Florida Public Service Commission
2014 Ten-Year Site Plan Workshop
FRCC Presentation

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Agenda

Executive Summary

FRCC Load & Resource Plan

- Load Forecast, Generation Additions, Reserve Margins, Fuel Mix
- Renewable Resources and Demand Side Management (DSM)

FRCC Fuel Reliability

- Natural Gas Energy Production in Florida
- Natural Gas Infrastructure in Florida
- Status of Third Pipeline

Key EPA Air Quality Regulations

- Mercury and Air Toxic Standard (MATS) Update
- Clean Power Plan

Physical Security of Infrastructure

- Metcalf Substation Event
- Update on Proposed Standard

Florida Reliability Coordinating Council

The purpose of the
Florida Reliability Coordinating Council is to
promote and enhance
the reliability and adequacy
of the bulk electricity supply in Florida,
now and into the future.

Executive Summary

- Planned Reserve Margins > 20% (Demand Side Management is projected to be a significant component of projected reserves)
- Demand Response[1/] reduces load (MW) at summer peak by an average of 6.7% throughout the 10-year horizon
- Utility-sponsored Energy Efficiency/Energy Conservation programs reduce load (MW) at summer peak by 1.5% by 2023
- Additional Energy Efficiency delivered through mandated codes and standards accounted for in load forecast reduces load (MW) at summer peak by at least 4% by 2023
- Renewables are 3,462 GWh (1.4%) of energy served by 2023

[1/]Demand Response (DR) = Load Control + Interruptible programs; i.e. dispatchable Demand Side Management (DSM)

Executive Summary

(Continued)

- Energy production from natural gas expected to increase 10% by 2023
- Third gas pipeline is under development
- Impact of EPA regulations:
  - Crystal River units expected to be available through April 2018 and two new combined cycle units (1640 MW) planned for 2018
  - Entities providing comments on the proposed CO_2 rule
- Physical security standard – FERC issued Notice of Proposed Rulemaking (NOPR) on NERC standard

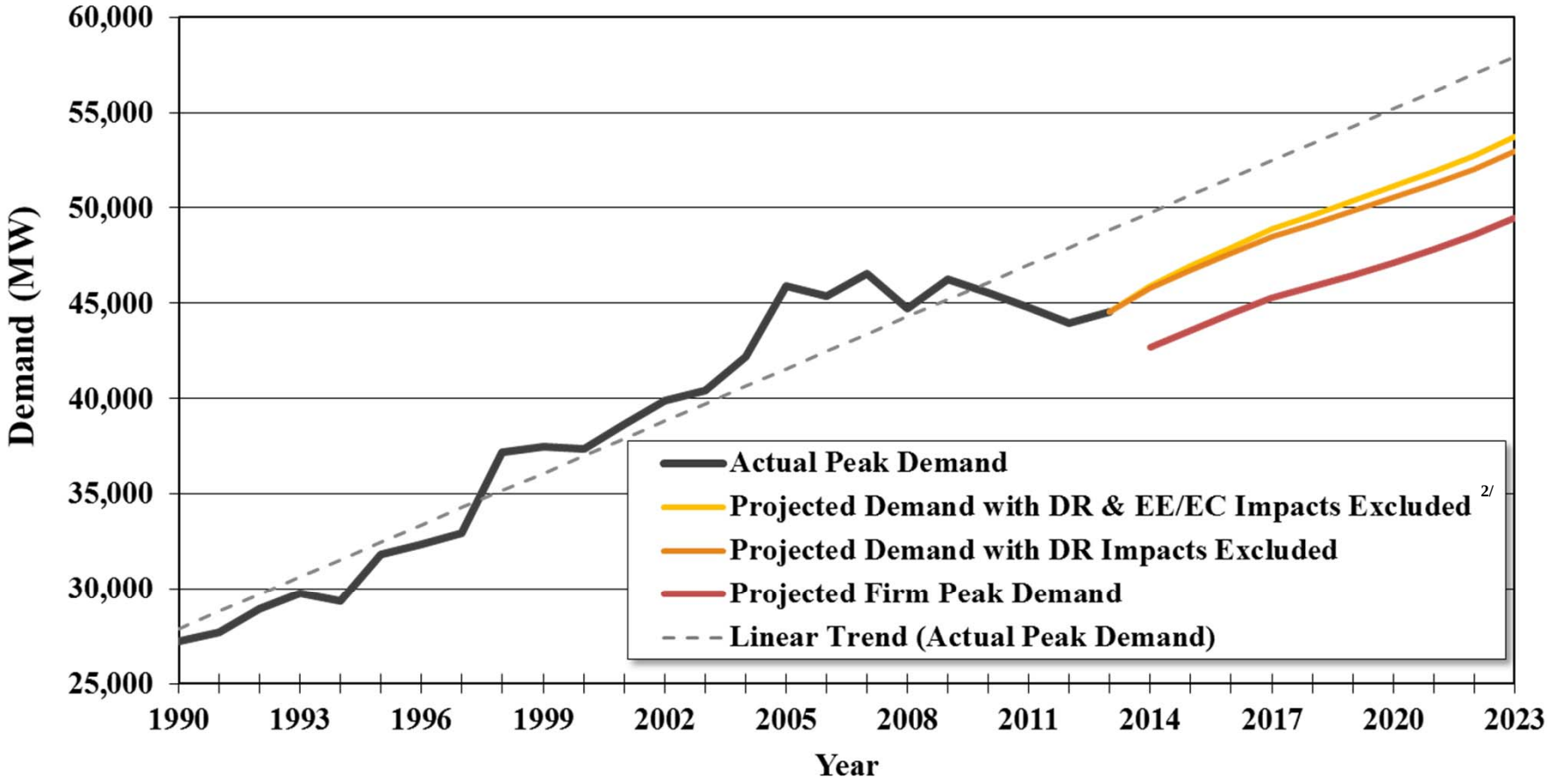
FRCC
Load & Resource
Plan

Load Forecast Factors

- Florida unemployment (actual) continues to decrease
- Population continues to pick up momentum
- Florida's Gross State Product (GSP) levels lower than expected in 2011-12
- Forecasted energy sales and winter firm peak demands are lower in 2014 TYSP compared to 2013 TYSP and forecasted summer firm peak demands are higher from 2017 forward

