United States General Accounting Office

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Report to the Chairman, Committee on Energy and Natural Resources, U.S. Senate

August 1992

# EAST EUROPEAN ENERGY

# Romania's Energy Needs Persist

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**United States**
**General Accounting Office**
**Washington, D.C. 20548**

**National Security and**
**International Affairs Division**

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August 4, 1992

The Honorable J. Bennett Johnston
Chairman, Committee on Energy
and Natural Resources
United States Senate

Dear Mr. Chairman:

As you requested, we are providing information on (1) trends and problems related to Romania's energy production and imports, (2) Romania's energy needs and the steps being taken or planned to address them, (3) factors that discourage U.S. trade with and investment in Romania's energy sector, and (4) U.S. government and international efforts to develop Romania's energy sector.

As agreed with your office, unless you publicly announce its contents earlier, we plan no further distribution of this report until 30 days from its issue date. At that time, we will send copies to the Secretaries of State, Commerce, and Energy; the Director of the Office of Management and Budget; the U.S. Trade Representative; the Director of the Agency for International Development; the Administrator of the Environmental Protection Agency; the Director of the U.S. Export-Import Bank; the Director of the Overseas Private Investment Corporation; and other interested parties. Copies will also be made available to others on request.

Please contact me at (202) 275-4812 if you or your staff have any questions concerning this report. The major contributors to this report are listed in appendix II.

Sincerely yours,

Allan I. Mendelowitz

Allan I. Mendelowitz, Director
International Trade and Finance Issues

# Executive Summary

## Purpose

Romania is attempting to implement free market reforms and reinvigorate its economy. To do so, Romania needs to modernize its energy sector and increase energy production, according to U.S. and Romanian officials. The changing energy economies of Romania and other East European countries may open up new markets for western energy technologies. With this possibility in mind, the Chairman of the Senate Committee on Energy and Natural Resources asked GAO to provide information on (1) trends and problems related to Romania's energy production and imports, (2) Romania's energy needs and the steps being taken or planned to address them, (3) factors that discourage U.S. trade with and investment in Romania's energy sector, and (4) U.S. government and international efforts to develop Romania's energy sector.

## Background

Romania's December 1989 revolution brought an end to the 25-year Communist dictatorship of President Nicolai Ceausescu and initiated a period of political and economic reform. The primary goals of U.S. policy in Romania and the rest of Eastern Europe are to support the region's transition to democracy and a free market economy. Securing sufficient energy supplies is vital to Romania's economic recovery, and most experts agree that development of the energy sector will require substantial foreign investment. U.S. government and private sector involvement in Romania's energy sector can play a role in the country's economic transition.

## Results in Brief

Romania's economic growth and development have been hampered by declining domestic energy production and disrupted fuel imports, creating an energy shortage. Consequently, homes and businesses lack sufficient light and heat, and industrial output has fallen.

In order to ensure sufficient energy supplies in the future, Romania is taking steps to decentralize its state-owned energy industries, modernize its outdated facilities and equipment, diversify its fuel sources, and eliminate its inefficient production practices. To accomplish these objectives, Romania needs substantial foreign trade and investment, according to Romanian officials.

However, despite government efforts to reform the energy sector and improve the business climate, impediments to U.S. trade with and investment in Romania persist. These barriers include lack of a comprehensive energy strategy, underdeveloped legal and business infrastructures, uncertain economic and political conditions, and the

absence of U.S. most-favored-nation trade status.[1] Recent efforts by the Romanian and U.S. governments to overcome the barriers to most-favored-nation status have led to progress in this area.

U.S. government and international agencies have initiated a variety of efforts to assist Romania's energy sector. For example, the Agency for International Development (AID) funded an Emergency Energy Program; the U.S. Trade and Development Program is evaluating requests to fund several feasibility studies in the power generation sector; and the Department of Commerce offers energy-related information exchanges and trade missions to Romania. International organizations such as the World Bank and the European Investment Bank have also granted loans for energy sector development projects in Romania.

# Principal Findings

## Declining Production and Imports Have Created an Energy Shortage

Romania has historically relied on a combination of domestic production and imports to satisfy its energy needs, but declines in both have created an energy shortage. Oil and gas production, which were already declining prior to the revolution, declined by 26 percent and 25 percent, respectively, from 1989 to 1991. Romanian officials attributed these declines to a lack of modern exploration and extraction technology and the depletion of proven reserves. Coal production dropped 53 percent from 1989 to 1991. Factors that contributed to this sharp decline were political disruptions in the mining community, a lack of mining equipment and technology, and insufficient capital for investment, according to Romanian officials. Moreover, recent political and economic conditions have limited Romania's ability to offset oil, gas, and coal production declines with increased imports. For example, as a result of the international oil embargo related to the 1991 Persian Gulf War, Romania did not receive $1.7 billion in crude oil shipments from Iraq intended as repayment for Iraqi debts. The shortage of coal, gas, and fuel oil, combined with the outdated and rundown condition of power generation plants, contributed to a 25-percent drop in Romania's electricity production from 1989 to 1991.

[1] Most-favored-nation treatment generally refers to the practice of extending to a country the best trade privileges granted to any other nation in the form of the lowest tariff rates and other charges imposed on imported products. Normally, most-favored-nation treatment is granted on a reciprocal basis.

## Romania's Energy Needs and Steps Being Taken to Address Them

Romania needs substantial foreign trade and investment to revitalize its oil, gas, and coal industries, according to Romanian government officials. To halt the decline in oil and gas production, Romania is decentralizing its state-owned oil and gas industries; inviting western oil companies to participate in oil and gas exploration and production; and seeking financing to purchase related equipment, spare parts, and services. To increase coal production, Romania is arranging foreign credits to import equipment and spare parts for its mining industry.

Romania also needs capital investment and modern technology to revive its ailing power generation and oil-refining industries, according to government officials. To this end, Romania has reorganized its government-owned electricity industry; developed plans for power plant modernization and construction projects; and encouraged foreign companies, governments, and international organizations to participate in such projects. It is also seeking foreign investment to modernize its oil-refining plants and operations and utilize excess oil-refining capacity. In addition, Romania is taking steps to diversify its foreign suppliers of oil and gas.

Since the revolution, the government has gradually begun raising electricity prices to cover production costs. It has also formed a new Agency for Energy Conservation to monitor energy efficiency and control energy-related pollution.

## Barriers to Trade and Investment Still Exist

Foreign investors interested in Romania's energy sector still face many impediments. Romania's national energy strategy is in the early stages of development, making it difficult for foreign companies to obtain the business and legal information they need to consider investment. In addition, potential foreign investors continue to express concerns about Romania's underdeveloped legal and business infrastructures and uncertain economic and political conditions. Finally, according to some U.S. and Romanian officials, Romania's lack of most-favored-nation trade status may further discourage trade between the two countries and U.S. investment in Romania. The U.S. administration took action to address this impediment in response to Romania's progress toward a market economy and democratic pluralism. The U.S. administration submitted a bilateral trade agreement to Congress in June 1992 which, if approved, would restore Romania's most-favored-nation status.

## U.S. and International Efforts to Assist Romania's Energy Sector

U.S. and international agencies have undertaken a variety of efforts to assist Romania's energy sector. For example, AID funded a $1.6-million Emergency Energy Program in 1991 to increase Romania's industrial energy efficiency, improve refinery operations, and develop a plan for reforming energy pricing. The U.S. Trade and Development Program is evaluating funding requests for several feasibility studies of power generation projects. The Department of Commerce has an Eastern Europe Business Information Center in Washington, D.C., and has assigned a Romanian foreign service national to facilitate U.S.-Romanian business contacts. International organizations, such as the World Bank, the European Investment Bank, and the European Bank for Reconstruction and Development, have extended loans to Romania's energy sector to fund technical assistance programs, finance imports of spare parts and equipment, and rehabilitate power plants.

## Recommendations

GAO is making no recommendations in this report.

## Agency Comments

As requested, GAO did not obtain official agency comments on this report. However, GAO discussed the information presented in this report with responsible program officials from the Departments of State, Commerce, and Energy; AID; and the Trade and Development Program. Their comments have been incorporated in the report where appropriate.

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## Abbreviations

| | |
|---|---|
| AID | Agency for International Development |
| CMEA | Council for Mutual Economic Assistance |
| Eximbank | U.S. Export-Import Bank |
| kwh | kilowatt hour |
| MFN | most favored nation |
| OPIC | Overseas Private Investment Corporation |
| PETROM | Regia Autonoma a Petrolului |
| RENEL | Regia Autonoma de Electricitate |
| ROMGAZ | Regia Autonoma Gazelor Naturale |
| RAFIROM | Rafinarii Romanesti |
| ROMPETROL | Company for of Oil and Gas Cooperation |
| TDP | Trade and Development Program |

# Introduction

## Background

Romania's December 1989 revolution brought an end to 42 years of communism and initiated a period of political and economic transition. Since the revolution, Romania has joined other Central and East European countries in implementing economic reforms including (1) price adjustment and liberalization, accompanied by a macroeconomic stabilization program; (2) transformation of the command economy and state ownership system into a market system with increased private ownership; and (3) reorganization of the publicly owned production and distribution system. As part of this process, Romania has adopted new laws on privatization and foreign investment and revised its tax and banking systems.

However, the political transition has hindered the government's ability to maintain economic and financial stability. While Romania's reform program has been carried out at a fast pace, economic performance was disappointing in 1990 and 1991. Industrial output declined by an estimated 18 percent in 1990 and by an additional 20 percent in 1991. Price increases of 200 to 300 percent have eroded consumers' purchasing power, while wages have failed to keep pace with inflation. Romania's current account balance swung from a surplus of $2.6 billion in 1989 to a deficit of $1.5 billion in 1990. The country's hard currency debt, which the Ceausescu regime had repaid in 1989, is expected to rise to $1.6 billion by 1992, and its foreign exchange reserves have been exhausted.

U.S. trade relations with Romania became increasingly strained during the 1980s due to U.S. concerns about Romanian human rights violations, but were renewed in 1990 following the revolution. According to the U.S. Department of Commerce, Romania is the U.S.' second largest trading partner in Eastern Europe after Poland, with total 1990 trade valued at $600 million. Moreover, the United States is Romania's third largest foreign investor after Germany and Italy, with $17.8 million in joint ventures registered as of June 1991. Commerce reported that overall trade and investment potential in Romania is strong, despite certain impediments such as Romania's lack of financing and underdeveloped legal and business infrastructure.

## Romania's Energy Profile

Romania is by far the largest producer of crude oil and natural gas in Eastern Europe, producing 59 percent of the region's oil and 64 percent of its gas in 1990. Natural gas is currently Romania's most important energy resource, accounting for about 50 percent of its primary energy production and consumption. However, production of all energy resources is increasingly falling short of demand, creating an energy shortage. Romania's energy-intensive industries are the primary consumers of electric power; per capita household electricity consumption has been among the lowest in Eastern Europe due to government rationing in the past.

