
**ENERGY EFFICIENCY POLICY
AND INSTITUTIONAL ISSUES
SUMMARY REPORT**

BULGARIA

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Introduction

In February 1991, the U.S. Agency for International Development (A.I.D.) initiated the Emergency Energy Program for Eastern and Central Europe, a program designed to help the newly emerging democracies of the region cope with some of their most pressing energy problems.

The first component of the Program, Industrial Energy Efficiency, involved conducting audits of eight major industrial facilities in Bulgaria. At these facilities, IRG engineers analyzed the current energy situation, recommended changes in operational and maintenance policies, strategic planning, and investment decision-making, and specified low-cost equipment items to be purchased as part of the Program.

In conjunction with the energy audits, IRG also analyzed the policy and institutional factors influencing energy-efficiency decision-making in Bulgaria. This analysis was meant to supplement the initiatives taken in the eight demonstration plants and provide insights into the best use of the demonstration results as the basis for broad national energy-efficiency improvement.

This report summarizes the main policy and institutional factors which influence the ability of the industrial sector to adopt operational, maintenance, and investment practices that optimize the use of energy as an industrial input.

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Government Policy Reform and Restructuring

The Government of Bulgaria has embarked on an ambitious restructuring program. Although the program still is in its early stages, the Government already has taken many important steps.

- In the **financial sector**, it has floated the Lev and made it internally convertible; broken up the former State Bank into a central bank and approximately 80 separate, competitive commercial banks (14 of which hold a full banking license for all types of transactions including foreign exchange dealings); contracted the domestic money supply; and raised interest rates to a current level of well over 50%.
- In general **economic development policy**, it has freed virtually all prices other than those of energy and foods and other staples from Government controls, and has enunciated a new policy emphasizing agriculture and agroprocessing, light industry, tourism, and sustainable use of domestic natural resources, and de-emphasizing heavy industry. If implemented, these changes will substantially reduce the energy and materials intensity per unit of Gross National Product, which Government experts estimate to be between 1.4 and 1.7 times that of Western countries.¹
- In the **industrial sector**, it has introduced and largely implemented a demonopolization and decentralization program. With few exceptions (many of which are in the energy sector), domestic and export market monopolies have been abolished, and all but a handful of the largest state enterprises (including some energy enterprises) have been broken up into small companies. The Government has eliminated direct subsidies of state enterprises from the government budget. Although much remains to be done, the Government has taken the first steps (including legal and analytical processes) toward wholesale privatization and has privatized a few small and medium-sized enterprises.
- To provide a **legal framework** for transition to a market economy, it has passed new laws which, among other things, establish a Western accounting and taxation structure for enterprises and return certain agricultural lands to their former owners.

The stated Government position is that it has eliminated monopolies of the old Kombinats by breaking most of them into smaller units, raised energy prices to world levels and removed price controls for most other products, and eliminated government budget subsidies

¹ Bulgaria has analyzed the present and projected energy and materials intensity of their economy, but these were completed before economic and political changes. Analyses are currently being revised to take into account expected restructuring impacts. In addition, a World Bank consultant, Dr. Gordon Hughes, and his colleagues are conducting independent assessment based on international competitiveness of Bulgaria's major industries, as well as an input-output model of the economy with coefficients for energy and materials consumption, as well as environmental impacts. Preliminary results are expected by June 1992.

of all enterprises. The Government will now take a "hands-off" approach, allow individual enterprises to fend for themselves, and let the market determine which will survive. Meanwhile, the Government - with assistance from an EC-funded consultant team led by Price Waterhouse and Development Finance Corporation - recently analyzed major sectors and soon will begin to assess individual enterprises, with the intention of privatizing those enterprises which survive the "shake out" period.

Energy Pricing

Energy is one of the few sectors in which prices have not been fully or largely decontrolled. The Government has moved most energy prices, other than those for household energy, towards world levels; it is attempting to create conditions where those segments of the industry suitable for competition (such as petroleum products distribution) move to free-market pricing, while those in which there are natural monopolies (such as transmission of gas or electric power) adopt regulatory pricing policies, including incentives for efficiency.

The Government (National Pricing Commission) raised all energy prices 70% in June 1991. These increases reflect agreements with the IMF and the Government's desire to eliminate subsidies of energy enterprises from the State Budget (the prior budget included a subsidy of 25 billion Leva for the Committee on Energy alone). It announced much smaller price increases in late 1991 and again at the beginning of 1992. The National Price Commission now adjusts ceiling prices of petroleum products twice monthly; Table 1 summarizes these as of February 1992.