FRCC Summer Peak Demands

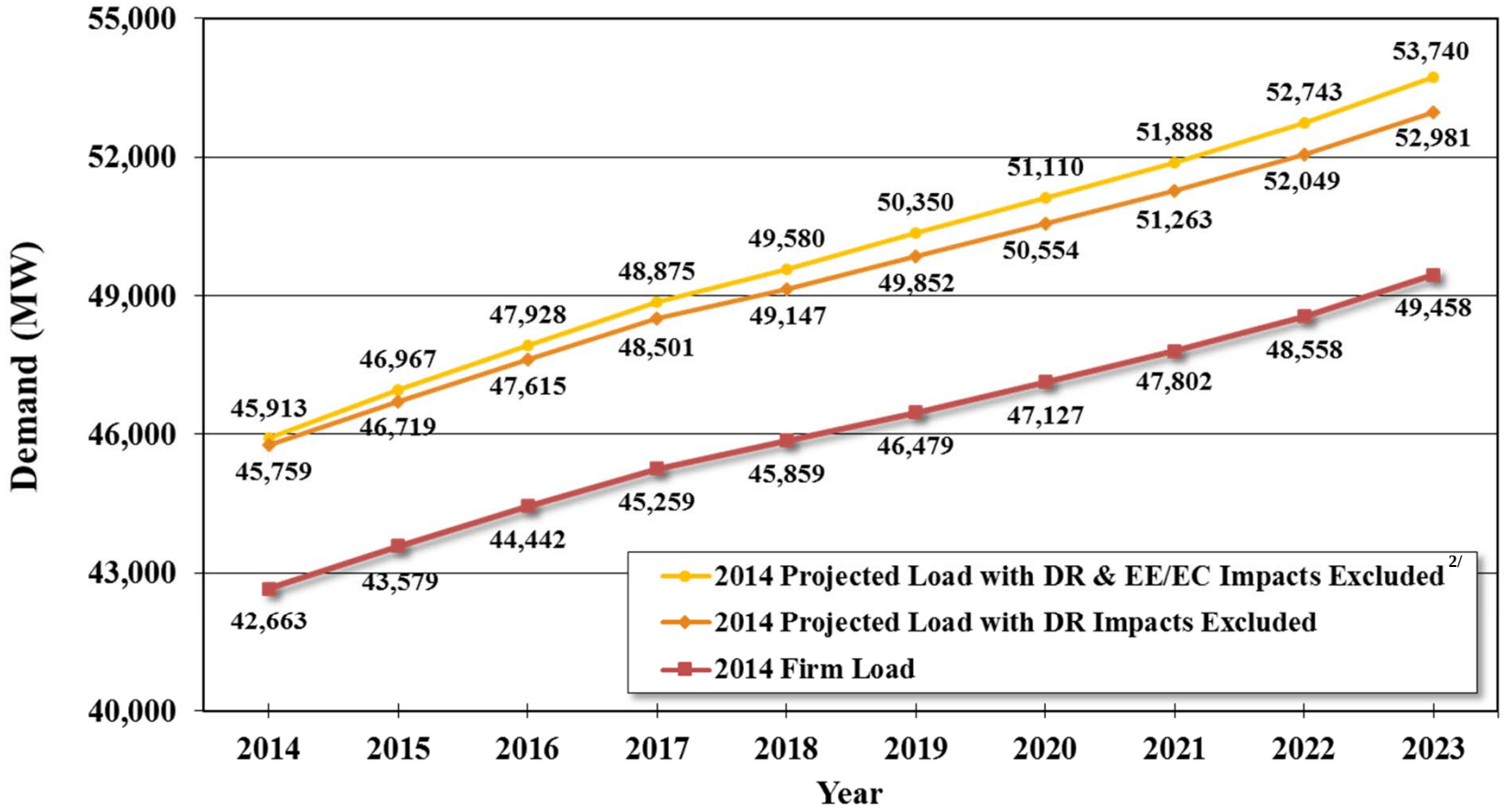
Actual and Forecasted[1/]



[1/] Projected impacts of Energy Efficiency codes and standards are included in all projections.

[2/] Impacts from Demand Response (DR) and utility sponsored Energy Efficiency/Energy Conservation (EE/EC) programs are excluded.

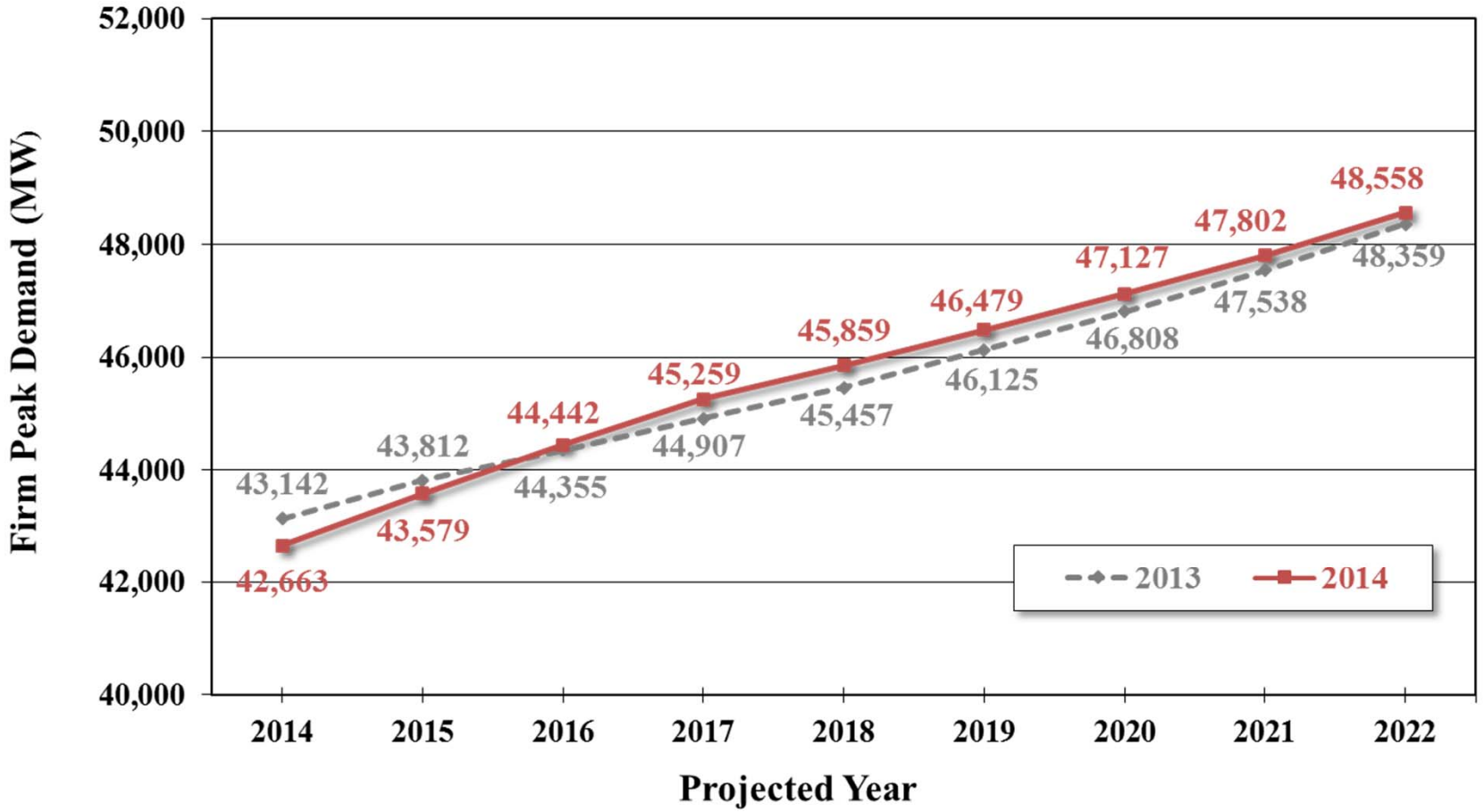
FRCC Demand Forecast[1/]
(Summer)