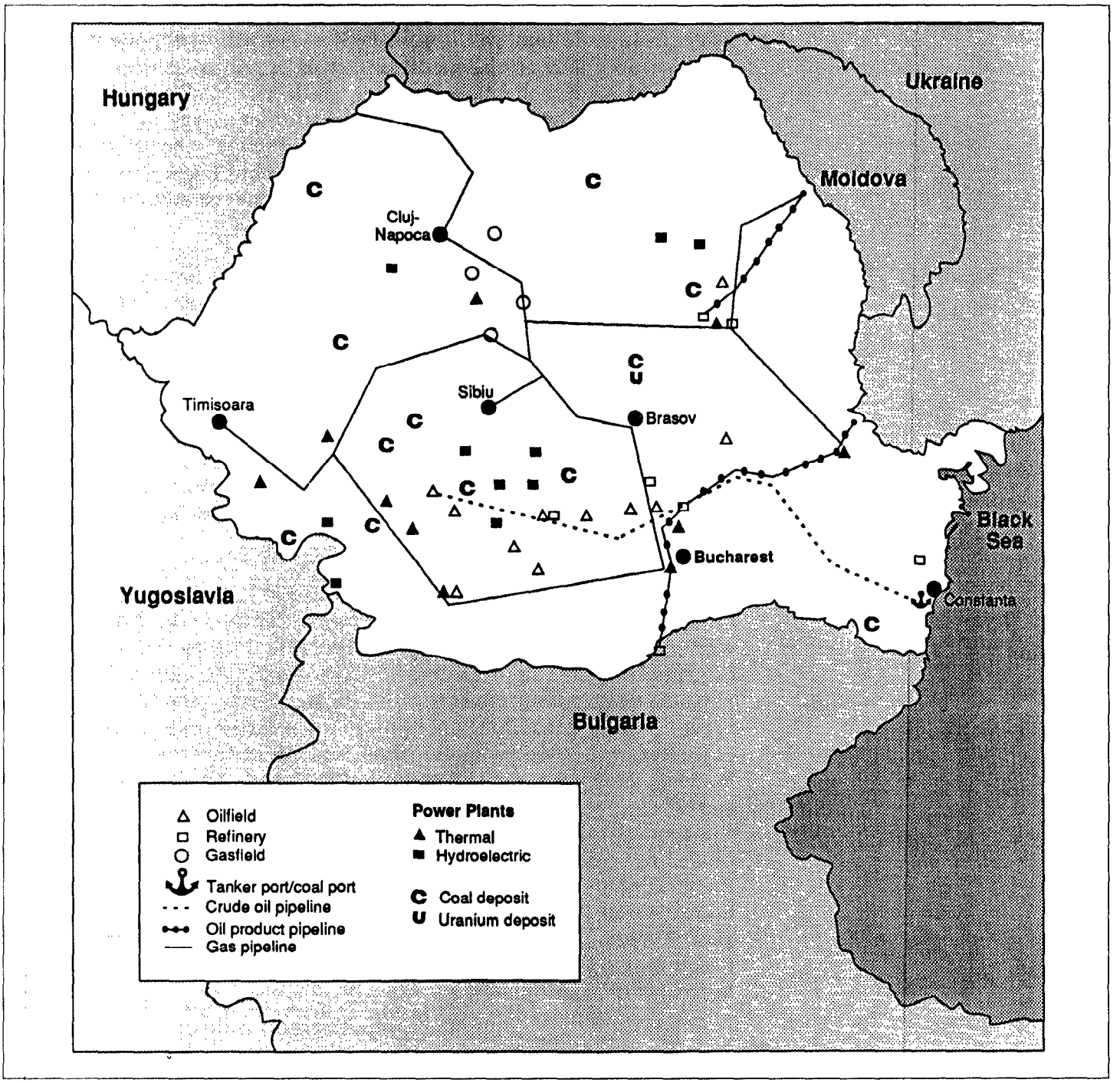
Romania's energy shortage has contributed to human hardships and declining industrial output. According to U.S. embassy officials in Bucharest, many Romanians had to endure the past winter with little or no heat in their homes, schools, factories, and offices. The flow of natural gas to homes was at times so low that many Romanians had to wait until late at night to prepare meals. University students have demonstrated to protest unheated classrooms. The energy shortage also has forced the government to ration energy to farms and factories. Many of Romania's energy-intensive industrial plants had to shut down or reduce their operations in 1991, contributing to a 20-percent decline in industrial production in that year.

## Energy Reserves and Facilities

Compared to other East European countries, Romania is well endowed with energy resources. In January 1990 the U.S. Geological Survey estimated Romania's proven crude oil reserves at 1.2 billion barrels, with potential undiscovered reserves of 1.5 billion barrels.[1] The U.S. Geological Survey estimated that Romania's proven gas reserves were 3.4 trillion cubic feet, with potential undiscovered reserves of 16.9 trillion cubic feet. Romania has an estimated 63 percent of Eastern Europe's total oil reserves and about 25 percent of the region's gas reserves, according to the Oil and Gas Journal. Romania currently has lignite reserves of 3 billion tons and bituminous coal reserves of 900 million tons, according to the Director of Romania's Mining and Geology Department. As shown in figure 1.1, Romania's energy facilities include an extensive system of crude oil, natural gas, and refined oil products pipelines; oil refineries; a major tanker port at Constanta on the Black Sea; and 20 major thermal and hydroelectric power plants.

[1]Crude oil reserves are generally classified as "proven" if they are profitably recoverable under existing economic and operating conditions.

**Figure 1.1: Romania's Major Energy Facilities, 1990**

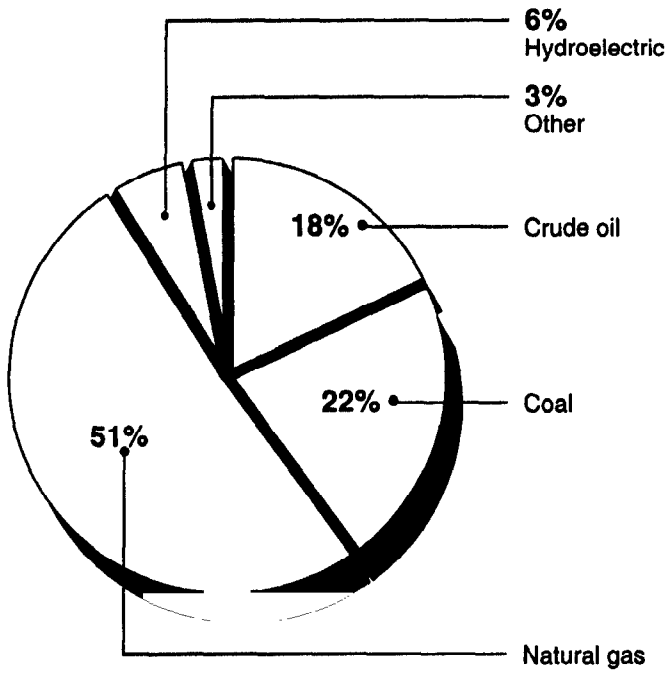



Source: U.S. Department of Energy.

## Primary Energy Production and Consumption

Romania's total production of primary energy[2] in 1989 was equivalent to 1.045 million barrels of oil per day, according to PlanEcon.[3] Natural gas accounted for over one-half of Romania's total energy production, with coal and oil each accounting for about one-fifth of total production. Romania currently produces no nuclear power, although construction of its first 700-megawatt nuclear power generator is expected to be completed by the end of 1994. Figure 1.2 illustrates each source's share of primary energy production in 1989.

**Figure 1.2: Romania's Primary Energy Production, 1989**




Source: PlanEcon.

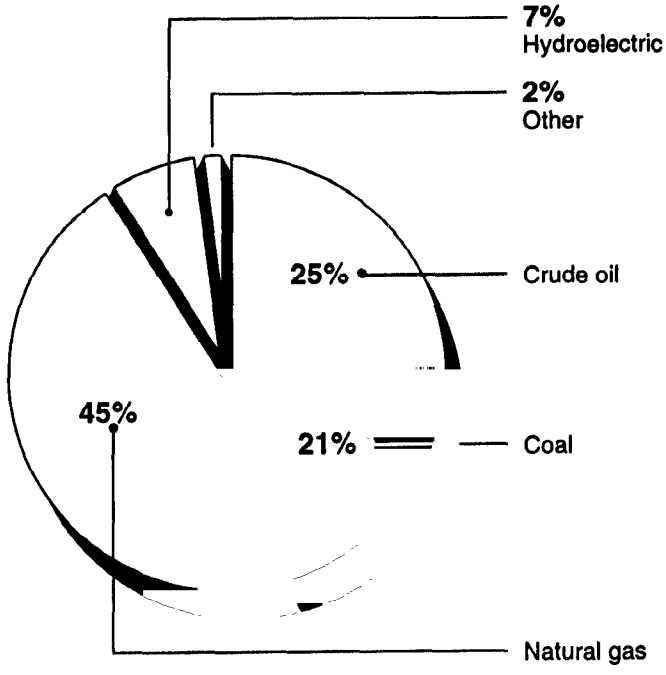
Romania's total consumption of primary energy in 1989 was equivalent to 1.444 million barrels of oil per day. Natural gas accounted for the largest

[2]Primary energy includes crude oil, natural gas, coal, and hydro-electricity.

[3]PlanEcon is a Washington-based business consulting and research firm specializing in economic assessments of Eastern Europe and the Commonwealth of Independent States.

share of Romania's energy consumption, followed by oil and coal. Figure 1.3 illustrates each source's share of primary energy consumption in 1989.

**Figure 1.3: Romania's Primary Energy Consumption, 1989**




Source: PlanEcon.

Romania's energy production falls short of consumption, and it is increasingly dependent on energy imports. Romania imported 28 percent of its total energy supplies in 1989, and the U.S. State Department reported that by 1991 Romania was importing about 60 percent of its energy needs.

Romania's primary energy consumption rose 7 percent from 1985 to 1989 and then declined by an estimated 17 percent between 1989 and 1991 as industrial production collapsed after the revolution. Experts believe energy consumption will return to the 1989 level by 1993-95 as Romania's economy recovers. Romania's efforts to reform energy prices, restructure its industries, and increase energy efficiency are expected to keep energy demand at or below this level into the next century.

