The Commonwealth and Energy-Virginia’s Energy Issues, Policies and Plans

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Energy Issues
Driving National, Regional and State Policies

Natural Gas Supply Limitations and Costs
Electricity Markets and Transmission Constraints
National Security and Energy Diversity
Climate Change
Transportation
Energy Issues

Natural Gas
– Cost increases
  • Large population of industrial gas users in eastern Virginia
  • Eastern Virginia is near the end of supply pipelines & relies heavily on the Gulf of Mexico
  • Mid-Atlantic cost differential

Source: US DOE EIA - Natural Gas City Gate Price in Virginia
Natural Gas Costs

Locational Spreads
- Rock to Henry: 2004 - (1.01) 2005 - (3.05)
- Waha to Henry: 2004 - .85 2005 - (2.84)
- MC to Henry: 2004 - (.97) 2005 - (2.88)
- Chicago to Henry: 2004 - (.31) 2005 - (1.15)
- MA to Henry: 2004 - .50 2005 - .49
- NE to Henry: 2004 - .29 2005 - .83
- STX to Henry: 2004 - (.35) 2005 - (1.55)
- Florida Z3 to Henry: 2004 - .34 2005 - 1.11

Source: AGL Resources
Energy Issues

Electricity

- Costs driven up by cost of fuel
- Impact of changing regulatory environment
- Aging infrastructure
- Transmission constraints
North American Electric Reliability Council
2006 Long-Term Reliability Assessment

- Declining capacity margins
  From 20% to 5% nationally over next 10 year period
- Slow transmission expansion
  Forecast of 19% demand increase over next 10 year period, with transmission miles increasing less than 7%
- Uncertain fuel supply/delivery
  Predominance of natural gas
- Aging workforce
  Much of the aging workforce will leave the industry over the next 10 year period
Energy Issues

National Security

• “Peak Oil” debate
• Dependence on foreign supplies
• Sensitivity to disruptions
• Developing and commercializing domestic alternatives
• Distributed energy resources
Energy Issues

Climate Change

• Health and environmental impacts
• Impact of incremental costs differences between conventional sources and cleaner alternatives - carbon controls - an “equalizer”? 
• Creates incentives for cleaner alternatives and efficiency and conservation
Energy Issues

Transportation

- Traffic congestion a growing problem
- Significant source of greenhouse gases
- Approximately 38% of energy used in Virginia is derived from petroleum products
Virginia Energy Policy – SB 262

Facing the Challenges

– State energy policy statements
– Virginia Energy Plan
– Energy conservation
  • Income tax deductions – Efficient equipment & fuel cells
  • Renewable electricity production & PV/solar/wind grants
– Landfill/synthetic/waste gas state & local tax exemption
– OCS – Resource study & all-states Atlantic planning area natural gas exploration beyond 50 miles in Minerals Management Service EIS
Virginia Energy Policy – SB 262

• **Major Components of SB 262**
  – Dominion Virginia Power electric fuel factor annual recovery
  – R&D framework – federal grants
    • VCCER Clean Coal
    • ODU Coastal Energy Research Consortium
  – Coordinated SCC/natural resources permit process study
  – State building energy efficiency
  – Wind/solar site rating
Virginia Energy Policy – SB 262

• Virginia Energy Objectives
  – Reliable energy supplies at reasonable cost
  – Rates of energy consumption in relation to economic growth
  – Sufficient infrastructure for reliability
  – Use energy resources more efficiently
  – Facilitate conservation
  – Optimize intrastate & interstate supply and delivery
  – Increase use of less polluting energy sources
Virginia Energy Policy – SB 262

• **Virginia Energy Objectives**
  – Research greenhouse gas sequestration
  – Remove impediments to use of low-cost, indigenous energy resources & ensure viability of energy producers
  – No disproportionate adverse impact to economically disadvantaged or minority communities
  – Foster economically developable alternate sources at market prices to diversify energy portfolio
  – Increase use of biofuels
Virginia Energy Policy – SB 262

• **Virginia Energy Policy**
  – Support R&D and promote renewable energy use
  – Ensure supply & conservation support economic growth
  – Promote R&D of clean coal technologies
  – Promote cost-effective conservation
  – Ensure affordable natural gas
    • Transmission & distribution, CBM, methane hydrates, landfill gas, LNG
  – Promote electricity through non-greenhouse gas technologies
Virginia Energy Policy – SB 262