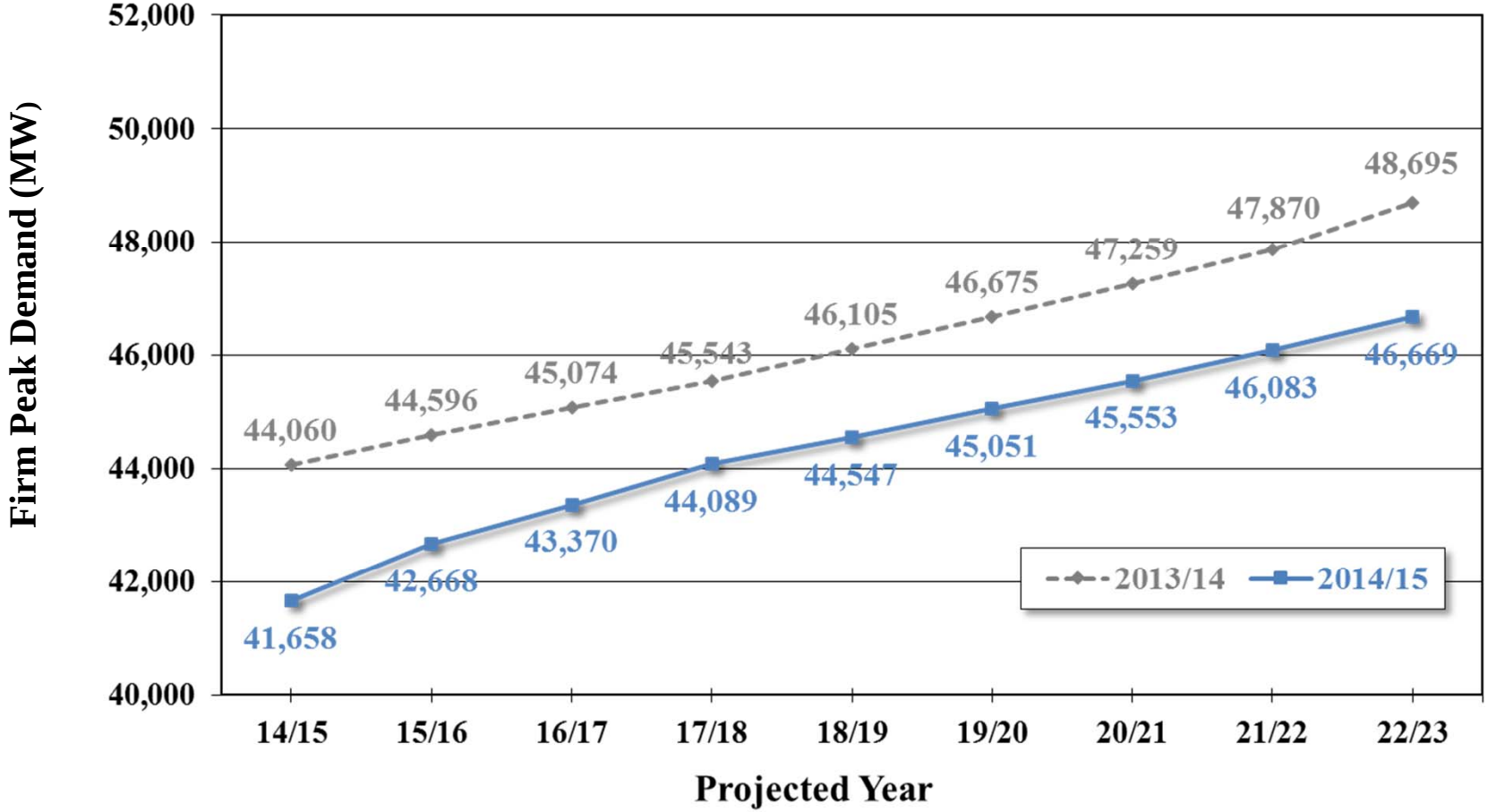
[1/] Projected impacts of Energy Efficiency codes and standards are included in all projections.

[2/] Impacts from Demand Response (DR) and utility sponsored Energy Efficiency/Energy Conservation (EE/EC) programs are excluded.

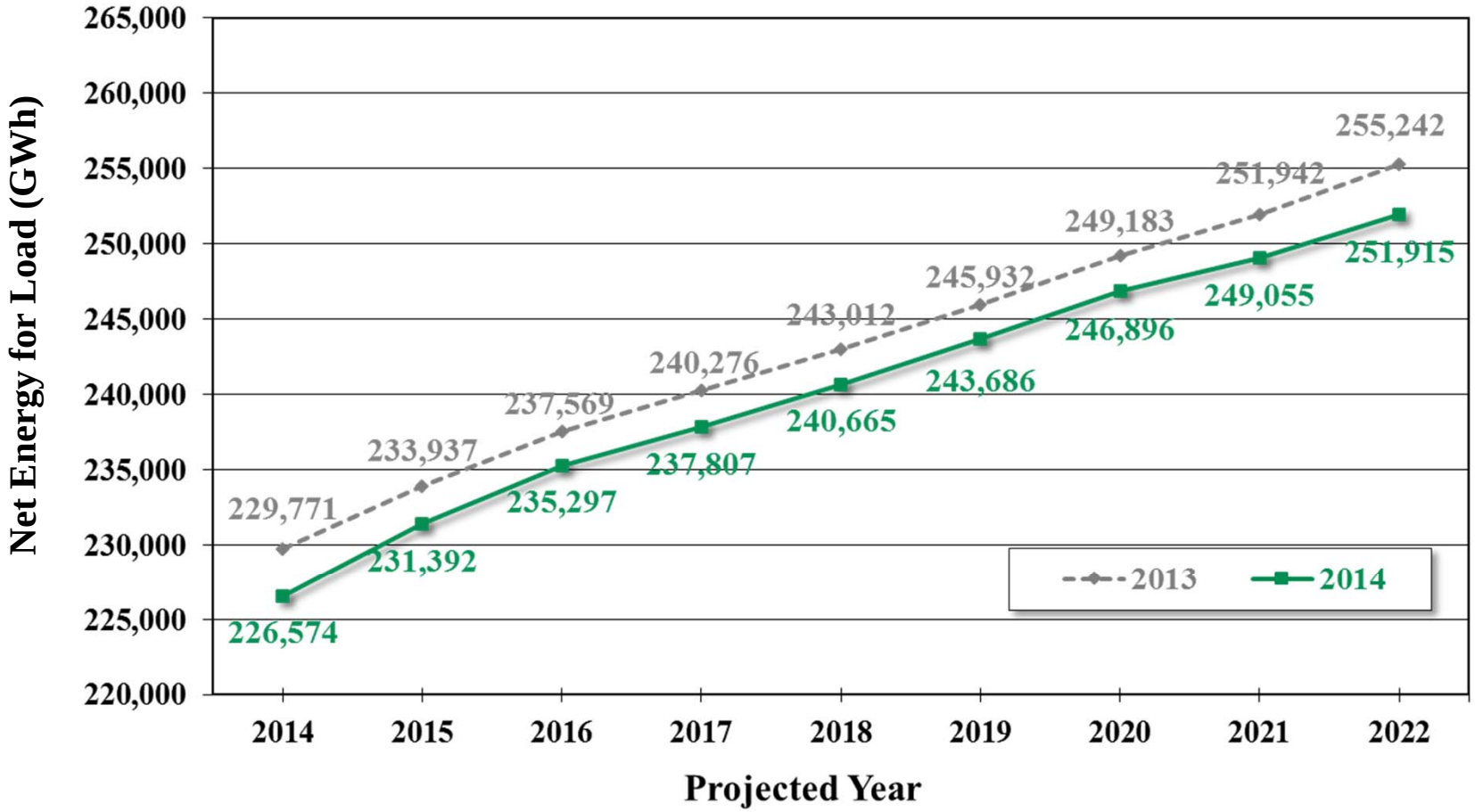
Comparison of 2013 vs. 2014
FRCC Firm Peak Demand Forecast
(Summer)



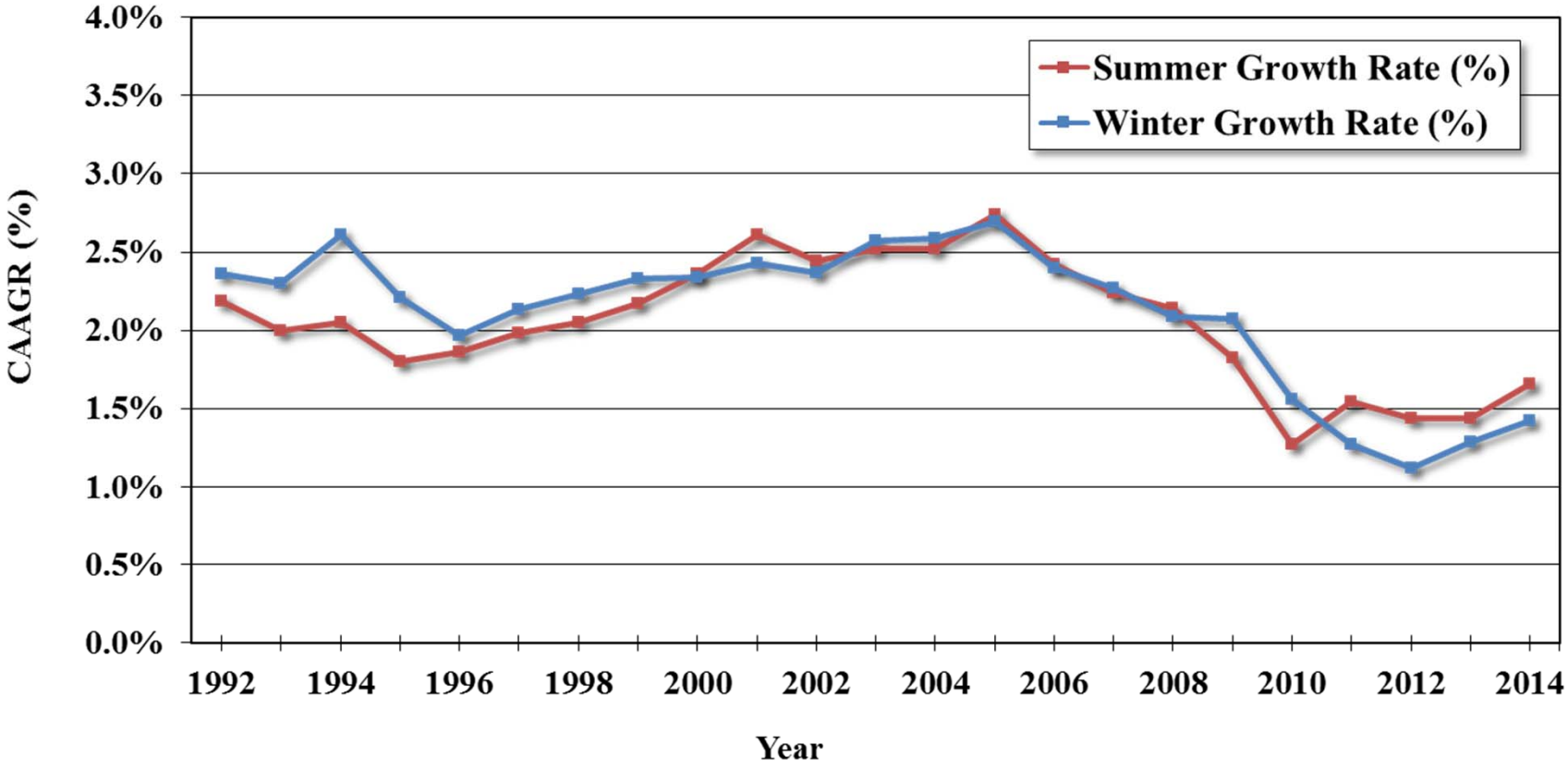
Comparison of 2013 vs. 2014
FRCC Firm Peak Demand Forecast
(Winter)



