

Trapped wind

Compressed air might help to make wind power more reliable

PUMPING water into the reservoir of a hydroelectric power plant may be a good way of storing energy captured by wind farms (see previous article)—but what if there are no such plants to hand and no high-tension lines to reach them? One answer is to use the energy to compress air, which can be squirreled away in hermetically sealed underground caverns. Then, when electricity is needed, the air can be released and used to turn a generator.

At the moment, however, there are only two compressed-air energy-storage plants in the world (one in America and one in Germany), and neither was built to make use of wind power. Instead, they are designed to take advantage of

variations in the price of electricity. When power is cheap, it is used to run their compressors. When it is expensive, the valves are opened and the generators turn.

Compressed-air plants are inefficient, and so they are commercially viable only in places where the price of power varies dramatically. But the intermittent nature of wind power can cause just that sort of variability. At any rate, a group of municipal power companies in the American Midwest reckon that building a wind-powered compressed-air plant to take advantage of the blustery Great Plains will be worthwhile. They have just selected a site in Iowa, and hope to be operational by 2011. BP, a British energy firm, is also looking into the concept.

Meanwhile, General Compression, a small firm based in Attleboro, Massachusetts, is taking another approach. Its windmill compresses air directly. This has the advantage of eliminating two wasteful steps: the conversion of the mechanical power of a windmill into electricity and its subsequent reconversion into mechanical power in a compressor. But an air-compressing windmill, while fine for storing energy, cannot transmit electricity directly to the grid. The firm will not produce its first prototype until 2009, but sceptics already worry that what it gains on the swings, it will lose on the roundabouts—or, in this case, on the turbines.



Red sails in the sunset