Southern Wind:

The Next Frontier for the Wind Industry

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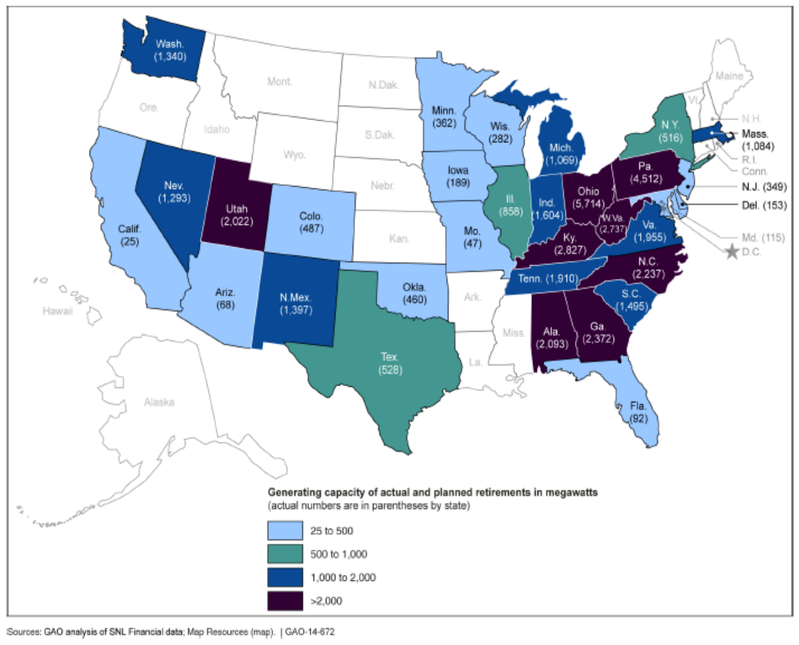
Utility Trends

Coal-Fired Power Plant Retirements are Increasing

As much of the country experiences a slowdown in electricity demand growth, the South is expected to need substantial quantities of new generation over the next decade. Retiring coal-fired power plants (and to a lesser extent, older gas steam turbine facilities) are driving additional demand for new power sources within the region.



Sources: GAO analysis of SNL Financial data; Map Resources (map). | GAO-14-672

Utility Purchases of Wind Energy are Increasing

Over 2,800 megawatts of wind power purchase agreements have been made with utilities across the South. Most of these purchases have been made voluntarily. Utilities are making these wind energy purchases because they lower the costs for their customers.

TVA

"Wind power is a ***clean and limitless source*** of energy that directly enhances TVA's mission of environmental stewardship."

GEORGIA POWER
A SOUTHERN COMPANY

"Adding wind energy to our generation mix underscores our commitment to a diverse portfolio that offers ***clean, safe, reliable, sustainable and low-cost electricity for years to come.***"

ALABAMA POWER
A SOUTHERN COMPANY

"These agreements are good for our customers for one very basic reason, and that is, ***they save our customers money.***"

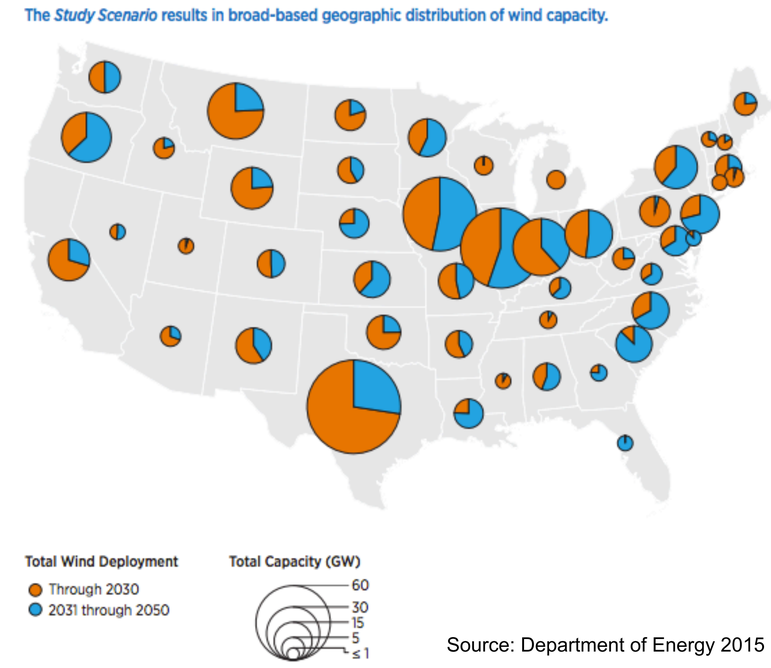
AEP SOUTHWESTERN ELECTRIC POWER COMPANY
A unit of American Electric Power

"…[W]e were in a good position to pursue additional renewable resources at ***a good price for customers***."