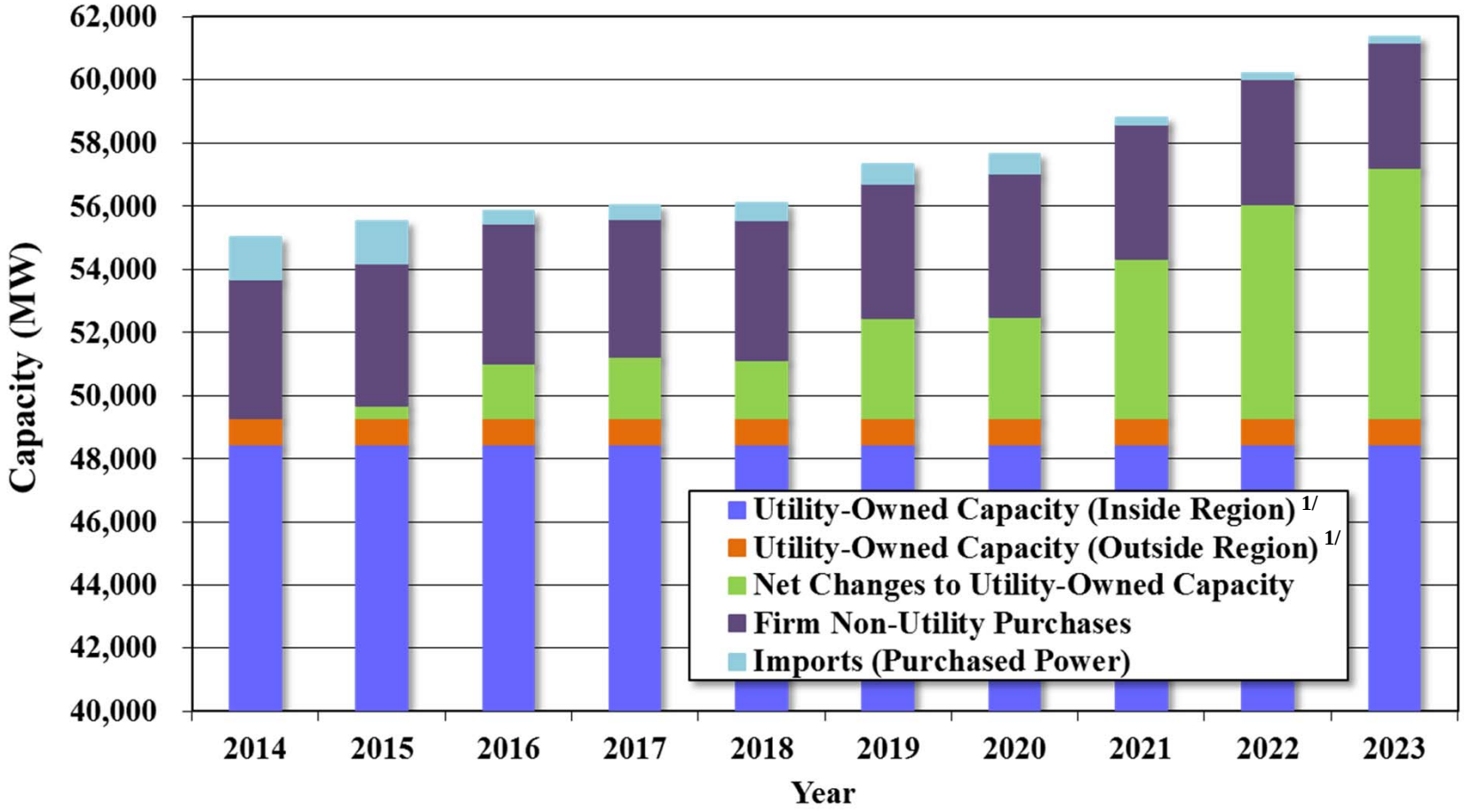
Comparison of 2013 vs. 2014
FRCC Net Energy for Load Forecast



FRCC Region
Compound Average Annual Growth Rate for Firm Peak Load (MW)

