Environmental Case Study
Buffalo Ridge

A steady breeze flows most of the year across the Great Plains, rippling prairie grasses in the summer and sculpting snowdrifts through the winter. When it reaches western Minnesota, the wind rises over a broad upland known as Buffalo Ridge, where it encounters row after row of tall, white columns, each holding three long, black propellers that swoosh softly as they spin. The 365 wind turbines now standing in ordered ranks on the rolling farm and pasture land are the first stage in an exciting step toward energy sustainability. By 2002, there will be 566 of these giant windmills generating a total of 425 MW of electrical power, or enough for about 42,000 average homes. Together, the wind turbines will be equivalent to one large coal-burning or nuclear electric power plant.

Each of the sleek, steel towers is 50 m (165 ft) tall, or about as high as a 12-story building. The hollow, fiberglass blades are each 23 m (65 ft) long and weigh about 2 metric tons apiece. From tip to tip, the blades cover 48 m or about the wingspread of a DC10 airplane. Every tower is topped by a 750 kilovolt generator about the size of a minivan. Although the entire project will eventually spread across 7,000 ha (17,000 acres) of land, each tower has a footprint of only about 0.1 ha (roughly 0.25 acre), or 1 percent of the landscape.

Costing slightly less than $1 million each, the wind turbines will represent a total investment of about $500 million. This is slightly less than construction of a comparable-sized coal-fired power plant, and about one-fourth of the current cost to build a nuclear plant. Best of all, with wind power, the energy source is free and nonpolluting. Project managers estimate that burning enough coal to provide as much energy as the completed wind farm would release about 750,000 metric tons of carbon dioxide (the major gas in global warming) every year, together with about 2 metric tons each of sulfur dioxide (a major source of acid rain and respiratory diseases) and nitrogen oxides (a major source of smog) per year. Maintaining the wind turbines also provides far more jobs and a greater boost to the local economy than would fossil fuels or nuclear power. Although the residents of the small towns near Buffalo Ridge were skeptical of the project at first, they are now delighted with its economic benefits, and proud of their role in energy independence.

Perhaps the most important aspect of the Buffalo Ridge development is the promise it holds for the rest of the Great Plains. Millions of square kilometers, from Alberta and Saskatchewan to Texas, and from the Rocky Mountains to the tree line east of the 100th meridian, have the potential to supply considerably more energy than the total current world commercial production. As David Morris, from the Center for Local Self-Reliance says, “The Midwest could be the Saudi Arabia of safe, clean, sustainable wind power, and it would free us from dependence on foreign powers for our energy supply.”