NATIONAL CENTER FOR POLICY ANALYSIS

Case Study: "Three Friends" and the Texas Wind Industry

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In recent years, Texas has become the nation's leader in wind energy. In 2014, wind farms in the Lone Star State had the capacity to produce more than 12,000 megawatts of electricity, enough to power 3.3 million homes. But given the unpredictable nature of wind, they produce, on average, only 33.9 percent of their maximum capacity.

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However, some wind advocates think the nation-wide demand for electric power can be met by transporting electricity produced from renewable sources in remote areas to far-away population centers. Given the results of a recent attempt to connect the three U.S. electrical grids, the demand for renewable energy may be less than they think.

Connecting Electrical Grids. Tres Amigas LLC., literally, "three friends," was founded by a few former energy executives in 2009. Their business plan was to build a transmission station to connect the United States' three electric grids — the Eastern, Western and Texas grids — to transport renewable energy across the continent. Tres Amigas' idea is not unreasonable, given that electricity prices vary greatly. For instance, in 2014, electricity prices in Connecticut were 186 percent higher than in New Mexico.

Tres Amigas plans to transmit energy across such a long distance by building four transmission lines that meet at the Tres Amigas Superstation in New Mexico, where high-voltage alternating current (HVAC) would be converted into direct current (HVDC). (As the names suggest, electrons in a DC wire travel only in one direction, whereas in an AC wire electricity flows both ways.) Although AC has been historically the more popular choice, HVDC transmission is more stable and efficient over long distances.

There are losses in electric currents flowing through wires due to resistance. According to Siemens, the largest engineering company in Europe, HVDC transmission loses 30 percent to 50 percent less than AC. In general, 6 percent of electric power in the United States is lost through transmission, accounting for 9 percent of the average price of electricity.

Despite tax incentives from the State of New Mexico and advocates for the potential increase in the marketability of renewable energy, Tres Amigas has not garnered enough support for its project. So far, it has raised less than $16 million — a mere drop in the bucket considering its goal of $1.9 billion. One of the few backers, Southwestern Public Service Co., a New Mexico electric power utility, withdrew from the

Projected Electricity Production and Costs, 2020
(percentage of maximum capacity; cents per kilowatt hour)

	Output	Cost
Conventional Coal	85%	9.51¢
Natural Gas-fired Combined Cycle	87%	7.52¢
Advanced Nuclear	90%	9.52¢
Geothermal	82%	4.78¢
Biomass	83%	10.05¢
Wind	36%	7.36¢
Solar Photovoltaic	25%	12.53¢
Hydroelectric	54%	8.35¢

Note: Average Levelized Cost of Electricity (LCOE) for plants entering service in 2020 from the U.S. Energy Information Administration (EIA). Electricity cost per megawatt hour includes building and operating a generating plant over an assumed financial life and duty cycle. Output is a percentage of maximum capacity.

Source: U.S. Energy Information Administration (EIA), Annual Energy Outlook 2015, June 3, 2015.

project after Tres Amigas failed to make multiple payments. This only confirms the observation of Pat Vincent-Collawn, head of PNM Resources, that the project is not economically viable because of low natural gas prices.

The Growth of Wind Power. The Texas wind energy industry has been subsidized by federal and state taxpayers and consumers. Consider:

- A state Renewable Portfolio Standard (RPS) requires Texas retail electricity marketeers to obtain 10,000 megawatt hours (MWh) from renewable sources in 2025, a goal which was surpassed in 2009. These "retail entities" include investor-owned utilities that have not unbundled, retail electric providers in deregulated areas, and municipal utilities and electric cooperatives that offer customer choice.
- The Energy Policy Act of 1992 created Production Tax Credits (PTC), a federal subsidy of $23 per MWh of wind production.
- A provision in the Texas Tax Code exempts new renewable energy facilities from property taxes.
- The Texas legislature passed a $7 billion bill allowing the Texas Public Utility Commission to create Competitive Renewable Energy Zones (CREZ) — areas with a surplus of wind energy — and to fund the construction of transmission lines to more populous areas through an estimated $6 dollar a month fee on consumers' future electric bills.

However, Texas is one of seven states that does not have a net-metering policy requiring utility companies to purchase excess electricity from consumers who produce their own power, usually at the full retail rate. (This, combined with the fact that wind-generated electricity has been cheaper in Texas, has led to stagnation of the solar industry.)

Renewable energy sources have a noticeably lower capacity factor due to intermittency. Whereas wind turbines run only 36 percent of the time, natural gas generators operate 87 percent of the time. [See the table.]

Unsubsidized Wind? In recent years, there has been an attempt to repeal the subsidies to the wind industry by doing away with the RPS and ending the construction of CREZ transmission lines. State Representative Troy Fraser (R-Horseshoe Bay), who originally advocated the RPS, has proposed ending government support of renewable energy, claiming that Texas has achieved the goal it set. Wind lobbyists claim the end of the subsidies would harm future wind industry investments in Texas.

Conclusion. State subsidies to renewable energy give an unfair advantage to more expensive and inefficient producers, while requiring taxpayers and ratepayers to pick up the tab. States should allow the market to determine the best, most efficient, and most reliable sources of energy, and maybe with the progress of technology, renewable energy will become the best choice. But, as the failure of Tres Amigas has shown, renewable energy still has a long way to go.

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