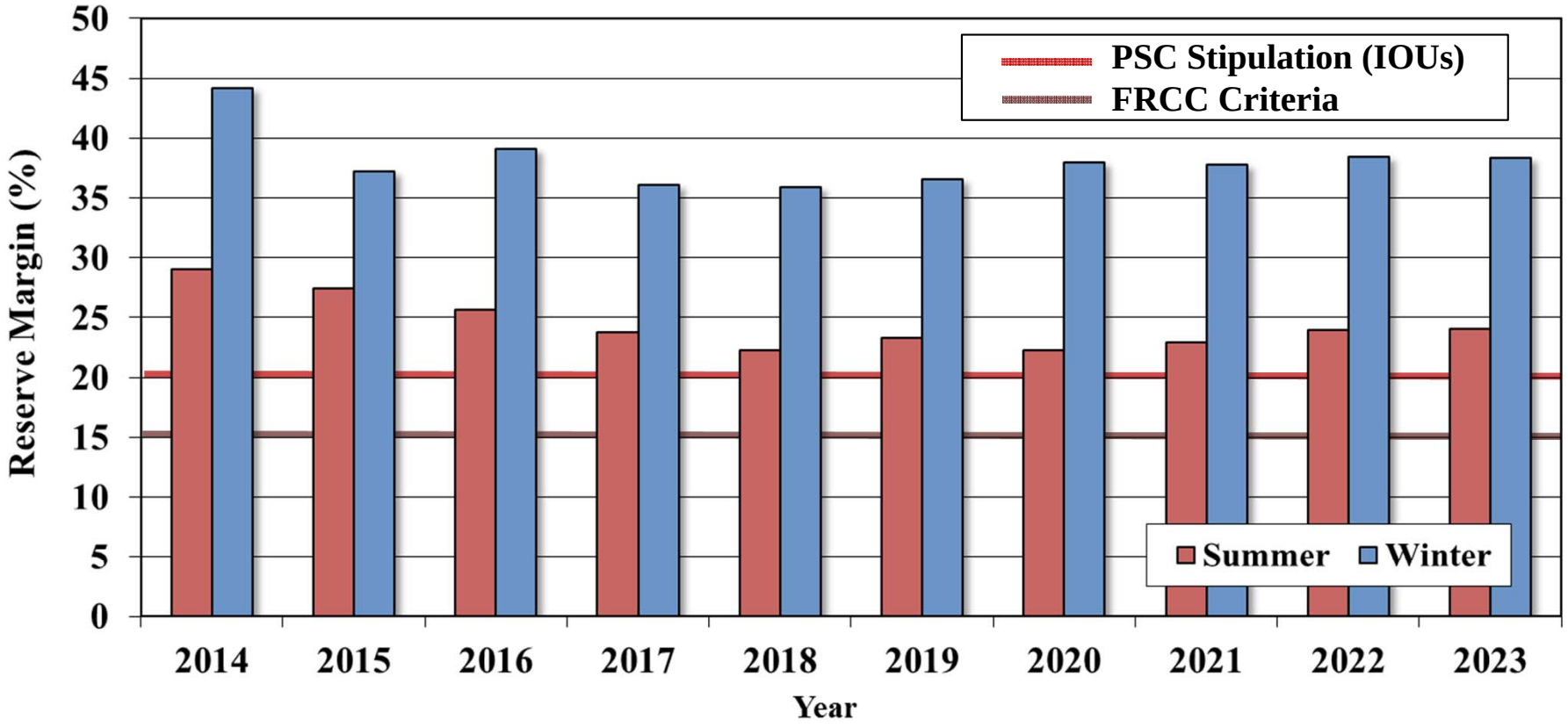


Load & Resource Plan
Total Available Capacity
(Summer)

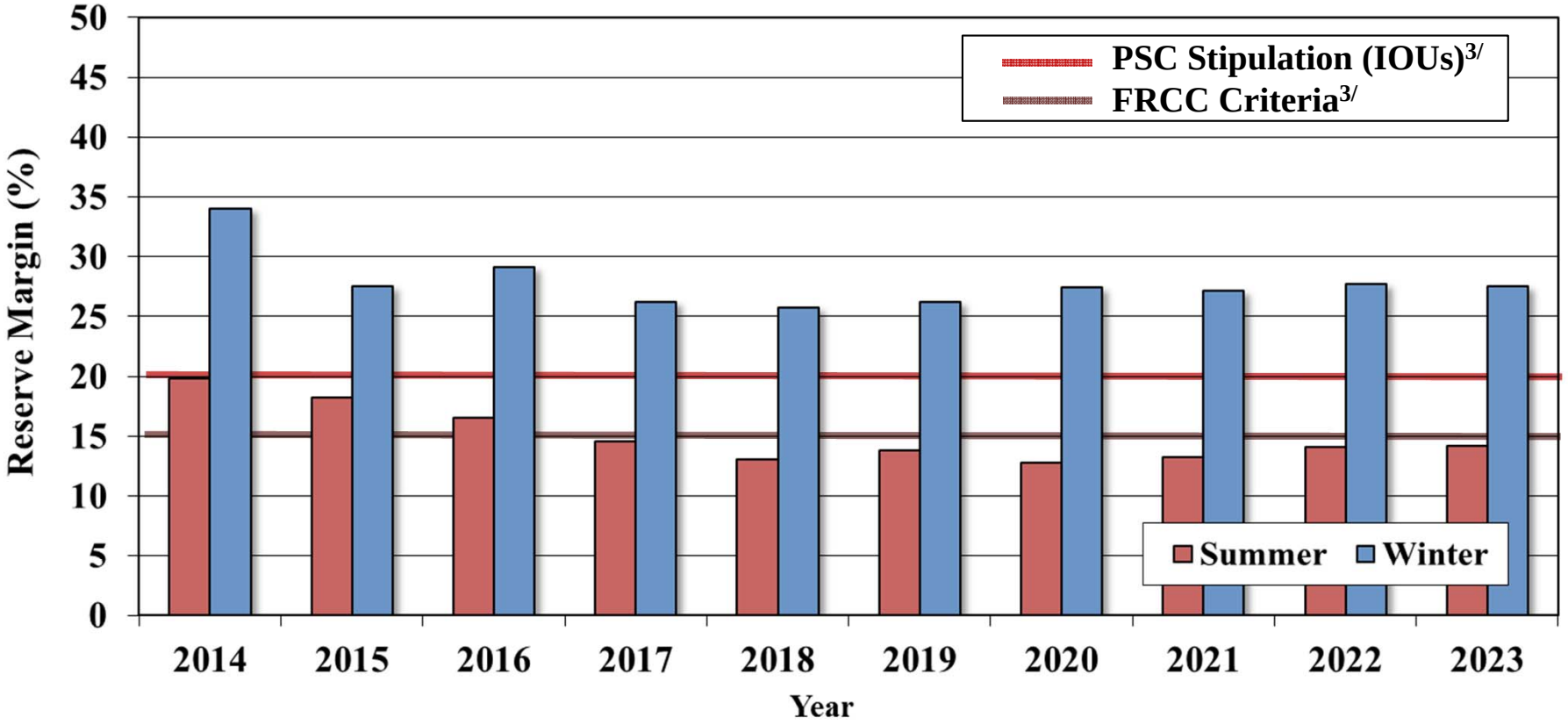


1/Existing generation as of December 31, 2013

Load & Resource Plan
FRCC Planned Reserve Margin
(Based on Firm Load)

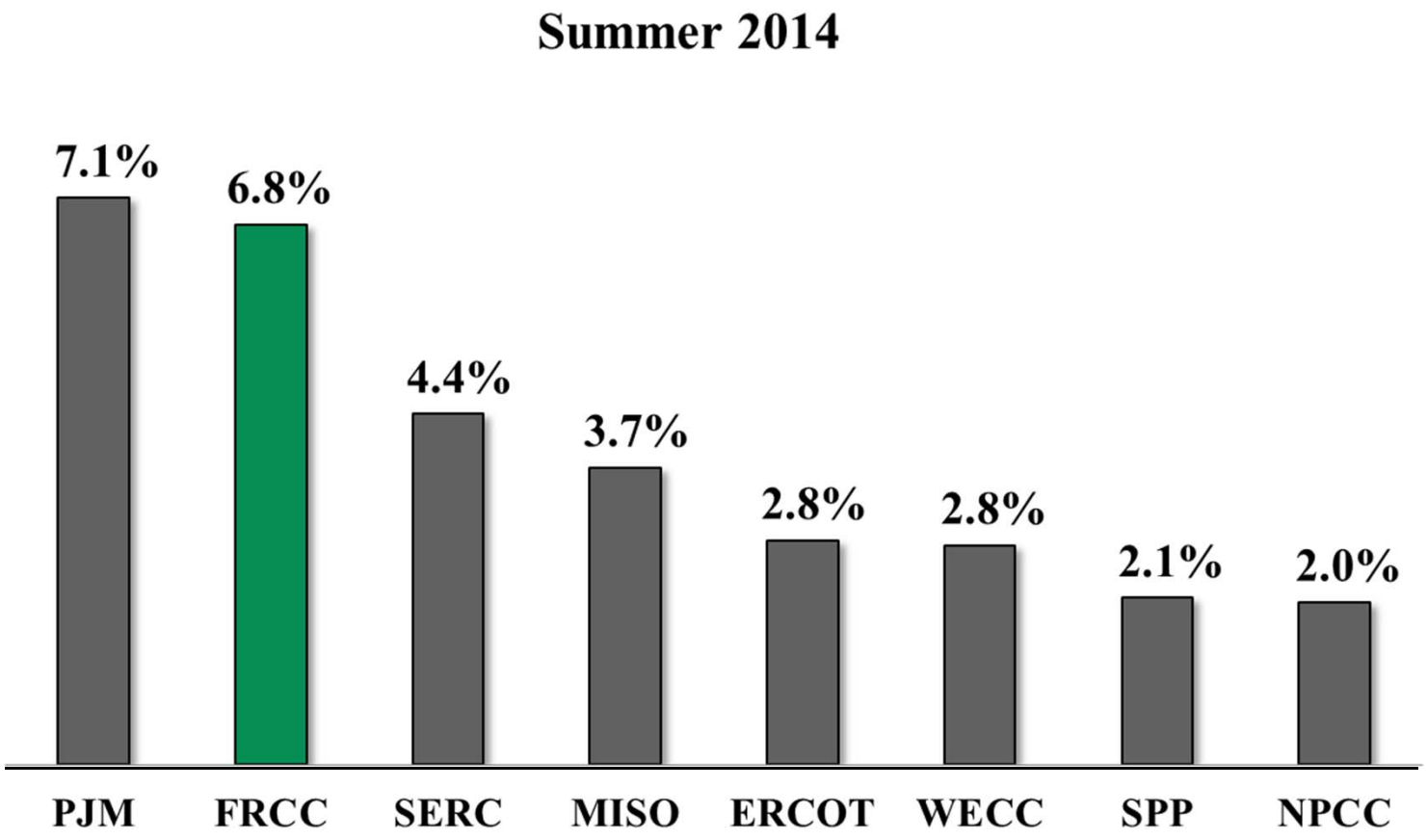


Load & Resource Plan
FRCC Planned Reserve Margin[1/]
(Excluding projected DR and EE/EC Impacts) [2/]



