

These giant machines generate electricity
at enormous cost, while citizens complain

they ruin the landscape. Yet thousands
more will soon be built throughout Europe.

Tilting
Against

Windmills

BY JOHN DYSON

AFTER A HARD DAY'S work, Ottfried Wolfrum liked walking his dog in the fields and forests around his village of Netsche, near Darmstadt, Germany. Though

he loved the countryside, the tall, bearded university scientist was not unhappy when he learned that three giant windmills were to be built on a hilltop overlooking the village.

"Wind is clean and free," this longtime Friends of the Earth supporter said. "Using it to make electricity makes sense."

At a meeting, residents were impressed to hear that the windmills, 72 metres high, would supply electricity for 1,100 homes and reduce polluting emissions from coal-fired power stations. Wolfrum listened, but had some doubts.

Back home, he did some maths—and found that the output of each windmill would at best boil the water in some 60 kettles at once. In a year, all three would cancel out the pollution caused by one tractor.

"The windmills sprouting all over our

When the windmills started operating, his entire house thrummed with vibration. Country walks were spoiled by disco-like reflections of sunlight on the spinning blades. Property values slumped.

Aghast, Wolfrum helped to set up the

Landscape Protection Society (BLS) to fight against new windmills. "Wind power is a big lie," he says. "The windmills sprouting all over our countryside are a giant nonsense."

The BLS is one of a thousand protest groups fighting windmills in Germany. Others are springing up throughout Europe, especially in the UK where opposition is outspoken.

Windmills are "triffids on the march" according to EU Commissioner Neil Kinnock, the former Labour leader. Sir Bernard Ingham, former spokesman of Margaret Thatcher, calls them "bog brushes in the sky." Even the Church of England is passionate. Says the Bishop of Hereford, its environmental spokesman: "The devastation of the countryside is akin to the Taliban blowing up ancient Buddha statues."

Meanwhile, the number of windmills has grown four-fold in the past five years. Germany now leads the world with about 18,000 and Spain is next with about 7,000. Denmark has nearly 6,000.

In the next few years, however, these structures—some with blades bigger than a Boeing 747 spinning on end—will multiply spectacularly. The EU goal is to generate 12.5 percent of total elec-

tricity needs from renewable sources—mostly wind—by the end of the decade. That means an astounding 100,000 large windmills by 2010.

Fear of Blackouts. "Well-meaning people believe in their hearts that wind en-



ergy must work," says Angela Kelly a painter in Wales whose organization, Country Guardian, opposes the blight. "The reality is quite different."

Wind energy's crucial shortcoming is reliability: windmills work only when the wind blows. Off-shore, that's maybe half the time. Inland, some windmills generate electricity for as little as six weeks a year.

"The industry admits that the average windmill generates power only one day in three," says Helmut Alt, chief

Windmills in northern Germany: "Triffids on the march," says European Commissioner Neil Kinnock

devices. Without power, hospital patients can die, central heating stops, freezers thaw out, TV videos go haywire.

"Until we invent a way of storing huge amounts of electricity, wind energy can never be relevant to our future," says Gundolf Dany, chief engineer of the Institute of Power systems in

countryside are a giant nonsense."

economist at RWE, one of the largest German utility companies. "But that's not much help when the power supply has to meet consumer demands exactly, every second of the day."

A blackout of just one millisecond causes chaos in computers and timing

Aachen.

As long as the wind-power feeding into a system is minor—as in the UK, where it's still less than 0.5 percent—existing power stations have the flexibility to cope with day-to-day, hour-by-hour fluctuations. Once input

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reaches about 12 to 15 percent, engineers report, the problems become acute—as in Denmark.

In the Danish town of Fredericia, Henning Rasmussen sits in the control room of the Eltra transmission company, balancing the input of wind energy with demand for power. “In strong winds our windmills provide as much as two power stations,” he says. “But in light winds we get nothing and we have

thing power companies can do is bring conventional systems back into play. “Even if the wind fails to blow for no more than one hour a year,” Alt says, “we can’t afford to shut down existing plants.”

This fact strikes at the heart of wind energy’s promise. It explains why not one power station has yet been replaced by the thousands of windmills already operating.

“There wouldn’t be a single windmill

to ask our neighbours to save us.”

Rasmussen gets on the phone to negotiate extra power from Nordic countries and Germany. Ironically, this means Danes often use hated nuclear power from Sweden and Finland. When there’s too much wind, surplus power is given away. “We’ve even had to pay Sweden to take it,” says Rasmussen. “It’s crazy.”

