

Department of Mines, Minerals and Energy July 1, 2010



- Energy policy framework established by General Assembly
 - § 67-101 Energy Objectives
 - § 67-102 Commonwealth Energy Policy
- Plan updated by DMME

– July 1, 2010 & every four years thereafter



- Energy policy & objectives
 - Ensure availability of reliable energy supplies at reasonable costs
 - Establish sufficient infrastructure
 - Use resources efficiently & facilitate energy conservation
 - Facilitate development of Virginia's low cost resources including clean coal and natural gas
 - Facilitate development of less polluting energy sources
 - Foster energy R&D
 - Address environmental protection with energy facilities



- Section 1 -- General Energy Information
- Section 2 -- Electricity
- Section 3 -- Coal
- Section 4 -- Nuclear Power
- Section 5 -- Natural Gas
- Section 6 -- Renewables
- Section 7 -- Petroleum
- Section 8 -- Findings & Recommendations



Section 1 - General Energy Information

- Where does energy used in Virginia come from?
 - 36% Petroleum
 - 18% -- Electricity generated outside Virginia
 - 17% Coal
 - 13% -- Nuclear-based power generation
 - 5% Natural gas
 - 5% -- Renewable sources



Section 1 - General Energy Information Total Energy Consumption by Sector (2007)





Section 1 - General Energy Information

Net Energy Imports/Exports (2007)





Section 2 - Electricity

- 3 investor-owned utilities 84% of retail sales
- 13 electric cooperatives 11% of retail sales
- 16 municipal utilities 5% of retail sales
- 2009 rates at 90.5% of national rates
- Average 2009 rates
 - 6.87 ¢/kWh industrial
 - 8.10 ¢/kWh commercial
 - 10.61 ¢/kWh residential



Section 2 - Electricity

• Meet the projected growth & replace aging generation

- New large, centralized generation facilities
- New smaller-scale independent power projects
- Expand distributed generation
- New transmission facilities
- Expand conservation & efficiency actions
- 7,224 MW new capacity needed



Section 3 - Coal

- Virginia coal used primarily for
 - Electric generation
 - Industrial steam
 - Coke for steel manufacturing
- Coal prices
 - Steam coal around \$60/ton
 - Metallurgical coal around \$120/ton
- Coal mining provides
 - $\approx 4,400$ direct mining jobs
 - \$1.7 billion in coal sales revenue



Section 3 - Coal

• Future Uses

- Base load power & steel
- Affected by
 - Price of competing fuels
 - Increasing regulatory costs
 - Carbon capture & storage / carbon regulation



Section 4 - Nuclear Power

- Generation -- Dominion units (2 each at the Surry & North Anna Power Stations)
 - Operating licenses extend through 2032 & 2040
 - Third reactor at North Anna?
- Services & construction -- leader with AREVA, B&W, & Northrop Grumman Newport News
- Commercial uranium deposit at Coles Hill
 Study by the Virginia Coal and Energy Commission



Section 5 - Natural Gas

- 7 investor-owned and 3 local government LDCs
- $\approx 37\%$ of households / 90,000 commercial accounts
- Average 2008 rates
 - \$16.20/mcf residential
 - \$12.98/mcf commercial
 - \$11.49/mcf industrial
 - \$10.87/mcf utility
- Virginia natural gas production
 - 128.5 billion cubic feet of gas in 2008 from 6,428 wells
 - \approx \$0.5 billion in revenue
- $\approx 80\%$ production from coalbed methane
- Potential from Marcellus Shale



Section 5 - Natural Gas

- Offshore
 - ~ ≈ 1.66 trillion cubic feet of natural gas reserves offshore of Virginia
 - Value could total more than \$10 billion (1.66 trillion cubic feet at \$6/thousand cubic feet)
 - Offshore gas production
 - Support infrastructure expansion in Hampton Roads
 - Attract new business
 - Create jobs for exploration & production
 - Development dependent on federal leasing



Section 6 - Renewables

- Renewable energy sources provide
 - 2.8% of electricity generated & 6% of gasoline consumed
- Available electric generation capacity

| Renewable Energy Resource | 2007 Installed Capacity in Virginia (MW) | Potential Installed New Capacity in Virginia (MW) | Capacity Factor |
|------------------------------|--|---|-----------------|
| Land-based wind | 0.07 | 1,793 | 30 - 45% |
| Offshore wind | 0 | 28,100 | 35 - 40% |
| Solar PV | 0.91 | 11,000 – 13,000 | 14 - 20% |
| Biomass combustion | 418 | 760 | 83% |
| MSW/landfill gas | 254 | 30 | 90% |
| TOTAL | 673 | 41,840 - 43,840 | |



Section 7 - Petroleum

- Delivered through pipelines from the Gulf of Mexico area & coastal petroleum terminals
- 2009 consumption
 - 7.4 billion gal/year (176.3 million bbls/yr)
 - 3.9 billion gal/yr of motor gasoline
 - 20.3 million gal/day (483,000 bbls/day)
 - 10.7 million gal/day of motor gasoline
- Prices largely set by national & international markets
 - Volatile over time over \$4/gallon in September 2008 to around \$2.50/gallon today



Section 7 - Petroleum

Petroleum Consumption (2009 bbls)





Section 7 - Petroleum

• Offshore

- ≈ 165 million barrels of petroleum reserves offshore of Virginia
- Value could total to more than \$13 billion (165 million barrels at \$80/barrel)
- Offshore oil production
 - Support infrastructure expansion in Hampton Roads
 - Attract new businesses
 - Create jobs for exploration & production
- Development dependent on federal leasing



• Findings

- Growing economy & quality of life requires diverse portfolio of supplies
- Ample in-state energy resources are available
- Energy businesses can generate new jobs & investment
- Consumers can use energy resources more efficiently
- Developing new and emerging technologies -- requires university/private businesses R&D partnerships
- Energy environment is complex and dynamic plan to be revised regularly



• Goal 1

- Make Virginia the Energy Capital of the East Coast
 - Grow energy production, jobs, & investment
 - Increase conservation & efficiency of homes & businesses
 - Support energy efficiency businesses growth



• Goal 2

- Expand public education about Virginia's energy production & consumption
 - Its effect on our economy
 - How Virginians can use energy more efficiently



• Goal 3

- Maximize the investment in clean energy research and development
 - Coordinate use of available resources
 - Universities Clean Energy Development and Economic Stimulus Foundation
 - Virginia Energy Initiative
 - VCERC and other research entities
 - Southside Virginia as energy R&D hub

