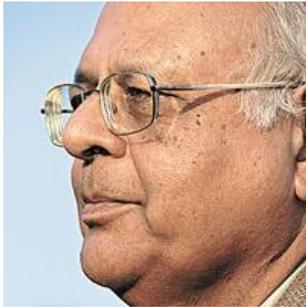


COMMENT

Renewables Run Amuck

by ashok v. desai



It is taken for granted that the world will run out of coal and oil, and that they will start getting more expensive. At present, they are too cheap to give renewable energy much of a chance. But many countries have made small forays into renewable energy to try out technologies and reduce costs. Amongst them is Germany, which has tried to apply its technological might to renewable energy. It is known that its enthusiasm has waned, but not much is known about the experiences that led to this rising caution. Stephan Kohler, head of Dena, the German energy agency, recently gave an interview to Der Spiegel, which throws light on this matter.

Last year, Germany announced its intention to close all its nuclear power stations, which supply 23 per cent of its electricity, by 2022. Kohler did not say it would not, but he dispelled the widespread notion that Germany would give up non-renewable energy sources soon; in his view, it is unlikely to happen before 2050. And the reason is not that renewable sources cannot generate equivalent power, but that they cannot be fitted into the grid.

Germany allows any family to put a solar power unit on its roof and start feeding its output into its own house and thereby replace public power supply. Initially, the panels on the roofs fed cheap electricity into the grid and brought down the costs. But soon there were too many. On bright, sunny days, those families were generating anything up to 30 gigawatts of electricity and feeding it into the grid. The result was massive surges in the grid. There was not enough demand for the power, and Germany exported power to Poland at such times. That destabilised the Polish grid, and Poland is now installing equipment to stop power inflows from Germany. In Germany itself, the midday surge in power reduced the demand for power from conventional plants, which are no longer profitable, so no one is prepared to invest in conventional power plants.

Luckily, land for solar panels is more easily available in out-of-the-way places which are not connected to the grid. They produce more solar power at times than they need, but at least they cannot destabilise the system. Kohler estimated that investments of 28 billion euros would have to be made before the grid could absorb solar power. The problem is even more acute when it comes to wind energy. Winds are strongest along Germany's west coast; Schleswig Holstein, the province next to Denmark in the northwest, has been setting up windmill farms with enthusiasm. But its grid connections are poor; until it is integrated into the grid, it has been told not to set up any more windmills.

Electricity cannot be stored, and its demand has to be matched to the supply every second. Every grid has a central control machinery which does this — which tells particular power stations to increase their output when demand is high and vice versa. Some stations are more flexible than others. It is difficult to vary power coming from a hydroelectric plant: you cannot close a dam when you feel like. Solar plants produce power only when the sun shines, and wind farms when the wind blows; it is impossible to control their output. So it is thermal power plants that are used to match demand and supply. Amongst them, plants based on solid fuels like coal are more difficult to control; those based on hydrocarbon fuels like oil and gas are easier. So every grid has to have a certain minimum proportion of electricity coming from oil and gas. Russia supplies Germany with a third of the gas it consumes; gas can be turned on and off most easily and is therefore crucial to the flexibility of a power generation system.

India could generate enormously more solar power than Germany; its west coast could also produce much more wind power, but it had better not; its power grid is incapable of absorbing the power. For historical reasons, power generation in this country is controlled by states. They are too small to match demand and supply. So they began to trade power, and connected their grids to transfer power. Then the government set up a Power Grid Corporation to manage the grids. But what it has got is a patchwork of grids. When states run short of power, they draw power from neighbouring states. This can overload transmission lines between them; if it is extreme, it can trip the network over half the country, as it did on 31 July. Unlike Germany, India's grid is not good enough even for its present generation system. To add solar and wind power to it will make it even more vulnerable. So we had better go on burning coal until we integrate our power system better. Except that we are running short of coal as well.

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