



**Governor's Commission on Climate Change  
*Electricity Generation/Other Stationary Source  
Workgroup***

***Revised Draft Recommendations***

The Electricity Generation/Other Stationary Sources Workgroup of the Governor's Commission on Climate Change was charged with looking at changes that could be recommended in Virginia's fuel mix, how to advance carbon capture and storage technology, and other actions that can be taken by Virginia utilities to help achieve the GHG emissions reduction goal.

**Membership**

The Workgroup is comprised of the following Commission members: The Honorable L. Preston Bryant, Jr. (Chair), Mr. Dan Carson, Jr., Christine Chmura, Ph.D., The Honorable Paul Ferguson, Mr. Bob Fledderman, The Honorable Patrick O. Gottschalk, Mr. David Heacock, Mr. Robert F. Hemphill, Jr., The Honorable Kenneth R. Plum, Mr. Mike Quillen, Jagadish Shukla, Ph.D., The Honorable Bruce Smart, Lydia W. Thomas, Ph.D.

**Workgroup Recommendations**

The Workgroup appears to have come to some consensus regarding the following recommendations:

***Interaction with Federal Action/Cap-and-Trade program***

Given the global nature of climate change and current activities at the Federal level, it appears likely that the Federal government will take action to mitigate carbon emissions economy-wide. It also appears that such action will be in the form of a cap-and-trade program.

Under a GHG cap-and-trade program, a regulatory agency sets a maximum limit or cap on the total amount of emissions of GHGs. The cap limits emissions from all covered facilities. The regulatory agency then implements an emissions trading program by creating and distributing a specific number of allowances for use by regulated entities. An allowance represents an authorization to emit a specific amount of a pollutant during a particular period of time. The total amount of allowances cannot exceed the cap, thereby limiting total emissions. At the end of each compliance period, each regulated entity must demonstrate that it possessed sufficient allowances to cover all emissions of the capped pollutant. If an entity releases emissions in excess of the allowances it holds, it can meet

the program requirements by buying additional allowances from entities that have excess allowances due to reduced emissions.

Under a cap-and-trade program, each regulated entity can design its own compliance strategy to meet the overall reduction requirement, including sale or purchase of allowances, installation of pollution controls, implementation of efficiency measures, among other options. Individual control requirements are not specified under a cap-and-trade program, but each regulated entity must surrender allowances equal to its actual emissions in order to comply. Sources must also completely and accurately measure and report all emissions in a timely manner to guarantee that the overall cap is achieved.

- The Commission should recommend that Virginia support efforts to develop a Federal cap-and-trade program.
- The Commission should recommend that Virginia continue to participate in policy discussions with other Southern states to develop a strategy for the region to participate in the national discussion regarding federal greenhouse gas policies in an organized way to ensure that the unique aspects of the South, including the fuel mix of the Southern states, are part of the national discussion.
- With respect to trading affecting electric utilities and other stationary sources (the focus of this Workgroup), the Commission should recommend that Virginia support a Federal cap-and-trade program which establishes a cap stringent enough to ensure emissions of GHGs are actually reduced. Such a program should allow trading of allowances in the United States and the use of offsets generated outside of the United States which have been verified/measured in accordance with Kyoto standards. Such a program also should provide free allowances to affected entities and should credit early action by sources within a reasonable time period. The program should include a safety valve established to prevent allowance prices from going too high but to also be high enough to encourage/facilitate the development of technology to control/sequester emissions.

### *Nuclear Energy*

Nuclear energy accounts for approximately 35% of the electricity produced in the Commonwealth. Virginia currently has 4 nuclear reactors used for commercial electricity generation. During operation, nuclear plants generate little or no GHG emissions, although there may be GHG emissions associated with the mining, enrichment, and transport of nuclear fuel and the construction and decommissioning of plants. Currently, the Federal government has a loan guarantee program designed to help facilitate new nuclear construction. This Department of Energy loan guarantee program was established by the U.S. Energy Policy Act of 2005 to assist companies pursuing the licensing of new nuclear units to finance the first wave of new commercial reactors in the United States. If a loan applicant's project is selected under this program, the federal government could guarantee all of the project's debt so long as it does not represent more than 80 percent of the project's qualified construction costs. Congress has appropriated \$18.5 billion to support the nuclear loan guarantee program. But it conditioned the loan guarantees on being awarded no later than 2009.

Current Virginia law prohibits uranium mining. Therefore, all of the uranium used to fuel Virginia nuclear power plants is imported. Virginia consumes about 1.6 million pounds of uranium per year. Uranium deposits were discovered about thirty-five years ago at Coles Hill in Pittsylvania County, but uranium has never been mined from the site. According to a 1983 report by Marline Uranium Corporation, a deposit estimated at 30 million tons could yield a potential annual extraction rate of approximately 2 million tons per year – more than sufficient to fuel Virginia’s nuclear facilities. Before any decision can be made whether to mine uranium in Virginia, significant work to assess the risk from mining and the need for regulatory controls must be completed.

