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Myths and facts about electricity in the U.S. South

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ABSTRACT

This paper identifies six myths about clean electricity in the southern U.S. These myths are either propagated by the public at-large, shared within the environmental advocacy culture, or spread imperceptibly between policymakers. Using a widely accepted energy-economic modeling tool, we expose these myths as half-truths and the kind of conventional wisdom that constrains productive debate. In so doing, we identify new starting points for energy policy development. Climate change activists may be surprised to learn that it will take more than a national Renewable Electricity Standard or supportive energy efficiency policies to retire coal plants. Low-cost fossil generation enthusiasts may be surprised to learn that clean generation can save consumers money, even while meeting most demand growth over the next 20 years. This work surfaces the myths concealed in public perceptions and illustrates the positions of various stakeholders in this large U.S. region.

1. Introduction

Shortly before embarking on his trip to the United Nations Climate Change Conference in Copenhagen in December 2009, President Obama announced a target for reducing U.S. greenhouse gas emissions. The goal was to bring U.S. emissions 17% below 2005 levels in 2020, with an ultimate reduction of 83% by 2050. In his 2011 State of The Union speech, President Obama proposed an even more ambitious clean energy future for the country: 80% of America's electricity will come from clean energy sources by 2035, including nuclear, high-efficiency natural gas generation, renewables, and clean coal. These targets may seem particularly challenging for the U.S. South[1] because of its unique electricity consumption and production profile.

1.1. Profile of electricity consumption and production in the U.S. South

In 2009, the South accounted for 42% of U.S. energy consumption and 45% of U.S. electricity use (Energy Information Administration, 2011a, Table 2; 2011b, Tables 5–7), but is home to only 37% of the nation's population. Half of the nation's industrial energy use occurs in the South, and the region also has higher-than-average per capita consumption of residential energy and transportation fuels (Energy Information Administration, 2011a, Table 2; 2011b, Tables 5–7). Availability of reasonably priced and reliable energy has been a value to businesses and industry in the South and has helped to drive the region's economic development. For example, in 2009, the South enjoyed an average electricity-sales-weighted residential electricity price of $0.107/kWh (in 2009$) (Energy Information Administration, 2011b, Tables 73–120), compared with a national average of $0.115/kWh (in 2009$; Energy Information Administration, 2011a, Table 8). Looking ahead, electricity demand in the South is expected to grow more rapidly than in the rest of the country, reflecting the region's relatively strong economy. While electricity rates are expected to rise in every region of the U.S., the South's rates are expected to remain below the national average.

These low rates have made it difficult to promote an ethic of energy conservation and efficiency. Sales data suggest a low

Abbreviations: CCF, Carbon-Constrained Future; CES, Clean Energy Standard; CHP, Combined Heat and Power; DSM, Demand-Side Management; EE, Energy Efficiency; EERE, Energy Efficiency and Renewable Energy; EIA, Energy Information Administration; IAC, Industrial Assessment Centers; IGCC, Integrated Gasification Combined Cycle; IRP, Integrated Resource Plan; ITC, Investment Tax Credit; NEMS, National Energy Modeling System; PTC, Production Tax Credit; PV, Photovoltaic; RE, Renewable Energy; RES, Renewable Electricity Standard; R&D, Research and Development; SEN, Save Energy Now; SNUG-NEMS, Southeast NEMS User Group version of NEMS; WAP, Weatherization Assistance Program

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[1] The U.S. Census Bureau definition of the South includes 16 states and the District of Columbia, stretching from Delaware down the Appalachian Mountains, including the Southern Atlantic seaboard and spanning the Gulf Coast to Texas. In contrast, the North American Electric Reliability Corporation (NERC)'s definition of the South includes four sub-regions—Southeastern Electric Reliability Council (SERC), Florida Reliability Coordinating Council (FRCC), Southwest Power Pool (SPP), and Electric Reliability Council of Texas (ERCOT) are used in the electricity supply modeling summarized in this paper. The Census South is used for demand-side analysis and the NERC South is used for supply-side analysis. These differences do not materially affect the results.