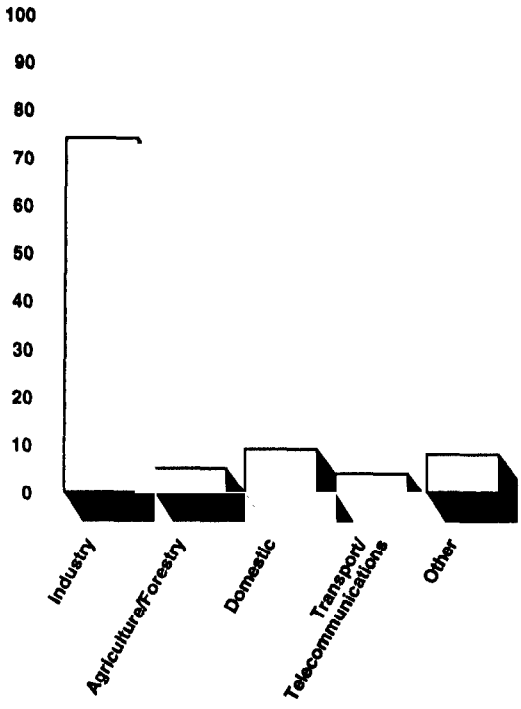
## Electricity Production and Consumption

In 1990, Romania generated 83 percent of its electric power in thermal power plants fueled primarily by coal and natural gas. The remaining 17 percent of the country's electric power was generated by hydroelectric power plants.

Due to a long history of government rationing, Romania's per capita household electricity consumption is still among the lowest in Eastern Europe. The Ceausescu government severely rationed household electricity while allowing industry's share of Romania's total electricity use to reach 78 percent in 1989. In 1990, after the revolution, the share of energy consumed by households rose from 6 to 9 percent as the new government removed quotas.[4] Figure 1.4 illustrates relative electricity consumption by sector of the economy in 1990.

[4]Although the share of energy consumed by households rose by 50 percent—from 6 percent to 9 percent—between 1989 and 1990, the actual level of household electricity consumption during this period increased by a smaller percentage because there was a decline in overall electricity consumption.

**Figure 1.4: Romania's Electricity Consumption by Sector of the Economy, 1990**




Source: Romanian Electricity Authority.

## Objectives, Scope, and Methodology

The changing energy economies of Romania and other East European countries may open up new markets for western energy technologies. With this in mind, the Chairman of the Senate Committee on Energy and Natural Resources asked GAO to provide information on (1) trends and problems related to Romania's energy production and imports, (2) Romania's energy needs and the steps being taken or planned to address them, (3) factors that discourage U.S. trade with and investment in Romania's energy sector, and (4) U.S. government and international efforts to develop Romania's energy sector.

To identify trends related to Romania's energy production and trade, we met with officials of Romania's Ministry of Industry in Bucharest and obtained relevant statistical data. In the United States, we held discussions with and obtained information from officials of the Departments of State and Energy, the Agency for International Development (AID), and the World Bank. We obtained additional statistical information from the U.S.

Geological Survey and PlanEcon. In Brussels, Belgium, we interviewed representatives from the European Commission.

In Bucharest, Romania, we obtained information on Romania's energy needs and the steps being taken or planned to address its energy problems. We interviewed officials of the Romanian government agencies responsible for managing the oil, gas, coal, and electricity industries, as well as several members of Romania's Parliament. In addition, we visited Romania's nuclear plant under construction at Cernavoda. U.S. embassy officials in Bucharest provided us with information on U.S. energy assistance programs and on Romania's political, economic, and investment conditions. We also reviewed existing literature on these topics. Legal information in this report does not reflect our independent legal analysis, but is based on interviews and secondary documents provided by U.S. and Romanian government officials.

To identify factors that discourage U.S. trade with and investment in Romania's energy sector, we spoke with eight U.S. firms that are conducting or have considered energy-related activities in Romania, as well as with officials from the U.S. Department of Commerce, the Office of the U.S. Trade Representative, and the Trade and Development Program (TDP). In Romania, we met with officials from the Romanian Development Agency and two foreign companies with offices in Bucharest. We also attended four conferences on energy trade and investment opportunities in Eastern Europe.

To obtain information on the current status of U.S. government programs to assist Romania's energy sector, we interviewed officials from AID; the Departments of State, Energy, and Commerce; and TDP. We met with representatives of the World Bank, the European Community, and the European Bank for Reconstruction and Development to get data on international programs to assist Romania.

Appendix I contains a complete list of organizations we contacted.

We conducted our work between August 1991 and May 1992 in accordance with generally accepted government auditing standards.

As requested, we did not obtain agency comments on this report. However, we discussed the information presented in this report with responsible program officials from the Departments of State, Commerce, and Energy; AID; TDP; and the World Bank. Their comments have been incorporated in the report where appropriate.

# Romania's Energy Production and Imports Are Decreasing

Romania's energy production and imports are declining, creating a serious energy shortage. Oil and gas production fell by 26 percent and 25 percent, respectively, from 1989 to 1991, while coal production dropped 53 percent during this period. Recent political and economic conditions have diminished Romania's ability to offset oil, gas, and coal production declines with increased imports. The shortage of primary energy resources, combined with the outdated and rundown condition of power generation plants, contributed to a 26-percent fall in Romania's electricity production from 1989 to 1991. In addition, lack of crude oil has limited Romania's production of refined oil products, an important source of hard currency export earnings.

## Primary Energy Production Is Declining

Romania's crude oil production has decreased by 53 percent since 1975, while natural gas production has fallen by 37 percent from its peak of 1,398 billion cubic feet in 1986. The steepest declines in oil and gas production have occurred since the 1989 revolution. Table 2.1 shows trends in crude oil and natural gas production.

**Table 2.1: Romania's Crude Oil and Natural Gas Production, 1970-91**

| | Oil[a] | | Gas[b] | |
|---|---|---|---|---|
| Year | Production | Percent change | Production | Percent change |
| 1970 | 275 | N/A[c] | 847 | N/A[c] |
| 1975 | 300 | +9 | 1,115 | +32 |
| 1980 | 236 | -21 | 1,243 | +11 |
| 1981 | 239 | +1 | 1,307 | +5 |
| 1982 | 241 | +1 | 1,321 | +1 |
| 1983 | 239 | -1 | 1,353 | +2 |
| 1984 | 234 | -2 | 1,388 | +3 |
| 1985 | 220 | -6 | 1,381 | -1 |
| 1986 | 208 | -5 | 1,398 | +1 |
| 1987 | 195 | -6 | 1,324 | -5 |
| 1988 | 193 | -1 | 1,303 | -2 |
| 1989 | 189 | -2 | 1,165 | -11 |
| 1990 | 160 | -15 | 999 | -14 |
| 1991 | 140 | -13 | 876 | -12 |

[a]Oil measured in thousands of barrels per day.

[b]Gas measured in billions of cubic feet per year.

[c]N/A denotes not applicable.

Sources: PlanEcon (1970-1975); Romanian Ministry of Industry (1980-1990); U.S. State Department (1991).

Romanian officials attribute the declines in oil production since the mid-1970s primarily to the lack of modern exploration and extraction technology and the depletion of known reserves. One U.S. government study reported that Romanian oil production has become increasingly expensive, requiring enhanced oil recovery in the older fields and deep exploratory drilling to discover new reserves.

As table 2.2 shows, Romania's coal production, which consists primarily of low-quality lignite, increased overall between 1983 and 1989, but fell sharply after the revolution, creating a crisis in the power generation industry.

**Table 2.2: Romania's Coal Production, 1981-91**

| Year | Coal production [a] | Percent change |
|---|---|---|
| 1981 | 41 | N/A[b] |
| 1982 | 42 | +2 |
| 1983 | 39 | -7 |
| 1984 | 49 | +26 |
| 1985 | 51 | +4 |
| 1986 | 52 | +2 |
| 1987 | 50 | -4 |
| 1988 | 58 | +16 |
| 1989 | 68 | +17 |
| 1990 | 38 | -44 |
| 1991 | 32 | -16 |

[a]Coal measured in millions of short tons.

[b]N/A denotes not applicable.

Sources: U.S. Department of Energy (1981-1990); U.S. State Department (1991).

Mining industry officials attribute Romania's declining coal production to a lack of modern mining equipment and technology, insufficient capital for investment, political unrest in the mining community, and reduced output resulting from a shortened work week. According to an investment survey by the Ministry of Finance, the mining department was able to implement only about 18 percent of planned investment for the first half of 1991.

## Primary Energy Imports Have Declined in Recent Years

While Romania has become increasingly dependent on imported oil, gas, and coal supplies over the last decade, recent political and economic conditions have prevented it from obtaining enough imports to offset production declines. Oil and gas supply disruptions associated with the collapse of Council for Mutual Economic Assistance[1] trade between the Eastern Europe and the Soviet Union[2] and with the 1990 Persian Gulf crisis have had severe repercussions on Romania's energy economy.

Romania's oil imports, traditionally supplied by Iraq, Iran, and the former Soviet Union, increased by 36 percent between 1980 and 1989. By 1989, oil imports accounted for 70 percent of the nation's total oil consumption, according to PlanEcon. Hard currency shortages and oil supply disruptions associated with the Persian Gulf War led to a 60-percent decline in crude oil imports between 1989 and 1991. As a result of the related international oil embargo imposed on Iraq, Romania did not receive the $1.7 billion in oil shipments from Iraq intended as repayment for Iraqi debts. According to Department of Energy officials, oil imports were further diminished when the former Soviet Union failed to deliver any of its planned crude oil shipments in 1991.

Romania's natural gas imports, supplied exclusively by the former Soviet Union, increased by 373 percent from 1980 to 1990 but then dropped by 37 percent in 1991. Imports of Soviet gas represented 22 percent of total gas consumption in 1990. Higher Soviet gas prices, combined with supply disruptions associated with the collapse of the Soviet economy, led to the sharp decline in Romania's 1991 gas imports. Table 2.3 shows trends in crude oil and natural gas imports.

[1]In 1990 the Council for Mutual Economic Assistance (CMEA) also known as Comecon, was composed of the former Soviet Union, Bulgaria, Czechoslovakia, East Germany, Hungry, Poland, Romania, Cuba, Mongolia, and Vietnam.

[2]Trade between CMEA members declined in 1990 following the political revolutions of the East European countries.

**Table 2.3: Romania's Crude Oil and Natural Gas Imports, 1980-91**

| Year | Oil imports[a] | Percent change | Gas imports[b] | Percent change |
|---|---|---|---|---|
| 1980 | 321 | N/A[c] | 55 | N/A[c] |
| 1981 | 245 | -24 | 35 | -36 |
| 1982 | 218 | -11 | 71 | +103 |
| 1983 | 248 | +14 | 53 | -25 |
| 1984 | 272 | +10 | 64 | +21 |
| 1985 | 278 | +2 | 65 | +2 |
| 1986 | 295 | +6 | 70 | +28 |
| 1987 | 300 | +2 | 88 | +26 |
| 1988 | 330 | +10 | 114 | +30 |
| 1989 | 435 | +32 | 254 | +123 |
| 1990 | 330 | -24 | 260 | +2 |
| 1991 | 173 | -48 | 164 | -37 |

[a]Oil imports measured in thousands of barrels per day.