- The Commission should adopt a statement of policy supporting nuclear energy and encouraging the development of additional nuclear energy capacity in Virginia.
- This policy should include a statement encouraging the federal government to develop a nuclear waste facility.
- This policy should recommend extension of the Federal loan guarantees for new nuclear power plants. **Additionally, this policy should recommend that Congress consider long term, reasonable, predictable and sustainable financial incentives like production tax credits and/or Federal loan guarantees to encourage development of carbon-free renewable energy projects. [This particular recommendation may better fit with other renewable energy policy recommendations from the Workgroup.]**
- Given the potential for uranium mining in Virginia to supply additional nuclear capacity in the Commonwealth, the Commission should recommend that the risks associated with uranium mining in Virginia should be studied.

### **Conservation Pricing**

Utilities generate a predictable long-term earnings stream from investments in new energy supply resources that are needed to meet customer demand. Conservation and energy efficiency projects reduce sales and the predictability of future earnings of the utility. Under traditional ratemaking, costs incurred by utilities, including a return on investment, are recovered through the sales of electricity. Because conservation and energy efficiency can decrease the volume of electricity sales, traditional cost-recovery mechanisms have created a financial disincentive to utility support for these demand-side programs. This policy is designed to ensure that efforts to reduce energy customer demand provide the opportunity for an appropriate earnings stream to achieve investment parity.

- The Commission should recommend that Virginia statutes and regulations for utility ratemaking should be changed to ensure timely cost recovery for conservation programs.
- Additionally, the Commission should recommend the provision of rate incentives similar to supply-side rate incentives to encourage the development of conservation and energy efficiency programs.

### **Research and Development**

Research and development in carbon-free energy resources and advancement of energy technologies is critical if the United States is to reduce its dependence on fossil fuels and mitigate greenhouse gas emissions. A number of energy technology research and development programs are already underway at organizations and academic facilities throughout Virginia. For example, in July 2008, the Virginia Tobacco Commission approved more than \$36 million to fund a variety of energy research centers in Southwest and Southside Virginia, including \$8 million for a center in Abingdon which will focus research on carbon sequestration, \$8.07 million to establish a sustainable energy research center in Danville, \$7.69 million for a nuclear energy research center in Bedford County; \$873,845 in additional funding for a Gretna, Va. facility that converts crops into bio-diesel fuel; nearly \$8 million for a nuclear research center in Halifax; and \$4 million for an energy research center in Wise.

The Virginia Research & Technology Advisory Commission (VRTAC) in its report entitled “Collaborative Research and Development Strategies and Directors for the Commonwealth of Virginia” recommended energy, conservation, and the environment research and development as one of three priority areas for investment by the Commonwealth, contingent upon cost sharing by universities and industry. VRTAC found that research institutions in the Commonwealth are involved in a substantial, but largely uncoordinated, base of research and development activities across the following areas: alternative energy, including biorenewables (UVA, VT, JMU, VCU, ODU, VSU), fuel cells (VT, UVA, VCU, JMU), hydrogen (UVA, VT, JMU, VCU, WM), photovoltaics (UVA, VT, JMU, VCU, ODU, NSU, NASA, Jlab), wind and coastal (ODU, JMU, VT, WM, NSU); conservation and sustainability (UVA, VT, JMU, GMU, HU, NASA); environment, environmental health and safety (UVA, JMU, VT, GMU, WM, ODU, VCU, EVMS, NSWC, Jlab, NASA); societal implications of policy (VT, UVA, WM, JMU, GMU). VRTAC recommended funding of large scale collaborative research programs through a consortium of stakeholders to achieve a focused, state-wide effort to coordinate resources and activities.

Similarly, the Virginia Energy Plan noted the importance of advancing energy technology and the significant opportunity for leadership Virginia has in this area. The VEP recommended strengthening energy R&D in Virginia by providing a consistent funding source and using a governance system involving university, business, and government stakeholders to set energy R&D priorities by setting out a roadmap identifying the growth areas for energy R&D, the areas where Virginia researchers can bring added value to these growth areas, and recommend projects for state support.

- The Commission should recommend that Virginia support Congressman Rick Boucher’s bill (H.R. 6258, Carbon Capture and Storage Early Deployment Act) to fund research for carbon capture and sequestration.
- The Commission should recommend that state funding for research and development prioritize research relating to carbon capture and sequestration technology and emissions-free energy sources.
- The Commission should recommend that there be public funding of research at Virginia Tech on carbon capture and storage.

Electricity demand is increasing in the Commonwealth, requiring the development of additional resources to meet that need. Renewable energy resources can help meet this demand while producing low or no GHG emissions. A renewable portfolio standard is a mitigation option requiring electric utilities to supply a certain percentage of retail electricity from renewable energy sources by a stipulated date. Currently, Virginia has a voluntary RPS goal that, by 2022, 12% of an electric utility's total electric energy sales will come from renewable sources. Virginia also has a goal for the Commonwealth to reduce consumption of electric energy use by retail customers through the year 2022 by an amount equal to 10 percent of the amount of electric energy consumed by retail customers in 2006.