While most prices (including petroleum product prices) reflect world-market costs, those of electricity and heat to households remain below international levels. The National Electricity Company asserts that electricity prices still cover fuel and other operating and maintenance costs, but contribute only a small fraction of the amount needed for capital to construct new plants (i.e., prices are well below long-run marginal costs). The Government also maintains that remaining price subsidization of district heating to households exceeds profits made on the sale of heat and steam to industries², making aggregate production of heat and steam unprofitable. In mid-1991, the Committee on Energy proposed raising power prices by 112%, versus the actual price increase of 70%. Outside analysts have recommended that average electricity prices be raised by at least 20%, and that electricity and heat prices to households be raised by 2 to 3 times this percentage. From mid-1991 to mid-1992, rates to individual users have risen by less than 10%, and household rates had not changed at all.

Current energy prices seem to represent full-cost pricing of fuels delivered to industry; however, subsidies largely remain in the residential sector. Certainly the increase in energy prices, combined with the elimination of subsidies to state enterprises and other changes, has created a strong incentive to improve the efficiency of energy use and to pursue alternative sources of energy supply. In 1989, for example, an enterprise faced a price of L112 per 1000 normal cubic feet for natural gas; by early 1991, the price was L767. Now, an enterprise must pay L22000 per 1000 cubic feet.

² The Committee on Energy estimates that gas fuel for heating costs L270. The Committee charges industry L345/GCal for heat but households only L85/Gcal.

TABLE 1
ENERGY PRICES IN BULGARIA
(as of February 1992)

Petroleum Products	
Diesel	6 lev/litre
Unleaded Gasoline	7 lev/litre
Fuel Oil	
1% sulphur	3260 lev/tonne
3.5 sulphur	2110 lev/tonne
Liquified hydrocarbons	10.14 lev/kg
Natural Gas	1899 lev/1000 m ³
Coal	23.25 lev/tonne (industrial)
Electric Power	.787 lev/kWh (industrial)

Other issues include the future pricing of coal (which is being de-monopolized and whose prices in theory can be set competitively, but where in fact many mines are currently subsidized), the mechanism for automatically changing electricity prices to reflect changes in fuel prices and the power company's fuel/capacity mix,³ and the adequacy of electricity prices as a basis to raise capital for new power plants and as an incentive to limit consumption. The Ministry of Environment also wants to introduce resource depletion charges (which will apply to coal and other domestically mined products), more stringent air emission standards, and higher fines for air emissions or other pollution in excess of standards. Any of these options could have substantial energy cost impacts which should be reflected in higher prices.

External Trade and Finance

National and plant-level economics are heavily influenced by:

- the collapse of the Council for Mutual Economic Assistance (CMEA) regional trading block;
- the need to pay the former USSR from the beginning of 1991 in dollars rather than in convertible rubles for all external trade; and
- the breakup of the former USSR.

The USSR and the Government of Bulgaria negotiated a bilateral trade agreement for 1991, under which Bulgaria was obligated to deliver a range of agricultural commodities and products of selected heavy industries in return for imports from the USSR of oil, gas, and other

³ Until recently less than 12% of electricity generation was based on oil and gas. The rest was nuclear, coal or hydro. In 1989, nuclear accounted for 33% of both in-house installed capacity and total kilowatt hours generated. The new 1000 MW Kozloduy unit would have increased total nuclear capacity by an additional 36%. Now, with all of the first four units of Kozloduy to be shut down (although there is disagreement on timing), the mix will shift dramatically toward hydro and natural gas, with important cost and price implications for the power system.

commodities. However, the level of trade under this agreement was greatly reduced from that of former years, and it appears actual trade fell even lower. These changes have important energy, as well as economic, implications. Of all the Eastern European countries, Bulgaria is by far the most dependent on imported energy, most of which has been supplied by the former USSR.

Sector Analysis

Oil

In oil, the Government has de-monopolized marketing and distribution of petrol and has begun to privatize gas stations, in order to establish broad competition in marketing and distribution. The Government allows large users of petroleum products to import their fuels directly (though most still deal through Neftochim or Chimimport), and has exempted fuels which are imported directly for use by gas stations from taxes, which creates a substantial incentive for new firms to enter the business but which can create large windfall returns for importers of petroleum products. This is particularly important given the Government's suspicion of collusion in bidding for some gas stations.

