production costs in electric energy production.

Introducing new technologies in electric energy production (combined steam-gas cycle, circulating boiling layer) or carrying out a reconstruction of boilers while changing the fuel base (Varna, Rousse, Bobov Dol) will create the technical potential for changing the electric power of the units in a wider range, which, together with the

introduction of the 840 MW of capacities in the Chaira pumped-storage plant will increase the maneuverability of the energy system. Expansion of the international transfer systems will be provided in order to increase the reliability and potential of the system, by seeking opportunities of faster association of Bulgaria with the West European energy system (UCPTE). In this way conditions will be created for more successful export of electric energy to neighbouring countries.

Along with the stated above, the Committee of Energy also performs activities related to the creation of the required pack of acts, norms, regulations and tariffs needed for the conversion of electric power industry to the grounds of market economy and the resolution of a number of other important issues.

The first one of a number of bills related to the energy sector has been prepared and submitted for discussion and adoption by the National Assembly.

The purpose of the prepared bill of electric energy is to transform the energy industry from a losing business into an economically balanced and state-regulated business.

The principles on which this bill has been built are:

- Market economy and state regulation
- Demonopolization by means of which the interests of the state and the users are distinguished from those of the electric energy organizations
- Protection of the legal rights and interests of the parties participating in the process of production, sale and utilization of electric energy
- Protection of the interests of the society.

The functions of conducting the state electric energy policy have been assigned to the Committee of Energy as a state energy institution, in order to:

- Encourage the efficient and economic production, transfer, supply and utilization of electric energy, as well as combined production of electric and heat energy
- Create privileged conditions of production of electric energy by reusable energy sources (water, sun, wind, geothermal energy) as well as energy from recycling of waste and biomass
- Create conditions for competition at the production and transfer of electric energy and electric power supply
- Protect the interests of the consumers related to the price and quality of the supplied electric energy and reliability of electric supply, etc.

The Committee of Eergy has been assigned the rights to grant licenses to organizations concerned with electric energy production, transfer, supply for a specific region, as well as combinations of these activities. Besides, it resolves electric energy import and export, etc.

A similar issue related to heat supply will be the Act of heat supply.

The bill of energy efficiency shall provide conditions for:

- Encouraging efficient utilization of primary energy resources in industrial facilities and household appliances

- Economical utilization of electric energy through realistic tariffs of charging

- Protection of socially incapable persons from the increase of electric energy prices

- Creating privileged conditions for independent producers from reusable energy sources and energy from recycling of waste and biomass sources, as well as for the combined production of electric and heat energy.

At the end, may I be allowed to conclude my report in a non-traditional way, by communicating something interesting to the audience. Following the enforcement of the Restitution Act, three small water power plants are already in the hands of their owners or owners' heirs. Five more are to be handed soon. The turn of the Rila Cascade Chain is coming next. So the number of independent electric energy producers will grow.

A couple of companies have approached the Committee of Energy for resolution on building and exploitation of new electric power plants: one of the projects provides building a combined steam-gas cycle on natural gas in the existing heating plant in the town of Yambol with a total power of 108 MW (four gas turbines of 27 MW and 4 boilers-utilizers of 63 tons per hour; another project provides building the Kaliakra electric power plant near the village of Bulgarevo, Kavarna municipality, with a total power of 20 MW (40 wind units of 0.5 MW), and the third project concerns thermal power of 120 MW on imported fuel, in the region of Elin Pelin and Ihtiman.

Time will not wait. Nor will independent producers.

INDEPENDENT POWER GENERATION IN BULGARIA - EXISTING PRACTICE

Prof. Bozhan Siromahov, Ph.D - Executive Director "Development and Investments" of NEK

1. Actual Situation

During the period following the nationalization of industry in December 1997 until the establishment of the Natzionalna Elektricheska Kompania (NEK) by a Decree of the Council of Ministers of the Republic of Bulgaria, independent power generation in Bulgaria was virtually non-existent. With the exception of the co-generation facilities of several large industrial enterprises, the economic and administrative management of all power plants was centrally performed by the Committee on Energy (or by its modifications - ministry, association, etc.). But even the industrial co-generation facilities at that time, by their character, had almost nothing in common with the contemporary concept of "independent power generation".

The generation facilities operating at present outside NEK could only at a high degree of approximation be considered as representing independent power generation, given that some important aspects of their legal status and of their interrelations with the company, which has the exclusive transmission and distribution rights, are not settled. According to the type of generation, the generators outside NEK at present could be classified in **three groups**:

(a) **industrial** -- power generation. related to and resulting from the primary production activities (Neftochim, Polimeri-Devnya, Kremikovtzi, Sviloza, etc.);

(b) **heating** -- combined generation of heat for central heating and electricity;

(c) restituted and newly built small hydro power plants.

All above mentioned generation facilities (the share of the third group being insignificant) account for 5.19 percent of the annual volume of electricity

purchased in 1992, with capacity ranging between 3 and 13 percent of the peak system's load.

2. Problems of the independent power generation in Bulgaria

The unregulated status of the independent power generation and the unsettled interrelations with NEK cause problems in its functioning and development.

The major problems of the functioning independent power facilities are economic - setting a price higher than the production costs, and lack of normal and stable technical and economic conditions for sustained generation.

At present the regulatory function of determining the electricity prices is performed by the Council of Ministers in an administrative way through a less than perfect procedure which does not take into account a series of important factors while overrating others. For the time being, conditions for market-based prices do not exist.

By normal technical and economic conditions for sustained generation we mean here conditions which make feasible the technical subsistence of generation (technical personnel, maintenance, supply) at acceptable cost. The lack of such conditions forces some owners of restituted small hydro power plants to give up their ownership, to offer the facilities to NEK or to stop generation.

Factors impeding the development of independent power generation, other than the above mentioned, are:

-- lack of a legal status and of a licensing system;

-- lack of lasting legal guarantees for return of capital;

-- lack of access to low interest long-term credits;

-- risk factors - unstable political environment, strong pressure by the trade-unions, crisis state of the economy.

3. Reasons for promotion of independent power generation

The motivation for promoting independent power generation is easily comprehensible, and is generally determined by the public interest in:

-- utilization of local energy resources, therefore, in limitation of GNP export needed for import of energy resources;

-- cost reduction resulting from the establishment of internal electricity market;

-- attracting local private capital;

-- opening of new job opportunities.

Perhaps the attraction of local private capital is the only reason that needs to be commented on.

Local private investments in independent power generation would:

-- alleviate the financial burden on NEK (the state sector) for providing investments;

-- lessen the pressure of "hot money" in other sectors of the economy;

-- balance the eventual foreign investments in the energy sector;

-- saturate energy sector niches which are unattractive for state investments.

4. Conclusions

Given the current state of the independent power generation in Bulgaria and the world global tendency towards its promotion and development, a conclusion could be drawn that immediate and energetic measures are needed so that conditions and incentives for stimulation and development of local independent power generation be created. Should we agree that the impediments to independent power generation are substantial, the realization of

our being behind the world tendency, as well as the needs of the Bulgarian energy sector and economy in general, impose upon us the obligation to undertake immediate and vigorous measures for determined and prompt solution. This goal could be specified by formulating the following priority national tasks:

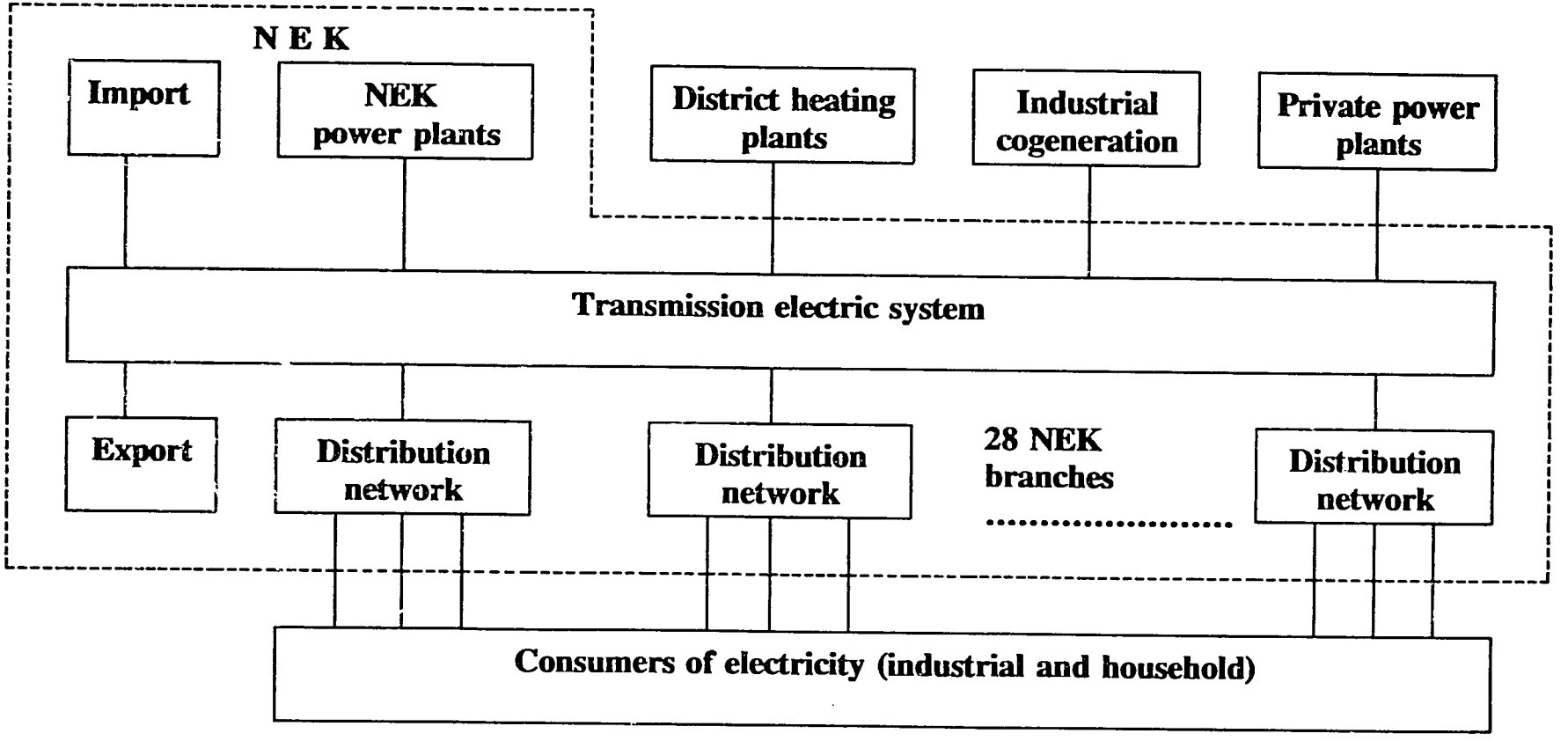
4.1. Establishing in the shortest possible term of normative (legislative) environment (law, regulations, ordinances), which would make legitimate and would guarantee the existence and development of independent power generation in Bulgaria. This environment should include licensing, regulation and provisions for return of developers' capital through lasting long-term legal norms. It should be established and made operational in a way which could reinforce faith in the legal guarantees for doing business in the energy sector and enhance the formation of an internal electricity market.

4.2. Developing of stable, state guaranteed incentives for independent power generation through preferential prices and taxes, state guaranteed long-term purchase contracts, and state guaranteed long-term loans from foreign financial institutions at lower interest rates. Part of the expenses of local investors for conducting research and development for such projects could be covered by the National Energy Fund (fund "Energy Resources").

4.3. Starting a broad spectrum of information and promotion activities among the Bulgarian businessmen and their organizations aimed at encouraging and attracting investments in the independent power generation.

S C H E M E

for generation, transmission and distribution of electricity



IPP LEGAL REQUIREMENTS:

POWER PURCHASE, IMPLEMENTATION AGREEMENT AND OTHER PROJECT AGREEMENTS AND CONTRACTS

By

John L. Sachs
Partner
Latham & Watkins

At the

INDEPENDENT POWER IN BULGARIA WORKSHOP

JUNE 23-24, 1993

Borovets, Bulgaria

IPP LEGAL REQUIREMENTS:

POWER PURCHASE, IMPLEMENTATION AGREEMENT AND OTHER PROJECT AGREEMENTS AND CONTRACTS

TABLE OF CONTENTS

I. Project Finance

II. Power Purchase Agreement

III. Security Package

IV. Commercial Risk

V. Political Risk

VI. Implementation Agreement

PROJECT FINANCE

Most IPPs are financed on a project finance basis.

- The developer borrows money on the basis of revenues he expects to receive under long-term contract with utility.
- The lender takes a security interest in this long-term contract with the utility.
- The lender may also take a security interest in the physical assets of the project, but these assets are of little value without the long-term contract.
- The lender has no recourse against the other assets of the developer.

POWER PURCHASE AGREEMENT

Developer's Obligations

obtain land, secure permits and obtain financing by certain date

build powerplant by certain date

operate and maintain powerplant

Utility's Obligations

interconnect IPP with grid by certain date

purchase power from IPP at fixed price for 20-30 years

Utility's Remedies

impose penalties for failures

hold security deposit to ensure payment

terminate long-term contract

right to operate/right to purchase

Developer's Remedies

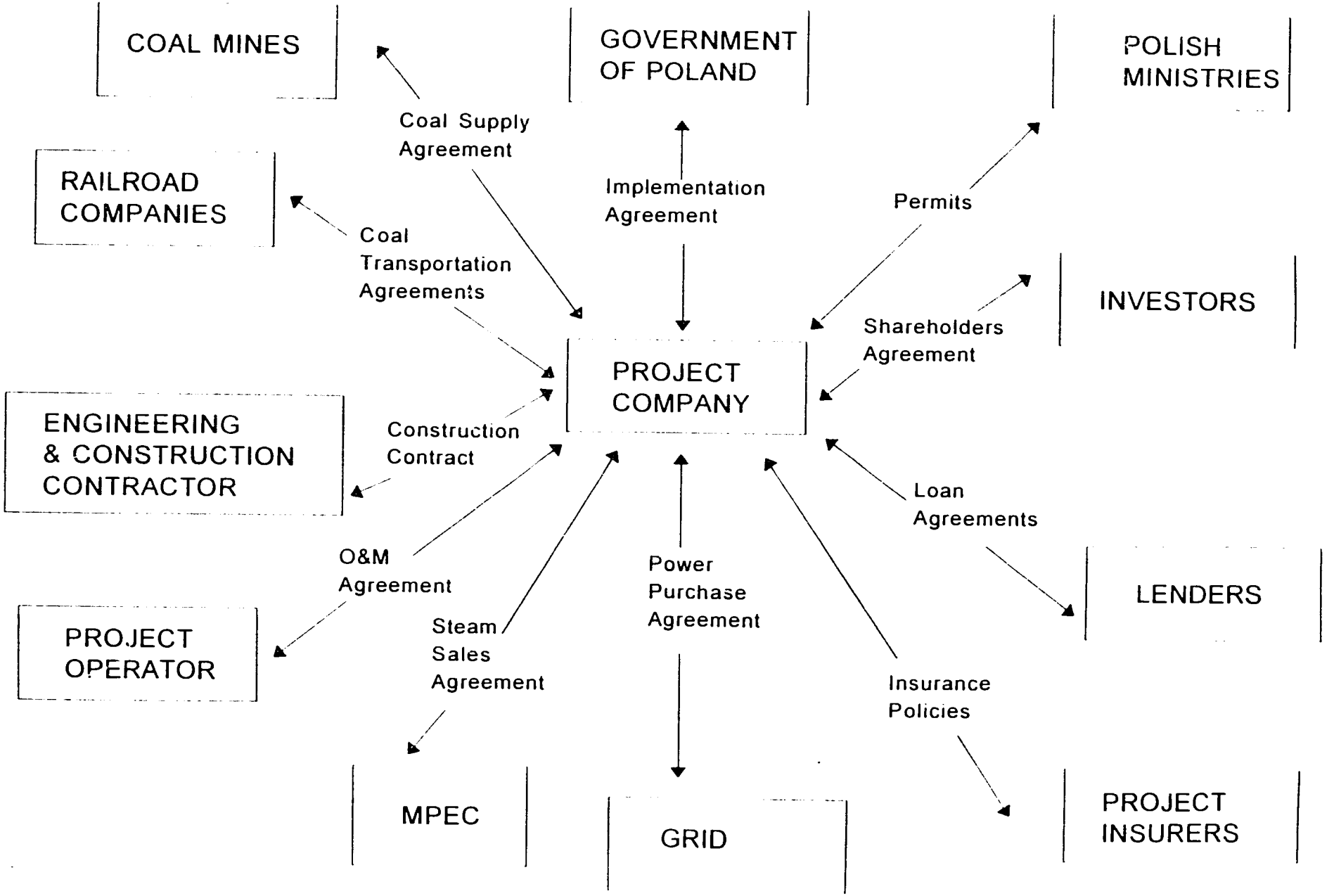
deemed commissioning

sue utility for damages

terminate long-term contract

transmit power to another buyer

POLISH SECURITY PACKAGE



EXAMPLES OF COMMERCIAL RISK

- Increase in construction costs.
- Delay in completion of powerplant.
- Poor performance after completion of powerplant.

DELAY IN COMPLETION

Problem: Developer fails to complete project by PPA deadline. Developer suffers following consequences:

a. Generation of revenue delayed.

   (1) More interest during construction.

   (2) No return on equity.

b. Liquidated damages under PPA for harm to generation planning.

c. Liquidated damages under FSA for carrying costs of new coal producer investments.

d. Termination of IA, PPA and FSA by Government.