• **Virginia Energy Policy**
  – Facilitate new/expanded petroleum refining
  – Promote alternate fuel/efficient motor vehicles
  – Reduce petroleum demand by developing infrastructure for synthetic and hydrogen-based fuels
  – Promote ethanol and biodiesel from agriculture
  – Avoid disproportionate adverse impact on economically disadvantaged communities
  – Energy generation & distribution systems to minimize impacts to pristine natural areas & significant onshore natural resources
Virginia Energy Policy

National Energy Use Per Capita and Per Dollar of GDP
(Index: 1980=1)
Virginia Energy Policy

New physical supply has grown by 25 quads since 1973, energy intensity reductions account for 100 quads

Virginia Energy Plan

- DMME to develop
- 10 year plan, updated every 5 years
- Coordinate with Commission on Electric Utility Restructuring & Coal & Energy Commission
  - Joint Commission on Technology and Science & Manufacturing Commission interest
- Due by June 30, 2007
Virginia Energy Plan

Proposed Plan Outline

I. Introduction
II. Virginia Energy Sources & Consumption
III. Energy Conservation & Efficiency
IV. Virginia/Regional Energy Infrastructure
V. Energy and Environment
VI. Energy Research & Development
VII. Conclusions & Recommendations
Virginia Energy Plan

Plan Schedule

– Plan framework – August
– Research – July to December
– Agency input – October to January
– Issue meetings – September to December
– CEUR/VCEC coordination – ongoing
– 2007 Legislative session – January to March
– Drafting & review – April to June
Virginia Energy Plan

• Input into plan
  – Public meetings
  – Advisory group
  – Agency input
    • State Corporation Commission
    • Department of Environmental Quality
    • Virginia Center for Coal & Energy Research
    • Other agencies and institutions
  – Center for Innovative Technology & Virginia Research and Technology Advisory Commission
  – Review other plans
Virginia Energy Plan

• Public Input into Plan
  – Public listening sessions
    • Sept 11 – Abingdon
    • Sept 25 – Annandale
    • Oct 18 – Lexington (with Energy Virginia Conference)
    • Nov 2 – Williamsburg
    • Dec 4 – Virginia Beach
  – Web based comments
    • http://www.dmme.virginia.gov/VaEnergyPlan
Virginia Energy Plan

Advisory Group meetings have been held in conjunction with public comment meetings. Topics of interest have included:

- Permitting requirements for energy infrastructure
- Importance and opportunities of efficiency and conservation
- Protection of environment, habitats, and scenic views
- Renewable portfolio standards
- Sustainability practices
- Demand response
- Funding energy programs and government incentives
The Center for Innovative Technology (CIT) is providing R&D input to the plan. CIT objectives are to:

- Identify and describe specific Virginia institutional strengths in energy R&D.
- Identify Virginia energy R&D activities that are currently or could be leveraged into positions of national or international leadership.
- Assess best practices for energy R&D facilitation and coordination and how those can be applied in Virginia.
- Provide an initial analysis of potential benefits to Virginia from coordinated energy R&D.
University Research

- **Renewables**
  - Biofuels; Solar
  - Wind; Tidal / ocean
- **Clean Coal**
- **Carbon Sequestration**
- **Energy Efficiency**
- **Green Buildings**
- **Energy Electronics**
- **Environmental Impact of Energy Production & Use**
- **Energy Infrastructure**
- **Transportation**
- **Nuclear**
- **Hydrogen & Fuel Cells**
- **Energy Policy**
- **Economics of Energy**

- **VT**
- **UVA**
- **JMU**
- **ODU**
- **GMU**
- **VCU**
- **VSU**
- **W&M**
- **VMI**
Virginia Energy Plan
Learn from others, lead by example

• **EPACT 2005/Advanced Energy Initiative**
• **Appalachian Regional Commission**: Appalachia’s Energy Blueprint
• **Southern States Energy Board (SSEB)**: The American Energy Security Study
• **Metro Washington Council Of Government**: COG 2006 Energy Strategic Plan
• **Numerous other states**
Virginia Energy Plan-Path Forward