Market Potential

Most southern states have three or four opportunities to incorporate wind power into their energy portfolio. States can either develop wind energy in-state, purchase wind energy via existing transmission routes, purchase wind energy via new HVDC transmission projects, or develop wind energy offshore. Each different source of wind power has unique cost and performance attributes. The Department of Energy recently released its Wind Vision Report, which studied wind penetration scenarios where the country received 20% of its electricity from wind power by 2030 and 35% by 2050. Significantly, the scenarios showed every state in the country developing wind energy resources. The report evaluated in-state and offshore wind development, without the Production Tax Credit (PTC).

The *Study Scenario* results in broad-based geographic distribution of wind capacity.



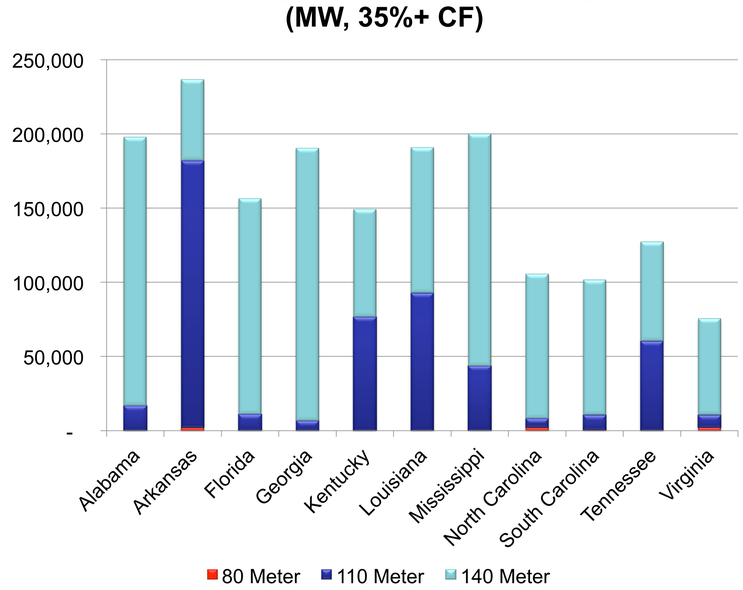
Source: Department of Energy 2015

Wind Energy Industry Trends

New Turbine Technology is Improving

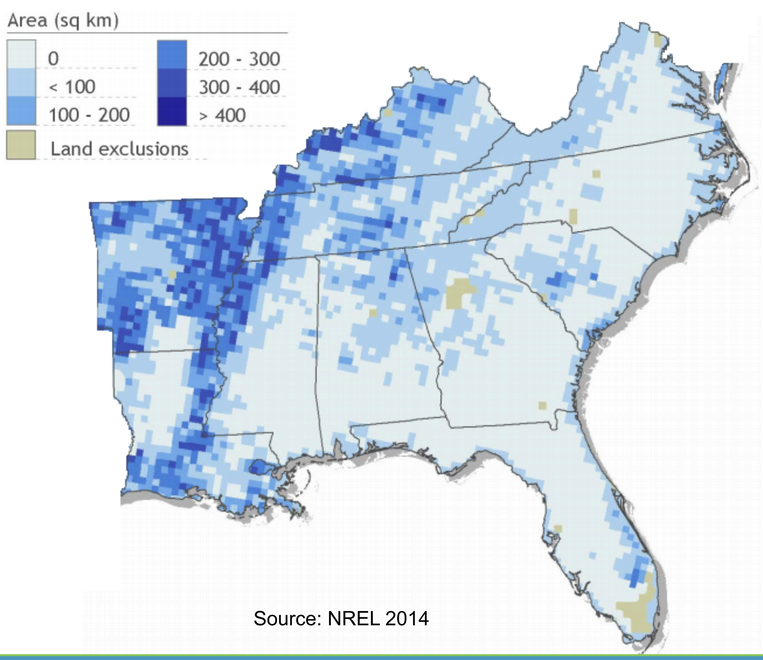
The South has historically been a marginal market for the wind industry; however, with newer turbine technology, wind farm proposals have developed in every state within the region. Taller towers with longer blades are now capable of harnessing the region's wind energy resources. New research from the National Renewable Energy Lab shows the South now contains over 1,500 Gigawatts of onshore, in-region wind energy potential.