[b]Gas imports measured in billions of cubic feet.

[c]N/A denotes not applicable.

Sources: U.S. Department of Energy (1980-1989); U.S. State Department (1990-1991).

Romania imports about 10 percent of its lignite coal and about 83 percent of its bituminous (or hard) coal, according to mining agency officials. Romania's primary foreign suppliers of coal are the Soviet Union, Poland, Australia, South Africa, and China. It also imports metallurgical and steam coal from the United States. Romania's coal imports fell by 63 percent from 1989 to 1991, intensifying the impact of domestic production declines during that period.

## Electricity Production and Imports Are Falling

According to statistics provided by Romania's Regia Autonoma de Electricitate (RENEL), the national electrical utility, power production has declined significantly since 1989, and the country's power generation capacity is significantly underutilized. Romania's annual electricity production dropped by 26 percent from 1989 to 1991, as shown in table 2.4. While the current installed capacity of Romania's power plants is 22,479 megawatts per hour, operating plants are able to generate only 8,000-9,000 megawatts per hour.

Ministry of Industry officials attribute the gap between electric generating capacity and actual output to the outdated and rundown condition of power generation plants; the reduced hydropower due to recent droughts; and the shortage of coal, gas, and fuel oil. In addition, Romania lacks

capital for investment in the power generation industry. Romania's Ministry of Finance reported that RENEL was able to implement only 30 percent of planned investment for the first half of 1991.

Imports of electric power dropped by 24 percent from 1990 to 1991 after steadily increasing in the 1980s. Romania had to import 13 percent of its electricity in 1990 and 11 percent in 1991 to offset declines in production.

**Table 2.4: Romania's Electric Power Production and Imports, 1980-91**

| | Production[a] | | | |
|---|---|---|---|---|
| Year | Thermal | Hydro | Total | Imports |
| 1980 | 54.9 | 12.6 | **67.5** | 0.5 |
| 1985 | 59.9 | 11.9 | **71.8** | 3.3 |
| 1986 | 64.7 | 10.8 | **75.5** | 4.4 |
| 1987 | 62.9 | 11.2 | **74.1** | 5.2 |
| 1988 | 61.7 | 13.6 | **75.3** | 7.2 |
| 1989 | 63.2 | 12.6 | **75.9** | 7.8 |
| 1990 | 53.3 | 11.0 | **64.3** | 9.5 |
| 1991 | N/A[b] | N/A[b] | **56.2** | 7.2 |

[a]Measured in millions of megawatt hours.

[b]These figures not available for 1991.

Sources: RENEL (1980-1990); U.S. Department of State (1991).

In 1990, 64 percent of Romania's electric power imports came from the Soviet Union; 11 percent from Yugoslavia; and the remainder from Austria, France, Czechoslovakia, and Albania at prices of $25-$38 per megawatt hour. In 1991, Romania imported electric power from the Soviet Union, Germany, Yugoslavia, Austria, France, and Turkey at prices of $35-$50 per megawatt hour. Romanian officials told us that individual electric power stations cannot import fuel supplies directly; they must still rely on a centralized importing process through RENEL.

## Lower Production and Exports of Refined Oil Products Limit Hard Currency Earnings

Romania's production of refined oil products[3] (primarily gasoline and fuel oil) has declined in recent years, depriving the country of a major source of hard currency earnings. The total output of Romania's 11 oil refineries declined by 23 percent from 1989 to 1990. (See table 2.5.) Romania's

[3]Refined oil products are obtained from the processing of crude oil, unfinished oils, natural gas liquids, and other hydrocarbon compounds. They include products such as gasoline, distillate fuel oil, residual fuel oil, lubricants, and jet fuel.

refining plants are now significantly underutilized, with 1990 production of 23.7 million tons representing only 69 percent of the nation's 34.4-million-ton refining capacity. Romanian officials reported further production declines in 1991.

**Table 2.5: Romania's Production and Exports of Refined Oil Products, 1970-90**

| Year | Production[a] | Exports | Exports as percent of production |
|---|---|---|---|
| 1970 | 15,400 | 5,370 | 35 |
| 1975 | 19,349 | 6,176 | 32 |
| 1980 | 27,071 | 8,754 | 32 |
| 1985 | 24,700 | 9,689 | 39 |
| 1986 | 26,774 | 10,374 | 39 |
| 1987 | 29,670 | 11,829 | 40 |
| 1988 | 29,380 | 13,248 | 45 |
| 1989 | 30,613 | 13,375 | 44 |
| 1990 | 23,664 | 8,400 | 35 |

[a]Measured in thousands of metric tons.

Source: PlanEcon, 1991.

The gap between refining capacity and actual production is attributed to the lack of crude oil and gas inputs, the declining physical condition of refining plants, and the inefficiency of plant management and operations. According to the European Bank for Reconstruction and Development, Romania's refining operations are very inefficient compared to those of western countries. Disruptions to industrial operations following Romania's revolution contributed further to the decline in the production of refined oil products.

Romania is Eastern Europe's largest exporter of refined oil products, exporting 35 percent of its total output in 1990.[4] Refined products represented 23 percent of Romania's total hard currency export earnings in 1991. Romania's primary refined oil product exports are gasoline, distillate fuel oil, and residual fuel oil. According to PlanEcon data, exports of refined products increased by 53 percent from 1980 to 1989. This trend

[4]In 1990, about 68 percent of Romania's refined oil products output was produced from imported crude oil, with the remainder produced from domestic oil.

changed abruptly in 1990 when exports of refined products dropped by 37 percent, and then fell even further in 1991. Since refined products represent such a significant portion of Romania's hard currency earnings, the recovery of this industry could strongly affect Romania's ability to purchase goods and services on the international market.

# Romania's Energy Sector Requirements and Steps Being Taken to Address Them

According to Romanian officials, the energy sector needs substantial foreign investment and technology to address its energy problems. Romania's hard currency shortage and limited sources of financing have hampered efforts to modernize the energy sector.

Romania is taking steps to increase energy production and attract foreign investment in its energy industries. For example, the government has decentralized its state-owned oil and gas industry and invited foreign firms to bid for joint ventures in oil and gas exploration and production. It is also seeking financing to buy foreign parts, equipment, and technology for the coal mining industry. Romania is negotiating with foreign companies to help modernize its power generation plants and has already obtained Canadian financing and technology for the construction of its first nuclear power plant. Further, Romania is seeking foreign participation in oil refinery modernization and joint oil processing projects. To supplement domestic resources, Romania is taking steps to find new suppliers of crude oil and natural gas. In addition, the government is seeking foreign expertise to increase energy efficiency and to reform energy prices to reflect true economic and environmental costs.

## Oil and Gas

To increase oil and gas production, Romania is decentralizing its state-owned oil and gas industry, encouraging foreign participation in oil and gas exploration and production, and seeking financing to buy needed equipment, spare parts, and services.

### Decentralization

Romania is decentralizing its oil and gas sector to increase market incentives and attract private investment. The industry was recently divided into autonomous units (companies) fully owned by the government but designed to operate according to market principles. Reporting to the Ministry of Industry, these companies include Regia Autonoma a Petrolului (PETROM) and Regia Autonoma Gazelor Naturale (ROMGAZ), which manage oil and gas production, respectively. The Romanian government has also designated certain sectors of its oil and gas industry as "commercial societies" that could be privatized in the future. These include the Company for Oil and Gas Cooperation (ROMPETROL, S.A.), the state-owned oil equipment and services company that oversees Romania's oil exploration and extraction services abroad; Rafinarii Romanesti (RAFIROM), which manages the oil refining industry; and Petrol Export-Import, Romania's national oil and gas trading company.

## Foreign Participation Invited

Romania is counting on a substantial infusion of capital and modern technology to promote the discovery of oil and gas reserves not accessible with its outdated equipment. After being closed to most foreign investment for decades, Romania's oil industry is trying to attract financing and technology through joint ventures with foreign companies. Although Romania's territory has been heavily explored at shallow depths, western companies and World Bank officials stressed that many existing reservoirs were inadequately tested and could prove more productive with western exploration methods and technology. According to Romanian and World Bank officials, there is also a good likelihood that new reserves will be discovered with modern technologies.

In September 1990, Romania invited foreign companies to bid for exploration, development, and production sharing for 12 onshore and 3 offshore petroleum tracts. According to ROMPETROL, the government's agent for the project, 26 western companies expressed interest in individual tracts by purchasing geological information packages. However, subsequent negotiations resulted in only six bids for two onshore and two offshore tracts. Among the final bidders were oil companies from the United States, Canada, the United Kingdom, and the Netherlands. As of March 1992, the four winning contracts were awaiting final approval from the Romanian Prime Minister. The contracts will then be submitted to the Romanian Parliament for approval of negotiated exemptions from current income tax and customs laws.

ROMPETROL officials provided us with the model contract for the project, which covers 25 years, including a 5-year exploration term. According to the agreement, petroleum operations during the contract term will be undertaken solely at the risk and cost of the foreign partner. The foreign partner will receive no compensation for its services except for a share of production in the contract area, negotiated on a case-by-case basis. The foreign oil company will have the right to export its share of crude oil duty free or sell a negotiated amount to the Romanian government. The agreement also stipulates that the contractor is obligated to carry out intensive training and technology transfer programs in all areas of petroleum operations. The model contract stipulates that the foreign contractor must give preference to Romanian-manufactured materials and equipment, as long as they are of comparable quality to those available internationally. In addition, the contract provides that the foreign partner give priority, with certain exceptions, to Romanian labor. Romanian officials said they will consider existing oil infrastructure, such as roads and pipelines, to be part of Romania's contribution to the joint ventures.

U.S. oil companies attributed to several factors the relatively low response to Romania's invitation for bids. Some companies suggested that only the most heavily explored or least productive fields were being offered for joint ventures and that the geological information available for individual fields was inadequate for assessing oil and gas prospects. Other oil companies expressed uncertainty about Romania's political stability and general economic climate. U.S. oil companies also expressed concerns about (1) the application of income tax laws, (2) the availability and quality of Romanian labor and supplies, and (3) the possibility of being held liable for past environmental neglect at oil fields. Two oil company officials stated that Romanian energy officials lack experience with western business practices, which made doing business in Romania more time-consuming and costly.

U.S. oil companies we contacted cautioned that opportunities for oil and gas production in Romania should be assessed in the context of the greater world market. Although its oil and gas production potential is the highest in Eastern Europe, Romania must compete with other regions of the world for foreign investment capital. U.S. oil companies also stressed that oil exploration and production in Romania must be viewed as a long-term investment because immediate returns are unlikely.