Nothing Saved. Germany, with up to eight percent of its power now wind-generated—much more in some northern areas—is approaching the same tricky threshold. For the moment it’s buying balance power on the market, though prices are up to 20 times higher than the wholesale cost, and selling surplus power very cheaply.

“But what happens when the wind dies and the windmills stop?” asks RWE economist Helmut Alt.

Most of Europe can lie under a high-pressure system with not a breath of wind for days at a time. In winter, these conditions bring frost and fog so demand for heat and light soars. The only

The need for back-up has unfortunate consequences. First, to allow for short variations of wind-power supply, conventional power plants have to throttle back so they produce less electricity. This drives up their running costs. According to engineer Gundolf Dany, the extra cost of “balance” power in Germany is about €500 million a year.

Throttled back or idling, however, power plants are more polluting, like a car stopped at a traffic light. Dany and other engineers report that windmills have an insignificant impact on pollution reduction and in some cases even increase it.

Nor is wind energy cheap. All windmills throughout Europe and England are fuelled by subsidies of various kinds. Hidden in their power bills, German consumers, for example, pay 9.1 euro-cents for every unit (kilowatt/hour) of wind electricity, plus 2.4 cents for the cost of handling it in the system—in total, 11.5 cents compared with the 2.5 cents paid for conventional power. “There wouldn’t be a single windmill

CLAY RUN HEAD GOES HERE

operating without subsidies,” says Helmut Alt.

Costs will only increase, thanks to the need to integrate thousands of intermittently working windmills in remote places with existing power networks. “The whole European grid has to be renewed and extended,” says Dany. “We will need 1,500km of new high-voltage transmission lines in the north of Germany alone, but planning

“As fossil fuels are depleted or become too expensive, wind energy will become increasingly attractive and useful.”

Maybe so, but wind has caught the political imagination to the exclusion of nearly everything else. “Investment in other energy sources is paltry by comparison,” warns Michael Laughton of Britain’s Imperial College, a leading expert on power systems. “We should be researching every possibility, in-

operating without subsidies.”

permissions take ten years—it’s not a realistic target.”

In Britain, vast new wind farms in Scotland must be connected with England, where the demand is. But existing transmission lines are full up. Grid improvements will cost £1.3bn up to 2010, much more if a proposed new cable is laid the length of the Irish Sea to bring power from Scotland, Wales and Cornwall to inland cities where it’s needed.

In both Germany and the UK, moreover, new powerplants will be needed as nuclear stations are closed down. These will provide back-up power for windmills but run on costly natural gas imported by pipeline from Russia or by ship from Algeria and the Middle East.

Roads Not Taken. Windmill advocates are not fazed by these issues. “It’s true that a lot of problems have to be sorted out,” says Peter Ahmels, of the Wind Energy Association in Germany. Adds Aloys Wrobbel, chief of Enercon, Germany’s biggest windmill manufacturer:

cluding cleaner ways to use coal. The way energy policies rely on wind power is dangerous to our future.”

Wind-power backers hold up Denmark as a model because it already generates 20 percent of its electricity from this source. Its experience began in the 1970s, in response to the crises of high oil prices and shortages. In later years, wind energy there and elsewhere in Europe became popular once coal-, oil- and gas-powered stations became targets for the reduction of air pollutants and greenhouse gases such as carbon dioxide.

Nevertheless, Danish experts admit that wind power has not worked out very well. “In just a few years we’ve gone from some of the cheapest electricity in Europe to some of the most costly,” says Jytte Kaad Jensen, chief economist for Eltra, Denmark’s biggest electricity distributor. Aase Madsen, an MP who chairs energy policy in the Danish parliament, is emphatic: “For our industry it has been a terribly expensive disaster.”

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In fact, the Danish government recently cut subsidies for wind power so drastically that practically no new land-based windmills are being built. Plans for three more huge offshore wind farms have been put on hold.

Germany's wind-power growth is now slowing as banks reconsider investment strategy after disappointing results. In France, where wind energy is still very small, the government has put

the brakes on with tougher planning rules.

"In green terms windmills are a mistake and economically they make no sense," says Niels Gram of the Danish Federation of Industries. "Many of us thought wind was the 100 percent solution for the future but we were wrong. In fact, taking all energy needs into account, it's only a three per-cent solution."