Potential Wind Energy Capacity Potential by Hub Height (MW, 35%+ CF)



Source: NREL 2015

Wind Potential Capacity at 110m Hub Height, 35%+CF

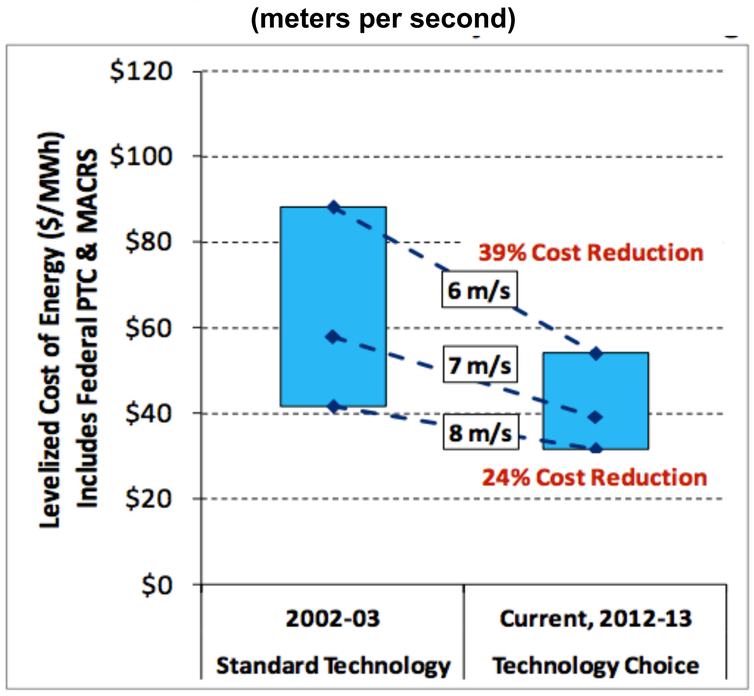


Source: NREL 2014

Wind Energy Costs are Declining

Over the past decade, the levelized cost of energy from wind power has declined substantially. New figures from both Lawrence Berkeley National Laboratory and Lazard Associates show that current power purchase agreement prices have reached between $22-$60 per megawatt hour, depending on region, technology and contract attributes. While the best wind energy resources can provide extremely low cost power, even moderate wind speeds available throughout the South are now capable of providing cost competitive energy.

Wind Energy LCOE Improvements by Wind Speed (meters per second)



Source: LBNL 2012

Most southern states have three or four opportunities to incorporate wind power into their energy portfolio. Each different source of wind power has unique cost and performance attributes.

- **In-State Wind Development.** The first wind farm developed in the South is the Buffalo Mountain wind project near Oak Ridge, Tennessee. Additional projects have been proposed across the region.
- **Importing Wind Via Existing Transmission.** Approximately 2.8 gigawatts worth of wind power purchase agreements have been signed with Southern utilities. Most of purchases are from the Midcontinent Independent System Operator (MISO) or the Southwest Power Pool (SPP).
- **Importing Wind via New HVDC Transmission.** Clean Line Energy Partners and Pattern Energy have proposed two separate High Voltage Direct Current Transmission projects that would connect gigawatts worth of wind energy from Oklahoma and Texas to Southern states.
- **Offshore Wind Development.** Several Southern states contain the best offshore wind energy resources in the country.

Barriers

Unpredictable Federal Policy

Many utilities in the South are purchasing wind power, primarily due to its low cost and ability to reduce ratepayer bills. However, without the federal Production Tax Credit (PTC), the levelized cost of wind energy may not be as cost competitive against other forms of new power generation. Some utilities are hesitant to issue requests for proposals for wind power because of the variable nature of the PTC.

Outdated Information

Many utilities throughout the South rely on Integrated Resource Planning (IRP) models to develop near-term and long-term generation portfolio scenarios. IRP models are highly sensitive to cost and performance information provided by the utility. If outdated information is used in an IRP, wind energy may not be selected as a necessary generation option for the utility. Utility planners are not required to follow IRP conclusions; however, IRP's provide strong recommendations that may be difficult to ignore.

Transmission Constraints

Viable transmission routes from the Interior region of the country into the South are becoming limited. According to wind energy developers, few routes remain to supply considerable quantities of wind energy to the South. Additionally, with Arkansas and Louisiana joining the Midcontinent Independent System Operator (MISO), wheeling power from the Southwest Power Pool (SPP) requires additional transmission costs and risk. High voltage direct current (HVDC) connections could provide a pipeline for low-cost wind power to reach the South.

Social Acceptance

Many wind farms have been proposed throughout the South. However, some wind farms have created local controversy. In some of the most extreme cases, wind farm development has effectively been prohibited in certain counties. A few state laws cause excessive regulatory burden on wind farm development. If a wind farm development company has a choice of developing in a Class III wind regime with a hostile regulatory environment, or somewhere else, the developers may opt to abandon projects.

References

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