## Financing for Imports

In addition to inviting foreign investment in oil exploration and production, Romania is seeking foreign credit to import equipment, spare parts, and services for its oil and gas industry. According to Ministry of Industry officials, Romania's land and oil well geophysical equipment dates back to the 1970s and is in serious disrepair. The Ministry is negotiating with several foreign firms to purchase seismic exploration and drilling equipment and, according to a Department of Commerce publication, has allocated $93 million from its budget for oil and gas equipment. ROMPETROL has also shown interest in arranging joint overseas projects with western suppliers.

## Coal

Like other parts of Romania's energy sector, Romania's coal industry has been reorganized and is seeking financing to purchase foreign equipment and modernize facilities. After the 1989 revolution, Romania's coal industry, managed by the Department of Mining and Geology within the Ministry of Industry, was organized into seven state-owned autonomous units. These units include operations for the production of lignite coal and bituminous coal. While these enterprises will remain under state

ownership, opportunities exist for foreign trade and investment, according to the Department's Deputy Director.

To modernize Romania's coal extraction and processing operations, the industry needs an estimated $200 million to purchase equipment, spare parts, and technology, according to Mining and Geology Department officials. For example, Romania needs to purchase equipment to improve the safety and efficiency of its bituminous coal mines. In addition, it is seeking training in coal preparation techniques to increase energy yield and reduce sulphur emissions from coal-burning power plants. The U.S. Department of Commerce reported that Romania's mining industry needs to import excavators, earthmoving equipment, conveyor belts, ventilation units, safety and measuring equipment, and modern coal-processing technologies.

The Romanian government has arranged for World Bank financing and foreign credits to help acquire some of these items. A portion of the World Bank's $26.6-million loan to Romania's coal industry is to finance imports of spare parts. According to the Mining and Geology Department's Deputy Director, the Romanian government has also transferred about $40 million to the Department from credit lines opened in 1990 with France, Germany, Sweden, and other countries. In addition, Canada has extended a $15-million credit for mining equipment, and in 1991 the Mining and Geology Department was negotiating a guaranteed credit with the British Chamber of Trade for mining equipment components. The Department has also purchased spare parts and equipment for its coal mining industry from a German firm. To facilitate coal industry imports, Romania has issued a decree guaranteeing the repayment of all foreign credits to the mining industry through hard currency payments from the Romanian National Bank. The guaranteed repayment policy has helped the mining industry to conclude a $40-million contract for 200 Caterpillar dump trucks used in coal extraction.

Romania is also seeking foreign investment in its coal mining industry. Mining and Geology Department officials said that foreign investors may participate in the extraction, processing, and preparation phases of Romania's coal production. For example, the government has negotiated a joint venture with a German company to modernize mining facilities at a major coal mine. According to a high-level mining industry official, geological research is underway at 56 mining areas that will be offered for lease to foreign partners in mid-1992. One World Bank official told us that despite its shortage of spare parts and equipment, Romania's lignite coal

industry has the technological capacity to operate competitively at world market coal prices. In contrast, the survival of the bituminous coal industry will likely continue to depend on heavy government subsidies.

## Electricity

Romania needs capital and modern technology to revive its ailing power generation industry, according to a high-level Ministry of Industry official. To attract the needed investment and increase market incentives, Romania has reorganized its government-owned electricity industry, developed plans for power plant modernization and construction projects, and encouraged foreign companies, governments, and international organizations to participate in such projects.

In November 1990, Romania transformed its Ministry of Electric Energy into a state-owned autonomous company, RENEL, which reports to the Ministry of Industry. As part of its transformation to an autonomous unit, RENEL plans to become dependent solely on revenues for its budget. RENEL's responsibilities include electric and thermal power generation, transport, and distribution; import-export activities relating to electric power, fuel, spare parts, and maintenance materials; and development of measures to monitor the environmental impact of power generation in Romania.

### Modernization of Existing Power Plants

To narrow the gap between power-generating capacity and actual production, Romania is seeking financing for the repair and modernization of existing power plants. RENEL officials said that Romania hopes eventually to increase production enough to export electricity to neighboring countries. Preliminary cost estimates for rehabilitating and modernizing Romania's power generation industry are $2 billion between 1991 and 1995 and an additional $683 million through the year 2000, according to RENEL officials.[1] Romania has begun to receive financing and make contacts with foreign firms to modernize and rehabilitate power plants. For example, the World Bank extended a loan of $22.8 million for updating existing technologies at RENEL power stations. A German bank also extended a loan of 30 million Deutsche marks[2] to help finance modernization of Romania's two largest coal-fired power plants under a

[1]These figures were converted from Romanian lei to U.S. dollars based on the official exchange rate of 60 lei to the dollar in effect at the time of our discussion in September 1991.

[2]At the time of our discussion in September 1991, 30 million Deutsche marks equaled $17.9 million based on the exchange rate of 1.68 Deutsche marks to the dollar.

contract with two German firms. In addition, two major U.S. electricity firms have offered equipment and consulting services for power plant modernization projects. Romanian officials told us they were eager for U.S. participation in such projects, but that U.S. companies may be discouraged by problems in obtaining financing.

Efforts to modernize the power generation industry may create opportunities for foreign suppliers. According to Romanian officials, Romania's power generation industry is a potential market for clean coal technology, waste heat recovery boilers, and metering and control systems. Imports of equipment that can operate on Romania's low-quality lignite coal or high-sulphur fuel oil are needed.

Some limitations on foreign trade and investment in Romania's power generation industry exist. Since RENEL's power plants have little financial autonomy, individual plants may not purchase equipment or fuels directly from foreign suppliers. Instead, they must rely on a centralized importing process through RENEL. Further, Romanian officials told us that while foreign companies are encouraged to supply equipment and services for power plant modernization projects, they may not purchase government-owned power plants.

## Development of New Power Generation Capacity

Based on RENEL's summer 1991 development strategy for the years 1991-2000,[3] the power generation industry needs to invest $15.6 billion between 1991 and 2000 to develop new power generation and distribution capacity.[4] (See table 3.1.) This investment would allow Romania to complete construction of an additional 19 percent (4,357 megawatts) of generating capacity. According to RENEL officials, this strategy will be reexamined in 1992 as part of the energy sector analyses now being conducted by the World Bank and the European Investment Bank.

The current strategy for construction in 1991-1995 calls for a 12-percent increase in power-generating capacity, including an additional 1,244 megawatts from coal-based thermal power stations, 700 megawatts from the first nuclear reactor unit now under construction, 703 megawatts from

[3]Strategy for the Development of Electric and Thermal Power, 1991-1995 and Tentatively Through the Year 2000, RENEL (Bucharest, Romania: Summer 1991).

[4]The figures presented in table 3.1 were converted from lei to dollars at the July 1991 official exchange rate of 60 lei to the dollar.

hydroelectric power stations, and 50 megawatts from gas and fuel oil-based thermal power stations.

Between 1995 and 2000, Romania plans to increase its total installed power generation capacity by an additional 7 percent, to 26,836 megawatts, according to the 1991 strategy. Thus, Romania's total capacity would include 37 percent in coal-based thermal power (9,854 megawatts); 27 percent in hydroelectric power (7,151 megawatts); 24 percent in gas and fuel oil-based thermal power (6,331 megawatts); and 13 percent (3,500 megawatts) in nuclear power.

**Table 3.1: Estimated Investment Needed to Develop Romania's Power Generation and Distribution Capacity, 1991-2000**

Dollars in billions

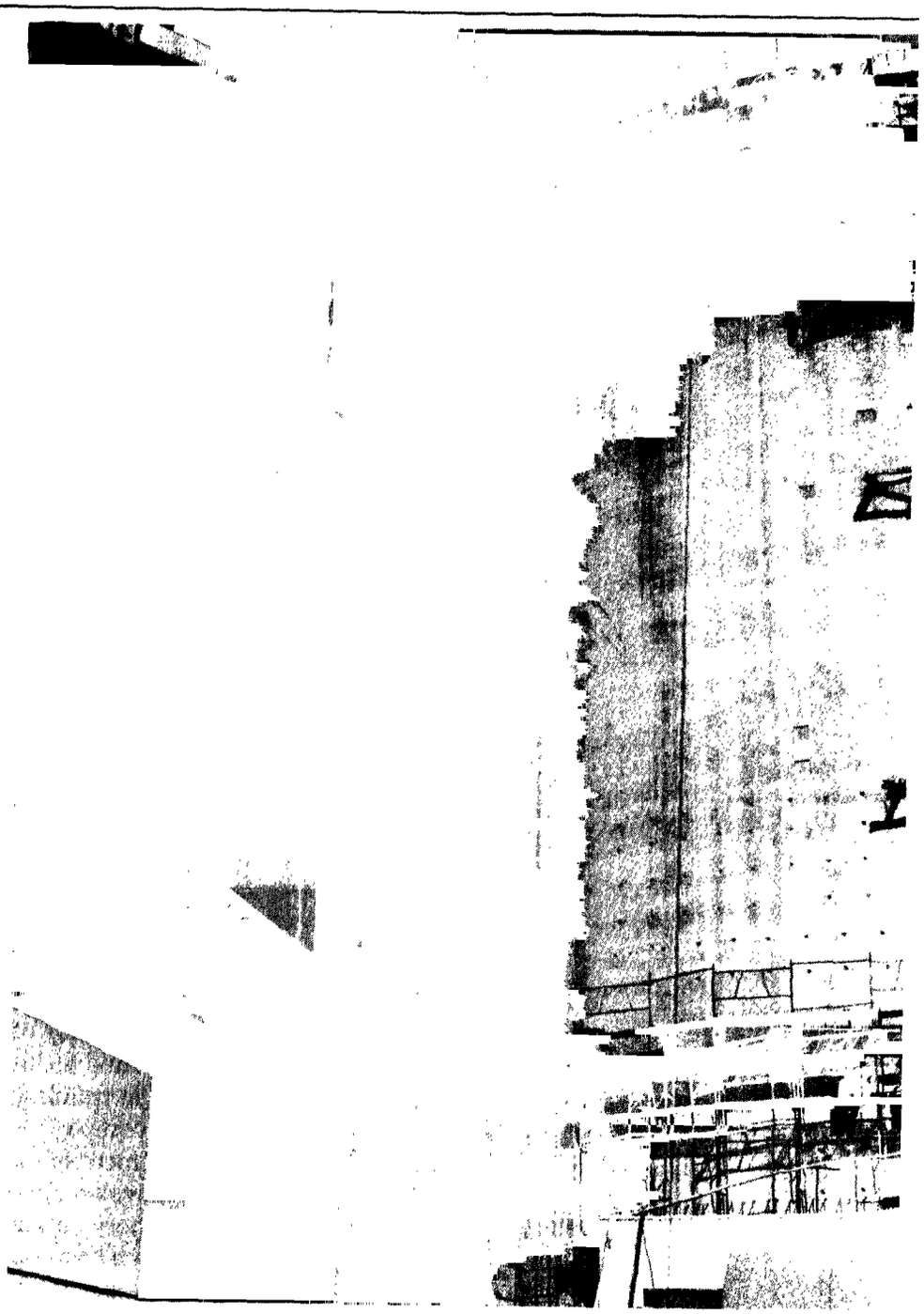
| Power source | Investment needed 1991-2000 | Investment needed 1996-2000 |
|---|---|---|
| Nuclear power | $3.9 | $3.9 |
| Hydroelectric power | 1.5 | 2.9 |
| Thermoelectric power | 1.2 | .2 |
| Electric mains | .5 | .7 |
| Other works | .5 | .3 |
| **Total** | **$7.6** | **$8.0** |

Source: RENEL, April 1991.