- Identify themes and an energy agenda.
- Identify and distinguish Virginia’s strengths.
- Match our strengths to areas of greatest opportunity and establish goals.
- Drive market-based solutions to our challenges.
- Implement creative, cost-effective solutions.
Population Trends

Virginia Population Trends

<table>
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<tr>
<th>Year</th>
<th>Population</th>
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Path Forward - Close the Gap

The Energy Supply and Demand "GAP" in Virginia

- Without additional energy efficiency
- With additional energy efficiency
- With additional new energy projects
- With planned supply projects

Total energy consumed in Virginia

Total energy provided in Virginia

TIME

Btus
Source:
Virginia Energy Patterns and Trends VA Net Energy Imports and Exports
Economic Potential

COAL

-3.57 \times 10^{14} \text{ Btu} (1 \text{ ton} / 2.5 \times 10^7 \text{ Btu}) = 14.28 \text{m tons} ($40/\text{ton}) = ($571 \text{ million})

NATURAL GAS

1.6 \times 10^{14} \text{ Btu} (1 \text{ Mcf} / 1 \times 10^6 \text{ Btu}) = 160 \text{m Mcf} ($10/\text{Mcf}) = $1.6 \text{ billion}

PETROLEUM

9.11 \times 10^{14} \text{ Btu} (1 \text{ bbl} / 5.8 \times 10^6 \text{ Btu}) = 157 \text{m bbl} ($50/\text{bbl}) = $7.85 \text{ billion}

URANIUM

2.69 \times 10^{14} \text{ Btu} (1 \text{ lb} / 2.1 \times 10^8 \text{ Btu}) = 1.28 \text{m lbs} ($33/\text{lb}) = $42.24 \text{ million}

ELECTRICITY

1.11 \times 10^{14} \text{ Btu} (\text{kWh} / 3.413 \times 10^3 \text{ Btu}) = 32.52 \text{b kWh} ($0.06/\text{kWh}) = $1.95 \text{ billion}

NET $10.79 \text{ billion}
Virginia’s Energy Agenda

Provide Reliable Low-cost Energy Supply
Increase Energy Conservation & Efficiency
Provide Adequate Energy Infrastructure
Minimize Energy’s Effect on the Environment
Expand Energy R & D
Support Virginia’s Agricultural, Mining & Industrial Base
Develop Alternate Energy Sources
Provide Virginia’s Future Energy Workforce
Virginia’s Strengths

- Technology sector
- University system/R&D capabilities
- Agricultural and coastal resources
- Fossil fuel resources
- Geology
- Proximity to nations population and markets
- Military presence
- MSW Resources
Goals

• **Enhance Virginia’s strong business climate to expand economic opportunities and job growth.**
  – *Ensure availability of reliable, low cost energy supplies to Virginia’s economy.*

• **Protect and preserve Virginia’s natural and historical resources.**
  – *Embrace sustainability, conservation and efficiency. Expand alternative energy and waste-to-energy development.*

• **Establish programs that meet the needs of Virginia businesses and facilitate their expansion.**
  – *Expand biomass energy development to support Virginia agriculture and forestry.*
Goals

• **Provide a world-class workforce system that is responsive to employer and worker needs and creates a well-trained, well-educated and globally competitive workforce.**
  – *Build the next generation energy business workforce through networking Virginia’s energy innovation assets and collaborating with Virginia’s education system.*

• **Enhance efforts in Virginia’s distressed areas to help reduce economic disparity and to promote opportunity for all Virginia’s regions.**
  – *Support Virginia’s mining and biomass energy industries for rural Virginia opportunities.*
Goals

• Capitalize on Virginia’s proximity to the national capital and the strong military presence in the state
  – *Position the Commonwealth to be the leader in developing new energy sources for the military. Be the provider of choice for alternative fuels.*

• Support technology, research and development, and other emerging sectors to diversify Virginia’s economy and maintain its competitive advantage
  – *Strengthen energy research and development in Virginia*
Virginia-On the Leading Edge

- OCS
- Nuclear Resurgence
- Wind
- LNG
- Carbon sequestration
- Clean Coal
- Locally derived liquid fuels
• **Contact**

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