DELAY IN COMPLETION (Cont.)

Allocation:

a. Developer hires experienced contractor to ensure timely completion.

b. Contractor pays liquidated damages to developer sufficient to cover developer's debt service and liquidated damages under PPA and FSA.

   (i) Contractor obtains insurance against natural force majeure events, but political force majeure events uncovered.

   (ii) Shareholders receive no return.

   (iii) Limit on maximum liquidated damages contractor will pay.

c. Beyond contractor's limit, developer commits additional capital and arranges standby credit facilities of 15-25%.

d. Utility may pay for increases caused by utility change orders.

DELAY IN COMPLETION (Cont.)

Allocation (Cont.):

e. Government or utility may pay for increases caused by entirely unpredictable events or political force majeure events.

f. Termination postponed long enough for developer to rebuild plant if entirely destroyed.

EXAMPLES OF POLITICAL RISK

- Inability to obtain governmental permits and approvals.
- Fluctuations in foreign exchange rates, unavailability of foreign exchange, inability to transfer foreign exchange abroad.
- Political force majeure.
- Expropriation or other Government default.

PERMIT RISK

Problem: Developer must obtain all required permits, but Government agencies withhold issuance of permits. Developer suffers following consequences:

a. Fails to complete plant on time or operate as required under PPA.

b. Shortfall in revenue.

c. Liquidated damages under PPA and FSA.

d. Termination of IA, PPA and FSA.

PERMIT RISK (Cont.)

Allocation:

Upon receipt of an application from the developer, the Government:

a. Could waive the permit requirement but risk violation of law.

b. Could pay the developer for any increased costs if problem can be solved with money, but Government unwilling to pay more.

c. Could guarantee issuance of permit:

   (1) Identify permits required in advance and review for problems.

   (2) Require complete and accurate application from developer.

   (3) Retain the power to revoke the permit.

PERMIT RISK (Cont.)

Related Problems:

a. Government imposes adverse terms and conditions on permit after issuance.

b. Government refuses to renew permit issued for limited time.

c. Additional permits are required later.

FOREIGN EXCHANGE RISK

Problem: Developer must pay foreign lenders, investors, contractors and suppliers in foreign exchange, but payments for power made in local currency.

a. Exchange rate fluctuates after amount of payment in local currency agreed or paid.

b. Insufficient foreign exchange reserves to convert local currency.

c. Foreign exchange not allowed to be transferred out of country.

FOREIGN EXCHANGE RISK (Cont.)

Allocation:

a. Fluctuation in exchange rates.

(1) Pay developer in foreign exchange, but utility receives revenue from sales in local currency.

(2) Index the amount of local currency agreed or paid.

(3) Sell the developer exchange risk insurance.

b. Insufficient foreign exchange reserves.

(1) Reduce foreign participation in the project.

(2) Tie the powerplant business to an export business that generates foreign exchange.

FOREIGN EXCHANGE RISK (Cont.)

Allocation (Cont.):

(3) Grant the developer priority access to available foreign exchange reserves.

(4) Government guarantee of availability.

c. Restrictions on transferability

(1) Government guarantee of right to transfer.

(2) Protection against breach of guarantee by creditworthy lender.

FORCE MAJEURE

Problem: How does the developer meet debt service obligations when an uninsured event occurs?

Allocation:

a. Developer maximizes insurance coverage, although cost will increase tariff.

b. Developer takes risk if fails to get available insurance or utility procures for developer.

c. If the event is uninsurable:

   (1) Utility continues payments to the developer, but these payments may not pay for repairs and utility may not collect from ratepayers.

   (2) Government lends money to the developer.

d. Developer terminates IA, PPA and FSA, but Government must repay loans at a minimum.

EXPROPRIATION RISK

Problem: The Government expropriates the developer's assets or shares or resorts to "creeping expropriation" rendering the developer incapable of performing.

EXPROPRIATION RISK (Cont.)

Allocation:

a. Developer purchases insurance against outright expropriation, but there are limits on coverage.

b. Government lends money to the developer, but unlikely if Government has engaged in expropriation.

c. Developer terminates IA, PPA and FSA and attempts to collect damages.

   (1) Expensive and slow to collect damages through a lawsuit or arbitration.

   (2) Government must waive sovereign immunity and consent to the enforcement of judgments against it.

   (3) Agree in advance to amount of damage.

IMPLEMENTATION AGREEMENT

1. Exclusive right to build powerplant
2. Assistance with permits
3. Relief from taxation and customs duties
4. Foreign exchange commitments
5. Government guarantees of the performance of government agencies \
6. Protection against Force Majeure
7. Definition of defaults and remedies
8. Dispute resolution procedures

FINANCING INTERNATIONAL INDEPENDENT POWER PROJECTS

by

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at the

INDEPENDENT POWER IN BULGARIA WORKSHOP

Borovets, Bulgaria

June 23 - 24, 1993

FINANCING INTERNATIONAL INDEPENDENT POWER PROJECTS

I THE LINK BETWEEN RISK AND REWARD

II ISSUES AND STRATEGIES IN REDUCING PROJECT RISK

III MECHANISMS AND SOURCES FOR PROJECT FINANCING

IV RECOMMENDATIONS

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THE LINK BETWEEN POLITICAL AND ECONOMIC RISK AND THE REQUIRED RETURN ON INVESTMENT

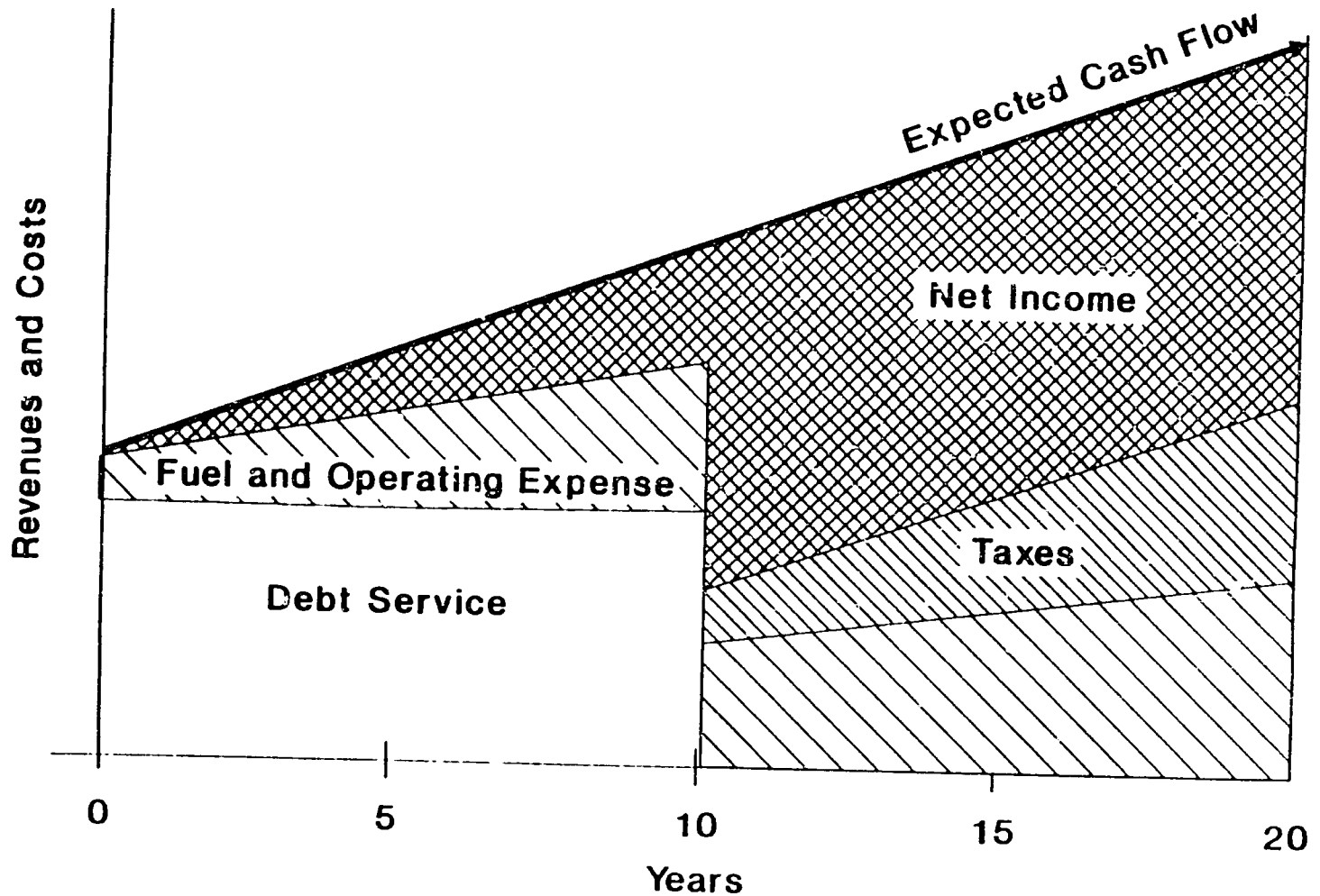
The level of political and economic risk determines the return on investment that investors will require for project financing. Countries with very high levels of political and economic risk (e.g. Lebanon or Iraq) would require such high returns that only equipment sales for cash would normally be feasibly, while countries with very low levels of risk (e.g. United States, Germany, and Japan) present attractive opportunities for long term investment. Risk is typically broken down into the following categories:

Political Risk:Political conditions that lead to (1) political violence, (2) expropriation of assets, (3) inconvertibility of local currency, and (4) legal unpredictability have a major impact on the investment climate for both domestic and foreign businesses.

