Florida Public Service Commission
2019 Ten-Year Site Plan Workshop
FRCC Presentation

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Vision: To maintain a highly reliable and secure bulk power system for peninsular Florida
Agenda

2019 FRCC Load & Resource Plan

- Integrated Resource Planning Process
- Load Forecast and Demand-Side Management (DSM)
- Generation Additions, Reserve Margins, Fuel Mix, and Renewable Resources
- Reliability Considerations of Utility Solar Generation Additions
- Natural Gas Infrastructure in Florida
2019 Load & Resource Plan Summary

Over the next ten years

- Firm peak demand and energy sales forecasts slightly lower than 2018 TYSP; yet, continue to show growth
- Over 12,000 MW of new firm generation planned
- Planned Reserve Margins above 20%
- Energy Efficiency Codes and Standards are projected to reduce peak demand by 5.7%
- DSM continues to be a significant component of reserves
- Renewables increase from 2% to 12% (energy)
FRCC
Load & Resource Plan
Methodology and Results
Utility Integrated Resource Planning (IRP) Process Overview

- Forecasts
  - Demand
  - Energy
  - Fuel
  - Economic
  - Other

- Existing Resources
  - Including plans for modifications/retirements

Identify Resource Need (with reliability criteria)

- Supply-side Options
- Demand-side Options
- Cost & Operating Data

Evaluate Alternatives

Integrated Resource Plan
FRCC Planning Process Overview

Utility IRP -> Utility TYSP -> FRCC Load & Resource Plan

Planning Models
- Loss of Load Probability
- Transmission Models

Reliability Assessments/Studies

NERC/SERC

FPSC
Load Forecast and DSM

- Firm summer peak demand (MW) slightly lower than 2018, but grow 1.15% per year
- Forecasted energy sales (GWh) slightly lower than 2018 TYSPs; yet, grow at 0.8% per year
- Demand Response reduces firm summer peak (MW) by 6.4%
- Energy Efficiency Summer Peak reductions by 2028
  - Mandated Codes and Standards: 5.7%
  - Utility-Sponsored Energy Efficiency/Energy Conservation: 1.4%

1/ Demand-Side Management (DSM) is made up of Demand Response (DR) and Utility-sponsored Energy Efficiency/Energy Conservation (EE/EC)
2/ Projected impacts of Energy Efficiency codes and standards included in all utilities’ forecasts
Load Forecast Factors

- Florida unemployment (actual) continues to decrease
- Population growth is projected to remain strong
- Wage and income growth have not kept pace with employment growth
- EE codes and standards and distributed solar dampen energy use growth
- Commercial customer forecasts affected by online commerce
- EV impact grows to 500 MW by 2028
Comparison of 2018 vs. 2019 Firm Peak Demand Forecast\(^1\) (Summer)

![Graph showing projected peak demand from 2018 to 2028.](image)

\(^1\) Firm Peak Demand includes impacts of DSM (cumulative Demand Response and incremental (2019-on) utility-sponsored Energy Efficiency/Energy Conservation) as well as Energy Efficiency Codes and Standards.
Comparison of 2018 vs. 2019
Net Energy for Load (NEL) Forecast

Projected growth of approx. 18,000 GWh

Firm Peak Demand includes impacts of DSM (cumulative Demand Response and incremental (2018-on) utility-sponsored Energy Efficiency/Energy Conservation) as well as Energy Efficiency Codes and Standards.
Summer Peak Demands
Actual and Forecasted

1/ Projected impacts of Energy Efficiency codes and standards are included in all projections.
2/ Impacts from cumulative Demand Response (DR) and incremental (2018-on) utility-sponsored Energy Efficiency/energy Conservation (EE/EC) programs are excluded.
3/ Linear trend based on actual peak demand from 1998 to 2017.
Forecasted Summer Peak Demands¹/

¹/ Projected impacts of Energy Efficiency codes and standards are included in all projections.
²/ Impacts from cumulative Demand Response (DR) and incremental (2019-on) utility-sponsored Energy Efficiency/Energy Conservation (EE/EC) programs are excluded.
Historical Compound Average Annual Growth Rate\(^1\) for Firm Peak Demand (MW)

\(^1\)Projected growth rate from prior forecasts
Demand Response as a Percentage of Peak Demand
Summer 2019