## Nuclear Power

The development of nuclear-generating capacity is an essential component of Romania's strategy to address the nation's energy shortage and become more self-sufficient in electricity production, according to a high-level Romanian government official. Romania's first nuclear power plant is now under construction in eastern Romania at Cernavoda. (See fig. 3.1). The first of five 700-megawatt reactor units was originally scheduled to come on line in 1985, but due to financing and construction problems, that unit is not expected to be operational until the end of 1994.

Figure 3.1: Romania's First Nuclear Reactor Unit Under Construction at Cernavoda, 1991



According to the International Atomic Energy Agency, the Cernavoda project is using advanced western technology in accordance with international standards and practices. The Cernavoda project has received a loan of about $300 million from Atomic Energy of Canada, Ltd., to complete construction of the first reactor, which is based on the Canadian "Candu" design, and a loan of about $100 million from an Italian company to finance engineering and construction for the conventional components of the plant. A Canadian subsidiary of a major U.S. electric company is building the steam turbo generators for the first and second units. Atomic Energy of Canada is providing management support and engineering assistance and is training Romanian staff. In addition, the International Atomic Energy Agency plans to monitor the project through completion.

Romania's plans to develop new power generation capacity will be reexamined in light of World Bank and other analyses that are questioning the need for additional capacity. According to Romanian and World Bank officials and an AID contractor, Romania's electricity demand may not rise above 1989 consumption levels until 2005 or later. For this reason, some experts are skeptical of the need for Romania's costly nuclear plant. They have suggested that Romania may be better off investing in the modernization and rehabilitation of existing plants and in technologies to increase energy efficiency and conservation.

## Oil Refining

Romania is seeking foreign export earnings and investment to modernize its oil-refining plants, obtain crude oil supplies, and utilize excess oil-refining capacity. In addition, the government has taken some steps that could provide for partial foreign ownership of individual refining plants in the future. By reviving the oil-refining industry, Romania hopes to increase its hard currency earnings from the export of refined products.

According to Ministry of Industry officials, Romania's refining industry needs modern equipment and technology, general repairs to existing facilities, and management training to increase the efficiency of plant operations. One U.S. oil company estimated that each of Romania's 11 refineries requires investment of $200 million-$250 million for upgrading and rehabilitation. Improved technology and maintenance will allow Romania to increase refinery output and develop the capacity to produce higher-value products such as unleaded gasoline and low-sulphur diesel fuel for sale to Western Europe's environmentally conscious markets.

Romania's refining industry has already initiated contacts with foreign companies. For example, the government has negotiated with two U.S. companies for advanced catalytic cracking technologies and repairs for its refineries. The Romanian government has also expressed interest in joint ventures for refinery modernization projects with Gulf states such as the United Arab Emirates and Kuwait. Typically, Romania offers to provide the building materials, installation equipment, and labor to carry out such projects.

Romania is also seeking leasing arrangements that allow foreign oil companies to process their crude oil at Romanian refining plants. In 1991, more than 15 foreign firms, including at least 1 U.S. firm, were reported to be negotiating such agreements. These agreements allow foreign companies to acquire extra refining capacity on a short-term basis without making a large investment of time or capital. Romanian officials added that foreign investors can benefit from Romania's well-developed oil infrastructure; its proximity to the Middle East; and its cheap, well-trained refinery workers.

Romania is also interested in the possibility of selling its excess oil-refining capacity to foreign investors, according to National Agency for Privatization officials. U.S. embassy officials in Bucharest officials told us that since refineries are now organized as "commercial societies," they could theoretically be sold to foreign investors through joint venture arrangements. However, according to these officials, legal prohibitions against foreign ownership of Romanian land could complicate such transactions.

## Diversifying Oil and Gas Suppliers

To supplement its domestic resources and reduce its vulnerability to future disruptions in world oil and gas markets, the Romanian government plans to diversify its suppliers and participate in international pipeline construction projects. For example, Romania is increasing its reliance on Saudi Arabia and Egypt to meet future oil demands. In 1992, Romania plans to purchase about 60 percent of its oil from Iran, 30 percent from Saudi Arabia, and 10 percent from Egypt; no imports are expected from the former Soviet Union. To assure future supplies of natural gas, the government is negotiating to participate in the construction of a gas pipeline from Iran to Europe via Turkey, which would enable Romania to purchase about 425 billion cubic feet of gas annually from Iran once the pipeline is in operation. In addition, Romania is considering expanding existing gas pipelines from the Soviet Union and is exploring the possibility

of building a liquified natural gas terminal at the Black Sea port of Constanta to allow imports from abroad.

## Improving Energy Use

Romania's energy shortage has been compounded by inefficient energy use and centrally controlled prices that discourage energy conservation and investment. In addition, Romania's energy production and consumption have created serious environmental problems. Romania's efforts to reform energy prices, improve energy efficiency, and control pollution associated with energy production and use could create opportunities for foreign trade and investment, according to Romanian and U.S. officials.

### Reforming Energy Prices

Romania's highly subsidized energy prices have contributed to wasteful and inefficient energy consumption practices. Since the revolution, Romania has begun reforming prices to reflect production costs and to encourage conservation and private investment. The government is gradually raising prices for electricity and fuel.

Government resolutions in 1990 and 1991 gradually increased electricity prices for industry in alignment with world market prices at official exchange rates. After a series of price increases starting in November 1990, industry prices for electricity now come close to covering production costs. In addition, RENEL has established a policy to cut off electricity supplies to industrial users who have not paid their bills.

While prices for industrial users come close to covering production costs, the government continues to heavily subsidize household electricity prices. According to U.S. embassy officials in Bucharest, as of May 1992 household consumers paid only 3.7 lei per kilowatt hour, while actual production costs are about 12 lei per kilowatt hour. However, the government intends to phase out subsidies on all household energy by the end of 1993.

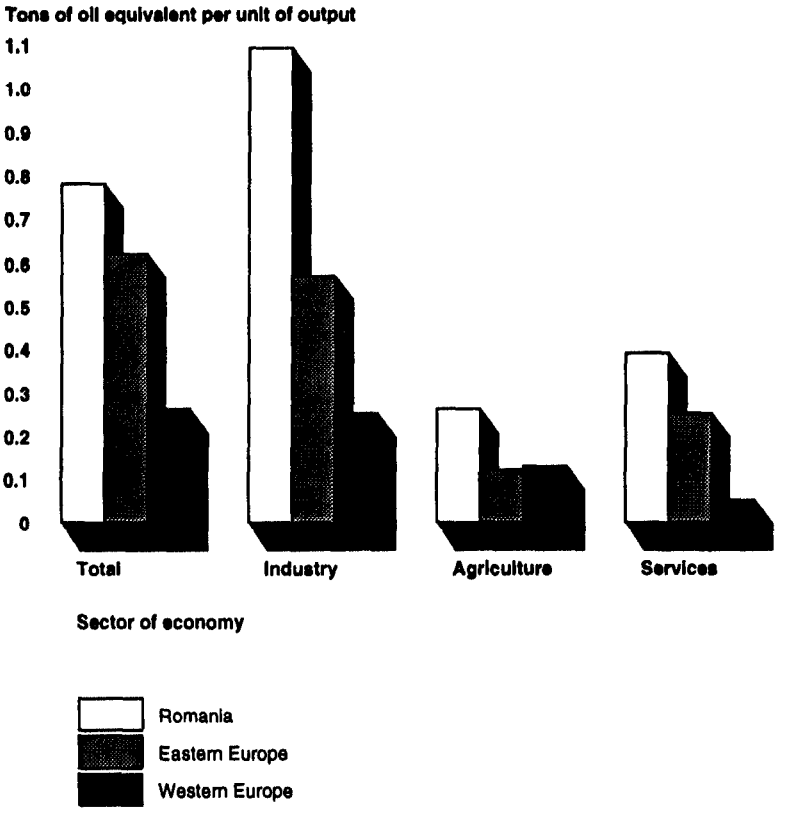
Romania now buys and sells oil and natural gas at world market prices and is adjusting the domestic prices of natural gas, gasoline, and coal to more closely reflect production costs. Natural gas is currently priced at about 55 percent of the price of imported natural gas from the former Soviet Union. The government plans to adjust the price of natural gas upward by 10 percent quarterly in real terms until the import price is reached. According to U.S. embassy officials, gasoline prices are now 120 lei per liter. However, as of March 1992, gasoline consumers were still entitled to

40 liters per month at the subsidized price of 50 lei per liter. Coal production continues to be subsidized by the government due to the high costs of domestic production, and the government has not yet set a time frame to phase out these subsidies.

## Increasing Energy Efficiency

Conservation and improved energy efficiency are essential to Romania's industrial and energy sector reforms, according to a high-level Ministry of Industry official. Currently, Romania's energy intensity, defined as energy consumption per unit of gross domestic product, is one of the highest in Eastern Europe. (See fig. 3.2.) According to AID, the factors that have contributed to Romania's high energy intensity are a lack of incentives to conserve energy, insufficient capital for investment in energy-efficient technologies, absence of a government institution to provide energy efficiency incentives and assistance, and inadequate management and training support for energy-efficient practices at the plant level. In addition, Romania's concentration on heavy industries such as aluminum, steel, and chemicals has contributed to its high energy intensity. AID's industrial energy audits found that Romania's large, centrally planned industrial facilities have typically sacrificed energy efficiency in order to maintain production quotas.

**Figure 3.2: Romania's Energy Intensity by Sector, Compared With Selected Countries, 1987**




Source: International Energy Agency, 1990.

Romania is taking steps to address these problems. In 1991 the government established an Agency for Energy Conservation under the Ministry of Industry to monitor energy use and develop methods for improving energy efficiency. A high-level agency official stressed the need to implement immediate low- or no-cost measures to increase industrial energy efficiency and, as a longer-term goal, to restructure Romania's economy away from heavy industries. This official told us the Agency would like to invest a total of about $14 million for energy conservation projects in 1991 and 1992. The agency is seeking foreign government and private sector assistance to help finance these investments.