The Government is only beginning to consider the future of the Burgas and other refining and petrochemical complexes. Meanwhile, Neftochim has entered into some contract refining arrangements to utilize its substantial spare capacity; they are also trying to form a joint venture to get involved in downstream marketing and distribution itself, and talk of setting up an affiliate to improve boiler efficiency (even though its own boilers appear to be operated at least as inefficiently as those in other large industries).

Perhaps the central shortcoming to Bulgarian oil policy is the lack of coordination between pricing, fiscal and trade policy goals, with the Burgas refinery the primary vehicle through which this lack of coordination is evident. Specifically: 1) the tax structure encourages imports, particularly if they can be mis-certified to avoid excise taxes; 2) the lack of refinery control over refinery gate sales prices and often delayed payment in leva discourages domestic sales and refinery utilization to meet domestic demand in favor of processing deals which result in hard currency payments (needed to finance imports); 3) previous incentives to export products (retaining 50 percent of hard currency earnings) to finance imports were apparently more than offset by dis-incentives related to below-market real domestic prices and the requirement to sell products at the official leva exchange rate. Alternatively the excise tax can be avoided with "certified exempt" imported product, but payment is officially required in leva (at a real rate well-above the official exchange rate) while importers will typically deal in prompt dollar payment at lower real prices. And; 4) the refinery's output also is held to stricter quality inspection standards than imported products. Thus, the Neftochim Burgas Refinery is in a position of losing market share to importers, without either the financial or regulatory support of the government. As a result, the overall oil supply and distribution system suffers from the lack of system optimization and coordination owing to these various price, tax and currency value dis-incentives.

Electricity

In electricity, the Government has created a new National Electric Corporation (NEC)

out of the former Committee on Energy. Earlier, it had separated coal mines from the Committee. (Captive lignite mines remain attached to the minemouth plants such as that at Maritza East which they supply).

Industry and other outside sources already account for some 10% of total power generated, and the Government has announced it will privatize a few small hydropower plants. Thus far, the Government appears to assume that with small exceptions, the NEC will continue to be a state-owned monopoly, subject to government oversight/regulation policies which have yet to be developed.

The Government may wish to reconsider whether continued state-owned monopoly of electricity generation and distribution is in the national interest. First, generation and transmission-distribution efficiencies do not appear up to Western standards. Second, once economic activity and consequently power demand begin to rebound, the country will need to invest in:

- new capacity to replace the closed Kozloduy nuclear power units
- additions to the nation's electricity peaking capacity
- rehabilitation, repowering, or replacement of older, less efficient thermal power units
- environmental controls at least in heavily impacted areas such as the Maritza East complex

Given likely limits on official lending, the international private sector should be tapped as an important source of financing.

Natural Gas

Some of the same issues also exist with respect to gas; Bulgargas appears likely to continue its monopoly over gas transmission as well as distribution. NEC officials state that Bulgargas has continued to import a fixed quantity of gas historically used entirely by industry. The company has been reluctant to provide gas for household heating, despite the fact that the use of gas would be much less expensive than that of electricity, not considering the cost of distribution piping and other equipment. In fact, with industrial demand down, Bulgaria did not use all the gas for which it had contracted in 1991 and was preparing to initiate limited supply of gas to households in local demonstrations.

It appears desirable to assess possible decentralization of gas distribution, including establishment of cooperatives or other new enterprises capable of financing, operating, and maintaining distribution systems for local non-industrial use. If distribution were decentralized and split off from the gas import and transmission enterprise, the Government would have a number of pricing options, including:

- allowing prices to be fixed by bidding among users;

- negotiating with the transmission company; or
- continuing price controls with regulated markups for both the transmission company and various categories of distribution companies.

Any increase in interfuel or intrafuel competition - including the options discussed above for petroleum products, electric power, and gas - is likely to lead to more efficient energy use for two reasons. First, with greater consumer choice and prices which more closely reflect actual costs, each consumer can select the form of energy most efficient for his specific needs. Second, as competition increases, some energy suppliers are likely to offer to help users improve energy efficiency as a way of attracting more customers (this could be an important part of the supplier's marketing strategy).