[1/] Projected impacts of Energy Efficiency codes and standards are included in all projections.
[2/] Impacts from Demand Response (DR) and utility sponsored Energy Efficiency/Energy Conservation (EE/EC) programs are excluded.
[3/] PSC stipulation and FRCC criteria are based on firm load as per slide 15. The values shown on this slide are solely for illustrative purposes.

Load & Resource Plan
Demand Response as a Percentage of Peak Demand



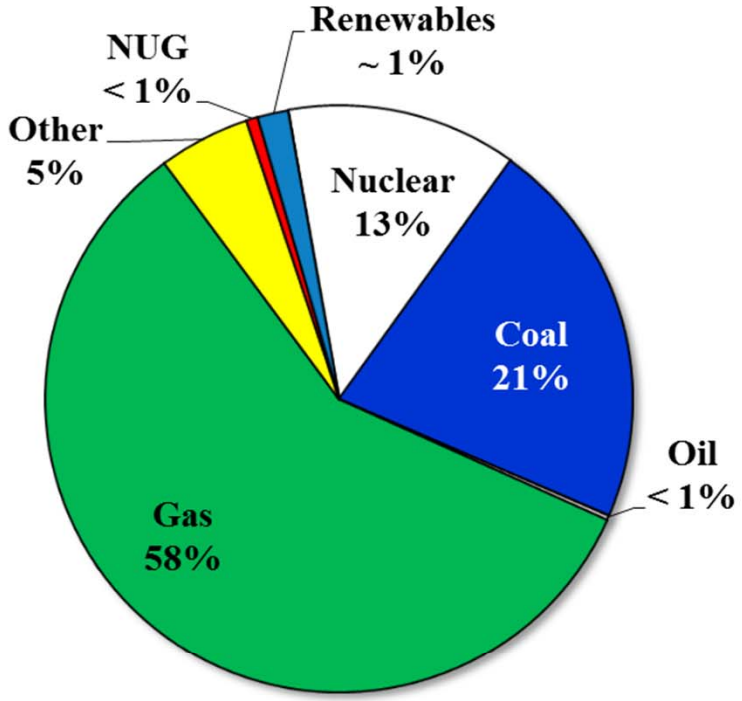
Source: NERC's 2014 Summer Reliability Assessment (*http://www.nerc.com/pa/RAPA/ra/Reliability%20Assessments%20DL/2014SRA.pdf*)

FRCC Reliability Assessment
Reserve Margin Review

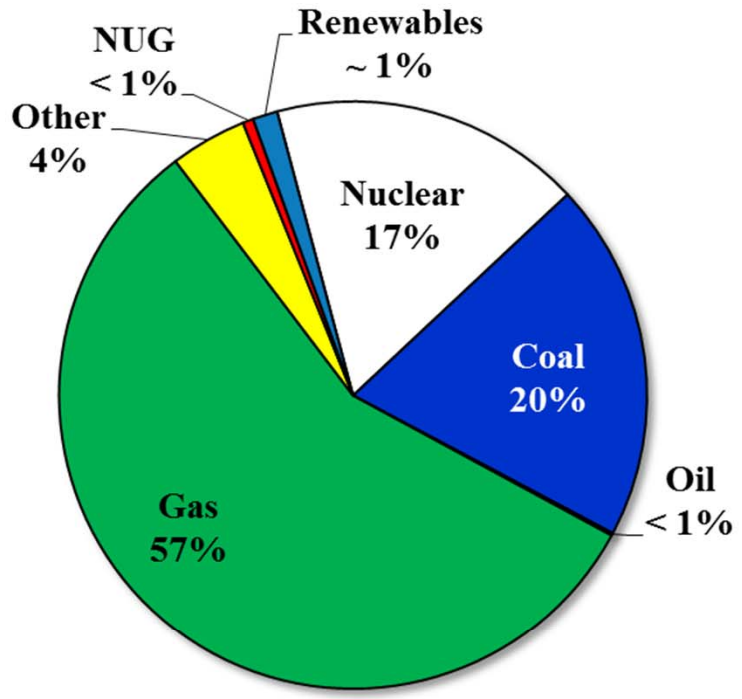
- Planned Reserve Margins expected to be greater than 20%
  - DSM is still projected to be a significant component of this reserve margin
  - FRCC has second highest amount of Demand Response as a percentage of a region's peak load

Fuel Mix (Energy)

Net Energy for Load (GWh)



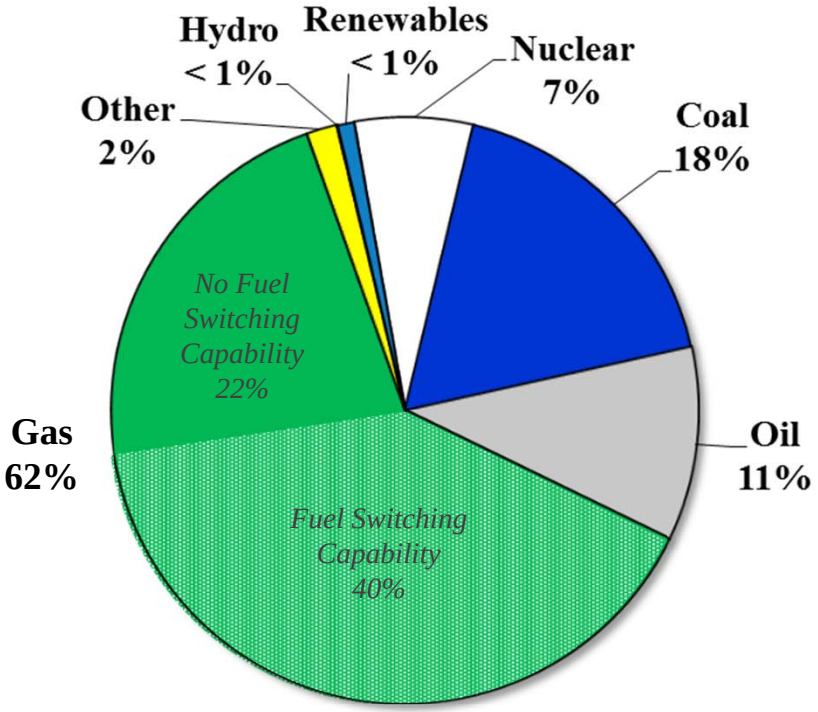
2014
226,574 GWh



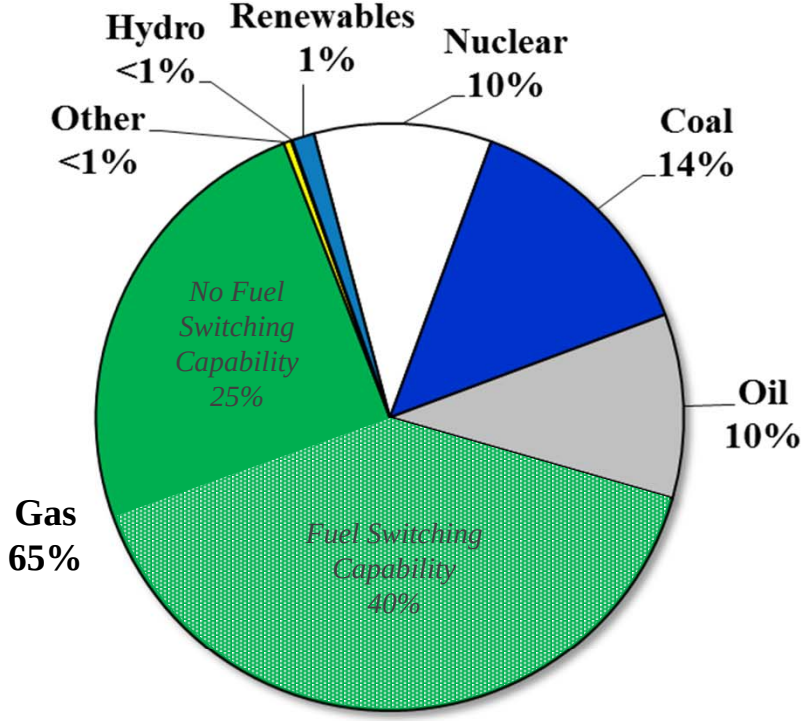
2023
255,366 GWh

Fuel Mix (Capacity)