As Romania works to increase the efficiency of its energy production and use, it will look to foreign companies for modern technologies and expertise. According to U.S. and World Bank officials, Romania is a

potential market for metering devices, energy monitoring equipment, and home energy products such as space heaters, energy-efficient light bulbs, and insulation materials. U.S. and Romanian officials have emphasized that relatively small investments in energy control devices can result in large energy savings. In addition to technology, Romania is seeking foreign expertise to develop an energy-efficiency strategy. For example, U.S. contractors under AID's Emergency Energy Program are working with Romanian energy officials to identify cost-effective improvements in industrial energy efficiency and improve energy auditing and management techniques.

## Controlling Pollution

Romania's oil, gas, coal, and power generation industries are highly polluting. Government officials have recognized the need to address the serious pollution problems associated with Romania's energy production and use and are seeking foreign technology and expertise to assist in this effort.

Romania's energy production and conversion practices have created extensive environmental problems. The discharge and improper reinjection of saline water from crude oil drilling rigs are one cause of Romania's soil and groundwater pollution, creating damage to agricultural land and drinking wells. Romania's coal production and preparation techniques have led to severe pollution of the Jiu River. Romania's thermal power generation plants burn high-sulphur fuel oil and lignite coal, resulting in emissions of sulphur dioxide, nitrous oxide, and particulate, as well as physical damage to power generation equipment. In 1990 production of electricity and heat accounted for about 80 percent of total sulphur emissions and 40 percent of nitrous oxide emissions in Romania, according to Romanian statistics. Air quality control systems currently installed in Romania's coal and lignite power plants perform inefficiently due to lack of maintenance, obsolescence, and design deficiencies.

A high-level Ministry of Industry official indicated that the Romanian government recognizes the need to develop a coherent strategy to deal with the environmental problems created by Romania's energy industries. The Romanian government, in cooperation with the World Bank, AID, the U.S. Environmental Protection Agency, and the European Community, is preparing an environmental strategy paper identifying problems and potential strategies to address the causes of energy-related pollution. The first draft of this paper was completed in May 1992. Romanian energy experts have highlighted the importance of improving the quality of fuels

used to generate electricity, retrofitting power plants with pollution measurement and control equipment, and establishing government emissions standards. Romania's efforts to cope with its energy-related pollution problems could create business opportunities for western companies in the area of pollution control technologies, according to U.S. officials. For example, Romania needs modern technologies such as electrostatic precipitators and improved ash disposal systems.

# Foreign Companies Face Impediments to Trade and Investment in Romania

Although Romania has taken steps to reform its economy and attract foreign business, foreign companies still face impediments to trade and investment there. The energy sector continues to be largely under state ownership and management, thus limiting market incentives. Romania's national energy strategy and petroleum law[1] are in the developing stages, making it difficult for foreign companies to obtain the information they need to consider investment. In addition, Romania's underdeveloped legal and business infrastructures, as well as its economic and political instability, continue to deter potential foreign investors.

According to some U.S. and Romanian officials, Romania's lack of most-favored-nation (MFN) trade status may further discourage U.S. trade with and investment in Romania. Recent actions by the U.S. government may address this problem. In April 1992, after determining that Romania had made sufficient progress toward a market economy and democratic pluralism, the administration signed a bilateral trade agreement with Romania restoring MFN on a reciprocal basis. The administration submitted the agreement to Congress in June 1992. However, U.S. government financing programs, including the Overseas Private Investment Corporation (OPIC) and the U.S. Export Import Bank (Eximbank), are awaiting further signs of political and economic reform before extending loans and loan guarantees to Romania.

## Energy Sector Reforms in Developing Stages

Although Romania has taken steps to reform its energy sector, its energy industries continue to operate inefficiently and under state control. In addition, Romania's energy strategy is in the early stages of development, and important petroleum legislation has not yet been approved by Parliament.

Lacking competition, Romania's energy industries have had little incentive to operate efficiently and profitably. For example, according to one U.S. oil company cited in Oil and Gas Investor, the oil industry employs many more workers than U.S. industry to complete similar oil exploration and drilling operations. Another U.S. oil company representative told us that Romanian refining plants employ many times the number of workers per unit of output as U.S. plants. Until energy industries, such as oil and gas

[1]According to a U.S. embassy official, Romania's parliament is considering a draft petroleum law that defines the new structure of Romania's oil industry and contains provisions governing the conduct of foreign oil companies in Romania.

production, refining, coal mining, and power generation, can demonstrate profit-making potential, foreign companies may be reluctant to invest.

U.S. oil company officials told us that Romania's lack of a published energy strategy has further discouraged U.S. trade and investment. Without access to Romania's national energy strategy, private companies have lacked an important source of business and legal information required to consider investment. U.S. oil companies have also expressed concern that Romania's Parliament has not yet passed the petroleum law intended to govern the conduct of foreign companies in Romania's oil industry. In addition, some U.S. companies have expressed reluctance to participate in joint ventures in the oil industry until they are assured that they will not be liable for past environmental damage.

The government of Romania recognizes the importance of developing a comprehensive energy strategy. A U.S. embassy official in Bucharest told us that in March 1992 Romania issued an industrial restructuring plan containing some information on energy supply and demand. The national energy strategy was expected to be completed in mid-1992 after international organizations such as the World Bank and the European Investment Bank complete their studies of Romania's energy sector. Romania must also make difficult economic and industrial restructuring decisions before it can accurately estimate future energy needs, according to U.S. government and Romanian officials.

## Underdeveloped Legal and Business Infrastructures

U.S. government and private sector representatives have expressed concerns about Romania's legal and business infrastructures. Although the basic legal framework for conducting business is in place, they are uncertain about how Romania's foreign investment, privatization, and business taxation laws will be applied in practice. In addition, U.S. companies have found the process to conclude contracts and joint venture agreements to be cumbersome and time-consuming. Further, some foreign companies have expressed concerns about the lack of legal protection for intellectual property.

Conducting business in Romania can be a challenge, according to U.S. government and private sector officials. Shortages of computers and other office equipment hinder the operation of foreign businesses in Romania. According to the U.S. Department of Commerce, the costs of office rentals, supplies, transportation, and telecommunications services are also disproportionately high for a country with such a low standard of living.

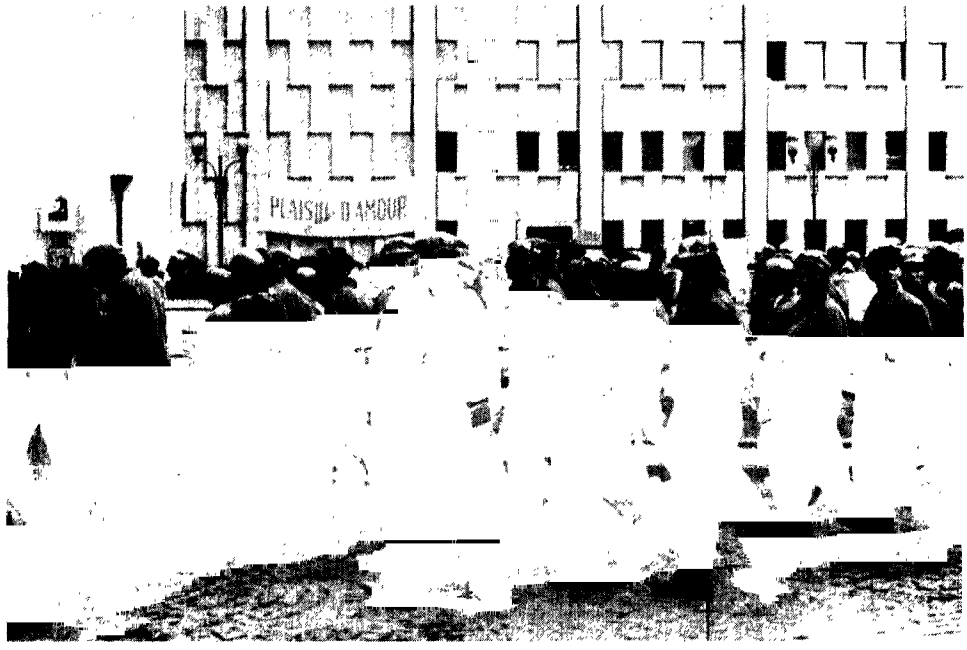
Foreign investors are sometimes frustrated in their attempts to determine the value and profit potential of Romanian enterprises because their financial records are not based on western accounting standards. Finally, Romanian industry officials lack experience with western business practices, adding time and cost to routine transactions.

## Persistent Financial and Political Uncertainties

Continued uncertainty about Romania's financial and political stability is an added deterrent for foreign investors. Romania has a relatively low foreign debt (estimated at less than $2 billion in 1991), which is expected to improve its prospects for foreign investment in the future. However, Romania's lack of hard currency, restrictions on repatriation of profits, and declining economy continue to discourage foreign private sector lenders. Thus, arranging for financing is a continuing struggle both for Romanians and foreign investors. One Romanian official told us that Romania will have to depend primarily on loans from international financial institutions, such as the World Bank and the European Bank for Reconstruction and Development, to finance near-term energy sector investment. A U.S. private sector official commented that foreign companies willing to arrange special financing schemes or barter transactions would have a business advantage in Romania.

Foreign investors have also expressed concerns about unsettled political conditions. Violent political confrontations have cost Romania substantial foreign investment. Romania has few allies, and, with the exception of Albania, has been the most politically isolated of the East European countries. One of the most serious incidents of political unrest since the revolution occurred in September 1991 when thousands of Romanian coal miners protested government reform policies during 3 days of rioting in Bucharest. (See fig. 4.1.) The coal miners' activities led to the resignation of the Prime Minister and fueled tensions between the conservative and reformist factions of the ruling National Salvation Front. Romania's former Economic Minister stated that the miners' riots cost Romania almost $3 billion in delayed foreign loans and lost investments. According to U.S. government and private sector representatives, Romania's political tensions are likely to persist. The current government has little popular support, and opposition parties are not well established. In addition, Romania's persistent ethnic rivalries continue to undermine the country's political stability.

**Figure 4.1: Romanian Coal Miners Protest Government Policies, September 1991**




## MFN Trade Status Under Consideration

According to some U.S. and Romanian officials, Romania's lack of MFN trade status may have discouraged trade between the two countries. Recent actions by the U.S. administration, in response to progress made by Romania toward a market economy and democratic pluralism, may help to address this issue. In April 1992, the administration signed a new bilateral agreement with Romania which, if approved by Congress, would provide MFN on a reciprocal basis. The administration submitted the new agreement to Congress in June 1992.

