

Air Quality Improved ... Possibly

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In the former German Democratic Republic, grey pungent smoke belched from millions of chimneys. City buildings were shrouded in a veil of soot, the somber monotony occasionally punctuated by decaying statuary. Chronic respiratory diseases and forest degradation were the grim parables of an archaic energy industry incapable of reconciliation with human health or the environment.

Sulphurous lignite, or soft brown coal, was used to meet 70 per cent of primary energy needs. Hard-currency shortages prevented the implementation of efficient power plants for imported gas and oil. Lack of financing did on the other hand mercifully stall the planned construction of 10,000 MW of nuclear capacity from the Soviet Union at 1830 MW.

Dust precipitators were rarely employed in the lignite power stations of the GDR. Desulphurization never passed the experimental stage, and local air pollution was routinely countervailed by increasing the height of smokestacks.

However, there was no prospect of fulfilling the 30 per cent sulphur transport reduction requirement of the Helsinki Protocol except by inflating the base-year data. A figure of 2.5 million tons for sulphur emissions, corresponding to 5 million tons of sulphur dioxide, was officially submitted to the ECE Secretariat for 1980,¹ but an analysis of the data for fuel consumption indicated only 3.9 million tons of SO₂ had actually been emitted.² By the end of the decade the annual production of lignite had risen from 253 to 320 million tons, boosting emissions of sulphur dioxide to 5.2 million tons, or one-third more than the level calculated for 1980.³

After national reunification, most of the municipal utilities in eastern Germany switched to natural gas or oil for heating services and cogeneration plants. Environmentally favourable district heating systems continued to serve large cities, while suburbs and smaller towns were for the most part connected to newly established gas networks. Lignite briquettes disappeared as the mainstay of space heating except in unrenovated housing.

Output in lignite mining has dropped to 65 million tons a year. About 50 million tons of crude lignite are burned in base-load power stations. The remainder is employed in heating plants, industrial processes, and briquette manufacturing. The GDR's widely diversified but highly polluting lignite chemical combines have been replaced by modern petrochemical complexes.

Whereas 140,000 were once employed in the lignite industry and its subsidiary operations, less than 20,000 now remain. Part of the workforce is engaged in the restoration of hydrological and ecological balances in the ill-reputed strip mining regions ("lunar landscapes") of Lausatia near the Polish border and the chemical triangle of Bitterfeld/Halle/Leipzig.

The last German offender on the list of 100 worst emitters of sulphur in Europe,⁴ the 30-year old lignite power plant in Lippendorf (600 MW), was shut down in March 2000. Eastern Germany's largest power company, the Vereinigte Energiewerke AG (Veag), has installed desulphurization equipment at the 3000 MW lignite plant it inherited at Jänschwalde, which formerly emitted up to 400,000 tons of SO₂ annually.⁵ Highly advanced lignite power stations have been built at Lippendorf (1866 MW), Schwarze Pumpe (1600 MW), and Boxberg (907 MW), the last flanked by 1000 MW of reconstructed GDR capacity. A new 960 MW lignite plant south of Halle at Schkopau is owned and operated by a German/Anglo-American consortium.

These state-of-the-art installations have contributed significantly to the 93 per cent overall reduction of sulphur dioxide emissions projected by the government of Saxony for the year 2000 (from their 1990 level).⁶ Air pollution has also been reduced by the widespread decline of productive industry. Despite having nearly one-fifth of the population, eastern Germany presently accounts for only 3.5 per cent of national German exports. Household consumption of electricity is typically 2000 kWh/a, about half the western German average. Since additional base-load generation is not required under these conditions, a second 907 MW block planned for the Boxberg power station has been postponed indefinitely.

In combustion lignite emits more carbon dioxide than any other fossil fuel. Generating a billion kilowatt-hours (1 TWh) of electricity requires nearly a million tons of crude lignite, releasing about the same weight of carbon dioxide into the atmosphere. At a current combined output of 50 TWh/a, the Veag and Schkopau plants are thus responsible for approximately 50 million tons of CO₂ annually.

Technological efficiency, fuel conversion, and diminished industrial activity have cut pro-capita CO₂ emissions to 11 tons per year, which is half the former GDR figure and roughly the same as western German levels. However, an additional 100 million tons of annual carbon dioxide emissions must be eliminated for Germany to achieve its self-imposed CO₂ reduction goal of 25 per cent by 2005. Realizing this objective would be equivalent to a twofold abandonment of lignite power production in the east. But in order to facilitate phasing out the country's 19 nuclear power stations, fossil-fuel plant operators are being tacitly encouraged by the federal government to maintain present capacities.

The consequent stabilization of lignite for electricity generation shifts the burden of CO₂ reduction to other sectors, where climate protection remains a tedious task. For instance, some 24 million German dwellings are currently in need of modernization, but barely two per cent are fully renovated each year to meet applicable insulation standards. A recent estimate ascribes 95 per cent of all heating energy consumption to older buildings. While the majority of homes and businesses in the east have been modernized with the assistance of post-reunification loan programs, significantly greater funding would be required to mount a comparable effort for the rest of Germany.

Because of stringent emissions standards for furnaces, nitrogen oxides from traffic have superseded SO₂ as the chief airborne pollutant. With unemployment reaching 25 per cent in some parts of eastern Germany, workers shuttle by hundreds of thousands in cars and buses to jobs in the west. In the early 90's, long-distance truck transport outdistanced that on the railways, which had previously handled 70 per cent of all freight traffic (although a third consisted of lignite transports). Because of low population densities, smog alerts remain rare in the east. Persistent forest damage in mountainous regions is however indicative of excessive concentrations of nitrogen oxides and ozone, as well as of the cumulative effects of acid precipitation.

Other conflicts are the result of inflexible energy policies. The Sorbian (Lausatian) town of Horno is facing imminent destruction by lignite mining for the Jänschwalde power station, and the 700-year-old village of Heuersdorf near Leipzig is similarly threatened by the Lippendorf plant. Yet recent court decisions have fallen in favour of these communities. The operating permit for a mine serving Jänschwalde was revoked in April 2000 for the failure of planning authorities to assess the effect on the environment. Three months later, Heuersdorf successfully contested a devastation law drawn up on the premise that a monopoly electricity market could be maintained indefinitely in eastern Germany.

The verdict refuting this assumption constituted an opportunity to realign energy strategies toward future trading in emission permits for CO₂, which could make it lucrative for the Veag to employ less lignite. The government of Saxony has nevertheless announced that amended legislation would be formulated for displacing the 225 inhabitants of Heuersdorf. The success of this renewed assault on communal sovereignty remains doubtful, however, since excess generating capacities throughout Europe have rendered the destruction of human settlements anachronistic. Ideally, the lignite mining regions could become fields of reconciliation. In June this year, Europe's largest wind park was inaugurated at Kletwitz, on the site of a former strip mine west of Schwarze Pumpe. The 38 wind turbines exhibit above-average performance in the deforested landscape. The state of Brandenburg already fulfills 4.6 per cent of its electricity requirements with wind power. Although that is too little to eliminate fossil fuels from the energy equation, it does stimulate speculation on the post-lignite era. Jänschwalde will have been shut down by the end of the next decade, and all the remaining lignite plants will have ceased operation by 2040. To date, no one seems to know what will follow.

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4. Still with us. Swedish NGO Secretariat on Acid Rain, inside back cover.
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