Summer Capacity[1/] (MW)



2014
55,031 MW

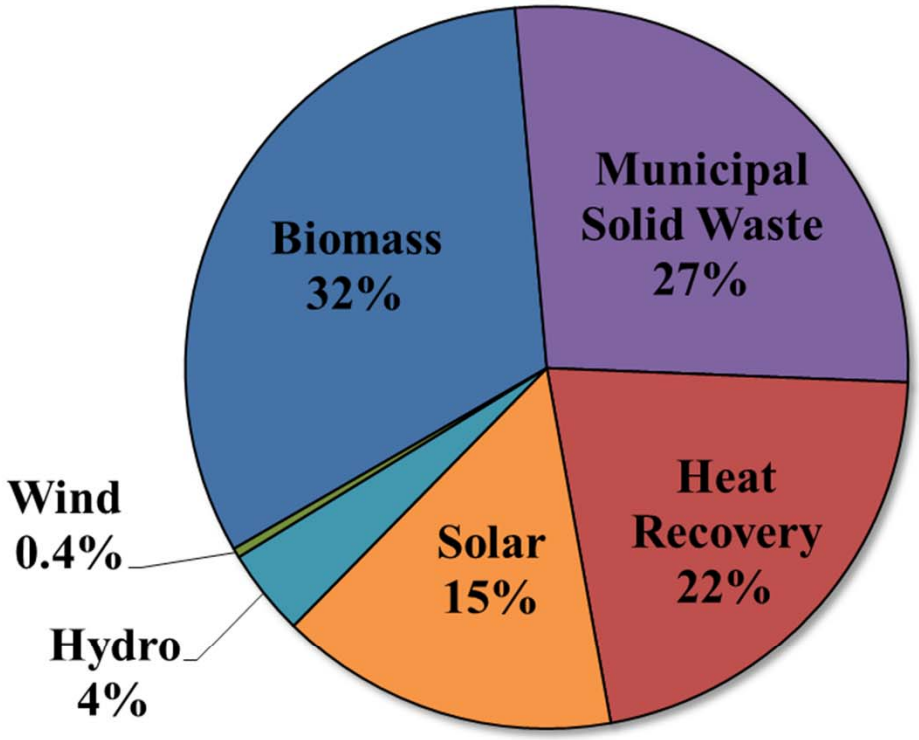


2023
61,370 MW

[1/] Only accounts for firm capacity

2014 Existing Renewable Resource Capacity

Summer Capacity[1/] (MW)



1,434 MW

[1/] Contains non-TYSP data that includes both Firm and Non-Firm Capacity in the FRCC region

Renewables Forecast [1/]

Existing Renewables Capacity	1,434 MW
Planned Additions (through 2023)	
Biomass	400 MW
Municipal Solid Waste	162 MW
Solar	314 MW
TOTAL	~ 876 MW

[1/] Contains non-TYSP data that includes both Firm and Non-Firm Capacity in the FRCC region

Nuclear Outlook

Existing[1/] Nuclear Capacity (Summer)

St. Lucie 1		981 MW
St. Lucie 2		986 MW
Turkey Point 3		811 MW
Turkey Point 4		821 MW
	Total	**3,599 MW**

Planned

Turkey Point 6 (new)		1,100 MW (6/2022)
Turkey Point 7 (new)		1,100 MW (6/2023)
	Total	**2,200 MW**

[1/] Existing capacity as of December 31, 2013

FRCC Load & Resource Plan: Conclusion

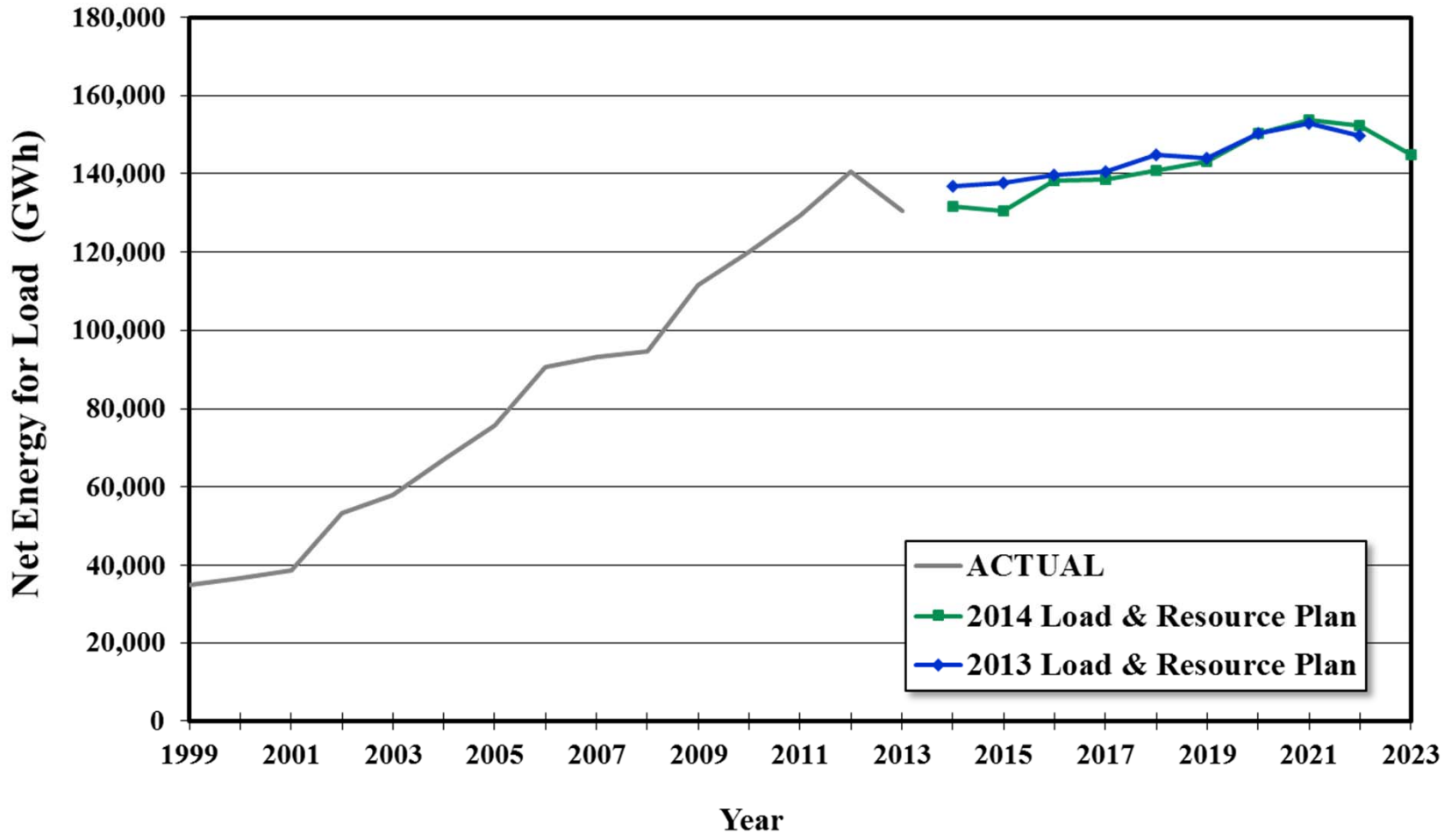
- The FRCC Region is projected to have adequate total planned reserves over the ten year period
- DSM is projected to be a significant component of projected reserves