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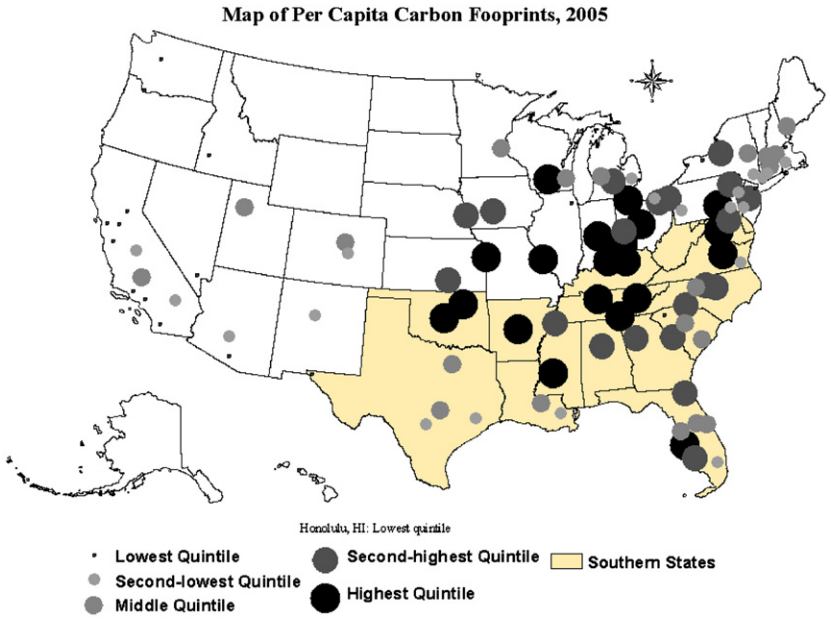

Fig. 1. Per capita carbon footprints of metropolitan areas in the South, 2005.
Source: Map drawn from the data published in Brown et al. (2009).

market penetration of energy-efficiency products in the South. For each of the five ENERGY STAR appliances with sales data that are tracked by EPA – air conditioners, clothes washers, dishwashers, refrigerators, and water heaters – the South has a lower-than-average rate of market penetration (U.S. Environmental Protection Agency, 2010a). Further evidence of a relatively weak energy conservation ethic is provided by the results of a poll conducted in January 2009 by Public Agenda. The poll suggests that Americans are divided geographically in terms of their views on energy conservation and regulating energy use and prices versus exploring, mining, drilling, and construction of new power plants. Conservation is supported by a large majority nationwide; however, it is close to even with exploration, drilling, and power plant construction in the South, at 48–45%. Energy policies in the South reflect these preferences. For example, as of August 2011, 27 states nationwide have implemented Energy Efficiency Resource Standards or targets to encourage more efficient generation, transmission, and use of electricity. Only six of these states are located in the South.[2]

Coal dominates the power sector in the South as it does nationwide, accounting for 47% of electricity generation in both the region and the nation in 2009 (Energy Information Administration, 2011b, Tables 73–120). However, the South depends less on renewable sources of electricity than any other region, with only 4.9% (Energy Information Administration, 2011b, Tables 73–120) of its electricity generation coming from renewables compared with 10.4% nationwide (Energy Information Administration, 2011a, Table 8). With a comparable percentage of nuclear power and a greater use of natural gas for electricity, the carbon intensity of electricity in the South is high. Southern energy policies reflect these differences. For example, as of August 2010, 29 states and the District of Columbia have promulgated Renewable Electricity Standards (RESs), and an additional eight states have renewable energy goals. Among the Southern states, only four states along with the District of Columbia have an RES: Delaware, Maryland, North Carolina, and Texas. In addition, Oklahoma, Virginia, and West Virginia have set voluntary renewable energy goals. The remaining nine Census South states represent the largest contiguous block of U.S. states without goals or standards for renewable power.[3]

When the greater intensity of energy consumption in the South is compounded by the carbon intensity of its power generation, the Region's carbon footprint expands well beyond the national average. A study by Brown et al. (2009), for example, estimated the per capita carbon footprint of the nation's largest 100 metropolitan areas, measured in terms of the metric tons of carbon emissions per capita from the consumption of residential electricity and other forms of residential energy, as well as transportation fuels for light duty vehicles and freight trucks. Eleven of the 20 metropolitan areas with the largest carbon footprints were found to be located in the South (Fig. 1).

1.2. Role of myths and misconceptions

Clean energy, defined as energy efficiency and renewable energy in this study, can be an important way to meet growing demand while minimizing pollution. However, adoption and development of efficiency programs and renewable resources in the South are constrained by myths and misconceptions on both sides of the clean energy debate.

Myths serve to restrain thought and behavior and can become powerful tools for sustaining the status quo. As Mark Twain said: "It ain't what you don't know that gets you into trouble. It's what you know for sure that just ain't so." Understanding myths as well as the belief system behind them is not only an important step to improve the clean energy situation in the South but also a key component of democratic decision-making. The process of identifying stakeholder beliefs and interests can promote a common understanding of dominant agendas and can help incentivize collaboration. Conversely, it can identify incommensurable views among stakeholders that must be resolved for consensus to occur. Also, by making some stakeholders belief systems more visible, our analysis of prevailing myths can improve social responsibility

[2] http://www.pewclimate.org/what_s_being_done/in_the_states/efficiency_resource.cfm.

[3] http://www.dsireusa.org/summarymaps/index.cfm?ee=1&RE=1.