
Integrated Resource Planning

Coal Finance 2013

David Schlissel

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Resource Planning – Some Basic Concepts

- **Integrated Resource Planning (IRP) – consider both supply-side and demand-side alternatives.**
- **Least cost planning – looking for the plan or portfolio that has the lowest net present value cost (e.g., NPVRR or the lowest societal cost).**
- **But need to consider both cost and the economic and financial risks of alternatives being evaluated.**
- **Need to ensure an adequate level of system reliability.**
- **Need a diverse fuel mix to address risk of reliance on any one fuel + to enhance system operability and reliability.**



Prudent Resource Planning Practices

- **Accept that you're not a Cassandra – you really can't see into the future.**
- **Therefore, emphasize importance of developing flexible portfolio of supply and demand side resources for when circumstances change.**
- **Include full consideration of energy efficiency and renewable alternatives.**
- **Develop a truly diverse resource mix – with EE, wind, solar, not just fossil and nuclear.**
- **Include a plan for aggressively reducing CO₂ emissions – include CO₂ price in base case.**
- **Analyze wide range of sensitivities for CO₂, fuel, load, EPA costs, construction costs.**



Imprudent Resource Planning Practices

- **Refuse to accept that circumstances have changed or are in the process of changing – therefore future won't be like the past.**
- **Refuse to reconsider past resource decisions that may no longer be economic or prudent.**
- **Overly constrain alternatives such as renewables and energy efficiency.**
- **Fail to develop an aggressive plan to reduce annual CO₂ emissions.**
- **Over-emphasize expensive investments in large central station facilities instead of developing a flexible portfolio of supply and demand side options.**



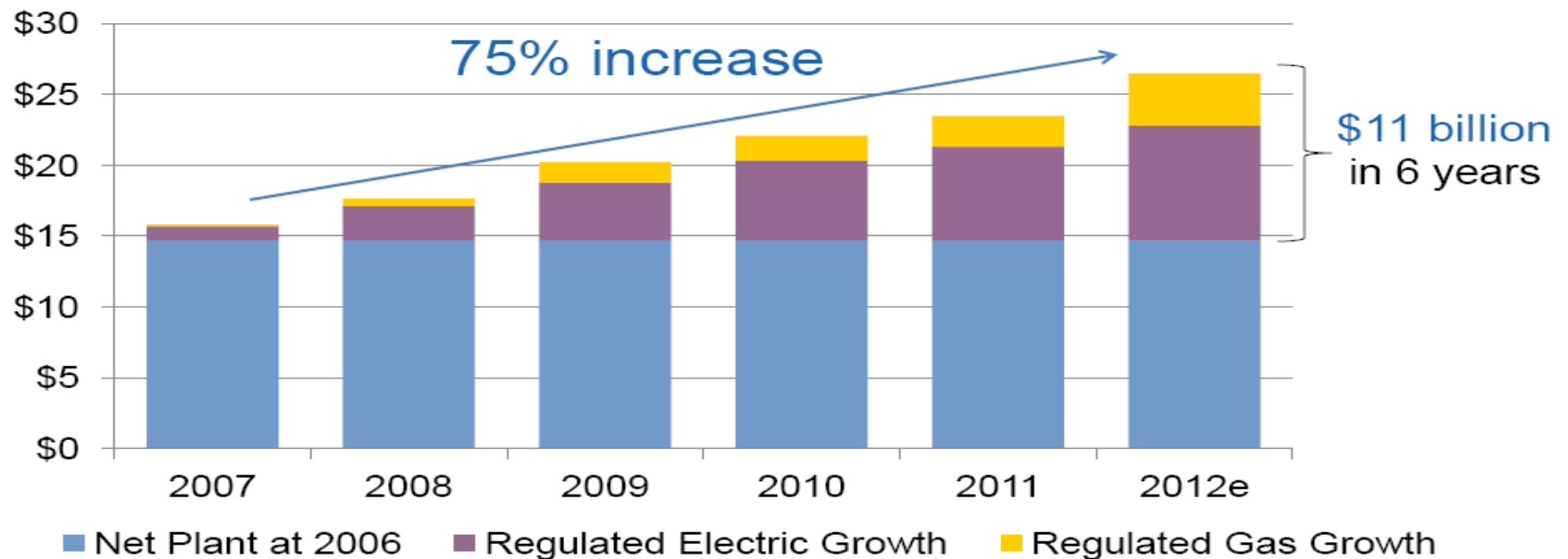
Unreasonably Constraining Energy Efficiency and Renewables – Dominion Virginia Power

- Preferred Resource Plan includes 7,104 MW of new DSM and supply-side capacity by 2027.
- This includes:
 - 4,550 more MW from natural gas-fired combined cycle and combustion turbine units.
 - 1,453 MW from a new nuclear unit – even though not part of a “least cost plan.”
 - Only 34 MW of solar (eventhough admit state potential > 10,000 MW).
 - Only 248 MW of onshore wind with none before 2022 (state’s onshore potential ~ 2,000 MW).
 - Zero offshore wind through 2027. (potential between 2,000 MW and 28,000 MW).