FRCC
Fuel
Reliability

2014 FRCC Fuel Reliability

- Fuel Reliability Working Group (FRWG)
  - Reviews existing interdependencies of fuel availability and electric reliability
  - Coordinate regional responses to fuel issues and emergencies

Energy Production from Natural Gas[1/]



[1/] Extended nuclear outages for uprate work resulted in higher gas usage in 2012

Ten Largest States for NG Consumption (2012 Data)

State	Total Annual Natural Gas Consumption (Bcf)	Annual NG Consumption for Electric Generation (Bcf)	Total Annual Marketed Natural Gas Production (Bcf)	Total Miles of Natural Gas Pipeline	Total Storage Capacity (Bcf)
Texas	3,872	1,517	7,475	46,380	831
California	2,403	855	247	11,621	592
Louisiana	1,482	323	2,955	26,479	700
Florida	**1,328**	**1,139**	**19**	**5,396**	**0**
New York	1,223	499	26	4,570	246
Pennsylvania	1,038	394	2,257	9,750	774
Illinois	938	89	2	9,423	1,000
Ohio	843	172	84	9,948	578
Michigan	790	181	129	8,749	1,079
Oklahoma	692	318	2,023	11,872	371
Total US	**25,533**	**9,111**	**25,308**	**301,035**	**8,991**
Florida as % of Total	**5.2%**	**12.5%**	**0.1%**	**1.8%**	**0%**

FRCC entities maintain liquid fuel storage capability to provide service for an average of 4.8 days before replenishing

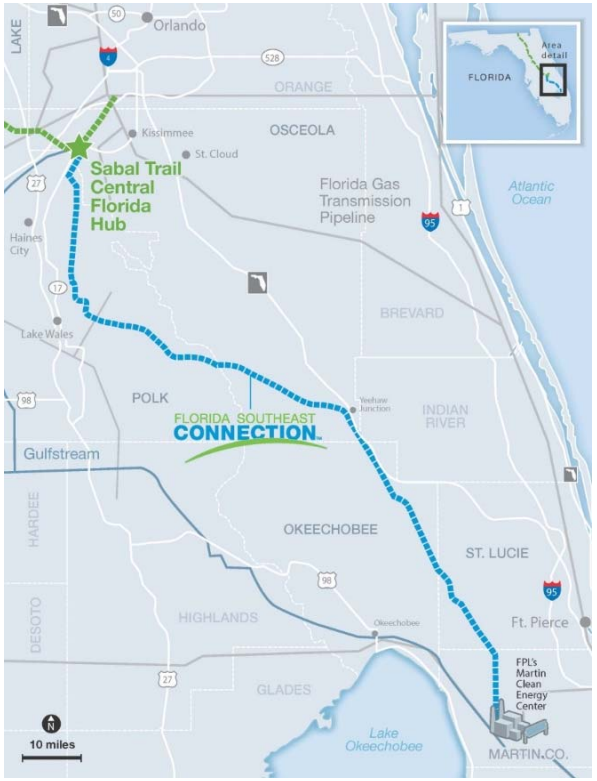
Sources: http://www.eia.gov/naturalgas/data.cfm and http://primis.phmsa.dot.gov/comm/states.htm?nocache=1369

Third Gas Pipeline

(Expected In-Service Date: May 2017)

Sabal Trail Project

Florida Southeast Connection



Fuel Reliability Conclusions

- Florida has greater natural gas demand than all but three states and greater natural gas demand to support generation than all states but Texas
- Florida has minimal in-state production, no in-state storage and less miles of pipeline within the state than all but one of the ten largest gas consuming states

Fuel Reliability Conclusions

(continued)

- Electric generation with dual fuel capability provides operating flexibility when NG supplies become limited due to unforeseen events
- A disruption to one of the two major pipelines, lasting more than a few days could exceed liquid fuel supply capability
- Third gas pipeline is under development

Key EPA Air Quality Regulations

Mercury and Air Toxic Standard (MATS) Update

- Transmission Reliability issues identified in 2013 have been addressed by the new generation expansion plan in Citrus county
  - Crystal River 1 and Crystal River 2 are expected to be available through April of 2018
  - New 1640 MW combined cycle (CC) unit planned

    820 MW in service May of 2018

    820 MW in service November of 2018

Clean Power Plan

- Environmental Protection Agency (EPA) issued a proposed rule on June 18, 2014
- Proposes greenhouse gas emissions guidelines from existing stationary sources
- Comment period extends to October 16, 2014
- Entities within FRCC are evaluating the impacts of the proposed rule
- NERC & FRCC will continue to monitor and evaluate potential reliability impacts

Physical Security of Infrastructure

Metcalf Substation Event

Event at Pacific Gas & Electric's (PG&E) Metcalf substation resulted in equipment damage and heightened industry awareness to physical security exposure at substations

A malicious attack on PG&E's Metcalf substation was an eye-opener for the electric utility industry

- Metcalf substation is a large facility just outside San Jose, CA serving the San Francisco Bay area
- In April 2013, PG&E's Control Centers received intrusion detection and operations alarms
- First responders found multiple transformers and breakers were damaged by gunshots from attackers
- No outage experienced during the event and no customers impacted

Metcalf Substation Event
Attack Specifics

- Just before 1:00 AM on April 16, 2013, attackers slipped into an underground vault in the vicinity of PG&E's Metcalf substation and cut fiber optic cables
- At 1:37 AM, a PG&E Security Center received an intrusion detection alarm on the Metcalf substation SW fence line; PG&E's Grid Control Center also received multiple alarms
- Multiple transformers and breakers were damaged by gunshots from multiple vantage points

The attack's sophistication was different than what industry had previously experienced

Metcalf Substation Event
Damage to Bulk Electric System Equipment

- **500 kV Transformers**
  - 10 of 11 single-phase transformers sustained gunshot damage
- **230 kV Transformers**
  - 3 of 4 had gunshot damage and were de-energized or de-rated
  - Gunshot damages to transformers were mainly to the radiators (cooling devices for oil)
- **115 kV breakers**
  - 6 of 12 breakers had gunshot damage

PG&E Shared Lessons Learned

Improve incident coordination

Perform continuous evaluation of system operations

Update on Proposed Standard
NERC Physical Security Standard Timeline

- FERC issued Physical Security Order on 3/7/2014
  - Required filing of standard by 6/5/2014
- NERC drafts CIP-014-1
  - Industry approved in record time (~ 9 weeks)
  - Standard is approved by industry on 5/13/2014
  - NERC filed with FERC on 5/23/2014
- FERC issued Notice of Proposed Rulemaking (NOPR) on 7/17/2014 requiring changes to the standard
- Initial comments on FERC NOPR due on 9/8/2014

Update on Proposed Standard
NERC Physical Security Standard (CIP-014) Overview

- Applicable to 500kV and large 230kV substations (five 230kV lines); primary control centers
- Requirements of CIP-014-1 are:
  - Perform risk assessments to identify significant transmission substations
  - Independent verification of the risk assessment
  - Evaluate potential threats and vulnerabilities of a physical attack
  - Develop and implement a security plan designed in response to the evaluation

Conclusion

- Planned Reserve Margin exceeds 20% for all peak periods for the next ten years
  - DSM is projected to be a significant component of projected reserves
- Energy production from natural gas expected to increase 10% by 2023
- Third gas pipeline is under development
- FRCC will continue to monitor and evaluate potential reliability impacts due to proposed EPA rules

Conclusion

(continued)

- Impact of EPA regulations:
  - Crystal River units expected to be available through April 2018 and two new combined cycle units (1640 MW) planned for 2018
  - Entities providing comments on proposed CO_2 rule
- Physical security standard – FERC issued NOPR on NERC Standard

Questions ?