

The answer is blowin' in the wind

Huge wind-driven turbines are being built the world over, yet individuals, companies and city authorities are looking to go miniature.

They are popping up everywhere in France, in the countryside, in private gardens, even on city rooftops. Mini private wind turbines have become very popular in the United States, but are only just beginning to appear in France (although France has the second-largest wind-power potential in Europe). A wider choice of turbines is now available, ranging from the standard horizontal-axis design to the recent vertical-axis version, which make better use of the turbulent winds in cities and blend into the urban landscape. Even designers have joined in: in 2009, Philippe Starck branded a range of attractive, high-tech mini wind turbine generators, dubbed RévolutionAir.

Operating on the same principle as full-size models, these miniature wind power units transform wind energy into electricity. But their power is limited. With a diameter of 0.5 to 1.3 meters and perched on masts 5 to 35 meters high, they can produce between 100 watts (as in sailboats and caravans) and 30 kilowatts. In comparison, a full-size wind turbine mounted on a mast about 100 meters high produces 1 megawatt of power.

But the generators aim to provide a clean, decentralized source of energy and can be used in isolated sites that are

not connected up to EDF's distribution network. The philosophy behind them is energy production in closer proximity to need. According to the Agence de l'Environnement et la Maîtrise de l'Énergie (Ademe), installing a turbine of 3 to 5 kW should meet the electricity needs of a household, excluding heating—on condition that there is enough wind. "The strength, frequency and regularity of the winds are essential factors for efficient energy production," warns Ademe. "Under an average of 20 kph per year, the installation of a wind turbine is not recommended."

You don't have to request permission to install one of these devices in a garden, as long as the mast height is under 12 meters. Prices vary, from €1,000 to €20,000, depending on its power, but a 50-percent tax rebate is available under certain conditions. A return on investment can be expected within 10 to 20 years, but the cost can be partially offset by selling excess electricity.

Many local residents are grumbling over wind farms, claiming they're noisy and eyesores. But the mini-turbines remain an attractive alternative, and improvements are in the making. |

River power — Plans are afoot to study the use of water turbines in rivers of major cities. Energie de la Lune, a Bordeaux-based agency, is planning to install 10 turbines in the Garonne. Jérôme Cougoul and Marc Lafosse, who are behind the project, estimate that the turbines could supply 4.8 gigawatts per hour of electricity annually—enough to supply 20 percent of the city's public lighting needs. The first trial runs are set to be launched in 2011. Paris is planning to install water turbines beneath the bridges of the Seine. Water turbines have certain advantages over land-based turbines—they don't mark the landscape (the bulk of the machines is hidden under water) and they can harness power from river currents round the clock.

