William and Mary School of Law
National Regulatory Conference
Panel on Grid Reliability

DE Public Service Commission
Chair Dallas Winslow
What is the State Regulatory Body’s Role?

* Must make sure the lights stay on
* Responsible to the consumers and utilities
* Reliable service
* Affordable service

* In a nutshell, To Promote Safe, Adequate, Reliable, and Reasonably Priced Service
Delaware Electric Reliability Standards

* System Average Interruption Frequency Index (‘SAIFI’)
* System Average Interruption Duration Index ('SAIDI‘)
  * Delmarva Power SAIDI - 295 minutes per customer

<table>
<thead>
<tr>
<th>Reliability Performance</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAIFI</td>
<td>1.47</td>
<td>1.41</td>
<td>1.14</td>
</tr>
<tr>
<td>SAIDI</td>
<td>199</td>
<td>192</td>
<td>146</td>
</tr>
<tr>
<td>Docket No. 50 SAIDI Performance Target</td>
<td>295</td>
<td>295</td>
<td>295</td>
</tr>
</tbody>
</table>
Delaware Electric Reliability Standards - Constrained Hours

- Constrained Hours of Operation benchmark standard maximum of 600 hours
- Constrained hours of operation is a precursor to transmission reliability issues
Why are we moving from Coal fired to Gas fired generation?

- Coal fired generation retirements
- Environmental concerns with coal
- Shale Gas has brought the price of gas to record lows
- Gas generation is less expensive to build and operate
- Gas generation is easy to build
- Gas generation can be built quickly
Coal Retirements and Conversions in Delaware

* Indian River (owned by NRG)
  * May 2010 Unit 2 ceases operation
  * May 2011 Unit 1 ceases operation
  * December 2013 Unit 3 is scheduled to cease operation
  * December 2011 $360M air quality control system online for Unit 4

* Edge Moor Energy Center (owned by Calpine)
  * Calpine decided to discontinue burning coal at the site
  * Uses Natural gas-fired/oil, simple-cycle
New Gas Fired Generation in Delaware

* Calpine
  * 309 MW scheduled for 2015
* Bloom Energy ("Bloom Boxes") uses an electro-chemical reaction to produce electric
  * Prior to June 2013 – 8.8MW
  * Scheduled to have 30MW by December 2013
PJM should consider:

- Gas is available
- Pipe is in place
- Deliverable when needed
- Evaluate the impact of lack of fuel diversity on reliability
Majority is wind
- Intermittent nature of renewable energy
- Non-dispatchable
- Cannot be used to follow the load
- Solar is normally available during peak load periods
  - 10 MW Dover Sun Park
  - 15 MW PSEG Milford Solar Farm
Peak periods
- PJM has said that they can accommodate up to 35% wind in the existing resource mix without the need for additional investment

Light load
- Need for Storage for the excess generation
- Battery storage
- Thermal storage
Public Policy Challenges

* FERC Order 1000
  * Tension in what Order 1000 requires
    * Allocation of cost commensurate with benefits
    * PJM must consider Public Policy
  * State agreement approach
  * Multi-driver approach
  * Independent State Agencies Committee (ISAC)
Delaware Renewable Portfolio Standards

* 25% by 2025
* According to DPL December 2012 IRP filing:
  * Compliance Year 2012/2013 (including Bloom)
    * 8.5% Renewable
    * 0.40% Solar/Photovoltaic
    * Cost - $28,312,824
  * Compliance Year 2022
    * 22% Renewable
    * 2.75% Solar/Photovoltaic
    * Cost - $83,430,370
* Cost of compliance $6.60 (CY13/14) to $15.15 (CY22/23) per average bill (1000KW)
Energy Efficiency and Demand Response can be used to relieve the need for new generation.

By 2011:

- 2% of the provider's 2007 electricity consumption
- Coincident peak demand reduction that is equivalent to 2% of the provider's 2007 peak demand

Increases to 15% by 2015
Future

- Electric vehicles
- Hot water heaters
- Solar
- Algae
- Small Nuclear