<table>
<thead>
<tr>
<th>Region</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Florida Reliability Coordinating Council</td>
<td>6.2%</td>
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<tr>
<td>PJM</td>
<td>5.4%</td>
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<td>Midwest Reliability Organization</td>
<td>4.9%</td>
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<td>ERCOT</td>
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<td>SERC Reliability Corporation</td>
<td>3.0%</td>
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<td>Northeast Power Coordinating Council</td>
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<tr>
<td>Southwest Power Pool</td>
<td>1.6%</td>
</tr>
<tr>
<td>Western Electricity Coordinating Council</td>
<td>1.4%</td>
</tr>
</tbody>
</table>


1/ Excluding FRCC (FL-Peninsula) Subregion
Generation Additions and Reserve Margins

- 12,000 MW of new generation planned over the next ten years
  - Includes approximately 4,000 MW of firm solar
- Planned Reserve Margins projected to remain above 20% over the next ten years
- DSM projected to contribute significantly to reserve margins
Incremental Generation Firm Capability Changes over 10-yr Planning Horizon by Fuel Type in MW

- Coal
- Natural Gas
- Solar
Nuclear Outlook is Stable in 10-yr Horizon

Existing\(^1\) Nuclear Capacity (Summer)

- St. Lucie 1: 981 MW
- St. Lucie 2: 986 MW
- Turkey Point 3: 837 MW
- Turkey Point 4: 821 MW

Total: 3,625 MW

Planned Nuclear Capacity (Summer)

- Turkey Point 4 Upgrade (10/2020): 20 MW

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\(^1\)Existing generation as of December 31, 2018
Planned Reserve Margin\textsuperscript{1/ 2/}

(Based on Firm Load)

1/ Projected impacts of Energy Efficiency codes and standards are included in all projections.
2/ Impacts from cumulative Demand Response (DR) and incremental (2019-on) utility sponsored Energy Efficiency/Energy Conservation (EE/EC) programs are included.
Planned Reserve Margin\(^1\)  
(Excluding projected DR and Utility EE/EC Impacts)\(^2\)
Forecasted Renewable Mix
Firm Summer Capacity

2019: 1,392 MW
- MSW: 18%
- Biomass: 8%
- Landfill Gas: 3%
- Hydro: 3%
- Solar: 68%

2028: 5,008 MW
- MSW: 4%
- Biomass: 2%
- Hydro: 1%
- Solar: 93%
2017-2019 TYSP Forecasted Solar Firm Summer Capacity
Forecasted Fuel Mix
Net Energy for Load (GWh)

2019
233,902 GWh

Nuclear 13%
Coal 12%
Gas 69%
Other 4%
Renewable 2%
Oil 0.1%

2028
251,295 GWh

Nuclear 12%
Coal 8%
Gas 65%
Other 3%
Renewable 12%
Oil 0.1%
Forecasted Renewable Mix
Total Energy Served

2019
4,922 GWh

2028
18,801 GWh

- Solar: 73%
- Biomass: 8%
- Landfill Gas: 6%
- MSW: 13%
- Solar: 95%
- Biomass: 1%
- Landfill Gas: 1%
Reliability Considerations of Utility Solar Generation Additions

- No significant operational impacts at current levels
- Utilities are developing experience with operations, dispatch, and output forecasting
- Ability to learn from other parts of the country that have higher penetration rates
Natural Gas Infrastructure in Florida

- Maintain a comprehensive gas infrastructure model and utility fuels database
- Perform periodic reliability analysis
- Compare gas infrastructure assessments to TYSPs' forecasted needs
- Coordinate regional response to fuel emergencies with utilities and pipelines
Natural Gas Reliability

- Gas infrastructure on pace with generation additions
- Gas generation with alternate fuel capability remains between 64-66%
- Recent analyses on delivery and supply diversity outside of FRCC
  - Utility strategies developed
  - Extreme failure scenarios mitigated
  - Resilient infrastructure to short term outages
Conclusion

Based on 2019 TYSPs, planned Reserve Margins above 20% for all peak periods for the next ten years

DSM projected to contribute significantly to reserve margins

Energy Efficiency Codes and Standards playing an increasingly large role

Renewables increase from 2% to 12% (energy)

Planned gas infrastructure capacity increases support planned generation
Questions?