How Dominion Benefits from Building Large New Central Station Generating Units

Growth in Regulated Net Plant (in \$billions)



Please refer to page 2 for risks and uncertainties related to projections and forward looking statements.

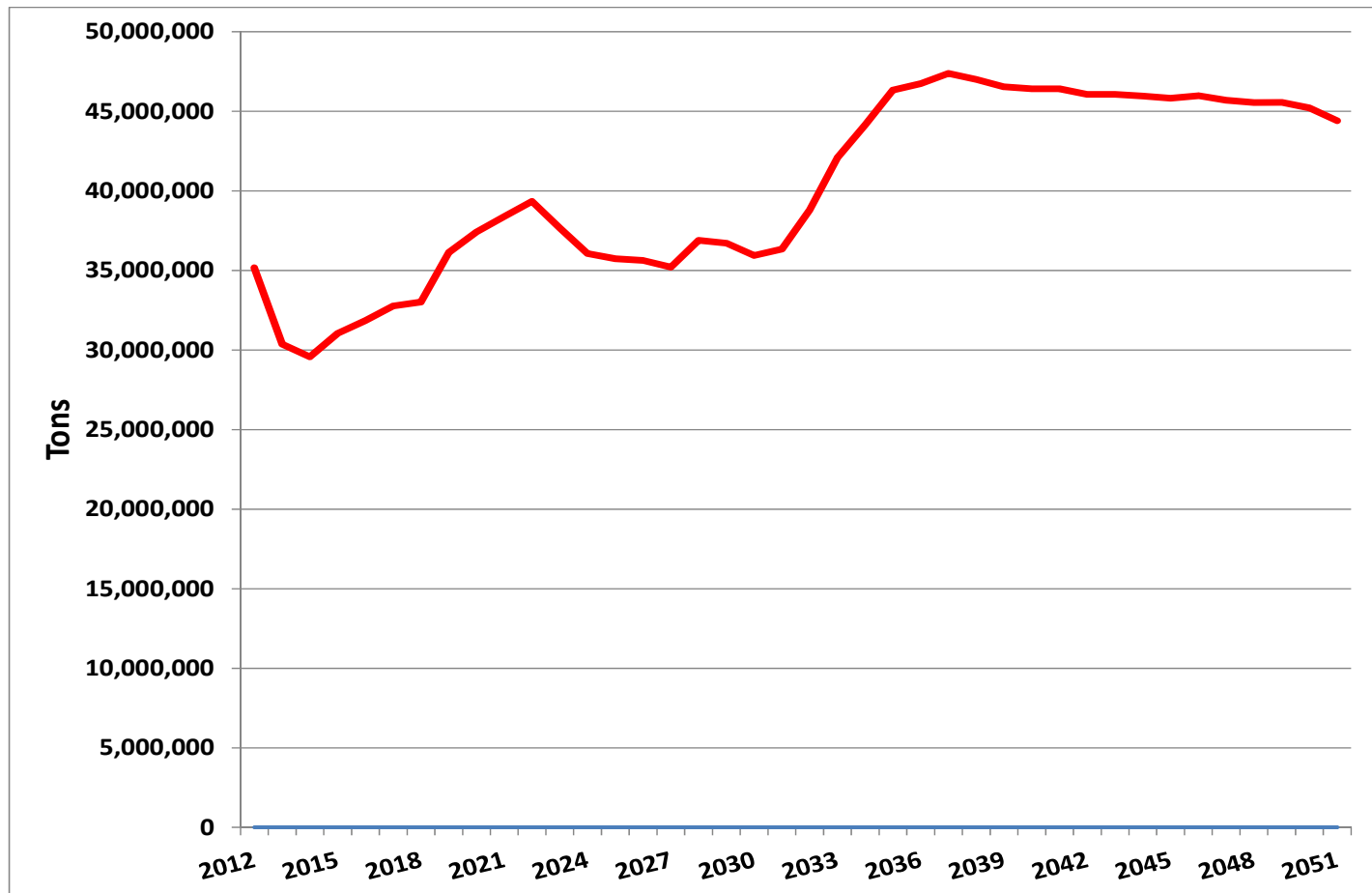
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Failure to Have a Really Diverse Fuel Mix - Dominion Virginia Power

Generation as % of Total						
Energy	2008	2010	2017	2022	2027	2030
Coal	33%	31%	23%	24%	20%	18%
Natural Gas	6%	10%	26%	34%	29%	29%
Net Purchases	17%	18%	13%	13%	13%	11%
Total Fossil	56%	59%	62%	70%	62%	58%
Nuclear	31%	28%	30%	27%	37%	35%
NUGs	11%	10%	4%	0%	0%	0%
Other (includes renewables)	1%	3%	4%	3%	2%	6%
TOTAL	99%	100%	100%	100%	100%	100%



Failure to Have Plan to Reduce Annual CO₂ Emissions – Dominion Virginia Power



However

- **Preceding slide does not reflect CO₂ emissions from the millions of MWh that Dominion expects to purchase from PJM.**
- **All or many of these MWh likely will be generated at fossil-fired units.**
- **So annual CO₂ emissions will likely be much higher than even shown in preceding figure.**