Economic Risk:The credit risk of a country is measured by such economic indicators as (1) GDP/capita, (2) GDP growth, (3) country debt, (4) trade balance, (5) months of imports coverage, (6) international reserves, (7) current account balance, and (8) government budget balance.

Country risk ranking services such as Euromoney and Institutional Investor grade most of the countries worldwide according to a range of economic and financial indicators. For instance, Euromoney uses 9 criteria that include economic data, political risk indicators, debt indicators, access to bank finance, access to short term finance, access to international bond and syndicated loan markets, access to and discount on forfaiting, credit ratings, and debt in default. Bulgaria had a listing of 118 out of 169 countries in the March 1993 edition of Euromoney. This rating means that most commercial banks would regard Bulgaria as having an unacceptable level of country risk at this time.

PRIVATE POWER PROJECT CASH FLOW



THE RISK THAT THE PROJECT'S ACTUAL CASH FLOWS DO NOT MEET EXPECTATIONS PRESENTS A MAJOR CONCERN FOR INVESTORS

The expected cash flow of a project must cover the debt service payments, the fuel and operating expenses, taxes, and the net income (after taxes) required to satisfy the equity investors. Typically, debt is serviced over about a 10 year period. The key events that could effect project cash flow are:

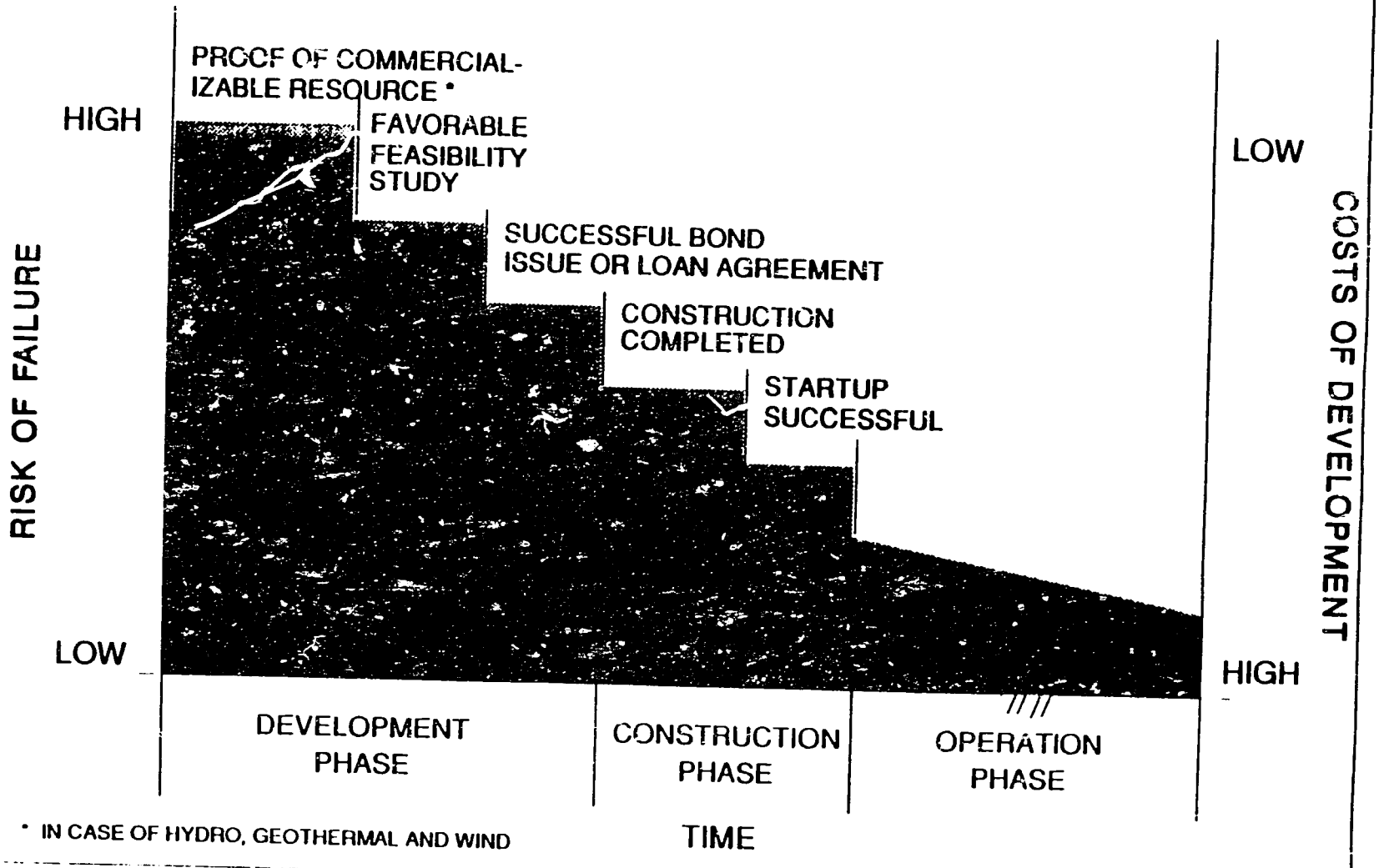
Development Risk: Problems and delays in siting the project, obtaining the necessary permits and licenses, negotiating the power purchase agreement, obtaining the required fuel and other security agreements, and securing the financing affect the capital cost and thus the debt service required for the project.

Construction Risk: Problems and delays with managing the construction, management/labor disputes, construction financing, cost increases, performance failures or discrepancies, and force majeure may result in major cost overruns.

Operation Risk: Problems with performance shortfalls, operating cost overruns, fuel price volatility, electricity payment delays, exchange rate volatility, legal changes, new environmental standards, force majeure catastrophes all influence the fuel and operating expenses and thus the level of net income earned.

Failure to generate the expected cash flows could prevent the project owners from delivering an adequate return to the equity investors, paying taxes, meeting operating expenses, or servicing the debt.

GOVERNMENT UTILITY POWER PROJECT DEVELOPMENT RISK AND COST PHASES



* IN CASE OF HYDRO, GEOTHERMAL AND WIND

THE GOVERNMENT'S LEVEL OF RISK AND COSTS ARE AFFECTED BY KEY MILESTONES IN THE DEVELOPMENT OF A PUBLIC SECTOR POWER PROJECT

As a government utility power project evolves through the development process, there are various key events that serve to reduce the risk of project failure but also increase the level of time and money that has been invested in the project. When the project is no more than a concept in the mind of planners, the risks that the project will never generate power are high, but the costs invested are minimal. As a successful project development proceeds, the following major events occur:

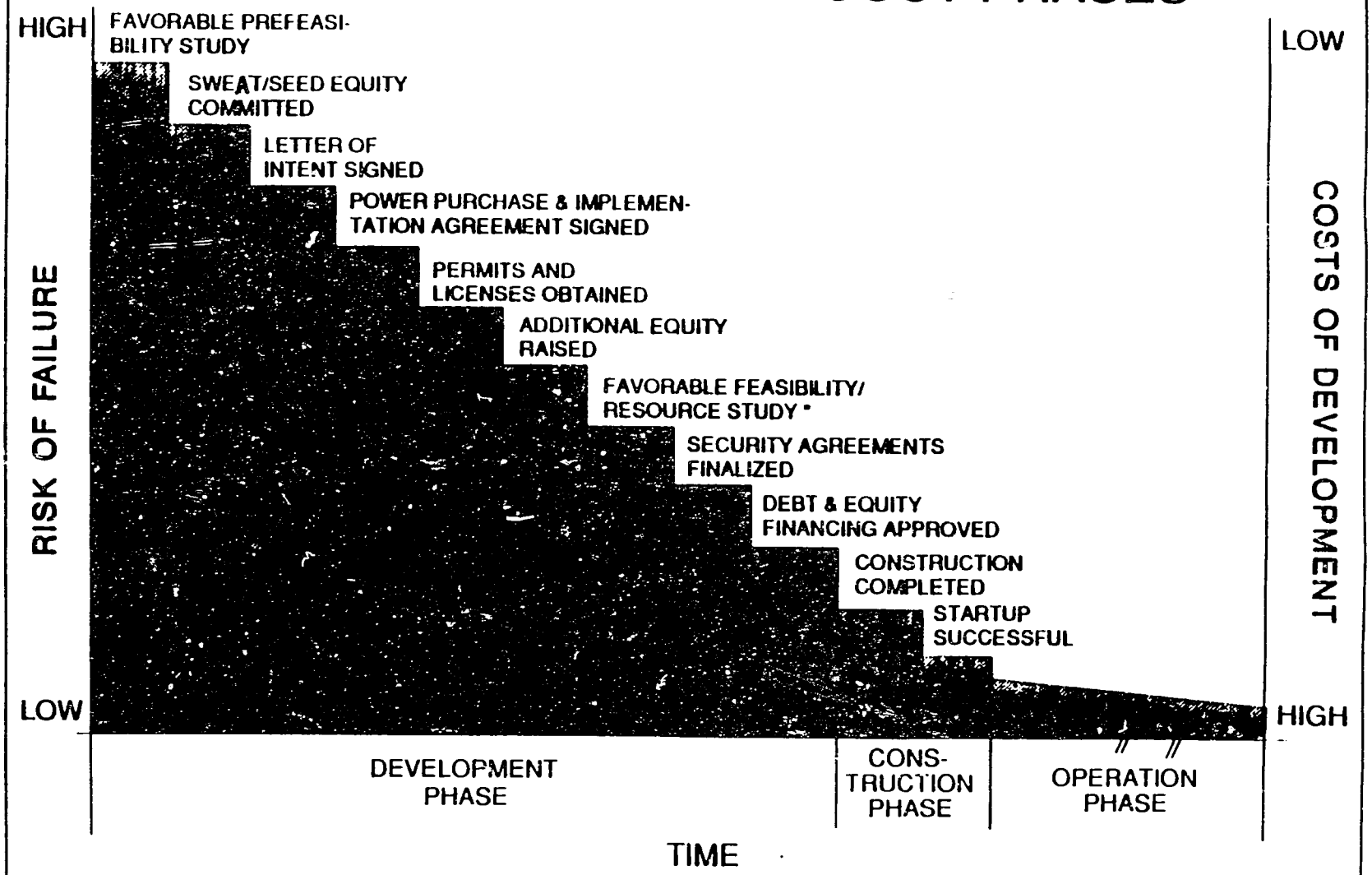
Development Phase: A favorable energy resource assessment and feasibility study and a successful bond issue or loan agreement are the key risk reducing milestones in the development phase.

Construction Phase: Construction completion on schedule and on budget followed by a successful start-up with on-specification performance are critical.

Operation Phase: Successful plant operation on budget and without unaccounted for fuel or operating cost increases and disasters over 20 to 30 years is essential.

Given that the government owns most if not all of the relevant institutions and resources needed for power generation (e.g. electric utility, grid, primary energy resources, central bank, environmental and other regulatory bodies, etc.), the process of project development is relatively simple compared to what private developers face. In addition, the cost of capital for the government is the lowest in the national economy, thus putting the developer at a financial disadvantage.

PRIVATE POWER PROJECT DEVELOPMENT RISK AND COST PHASES



* RESOURCE STUDY APPLIES TO HYDRO, GEOTHERMAL AND WIND

A PRIVATE POWER DEVELOPER FACES A MORE RISKY PROCESS WHEN DEVELOPING POWER PROJECTS

The impetus for developing country government-owned utilities to consider private power and privatization is largely due to two factors: (1) a shortage of public sector capital for electric power capacity expansion, (2) inadequate performance of power plants leading to reliability, efficiency, and financial indicators below what can be achieved in the private sector. While private developers can often build and operate power plants more efficiently, reliably, economically, they generally face a higher cost of capital and a more complex and risky process for project development. In the project development phase, there are a larger number of important hurdles that a private developer faces:

- **Pre-Feasibility Assessment** (preliminary internal analysis)
- **Sweat/Seed Equity Commitment** (to finance initial development work)
- **Letter of Intent** (optional) (between government and developer)
- **Power Purchase Agreement** (locking in buy back rate and term)
- **Permits and Licenses** (for construction, environment, resource rights, etc.)
- **Full Feasibility Study** (complete technical and financial analysis)
- **Security Package** (for power purchase, construction, operation, insurance, fuel, etc.)
- **Financing Arrangement** (covering both equity and debt)

The process of satisfactorily completing these development stages is both time-consuming and costly. The greater number of hurdles, the higher the probability that the project will fail at some point and the investors/developers will lose all their investments up until that point. A greater number of hurdles also increases the chances for delays that will drive up project costs.

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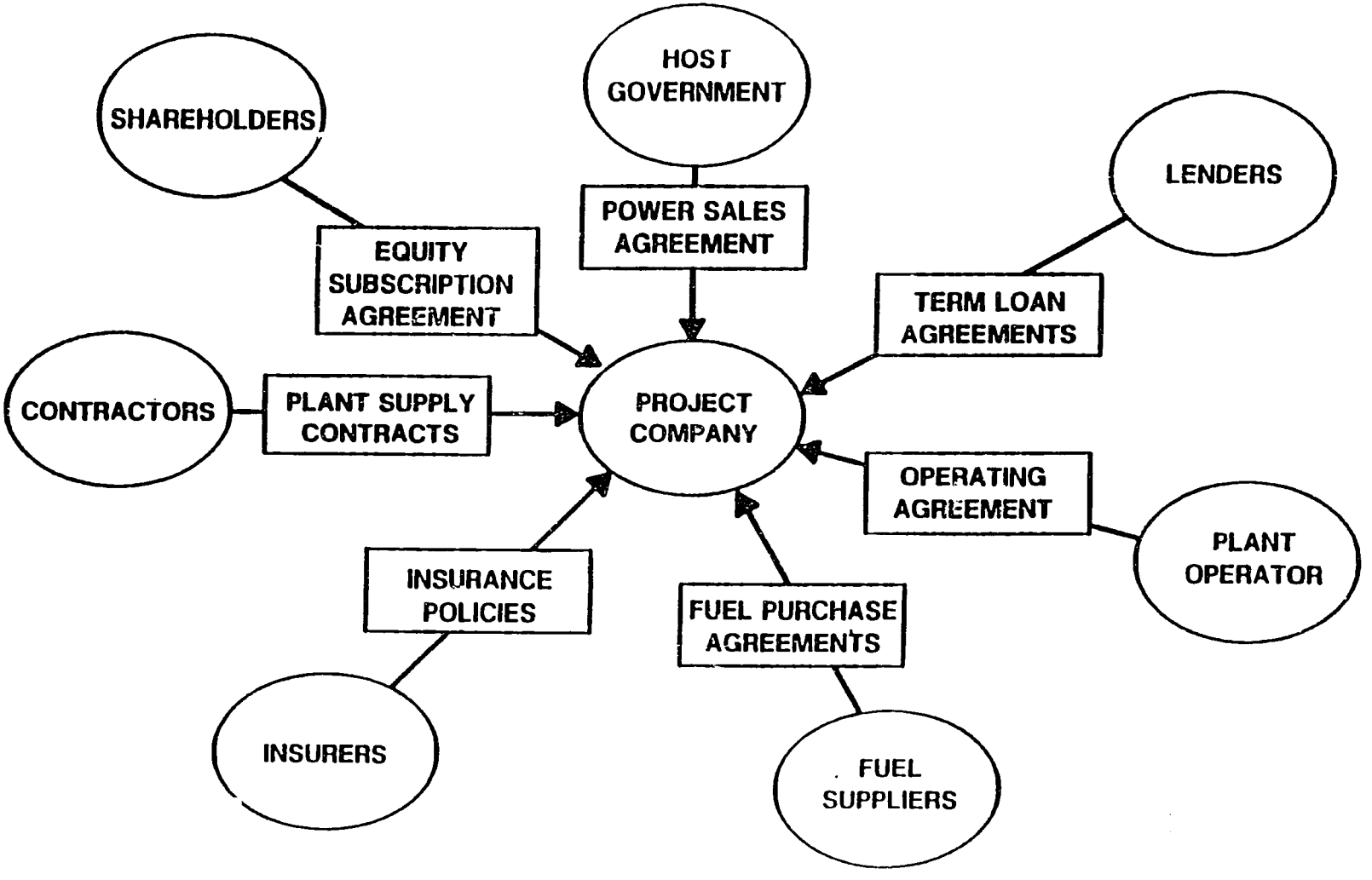
SECURITY AGREEMENTS FOR A PRIVATE POWER PROJECT



THE FORMATION OF A PROJECT COMPANY AND THE NEGOTIATION OF SECURITY AGREEMENTS IS THE WAY THE DEVELOPER REDUCES PROJECT RISK

In order to reduce the risks involved in large private power project development, the private developer establishes a project company that is based on limited-recourse project financing and enters into a range of security agreements:

Project Financing: With project financing and the formation of a project company, the debt and equity holders in the power project have little or no recourse to the financial assets of the parent company. For this reason, project financing is often considered as "off balance sheet" financing, since it minimizes the project's impact on the balance sheet and creditworthiness of the parent company.