Workgroup discussion regarding how to improve the current RPS statute included the suggestion to make the RPS standards mandatory subject to a safety valve based on price. A suggestion was made that pump storage facilities/generation associated with non-dispatchable renewable sources (e.g. wind) should be counted towards the RPS goal. It also was noted that if the goal of an RPS or of the Commission is to reduce emissions of greenhouse gases, then nuclear energy should be included as an option for meeting the RPS or that nuclear energy should be subtracted from a utilities total generation (so that nuclear generation does not count against a utility trying to reach the RPS goal). Another suggestion included increasing the RPS goal after 2022 (e.g. 15% by 2025).

The suggestion also was made that perhaps rather than recommending a revision of the RPS goal, the group should establish an "emissions free energy" goal or standard which would count traditional renewable sources as well as nuclear generation. No determination was made as to where such a goal/standard would be set.

The group also discussed the potential for developing a feed-in tariff similar to the renewable incentives established in many European countries. A feed-in tariff is an incentive structure to encourage the development of renewable energy sources by obligating utilities to buy renewable energy at above market rates. A feed-in tariff essentially offers a long-term guaranteed price contract (usually about 15-20 years) to any entity that contributes electricity to the grid via renewable sources. Arguments favoring this policy tool, over other policy tools like production tax credits and investment tax credits which may favor larger or more established corporations, suggest that it encourages the distributed generation of renewable energy and it levels the playing field by providing long-term investment security for small businesses, homeowners, churches, schools and others, so they may be more willing to make the financial commitment that is necessary for installing renewable energy themselves. Feed-in tariffs modeled after the German approach have been proposed in Michigan, Illinois and Minnesota.

- **[The Workgroup discussed the implementation of a mandatory renewable portfolio standard, but no consensus has been reached at this time. Would a mandatory 12% standard be feasible and can the group reach consensus on this?]**
- **[The group appeared to come to some consensus that an emissions-free energy goal may be an additional option, but no specific goal was outlined. How should such a goal be structured?]**

- [Does the Workgroup want to recommend that Virginia develop a feed-in tariff for utilities' purchase of energy similar to what is currently required in Europe and proposed in Michigan, Illinois and Minnesota?]
- [The Commission should recommend as part of its renewable energy policies that Congress consider long term, reasonable, predictable and sustainable financial incentives like production tax credits and/or Federal loan guarantees to encourage development of carbon-free renewable energy projects.]

### Renewable Distributed Generation/Combined Heat and Power

Renewable distributed generation (DG) is energy generated at or near the sites of consumption by naturally replenishing resources, avoiding GHG emissions and the costs associated with conventional electricity supply and electricity losses during transmission and distribution. Combined heat and power (CHP) is the simultaneous production of electricity and heat from a single fuel source, such as: natural gas, biomass, biogas, coal, waste heat, or oil. CHP is more energy efficient than separate generation of electricity at a central electric plant and production of localized thermal energy for the end user. This distributed generation resource allows for recycling the heat, which is normally wasted to meet onsite thermally-driven demand such as process and space heating, cooling, and dehumidification. Because less fuel is burned to produce each unit of energy output, CHP reduces air pollution and greenhouse gas emissions.

Workgroup members have noted that Virginia has policies in place to facilitate net metering and to facilitate interconnection and solar installations for residences. There are, however, no subsidies to facilitate or support renewable DG (except for certain subsidies for wind power). The Workgroup generally supports programs to facilitate the development of renewable DG and CHP. Some Workgroup members raised concerns, however, about the high costs associated with renewable DG and suggested that efforts to subsidize renewable DG may raise the costs of electricity when it may be more cost-effective to work towards lowering GHG emissions from the larger, centralized power plants. Additionally, Workgroup members noted that many of the barriers associated with renewable DG may be at the local level through building or local zoning codes and homeowner association regulations.

With respect to CHP, Workgroup members suggested that many manufacturers are already using CHP where appropriate to save fuel costs and that CHP may be a good idea in specific industrial applications but not be broadly applicable. Some Workgroup members believed that specific CHP goals in other state plans may be more aspirational than actually achievable.

The Workgroup generally expressed concern about the cost-effectiveness of DG and CHP and believes more expertise and/or site-specific information/research may be necessary to identify the hurdles to investment in DG and CHP and to determine how the Commonwealth may best use available resources to facilitate these activities.

- Interconnection requirements, including some that may be unnecessary, onerous and/or expensive may be a barrier to increased use of renewable distributed

generation. The Commission should recommend that the State Corporation Commission develop standardized interconnection rules in order to simplify the process and reduce costs for renewable energy generators to connect to utility systems.

- **[Does the Workgroup want to recommend that the full Commission recommend educating and providing incentives to localities to remove local barriers to DG development?]**
- **[The Workgroup recommends that the full Commission discuss the potential for DG and CHP in Virginia, as well as potential barriers and incentives to draw upon the broad range of expertise on the full Commission.]**