ENERGY USE: ECONOMIC AND ECOLOGICAL PROBLEMS

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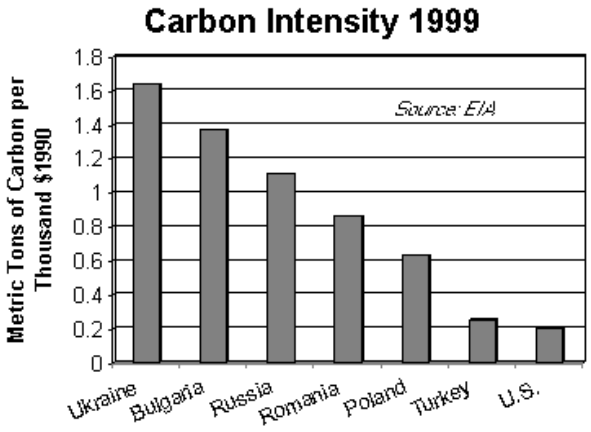
The nuclear meltdown at Chernobyl in 1986 and the resultant damage to the environment in Ukraine have been well documented, but the degradation of Ukraine's environment goes well beyond Chernobyl. Soviet industrialization of Ukraine, especially in the Donetsk basin, has left a legacy of air pollution, and industrial runoff into the Dnieper River has contributed to the pollution and decay of the Black Sea.

In addition, many of Ukraine's thermal power plants are old, with antiquated equipment, obsolete technology, and lacking modern pollution control equipment. In response, Ukraine adopted in May 1996 the "National Power Energy Program Until the Year 2010," designed to rehabilitate working thermal power stations to allow them to continue operation for the next 25 years. The program's mandate specified technological improvements, use of renewable energy sources and modernization of the power plants, as well as making them more environmentally friendly.

The program also specified that combined cycle-gas turbine equipment--as well as most of the auxiliary equipment--would be improved to reach acceptable safety levels. Good quality coal was to be used to reduce environmental damage. However, many of these reconstruction and modification projects have been seriously delayed because of the shortage of state budget financing for the Ministry of Environmental Protection and Nuclear Safety, unfavorable legislation, and the lack of private investment.

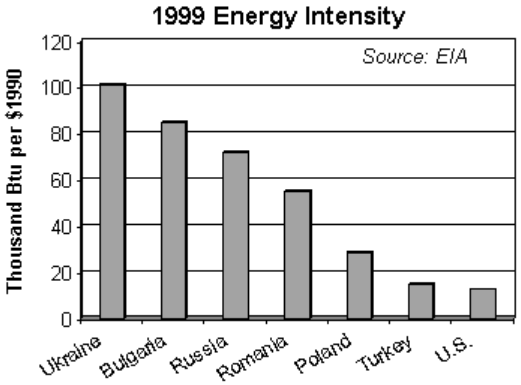
At 6.4 quadrillion Btu (quads) in 1999, Ukraine's energy consumption accounts for 1.7% of the world's total. In 1998, the country's vast industrial sector accounted for a disproportionate 61% share of the country's total, with residential standing at 16%, transportation at 14%, and commercial 9%. In 1999, natural gas consumption represented the largest percentage of energy consumption at 44%, with coal and oil at 30% and 11.8%, respectively.

Looking at recent trends, Ukraine has followed a continual pattern of reduced energy consumption. Since 1992, Ukraine energy consumption has dropped from 8.86 quads to 6.43 quads in 1999--a 27% drop. This figure is even more impressive when compared to Ukraine's neighbors that are also in transition to market economies. Only Russia, which saw a 25% decrease (from 34.9 quads to 26.0 quads), experienced a similar pattern. Unfortunately, much of the reduced energy consumption in Ukraine is due not to energy saving or energy efficiency but rather to the collapse in industrial production because of the contraction of the economy.



Ukraine emitted 104.3 million metric tons of energy-related carbon in 1999, representing 1.7% of the world's total. Ukraine's heavy dependence on coal accounts for the fact that this fuel makes up

nearly half (46.8%) of the country's carbon emissions, with the remainder coming from natural gas (39.4%) and oil (13.9%).



But still any economy can not develop without intensive usage of energy. So, we face the problem of energetic sources.

The use of renewable energy in Ukraine was one of the principal goals of the 1996 National Power Energy Program. In 1999, however, renewable energy sources represented only 8.6% of electricity generation, a figure that includes hydropower, solar, wind, tide, geothermal, solid biomass and animal products, biomass gas and liquids, and industrial and municipal wastes. This figure appears low, but it can partially be explained by the fact that the development of renewable resources in Eastern Europe and the former Soviet Union remains limited primarily to expansion or refurbishment of existing hydroelectric units. Indeed, the National Power Energy Program called for completion of new hydropower utilities--such as the Dnistrovska hydro pumping storage station--to reduce dependence on imported energy sources.

Yet, renewable energy sources are beginning to find a market in Ukraine. In the Carpathian region of the country, the Environmentally Sound Business Development project is focusing on small business development in wood processing industry to increase the efficiency of the production process by reducing timber use, waste products, and energy consumption. In addition, as part of an alternative energy source program, the Ukrainian State Geology Committee and the Ministry of Coal--along with the United States Agency for International Development, Ukrainian coal companies, and the U.S. coal bed methane industry--are working to identify opportunities to develop coal bed methane as a commercially viable alternative energy source in Ukraine.

In addition, the Ukrainian parliament passed a bill in July 2001 that aims to develop alternative energy sources such as solar, and geothermal. Additionally, through the Wind Power Development Project, Ukraine seeks to establish wind power as a significant source of electricity generation by 2020.

The difficult transition to capitalism and a market economy presents Ukraine with many environmental challenges. Chief among these is the need to decouple environmental pollution from economic output. The country's current decrease in environmental pollution is essentially linked to the collapse in industrial output.

Public awareness of threats to Ukraine's environment sprouted from the Chernobyl accident, and independence has brought greater public participation in decisions affecting the environment, but more is needed. The Ecological Television Center (ECO-TV) in Ukraine was established to do both. At the request of the Ukrainian Ministry of the Environment, ECO-TV produces programs providing up-to-date global, national, and regional environmental information to the Ukrainian public. The primary focus has been on community-based projects and increasing public awareness.

The accident at Chernobyl and its lingering environmental effects will serve as a constant reminder for Ukraine of the need to protect the environment. The challenge in the years ahead will be to find

a balance between Ukraine's energy needs and strengthening the country's commitment to environmental protection.