Energy Regulatory Issues

The Ministry of Industry oversees oil and gas, and in 1991, took over responsibility for coal from the Committee on Energy. It also oversees enterprises spun off from the former Kombinat for Industrial Energetics. The Committee on Energy appears has responsibility for electric power policy and, through the former Inspectorate for the Rational Use of Energy, also has a network of energy auditors throughout the country. The Committee is also able to contact Energoprojekt as an additional power sector analysis resource. However, the Ministry of Building Industry has responsibility for encouraging more efficient energy use in buildings, the Ministry of Agriculture for improving energy use in the agribusiness sector, and Transport and other relevant ministries are responsible for energy use within their individual sectors. Each organization can look at policy issues within its sphere of responsibility, but none has an overall energy sector perspective.

The only group within the Government which has responsibility across Ministries is the Committee on Prices, now responsible largely for energy prices. This group has virtually no energy staff or expertise, and is gradually cutting back its role. The Central Statistics Office can also take a sector-wide view, and in fact, collects data on energy use by individual enterprise. Since energy planning and statistics were formerly the exclusive responsibility of the Ministry of Economics and State Planning, the CSO was precluded from energy-sector analysis or sector-wide information reporting and as a consequence, has limited sectoral expertise.

A condition of the World Bank Structural Adjustment Loan is that the Government establish an integrated energy policy unit at a level reporting to the Council of Ministers. Establishment of such a unit has been debated for months without resolution. Two options under consideration are the Committee on Energy or a Deputy Ministry for Energy under the Ministry of Industry, Trade and Services. A May 1992 reorganization of the Ministry of Industry further complicates the future for government energy policy making.

The Government has not previously had energy regulatory bodies on the presumption that all energy supply institutions were state-owned and therefore by definition represented the public interest (a view which subsequently has been discredited throughout the economy). Though some aspects of the industry, such as gas stations, may have enough different enterprises to enable competitive markets to set prices efficiently, the country still is likely to have monopolies or oligopolies for power and natural gas transmission, refining, and for power

generation. The Government, therefore, will need to institute a regulatory regime to monitor these monopolies and ensure that the public is protected and that companies earn a rate of return sufficient to attract needed new capital investment.

Plant-Level Issues

Most new enterprises are not able to start with the full range of experience needed to survive as competitive entities. Most were simply production units, with rudimentary Soviet-style plant-level accounting. Marketing either was performed by separate export trading monopolies, by the umbrella Kombinats or, for the many plants producing for a government plan, was nonexistent. Most decisions typically made by managers of a Western enterprise were not made by the plant managers in Bulgaria but by someone higher-up. In fact, throughout Eastern Europe, plant managers and staff seem to have been discouraged from exercising management initiative of any kind.

Suddenly expected to become effective marketers and managers, officers of most enterprises see their traditional domestic or export markets declining rapidly. Primary sources of marketing skills were historically the Kombinats and former export trading companies, representing heavy industry or agriculture. Emerging enterprises do not have this marketing base, imperfect as it may have been, on which to build. Traditional industries thus start with an important advantage or disadvantage.

Second, traditional heavy industry has another unintended competitive advantage. In the current transition period, a Bulgarian enterprise faces a capital charge which appears in most cases to be only a tiny fraction of the plant's true cost of capital.⁴ Worldwide, the cost of capital is a major budgetary component for heavy industries. Since they do not have to repay or even account for anywhere near full capital costs, existing Bulgarian enterprises especially metallurgy and chemicals - have a broad margin for discounting. This margin, combined with Western traders' strong interest in contract (toll) refining, manufacturing, or other non-ownership arrangements which would lower processing costs, may be sufficient to enable even old and inefficient plants to remain active a few more years.

Third, while the Government has eliminated direct budget subsidies to industry, in late 1991 it appeared that well-connected enterprises were still able to secure additional short-term credit from the former state banks with which they have dealt for years, without having to demonstrate they were credit worthy in the new market environment. Companies also were getting cash by stretching out or stopping payments to suppliers. Bulgargas, for example, had roughly 1 billion Leva in receivables in mid-1991, stemming from volumes above the contracted amounts, primarily from those chemical companies that use natural gas as feedstock. Much of the money from both sources could cover operating losses which may not otherwise be recoverable.

⁴ Government regulations state that the accounts of an enterprise must include an annual charge of 8% of the capital cost shown on the books of the enterprise. The percentage itself, which covers not only capital requirements but also equipment maintenance, appears far too low. In addition, capital on the books of all enterprises, even those that imported 100% of their equipment, still is based on former Lev exchange rates. Finally, much capital investment does not appear to be reflected even after taking into account these factors.