The United States granted MFN trade status to Romania between 1975 and 1988. In 1988, however, the Ceausescu government renounced Romania's MFN status, anticipating that the United States would otherwise withdraw it due to concern over human rights violations. After the 1989 revolution, the United States continued to withhold MFN trade status because of concern about the commitment of Romania's new regime to democratic principles, respect for human rights, and market reform. The United States has been encouraging the government of Romania to demonstrate that commitment by holding free and fair elections; providing for independent print and broadcast media fully accessible to opposition points of view; ensuring democratic control over security forces and an end to abuses by such forces; respecting human rights; and implementing rapid market reform. According to State Department officials, Romania's progress in these

areas, particularly the conduct of local elections in February 1992, enabled the administration to take further steps toward restoration of MFN. As the administration and Congress consider the trade agreement and other aspects of U.S.-Romanian relations, they will watch for continued progress in the above areas.

According to some U.S. and Romanian officials, lack of MFN status may discourage U.S. trade with and investment in Romania for several reasons. For example, foreign companies, which typically view MFN status as a "green light" for investment, may be reluctant to do business in Romania without this assurance. In addition, lack of MFN status may interfere with U.S.-Romanian trade and political relationships by denying Romania an important "vote of confidence" on its reform efforts. Finally, without the favorable tariff treatment provided by MFN, Romania's ability to obtain hard currency export earnings with which to purchase western goods and services may be reduced. At the same time, one State Department official maintained that lack of MFN trade status is just one of several factors that limit U.S.-Romanian trade—declining industrial production, political uncertainties, and an underdeveloped business infrastructure also discourage trade and investment between the two countries.

## Limited U.S. Government Financing

According to some Romanian and U.S. government officials, restricted U.S. government financing has limited U.S. business involvement in Romania's energy sector. U.S. government financing agencies, such as OPIC and the Eximbank, are restricting their programs in Romania until further signs of political and economic reform emerge. OPIC must determine that the Romanian government adequately ensures workers' rights before it can offer risk insurance and loans. In April 1992, Eximbank made its short-term credit insurance available to assist the exports of U.S. goods and services to Romania. However, Eximbank officials told us that the Eximbank must determine that it has a "reasonable assurance of repayment" of medium- and long-term loans and loan guarantees before it can offer these financing programs in Romania. U.S. government officials told us that U.S. companies are at a disadvantage relative to their German, French, Italian, and British competitors, whose governments offer more extensive trade and investment financing for energy projects in Romania.

## Romania's Efforts to Address Impediments to Trade and Investment

Romania has taken steps to address some of the legal, financial, and political impediments to foreign trade and investment. For example, the government passed Law 15 on the Restructuring of State Economic Units in July 1990, which provided for the transformation of state-owned enterprises into commercial companies that would eventually be privately owned and operated. Nevertheless, a few strategic sectors, including petroleum, utilities, mining, defense, and telecommunications, will remain state-owned autonomous entities— "regies autonomes." The Romanian Parliament has also passed a full-fledged privatization law providing for a mechanism to implement privatization in July 1991. According to Romanian government reports, Romania intends to transfer 50 percent of the shares of the commercial companies to private hands by mid-1995. According to a report by the International Monetary Fund, it is estimated that about 20 percent of Romania's gross domestic product is now generated by the private sector.

Romania's April 1991 revision of the foreign investment law allows foreign investment in the form of partnerships, joint-stock companies, and limited liability companies in a wide range of industries. The law provides for 100-percent foreign ownership; 100-percent transferability of hard-currency profits; convertibility and transferability of lei profits equivalent to 8-15 percent of the foreign investment; 2- to 5-year year tax holidays and additional tax breaks for further years; and protection from nationalization and expropriation.

Romania has also made progress in reforming its financial institutions and liberalizing prices, according to U.S. Commerce Department reports. Romania has transformed its once highly centralized banking system into a two-tier system allowing privately owned Romanian banks and foreign joint venture banks to operate in Romania. The National Bank of Romania acts as the sole money-issuing institution and regulates all other banks. Price liberalization, which has taken place gradually since November 1990, was further accelerated in April 1991 when the government lifted price controls on many food items and all basic consumer goods.

The State Department has acknowledged Romania's progress in creating democratic pluralism and a market economy. Romania adopted a new Constitution in November 1991, with the endorsement of 70 percent of the

referendum voters. The Constitution formally declares Romania a presidential multiparty republic with a market economy and makes provisions for basic human rights and protection of private property. In addition, Romania held local elections in February 1992 that were viewed favorably by the international community.

# Assistance to Romania From the United States and International Organizations

U.S. and international agencies have undertaken a variety of efforts to assist Romania's energy sector. AID initiated programs in 1991 to increase energy efficiency, reform energy prices, and promote rural electrification. The U.S. Trade and Development Program is evaluating funding requests for several feasibility studies of power generation projects in Romania. The Department of Commerce offers energy-related information exchanges and trade missions in Romania. Finally, international financial institutions such as the World Bank, the European Investment Bank, and the European Bank for Reconstruction and Development have extended loans to Romania to support technical assistance and development projects in the energy sector.

## AID

AID has initiated three programs to assist Romania's energy sector: the Emergency Energy Program, the Regional Energy Efficiency Project, and the Rural Electrification Project.

The goals of AID's $10-million Emergency Energy Program, funded in fiscal year 1991, were to help Central and East European countries identify and implement low-cost measures to improve industrial energy efficiency; reduce refinery losses and adjust refinery operations to changing market conditions; train key personnel to purchase oil on the world spot and futures markets; and provide an improved analytical basis for decisions on energy price reform.

AID spent $1.6 million in fiscal year 1991 to support the Emergency Energy Program in Romania. Since February 1991, AID contractors have conducted energy audits of eight industrial plants, recommended low-cost management improvements, and provided energy efficiency equipment to each plant. These measures are expected to save a total of $10 million annually. AID contractors have also completed energy audits and systems analyses of 11 Romanian refineries and provided training, consulting, and computer services in the areas of energy price reform and world oil market trading. The program has been well received in Romania; government officials told us that industrial energy efficiency equipment was identified and installed in a timely manner, with immediate and visible energy-saving results.

AID initiated the $34-million, 4-year Regional Energy Efficiency Project in 1991 to support U.S. participation in a larger, multilateral effort to improve energy efficiency and reduce energy-related environmental damage in Central and Eastern Europe. The project also aims to promote

private energy investment and trade in the region. AID officials expect to allocate at least $500,000 in fiscal year 1991 funds for the Romanian component of the Regional Energy Efficiency Project. Proposed activities for Romania include continued assistance and management training related to energy efficiency; technical assistance in restructuring the power generation industry; and managerial, financial, and technical exchanges with U.S. energy industries through the U.S.-Eastern Europe Utility Partnership Program.

AID is also assisting Romania's power generation sector through the Rural Electrification Program. This program is funded through a 1.3-billion lei currency account generated through the local sale of U.S. food grants. The objectives of this program are to assess the condition of Romania's electricity distribution system and to recommend priorities for its rehabilitation and expansion. During their study mission in December 1991, AID contractors found that parts of Romania's electricity distribution system are up to 50 years old, and over 50,000 rural Romanian households are without electricity.

## Trade and Development Program

Romania's energy sector is receiving support through the U.S. Trade and Development Program. TDP, an independent U.S. government agency, funds feasibility studies for major projects in middle-income and developing countries where there is a potential for exporting U.S. technology, goods, and services. TDP officials anticipate spending about one-third of the agency's expected $35-million budget for fiscal year 1992 on projects in Eastern Europe and the former Soviet Union.

TDP received State Department authorization to operate in Romania in November 1991 and is currently evaluating three Romanian requests from the energy sector for 1992 feasibility study funds. These requests include studies for the rehabilitation of five district heating plants in Bucharest, the updating of Romania's electric power grid control system, and the modernization of one of Romania's hydroelectric power plants.

## Department of Commerce

The U.S. Department of Commerce's trade promotion activities in Eastern Europe include efforts to increase U.S. business opportunities in Romania's energy sector. Commerce's Eastern Europe Business Information Center in Washington, D.C., provides U.S. companies with energy trade and investment information on Romania and other countries in the region. In addition, Commerce's U.S. and Foreign Commercial

Service in Bucharest has assigned a Romanian foreign service national to facilitate U.S.-Romanian business contacts. Commerce also led a mining equipment trade mission to Romania in November 1991.

## International Assistance

International organizations have become increasingly involved in Romania's energy sector. As part of a $180-million loan approved in June 1991, the World Bank has extended $105.6 million for technical assistance and critical imports in Romania's oil, gas, power generation, and coal mining sectors. This loan includes $3.8 million to finance an energy cost and pricing study, to support the assignment of an energy policy adviser to Romania's Ministry of Industry, and other technical assistance. The remaining $101.8 million in World Bank credits will be used to finance critical imports of spare parts and equipment for Romania's energy industries. In July 1991 the European Investment Bank announced its first loan of $28 million to assist Romania's power generation sector. The purpose of this loan is to cofinance the rehabilitation of four of Romania's largest coal-fired power-generating units in cooperation with the World Bank, and to conduct an investment strategy study for the power industry. The European Bank for Reconstruction and Development is considering several energy projects in Romania and has approved a $31-million loan for a French-Romanian joint venture to produce modern steam turbines and electric generators for Romania's power generation plants. Also, the International Atomic Energy Agency is monitoring the construction of Romania's nuclear power plant. Finally, the European Community is providing training and technical assistance to help Romania develop an energy conservation and efficiency strategy.

# Organizations GAO Contacted

## Federal Government

Department of Commerce
Department of Energy
Department of State
Department of the Treasury
Agency for International Development
Environmental Protection Agency
Export-Import Bank of the United States
Office of the U.S. Trade Representative
Overseas Private Investment Corporation
Trade and Development Program

## Private Sector

AMOCO Company
ARCO International
Chevron International Oil Company
Citizens Democracy Corps
Exxon Company International
International Association for Energy Economics
Manufacturers Hanover Trust
Occidental Petroleum
Petroleum Economics Limited
Resource Management Associates
Shell International Petroleum Company
Texaco Oil Company
Westinghouse Electric Corporation
Universal Oil Products
U.S. Chamber of Commerce

## International Organizations

European Bank for Reconstruction and Development
European Community
International Atomic Energy Agency
International Energy Agency
Organization for Economic Cooperation and Development
World Bank

## Romanian Contacts

Center for International Private Enterprise
Cernavoda nuclear plant
Company for Oil and Gas Cooperation
Energy Conservation Agency
Mining and Geology Agency
Ministry of Industry
Ministry of Trade and Tourism
National Agency for Privatization
National Commission for Statistics
Petrol Export Import
Rafinarii Romanesti
Regia Autonoma de Electricitate
Regia Autonoma Gazelor Naturale
Regia Autonoma a Petrolului
Romanian Development Agency
Senate Economic Commission
Senate Financial Commission
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