Security Package: An interlocking web of security agreements are negotiated to minimize the risk to the project's investors and to allocate parts of the project's risk to those parties that are best able to manage it. These agreements cover the purchase of power, supply of fuel, construction and operation, insurance, investors, etc.

Only through the security agreement process is the developer able to convince the equity and debt holders to invest while simultaneously limiting its own exposure.

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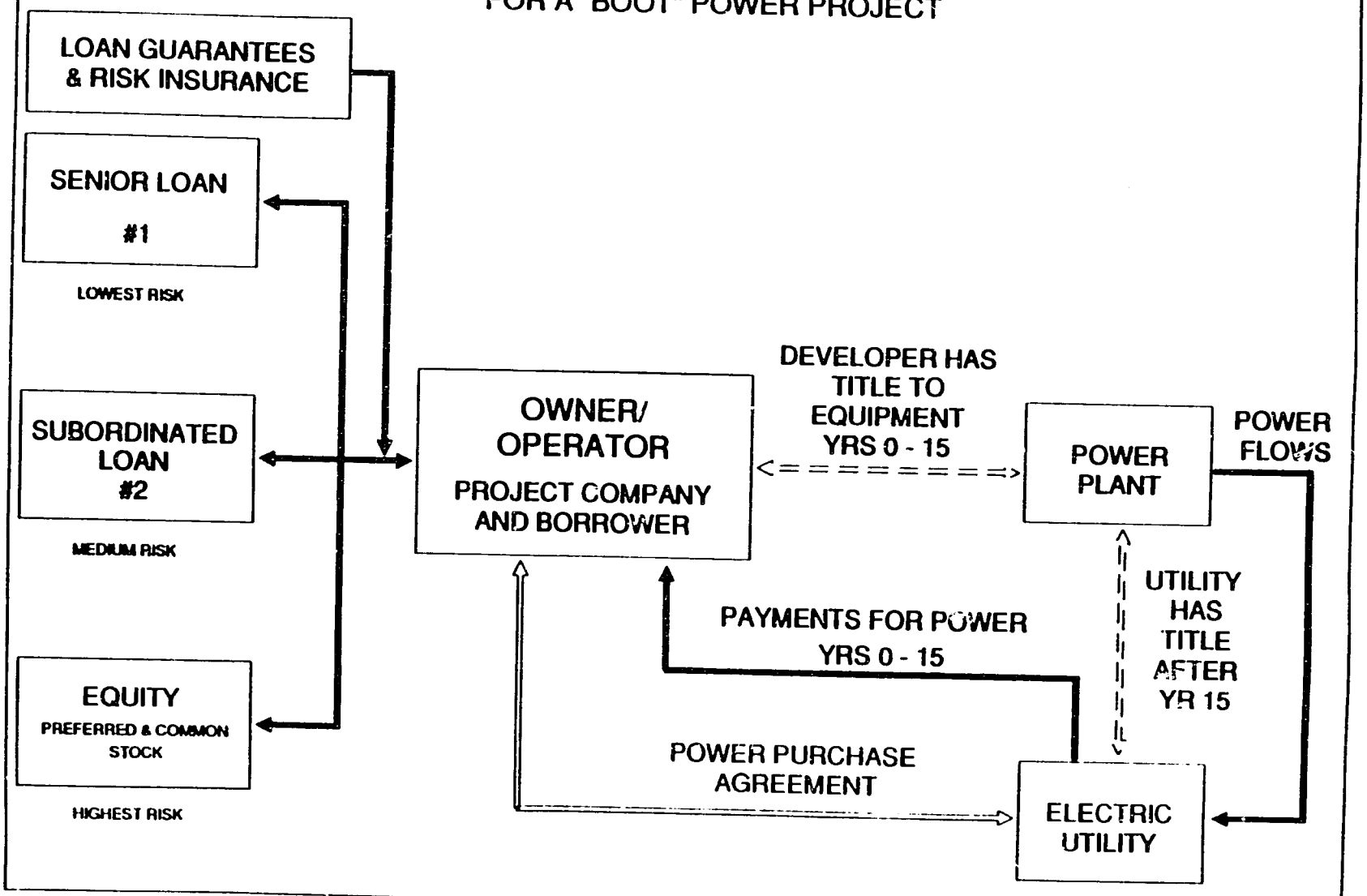
PRIVATE POWER PROJECT FINANCING

FOR A "BOOT" POWER PROJECT



POWER PROJECT FINANCING ULTIMATELY DEPENDS UPON RAISING ADEQUATE AMOUNTS OF DEBT CAPITAL

The successful implementation of a private power project is ultimately dependent upon raising sufficient quantities of debt capital. Private power financing in emerging economies typically requires about 20% to 40% equity and 60% to 80% debt. In developed countries, projects typically only require about 10% to 20% equity. Since the lenders provide the bulk of the capital, they represent the critical party whose interests must be satisfied.

Equity capital: The investors in common stock equity are the project owners and take the greatest risk because they are last to have any claim on the project's assets should it fail; in contrast they have the highest potential for reward should the project succeed. Preferred stock holders typically have no voting rights and earn a fixed dividend but are the first to earn dividends and have a higher claim on assets in the event of default.

Debt capital: The lenders or debt investors (particularly holders of senior debt) take less risk because they have first access to the assets or collateral of the project should it go bankrupt. As a result, they accept a lower rate of return typically in the form of a fixed interest charge.

Insurance and Guarantees: To reduce the risks of investing in a foreign developing country, developed country governments and multi-lateral banks provide insurance and guarantees for both debt and equity primarily against political risk.

The project lenders will scrutinize the company's performance, project financial projections, and country credit risk and will insist the project owners put equity into the project as a sign of confidence.

MECHANISMS FOR PRIVATE POWER PROJECT FINANCING PRESENT VARIOUS OPTIONS

Various ownership and financing mechanisms have been employed with private electric power projects. These different financial designs serve the different requirements of electric utilities and developers in terms of project ownership and operation.

Build, Own, Operate (BOO):

The private power developer finances, builds, owns, and operates the power plant and sells power to the electric utility under a power purchase agreement. The developer retains title and ownership to the power plant during its entire life.

Build, Own, Operate, Transfer (BOOT)

The project developer finances, builds, owns and operates the project and sells power to the electric utility for an agreed upon term. After a specific period of typically 20 years, the developer transfers ownership and operation of the power plant to the electric utility.

Build, Lease, Operate (BLO): The project developer finances and builds the power plant and then leases it to the utility in exchange for an agreed upon rent or lease payment. Leasing is particularly favored in those countries where the government or utility will not allow private and/or foreign entities to operate a major power plant. Leasing simply is a financing mechanism to employ private capital for a publicly operated power plant.

Debt/Equity Swap (DES): In a debt/equity swap, a sovereign debtor's foreign currency obligation to a commercial bank is exchanged at a discount for equity claims by an investor in the private sector. Debt/equity conversions have been endorsed by commercial banks as one means of reducing debt servicing burdens of highly indebted countries and increasing investments in the private sector.

These varied project financing mechanisms ensure that the equity and debt holders in the project earn their required return during the first 10 to 20 years of the project while meeting the utility's power and operational needs. Debt/equity swaps convert the excess debt that is unlikely to be repaid into productive equity investments.

PRIVATE POWER PROJECT SCALE AND CONFIGURATION

POWER PLANT CONFIGURATION

CENTRALIZED ⟷ DECENTRALIZED

POWER PLANT SCALE (MW)

> 50 MW	Power Plant Direct Sale To Utility; High Voltage Substation (BOO, BOOT, BLO, DES)		
5 - 50 MW		Power Plant Direct Sale To Utility; Lower Voltage Feeder (BOO, BOOT, BLO, DES)	Industrial Cogeneration: Utility-Interactive (BOO, BOOT, BLO, DES, BS)
1 - 5 MW			Industrial Cogeneration: Captive Power (BS, EL)
			Small Power Plant: Captive Power (BS, EL)

-- Build, Own & Operate (BOO)
-- Build, Own, Operate & Transfer (BOOT)
-- Build, Lease, Operate (BLO)
-- Debt/Equity Swap (DES)
-- Equipment Lease (EL)
-- Corporate Balance Sheet (BS)

PRIVATE POWER PROJECT SCALE AND CONFIGURATION DICTATE FINANCING STRUCTURE

The size of the project and the degree to which it is centralized or decentralized plays a key role in defining the type of financing mechanism that will be used:

	OFF-BALANCE SHEET FINANCING
MEDIUM TO LARGE SCALE PROJECTS (> 5 MW)	Build, Own, Operate (BOO) Build, Own, Operate, Transfer (BOOT) Build, Lease, Operate (BLO) Debt Equity Swaps (DES)
	BALANCE SHEET FINANCING
MEDIUM TO SMALL SCALE PROJECTS (< 5 MW)	Corporate Balance Sheet (BS) Equipment Lease (EL)

The larger the project, the greater the tendency for project developers to pursue the formation of a project company and the use of limited recourse or off-balance sheet financing. The developer's and lender's transaction and due diligence costs are roughly the same regardless of the project's size. The larger projects therefore are more attractive to lenders, since their processing costs are spread across higher potential revenues.