The Central Bank, Ministry of Finance, and Ministry of Industry all recognized this was happening and justified it on the basis that they did not want a cutoff of credit to force an enterprise into bankruptcy - "the market" should do that. The problem is that, in the West, it is precisely through the financial institutions that the market forces companies that are not viable out of business. Thus, the Government is not letting a primary free-market instrument operate effectively. Heavy industrial enterprises are most likely to gain access to short-term credit or to have the power to not pay their bills but to force suppliers to keep delivering - counter to the Government's stated restructuring objectives. Finally, as in Hungary, the Government may be forced to cover bad debts and accounts receivable to keep its new banks solvent, and to keep otherwise sound companies with bad receivables from collapsing.

The current overriding objective of Bulgaria plant managers is survival - whether for the enterprise which they lead or their personal survival. This generally leads them to focus on the following priorities:

- **Markets and Marketing:** One option being pursued vigorously is to attract joint venture or other arrangements with foreign partners offering market access.
- **Cost Reduction and Quality Improvement:** In virtually all export and domestic markets, there is pressure to improve cost-competitiveness and to enhance product quality. In heavy industry, energy makes up a sufficiently large percentage of the product cost to represent an important target for reduction. Even in mid-sized industries, however, the IRG Team found that substantially higher prices were forcing managers to seek ways to reduce such expenses.
- **Environment:** A few industries are targets of a powerful environmental movement and of local towns and villages affected by the plants' environmental contamination. Thus, in ferrous and non-ferrous metals and chemicals as well as in oil refining, enterprise managers are being forced to devote much of their energy to finding ways to deal with growing local opposition. Other industries are affected to a lesser extent, with most environmental pressure directed at reducing air emissions associated with industrial processes (e.g., smelting or boilers). In these cases, environmental and energy improvement go hand in hand.
- **Capital Investment:** Many managers see cost reduction, quality improvement, and environmental improvement in target industries, as requiring major capital investment. This may be at least as important a motivator in considering joint ventures as market access. As the Government and donors consider investment funds which bypass the financial system, there are signs of political jockeying for such funds.

Demand for Energy Efficiency Improvement Assistance

Managers of the participating plants had a strong interest in energy efficiency improvement but did not have the capability to recognize and implement such measures by themselves. They lacked an effective energy accounting system (or in most cases an effective cost accounting system), basic instrumentation to measure energy flows, and instruments to

control energy use (e.g., boiler controls). With few exceptions, most responsible personnel lacked awareness of the specifics and extent of energy wasted and of the measures needed to use energy more efficiently.

This reflects in part the lack of importance placed on energy in the past, which in turn was reflected not only in in-plant operations and incentives but, for example, in an apparent decline in the quality of energy engineering and economics taught in schools at all levels. Poor energy management often reflects poor plant operations and management and often parallels poor cost and quality control, environmental housekeeping, labor relations, or other aspects of operations and management. The standard of maintenance in many plants is unacceptably low and is a significant contributing factor to energy waste. In all plants surveyed by the IRG Team, managers and engineers said they needed substantial investment in new equipment to improve efficiency.

Based on results of the initial A.I.D. program, IRG estimated that savings of 12% in electricity use and 10% in thermal energy use are possible with little or no capital investment. What little capital investment is required under this category has a payback period of less than six months. With longer-term, capital-intensive investments (and considering only investments with paybacks of two years or less), savings of roughly 30% in electricity and thermal energy use are possible. These estimates, however, presume ongoing, effective programs for in-plant energy management which have the visible backing of top plant management and include energy-use targets, energy accounting and analysis, and strong motivational and training programs. Without such infrastructure, discrete technical changes will be of limited, temporary value.

Energy Efficiency Improvement Equipment and Services

The underdeveloped nature and uneven quality and reputation of the energy efficiency industry is more important than demand constraints in the development of energy service activities. The current industry in Bulgaria includes:

- energy audit and efficiency-improvement service entities of the former Committee on Energy's Inspectorate for the Rational Use of Energy -- (which has its headquarters in Sofia and seven branches around the country)⁵
- eight former units (now separate enterprises) of the Kombinat for Industrial Energetics (SK Promishlena Energetika)
- private firms that either have conducted energy audits and implemented no-cost/low-cost efficiency improvement programs or would like to do so. (The Committee on Energy says that roughly twelve enterprises, including the former Industrial Energetics units, have registered with it to provide such services.)

