



Is Bigger Always Better? An Arithmetic Lesson for Policy Makers

by John Farrell

Policymakers who promote wind energy and biofuels argue that their policies have two goals: the rapid increase in renewable energy, and the betterment of the rural and agricultural economies. Yet to date their policies have been tailored almost entirely to achieve the first goal—more, not better.

Larger wind farms and ethanol plants do produce energy at a lower unit cost, but because they are usually more distant from their ultimate customers, transportation related costs increase. Thus, the net cost reductions are modest.

Meanwhile, megaplants impose considerable social costs. By reducing or eliminating the possibility of majority local ownership, they dramatically reduce the facility's benefit to rural communities and farmers.

Policymakers should design energy policies that truly achieve both goals: increased production and maximum rural benefits.

Economies of Scale

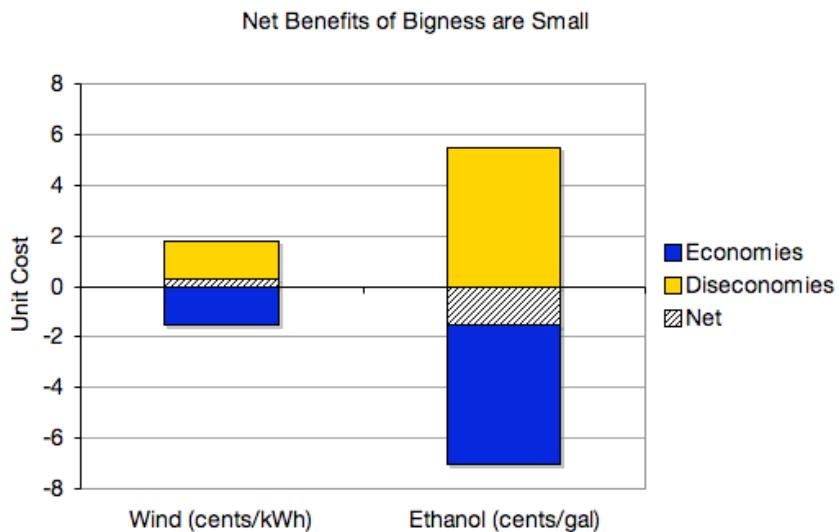
The production cost of electricity declines by as much as 25 percent when scaling up from a 10 MW to a 200 MW wind farm. The production cost of ethanol drops by 6-8 cents per gallon as the plant size increases from 40 million to 100 million gallons per year.

However, very large wind farms and ethanol plants also increase certain costs, notably the cost of transporting the product to the ultimate customer. Large wind farms sited in remote high wind areas often require new transmission lines, the cost of which can cancel out a significant portion of the lower production costs from larger facilities. Transmitting electricity 500 miles, for example, costs about 1.8 cents/kWh. A 100 MGY plant must ship its ethanol and dried distillers grains further, increasing costs by 5-6 cents per gallon.

Diseconomies of Scale

From the plant owner's perspective, even a small cost saving can translate into significantly increased profits. But public policies should be designed not only to encourage private investment but to maximize public benefits. As we can see from the chart, the net benefits of bigness are modest. The single greatest penalty incurred from building big is the virtual elimination of local ownership and the benefits that stem from widespread local ownership.

A locally owned wind project generates from 25 to 300 percent greater local economic benefits than an equivalent absentee owned project. A 2 MW locally owned turbine provides the owner with \$1.2 million in nominal payments over a 20-year project, compared to \$100,000 in lease payments from an absentee owner. A locally owned ethanol plant generates from 5 to 30 percent greater local economic impact than an absentee facility. Furthermore, farm owners see a substantial benefit; dividend payments of 30-40 cents/bushel-- over \$10,000 per year.



Implications for Public Policy

Policymakers should design rules that promote not only more but better. Three 33 million gallon ethanol plants generate the same amount of ethanol as a single 100 million gallon plant. The production cost penalty might be in the order of 1-2 cents per gallon, likely not lowering wholesale or retail prices at all. But the local economic impact of three locally owned plants will be dramatically larger than the impact of a single absentee owned plant.

Five hundred locally owned and dispersed 10 MW wind farms that inject electricity into existing transmission and subtransmission lines will produce electricity typically less than a penny a kWh more than twenty-five 250 MW wind farms, but provide ownership opportunities for thousands of local residents and inject hundreds of millions of dollars more into the rural economy.

If the main focus is always size-- on making things bigger-- the bigger picture is missed. Locally owned renewable energy facilities foster a sense of community, and they give a community a sense of ownership in its own resources. While there is a modest cost benefit to large-scale renewable energy facilities, it doesn't compare to the priceless opportunity to give rural residents ownership in their community.

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