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IMPORTANT INTERNATIONAL SOURCES OF CAPITAL AND FINANCIAL SERVICES

The major international sources of capital and financial services are found in three distinct arenas:

- **Private Sector Investors** provide both debt and equity and involve commercial banks, institutional investors (e.g. pension funds), venture capitalists, individual investors, and equipment suppliers.

- **Multi-lateral Development Banks** mainly provide loans to developing country governments, but increasingly have developed institutions such as the International Finance Corporation (IFC) and the European Bank for Reconstruction and Development (EBRD) which take both equity and debt positions in private sector projects. The World Bank (IBRD) can also provide financing for private sector projects by onlending through a government institutions.

- **Government Export Trade and Investment Programs** such as those provided by the U.S. government provide funds for feasibility studies (e.g. US Trade and Development Agency (TDA)), equity and debt investments, and political risk insurance and loan guarantees (e.g. US Export Import Bank (EX-IM) and US Overseas Private Investment Corporation (OPIC)). These programs help US companies selling equipment or making investments overcome some of the critical risk and financial hurdles to doing international business.

By working together with these multiple sources of capital and financial assistance, private developers can assemble a financing package when the project and investment climate in Bulgaria are attractive.

PRIVATE SECTOR INVESTORS

	EQUITY INVESTMENT	DEBT INVESTMENT	DEBT/EQUITY SWAPS	PROJECT CO-FINANCING	EQUIPMENT FINANCING
COMMERCIAL BANKS		●	●	●	●
INSTITUTIONAL INVESTORS	●	●			
VENTURE CAPITALISTS	●				
INDIVIDUAL INVESTORS	●				
EQUIPMENT SUPPLIERS	●				●

MULTI-LATERAL DEVELOPMENT BANKS

	FEASIBILITY STUDIES	EQUITY INVESTMENT	DEBT INVESTMENT	INVESTMENT CO-FINANCING	LOAN GUARANTEES	LEASE GUARANTEES	POLITICAL RISK INSURANCE	TECHNICAL AND TRAINING ASSISTANCE
WORLD BANK (IBRD)	●		●	●				●
INTERNATIONAL FINANCE CORPORATION (IFC)	●	●	●	●				●
MULTILATERAL INVESTMENT GUARANTEE AGENCY (MIGA)					●	●	●	●
EUROPEAN BANK FOR RECONSTRUCTION AND DEVELOPMENT (EBRD)	●	●	●	●	●			●

U.S. GOVERNMENT TRADE ASSISTANCE PROGRAMS

	FEASIBILITY STUDIES	DEBT INVESTMENT	INVESTMENT CO-FINANCING	EXPORT EQUIPMENT FINANCING	LOAN GUARANTEES	LEASE GUARANTEES	POLITICAL RISK INSURANCE	TECHNICAL AND TRAINING ASSISTANCE
U.S. EXPORT-IMPORT BANK				●	●	●	●	
U.S. OVERSEAS PRIVATE INVESTMENT CORPORATION		●	●		●	●	●	●
U.S. AGENCY FOR INTERNATIONAL DEVELOPMENT	●	●	●					●
U.S. TRADE AND DEVELOPMENT	●							●

MAJOR RECOMMENDATIONS FOR ATTRACTING FOREIGN INVESTORS INTO THE POWER SECTOR

In order for Bulgaria to increase the level of both domestic and foreign private investment in the private sector, there are various measures that can be implemented:

- **Understand the needs of the private sector** so that the Bulgarian government can obtaining the best electricity price at the lowest cost to the country, while simultaneously satisfying the valid needs and concerns of the investor and developer.

- **Establish a legal framework** that responds to private sector concerns, is stable, and is relatively clear to understand and apply.

- **Streamline the negotiation process** between the government and private developers by reducing where possible the complexity involved in finalizing key agreements and contracts and obtaining the necessary permits and licenses.

- **Provide incentives** such as tax holidays and import tariff reductions that will reduce the project's costs in the critical early years. The first private power project may need extra incentives because it is the most risky and will set the stage for more to follow.

The goal is to create a policy and business climate that is a win-win situation for both the country and the individual companies and investors engaged in the private power projects. In the early stages, most if not all debt financing and some equity will come from multilateral institutions such as the EBRD, IBRD, and IFC.

KALOYAN DISTRICT HEATING PLANT CASE STUDY

Independent Power in Bulgaria Workshop

June 24, 1993

This case study describes an independent power project development opportunity at the Kaloyan district heating plant in Central Bulgaria. An international power project developer has presented a proposal to the electric utility, NEK, the Government of Bulgaria, and the banking community for developing this project. While the names presented in this case are imaginary, the facts and data are based on a real district heating cogeneration opportunity in Bulgaria. The following profile of the project is provided for a preliminary project negotiation at the Independent Power Workshop.

1) Proposed Cogeneration Plant

The current management of Kaloyan is considering a major investment over the next two years in a 53 MW cogenerating power plant to sell power to Bulgaria's electric utility, NEK. Given that the electric power requirements of the district heating plant is only 1 MW, 52 MW of capacity will be available for sale to NEK. The cogeneration plant will operate about 11 months of the year and will be prepared to offer firm capacity to NEK during this period. A favorable feasibility study has been performed to determine the technical configuration and investment and operating costs for the cogeneration facility. Due to a major shortage of capital, the owners and managers of Kaloyan are interested in attracting private investors.

<u>PROJECT INVESTMENT REQUIREMENTS</u>: The total installed cost for the boiler and turbogenerator is 469 million Leva. The fuel used by the cogenerator facility will be natural gas at a 1993 price of 1900 Leva/m3. In order to earn an adequate return on this capital investment, it is estimated that the project will have to charge an average price of 1.25 Leva/kWh for the electricity it generates. Currently, NEK only offers cogenerators a power purchase rate of 10% - 15% below the industrial rate, which varies for different times of the day (peak, day, and night) and year (winter and summer). This price discount is to cover the administrative and transmission/distribution costs. Based on this power purchase price scheme and using the most recent power tariffs, it is estimated that NEK would only be willing to pay an average of about 0.92 Leva/kWh for Kaloyan's power. From this information, it is clear that the developer of the cogeneration plant must negotiate a contract with NEK at a higher price than is currently being offering.

<u>PROJECT DEVELOPMENT OFFER</u>: The American Power Company (APC), a well-established international developer of cogeneration projects, has taken a great interest in owning and operating the proposed 53 MW gas-fired cogeneration plant at the Kaloyan

district heating plant. APC has entered into preliminary negotiations with COE and the future owners of Kaloyan, the municipality of Transition, about developing this cogeneration plant. As part of these negotiations, APC has offered to enter into a joint-venture with the municipality of Transition, where APC would become an 60% owner and the full-time operator of the facility. A group of private Bulgarian investors have in principle agreed to subscribed to 20% of the proposed company's stock. The municipality of Transition would own the remaining 20% of the project company and thereby have an interest in its success. Given that the project will require 20% or 92 million Leva of equity financing, APC and the Bulgarian investors are prepared to invest 80% of this equity, or about 73 million Leva. With APC's extensive experience in developing cogeneration project in over 5 countries, it has a clear set of terms it requires before it is willing to invest in a power project in Bulgaria. In principle, the developer has three basic objectives: (1) a secure revenue stream, (2) clear performance obligations and requirements, and (3) the ability to avoid risks beyond its control. Specific terms sought from the three major parties involved in the project are:

a) <u>Terms Requested from NEK:</u> APC wants the utility to enter into a 25 year power purchase contract in which it agrees to buy the power at an average rate of 1.25 Leva/kWh in 1993 and escalating at a rate that reflects the costs of natural gas and labor over the coming 25 years. It would like NEK to consider setting up a two-part tariff to pay for its power, with a capacity payment for firm capacity it delivers and an energy payment for electricity sold. Based on the above average tariff, the capacity payment would be 3,500 LV/kW year and the energy payment would be 0.75/LV/kWh.

b) <u>Terms Requested from Government:</u> Given the uncertain financial condition of NEK, APC wants the Ministry of Finance to enter into an implementation agreement that will effectively guarantee NEK's payment for power under its power purchase agreement with APC. APC is prepared to obtain all the permits necessary to operate this power plant. Given the use of a clean fuel (i.e. natural gas), APC is confident the plant will meet all the environmental requirements of the Ministry of Environment.

c) <u>Terms Requested from the Banks:</u> APC and the municipality of Transition are prepared to jointly invest 92 million Leva in equity and are seeking 377 million Leva of debt financing. APC is talking with the European Bank for Reconstruction and Development (EBRD), the International Finance Corporation (IFC), the World Bank, and the United Bank of Bulgaria to obtain the most favorable financing terms. APC is seeking debt financing over at least 10 years.