⁵ At the time of NEC's creation, the Government decided to leave the Inspectorate in the remaining Committee. However, there is some question whether the new smaller Committee (now essentially an energy policy unit) will retain the former Inspectorate, spin it off as a whole or in separate units, transfer it to the Ministry of Industry (which would like to form its own unit to help small and medium-sized enterprises improve energy use), or shut it down.

Except for units equipped by A.I.D. as part of the Emergency Energy Program and the German-Bulgarian joint venture described earlier, virtually no private enterprise or Government unit has adequate equipment to conduct energy audits or to identify and institute energy-improvement programs. IRG field teams also perceived that the capabilities of the Inspectorate staff varied widely and concluded, based on conversations with industry engineers, that most Inspectorate and former Kombinat units had poor reputations.

Reflective of the low priority formerly accorded energy efficiency, the Technical University provided only elementary training in energy use monitoring efficient boiler operation. Thus, while overall engineering training may be good, there is not a pool of well-trained energy efficiency specialists to be tapped by enterprises providing energy-efficiency improvement services. In fact, there may not even be enough local experts to train such a pool without substantial infusion of technical expertise from outside the country.

A closely related area is boiler maintenance, the responsibility of a separate Kombinat (SO Energoremont) which - like the Kombinat for Industrial Energetics - is now an independent enterprise. This organization focuses on maintaining or rehabilitating boilers and not on training individuals in routine boiler maintenance or in efficient boiler operation. As the Industrial Energetics units, boiler maintenance units are said to suffer from spotty staff quality, and their equipment is outdated but useable.

Present and prospective providers of energy efficiency services need up-to-date energy measurement equipment and rigorous training in its use. For example, hand-held stack gas analyzers can produce sizeable measurement errors if not checked for proper calibration, and can lead to prescriptions which will reduce, rather than improve, boiler efficiency. They also need to build an understanding of all aspects of a true energy management program, including in-plant employee and management motivation, energy accounting, financing, and others.

There are some state-owned enterprises that produce energy instrumentation or energy controls, but such equipment is often outdated, energy-inefficient, and unreliable. For example, most Bulgarian-produced industrial boilers have hand dampers to adjust inlet air; virtually none have oxygen analysis or stack-gas analysis instrumentation - equipment which the IRG team found would have a very short pay-back period. Standard boiler designs are at least 25 years out of date and there is no commercial production of waste-heat boilers or of multi-fuel industrial boilers capable of burning wastes (or coal).

Domestically produced steam traps, insulation materials, and other products are generally of low quality. As a result, even if there were good energy auditors and program developers/implementers (which with very few exceptions there currently are not), users installing equipment produced in Bulgaria cannot be assured they will achieve anywhere near the efficiency improvement considered reasonable in the West.

Finally, service providers need to learn how to price and market their services, how to oversee their field teams, and how to assure quality and consistency of service delivery.

There are signs of change however, in the energy efficiency field a relatively new enterprise in Veliko-Tarnovo will produce flow meters and other instruments for water/liquids measurement, as well as heat and gas flow meters. In Jambol, a new enterprise has been

main boiler factory in Sofia says it now incorporates Ray burners (U.S.) and improved boiler controls (imported). At Ruse, Bulgarians are testing a locally designed boiler to burn agricultural residues, and some factories producing small household boilers/stoves firing wood and coal are considering scaling up to small industrial boilers. These and other initiatives are encouraging, but not sufficiently widespread to have a substantial impact. Also, designs and production/quality control methods may or may not meet Western standards.

Progress in attracting joint ventures for energy-efficiency equipment or services has been hindered to date by national policies. Although Bulgaria has passed a liberal Foreign Investment Law, some major pieces of economic policy legislation (for example, new tax privatization laws) are not yet in place, and implementing regulations for most new economic legislation have not yet been drafted. Until the framework of economic policy is in place, new foreign investment is likely to remain limited. Also, Bulgaria is still sufficiently unknown to Western enterprises; thus, a positive marketing and awareness-building effort may be required to attract prospective partners and investors.

Energy Financing

The Bulgarian banking system was previously highly centralized and tightly controlled by the government. Until 1981, the National Bank of Bulgaria acted as both central bank and, through a network of more than 25 divisions and subdivisions, the country's sole domestic commercial bank. The Foreign Trade Bank had a monopoly over all foreign exchange transactions and trade finance. Outside the formal financial system, there also was a State Credit Corporation which provided long-term credit for economic development at low interest rates, and had a reputation for lending to low-payoff activities based on the political influence of the borrowers.

