

Proposed Title: North Carolina Solar Energy: A dichotomy on the state level

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Executive Summary/Abstract

North Carolina has one of the fastest growing populations in the Southeastern United States. The state as a whole consumes over 100,000,000 MW of energy every year. North Carolina currently utilizes a variety of energy generation sources - three-fifths of the state's electricity is derived from coal burning sources, while the other two-fifths of the state's electricity is derived from nuclear power, oil, and natural gas. In 2013, power generation from renewable sources increased from 5.3% to 7.5%.

In terms of renewable energy generation, although North Carolina is one of the top ten solar energy-producing states, only 1% of residents make use of solar panels on their personal homes. A solution must be found to ameliorate the lack of residential solar power use. In terms of policy, energy usage affects all aspects of the public: equity, costs, environmental impacts, political feasibility, and many others.

The lack of solar energy residential use in North Carolina has been considered a government failure due to the amount of money brought in from subsidies for non-renewable energy sources. Costs and lack of information have equated to decreased use overall.

In order to solve the issue, four separate alternatives were analyzed. All involved methods to increase ease of solar power use and installation. One of the alternatives is currently considered illegal in North Carolina, although voters desire reimplementation. The four alternatives are as follows: status quo or "do nothing," formation of a solar power educational program, legalization of third party sales, and implementation of SMARTGrid technology. Proposed alternatives were examined under the constraints of three evaluative criteria. Cost-Benefit and Cost-effectiveness analyses, as well as a literature review and public perception surveys, revealed which alternative best satisfied the criteria of economic effectiveness, political viability, and environmental impact.

Through the analytic methods employed, a number of conclusions were made concerning residential solar electricity generation in North Carolina. In order to

increase use in the most economically effective manner possible, an educational program should be implemented. Although SMARTGrid technologies have consistently been recommended, they are most expensive, and do not create the largest increased solar power use. Third party sales will produce some economic profit; though will not increase solar power use significantly, overall. Finally, an environmental education program will reduce air emissions most effectively through the greatest increase in solar power generation.

Taking into considerations all parts of the analysis, a solar power environmental education program should primarily be considered moving forward. In order to increase effective use of all energy sources in the future, improvements in power grid technology through a system such as SMARTGrid should be considered, despite initial costs. Through the combination of environmental education programs and continued improvements in energy technology, North Carolina will be capable of moving into a more secure energy future for years to come.

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