APC has been given assurances from the Ministry of Industry that it could obtain a long-term gas supply agreement. The gas will be imported from Russia and delivered to Kaloyan through the existing gas pipeline.

In order to advance this project, APC has been invited to enter into preliminary negotiations with the government, NEK, and the bankers on this project at the beautiful Rila Hotel in the mountain town of Borovets. It is hoped that these initial negotiations will clarify the acceptable terms for all the parties involved in this proposed project.

ELECTRIC UTILITY (NEK) CONDITIONS: NEK's overall objectives are to (1) deliver least cost and environmentally-clean power, (2) encourage independent power in a way that meets the above objectives, (3) procure power that is reliable, and (4) ensure that connected power plants meet its dispatching criteria. NEK projects that it will be needing about 350 MW of additional intermediate and base load capacity by the year 1996. Having recently completed a least cost utility plan, it has learned that industrial cogeneration capacity represents one of its least cost options. The average cost of generation estimated from this least cost plan is 1.32 Leva/kWh in 1994. NEK already has extensive experience with buying power from industrial and district heating plant cogenerators under 1 year contracts and at tariffs that are below its avoided cost of generation. These cogenerators have existed at government-owned facilities that have involved subsidies and investment criteria that generally would not be acceptable to private investors. NEK will need to considerably improve the terms it is willing to offer cogenerators in order to attract private capital.

GOVERNMENT OF BULGARIA CONDITIONS: The Government's major objectives are to (1) mobilize the private sector and international capital, (2) enhance tax revenues, (3) ensure the supply of electricity that is least cost, environmentally-clean, and reliable, and in the process (4) avoid offering sovereign guarantees and subsidies. The Ministry of Finance has traditionally been subsidizing NEK to cover its financial losses. NEK has agreed to eliminate its need for subsidies through tariff increases and management changes by the year 1995. The request by private investors for a government guarantee covering NEK's payment of power represents a problem for the Ministry of Finance. On the one hand, by agreeing to offer a guarantee, it would effectively assume financial liabilities in the event that NEK defaults on its power purchase agreement with the independent power generator. While it wants to support private investment in the power sector since it helps NEK to improve its financial performance, the Ministry of Finance is facing other requests for government guarantees in other sectors of the economy as well. It must weigh its options and priorities before issuing any such guarantee.

BANKER/INVESTOR CONDITIONS: The key objectives of investors and bankers are to (1) earn a return that is commensurate with the risk taken, (2) ensure that the risks are properly managed

through the security package, and (3) confirm that the utility is sufficiently creditworthy. The multilateral banks (i.e. World Bank, IFC, and EBRD) are very interested in making investments in bankable independent power projects in Bulgaria. Both the IFC and the EBRD are willing to provide both debt and equity for attractive power projects. The World Bank is able to on-lend to such projects through a Bulgarian government institution that is willing to offer a government guarantee. Commercial banks however are very cautious in Bulgaria's current economic condition. With interest rates exceeding 60% and Bulgaria commercial debt negotiations still being unresolved, most foreign commercial banks will not be willing to make any investments at this time. Domestic banks in Bulgaria typically are only willing to lend for no more than 1 to 2 years at prevailing interest rates.

The above profile of a proposed independent district heating cogeneration project provides the framework for preliminary negotiations. Four working groups representing; (1) the developer, (2) the utility, (3) the government, and (4) the banks will each need to clarify their respective position in these negotiations.

2) District Heating Plant Background Profile

The Kaloyan District Heating Plant is located in the town of Transition, a community of 115,000 people in Central Bulgaria. This district heating plant was built on municipal land and put into operation in 1976 by the Government of Bulgaria. Presently, the district heating plant is the sole property of the Government under the Committee of Energy (COE). However, according to a decree of the Council of Ministers, ownership of the plant will be transferred to the Municipality of Transition in January, 1994.

OUTPUT CAPACITY: Kaloyan has the capacity to supply about 250 Gigacalories per year or about 200 tons/hr of thermal energy in the form of steam and hot water to industrial, commercial, institutional, and residential customers. The plant is configured with 8 boilers with a remaining useful life of between 7 and 15 years. The plant is in reasonably good condition with investments in upgrading of the distribution system being called for.

FUEL USE: At full capacity, the plant consumes about 32,100 tons per year of heavy fuel oil. Due to the economic slow down during 1991 and 1992, output has only been around 100 Gigacalories per year, with fuel oil consumption at 13,500 tons per year. A gas pipeline has already been built to the district heating plant for future use.

CUSTOMERS FOR STEAM AND HOT WATER: Currently Kaloyan supplies 95% of its thermal output in the form of steam to 27 industrial

customers involved in the production processed foods, beer, and textiles. The remaining 5% of the thermal output is in the form of hot water sold to residential and administrative buildings involving over 24 apartment buildings (with about 4000 apartment units), one hospital, and two schools.

STEAM PRICES: Stream prices traditionally did not reflect the full costs of production. In May of 1993, however, the prices of steam for all COE district heating plants were increased to the point that at least industrial and commercial customers cover the costs of steam production. The new 1993 tariff levels depend on customer type: industrial customers: 610 LV/GCal; commercial customers: 488 LV/Gcal; administrative customers: 350 LV/Gcal; and residential customers: 238 LV/Gcal. It is estimated that the average cost of steam and hot water production in 1993 is about 500 LV/Gcal. Industrial and commercial customers, therefore, cover more or most of the costs of production, while administrative and residential customers pay well below the costs of production and are thus partially subsidized by the Ministry of Finance and by a cross-subsidy from industrial customers.

FINANCIAL STATUS: It is estimated that in 1993, total revenues from steam sales will be 44 million Leva. The total cost of producing steam for this period will be 62 million leva, representing a loss of 18 million Leva for the year. Even though 95% of the customers are industrial and recently started paying a steam price that more than covers the cost of production, during the first four high steam consuming Winter months of 1993 (January - April), the industrial steam prices were still subsidized. While there will be an overall loss for the year 1993, it is projected that the 1993 steam tariff increase will result in a total revenues of 69 million Leva in 1994, resulting in a net income before taxes of 5 million Leva for this year. This improved financial condition will also be affected by a planned 1994 increase in the traditionally subsidized steam prices for residential and administrative customers.

DEVELOPER OBJECTIVES:

1) SECURE REVENUE STREAM

2) CLEAR PERFORMANCE OBLIGATIONS AND REQUIREMENTS

3) AVOIDANCE OF RISKS INVOLVING EVENTS BEYOND THE DEVELOPER'S CONTROL

KEY CONTRACT PROVISIONS

1) POWER PURCHASE AGREEMENT

   a) PRICE TERMS / REVENUE STREAM

   b) DISPUTE RESOLUTION

2) IMPLEMENTATION AGREEMENT

   a) GUARANTEE OF UTILITY PERFORMANCE

   b) TAX STABILITY

   c) CONVERTABILITY & PROFIT REPATRIATION

   d) PROTECTION FROM CHANGES IN THE LAW (e.g. Environmental Laws)

   e) DISPUTE RESOLUTION

UTILITY OBJECTIVES:

1) DELIVERY OF LEAST COST & ENVIRONMENTALLY-SOUND POWER

2) DEVELOPMENT OF THE INDEPENDENT POWER MARKET

3) DISPATCHABILITY

4) DEPENDABLE CAPACITY

CONTRACT PROVISIONS:

1) PRICE TERMS

   a) CAPACITY AND ENERGY SPLIT

   b) INDICES

2) DISPATCH AND OPERATIONAL CONTROL

3) CAPACITY AUDITS

4) MILESTONE SCHEDULES

5) SECURITY AND PENALTY PROVISIONS

6) DISPUTE RESOLUTION

INVESTOR AND BANKER OBJECTIVES:

1) EARN A RETURN COMMENSURATE WITH THE RISK TAKEN

2) ENSURE THAT RISKS ARE ALLOCATED TO THOSE PARTIES BEST ABLE TO MANAGE THEM

3) ENSURE THAT UTILITY MEETS CREDITWORTHINESS CRITERIA

CONTRACT PROVISIONS:

1) WELL STRUCTURED SECURITY PACKAGE

2) GOVERNMENT GUARANTEES

3) PROTECTIONS AGAINST CURRENCY AND INFLATION RISK

GOVERNMENT OBJECTIVES:

1) MOBILIZE PRIVATE SECTOR AND INTERNATIONAL CAPITAL

2) ENHANCE TAX BASE AND REVENUES

3) SUPPLY ELECTRICITY THAT IS LEAST COST, ENVIRONMENTALLY-CLEAN, AND RELIABLE.

4) AVOID HAVING TO OFFER SOVEREIGN GUARANTEES

5) AVOID OFFERING ANY SUBSIDIES