The former government created one new bank (Bank for Business Investments) in 1981 and in 1987 created, as shareholding companies, seven new specialized banks - including the Agro-cooperative Bank, Biochim Bank, Electronics Bank, and Economics Bank - to provide both domestic and external financing services to clients in specific industrial sectors. At the end of 1989, the Government divided the National Bank into a central bank (National Bank) and 59 independent commercial banks. It also removed specialization restrictions on the former banks. As of June 1991, one private bank also existed, aptly named "First Private Bank".

There now are 80 banks, 14 of which have full banking licenses and offer the full range of allowable banking services, including in international transactions in domestic and international currencies. Most banks are very thinly capitalized, since the money supply has reportedly been shrinking since early 1991, and there is little liquidity in the financial system.

All plants visited by the IRG Team had several opportunities for energy-efficiency improvement with paybacks of six months or less - most notably dealing with purchasing oxygen and stack-gas analysis instruments, and training personnel to use them. More important, all enterprises need to develop and implement sustained energy-management programs on in-plant motivation and training, as well as energy monitoring and accounting. The most viable enterprises should be able to finance energy management programs and no-cost/low-cost measures out of current cash flow; where they cannot, it is unclear whether they

will be willing to borrow at current high interest rates to do so.

Until interest rates decline substantially, more capital-intensive energy efficiency projects are likely to be undertaken only on a joint-venture basis tied to overall restructuring to make the enterprise economically competitive. Most projects are being proposed by large heavy industries, which may not be economically feasible even if the proposed investment project is implemented. These industries also have substantial environmental liability problems and over-staffing problems, which may scare off potential investors; examples include a proposed investment in continuous casting at the Kremikova steel Mill, and another in autogenic roasting at the Plovdiv Lead Smelter.

Tax or Other Incentives

Higher energy prices alone appear to provide an adequate incentive to energy consumers seeking ways to increase efficiency of energy use. A number of additional incentives can be instituted that are reasonable by Western standards serve to add to the pricing incentives. Except for changes that are part of comprehensive tax reform, it may be beneficial to stimulate improved supply of equipment and services rather than increased demand which currently cannot be satisfied.

The Ministry of Finance has been analyzing a broad variety of tax options, including an EC-compatible value added tax (VAT) as part of comprehensive tax reform. An important issue being addressed, and one which currently impedes energy efficiency investment, is the tax treatment of capital investment and borrowing. Currently there is a 40% corporate income tax at the national level (30% for agribusiness and for foreign enterprises or joint ventures) and an additional 7% tax at the local level. Investment in energy-efficiency improvement must be taken out of taxable profits, with only the standard capital charge (8% of capital) counted as a cost element; interest payments must also be taken from net profit. The capital charge appears too low and should be raised to a reasonable level, or there should be rules for calculating reasonable capital charges for each specific enterprise. There also is a strong case for tax deductibility of interest costs. Finally, and particularly important in light of earlier recommendations, leasing costs should be fully deductible.

There is pressure to go beyond such structural changes and provide tax credit for investment in energy-efficiency improvement. The problem with this type of credit is that it will strengthen enterprises' current inclination to seek capital-intensive solutions to all their problems. Many waste large amounts of energy due to poor operating and management practices, lack of an effective energy-management program, or failure to implement no-cost and low-cost actions. Government should focus on these before providing new incentives for more capital-intensive solutions. Given their continued political power, heavy industry could use a tax credit for investment in energy efficiency to explicitly subsidize the kinds of process changes discussed earlier, even though such investment may not represent a sound use of the country's scarce capital resources.

Other measures which provide an incentive to energy efficiency improvement include reduction or removal of (a) import duties on equipment used for energy efficiency improvement and/or (b) turnover/VAT and/or income taxes on sales of domestic energy efficiency equipment or services. However, it is not obvious that additional incentives to stimulate demand for

equipment are needed, as much as better organization, quality and introduction of Western technology on the supply side.

The Ministry of Finance is reportedly skeptical about new tax preferences on the grounds they are complex, only help profitable companies at a time when there are not many such companies, inevitably create unforeseen opportunities for tax evasion, and result in a revenue loss which the Government can ill afford.