



# Future Directions for ERCOT

*Bill Magness*

President & Chief Executive Officer  
ERCOT

***ERCOT Market Summit***

March 1, 2016

# ERCOT Vision and Mission

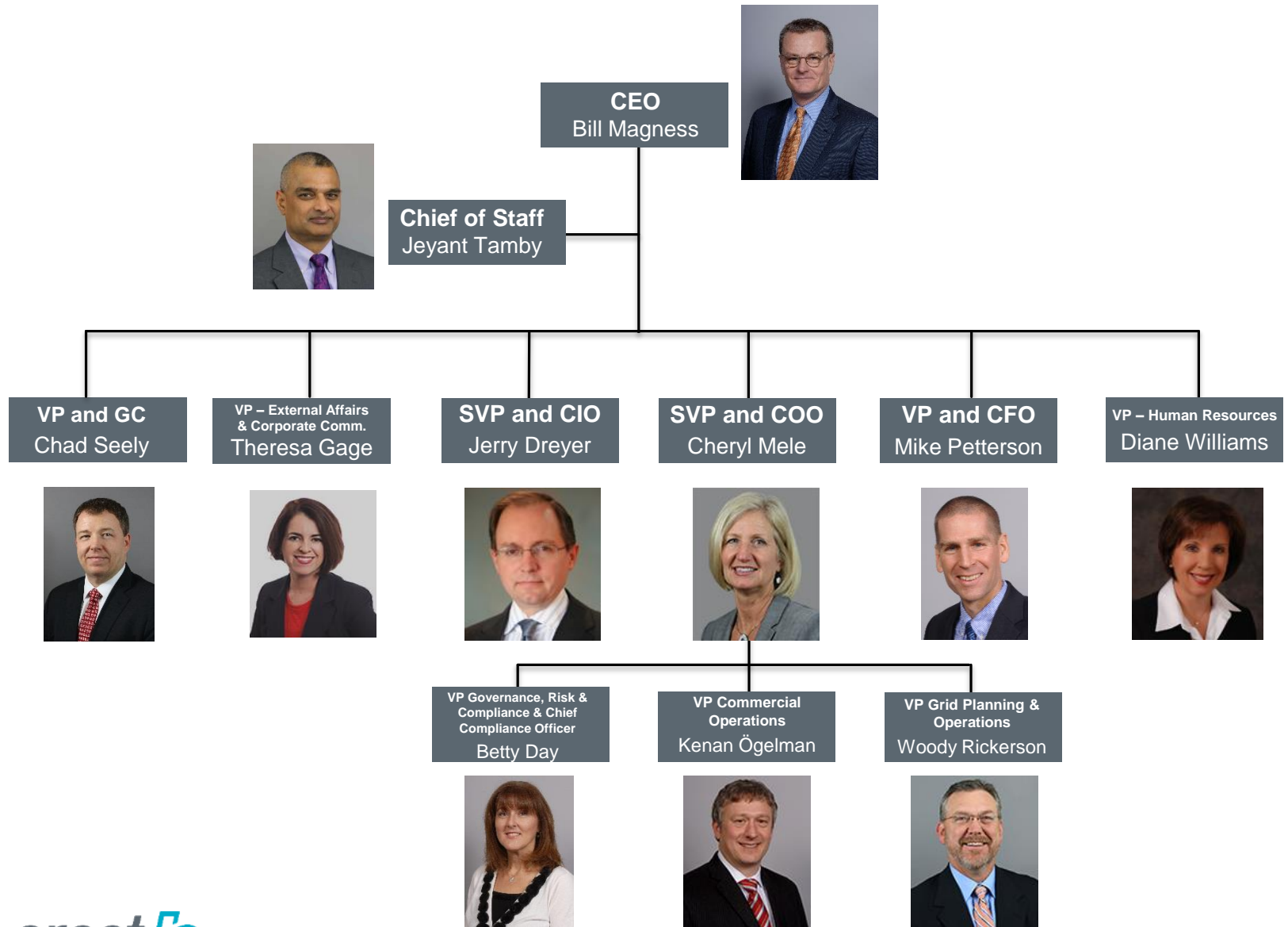
## ERCOT Vision:

Lead with independent insight on the future of electricity reliability, markets and technology in Texas in order to facilitate grid and market change for the benefit of all stakeholders.

## ERCOT Mission:

We serve the public by ensuring a reliable grid, efficient electricity markets, open access and retail choice.

# CEO Organization



# 2016 ERCOT Strategic Goals

In support of its mission to serve the public by ensuring a reliable grid, efficient electricity markets, open access and retail choice, ERCOT's goals are to:

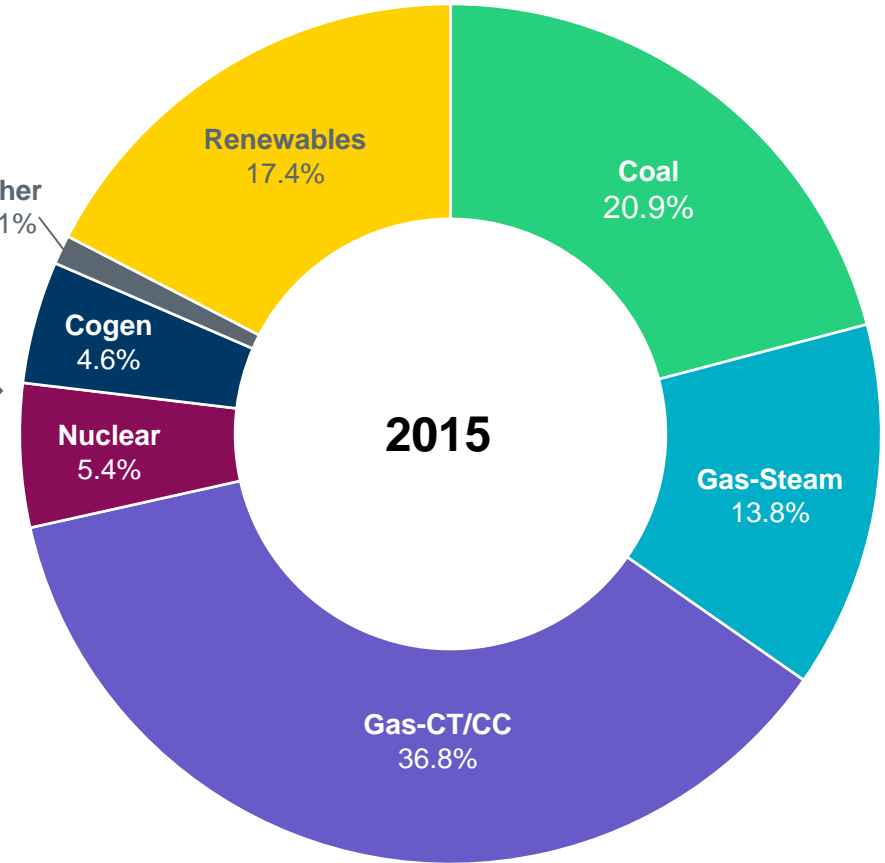
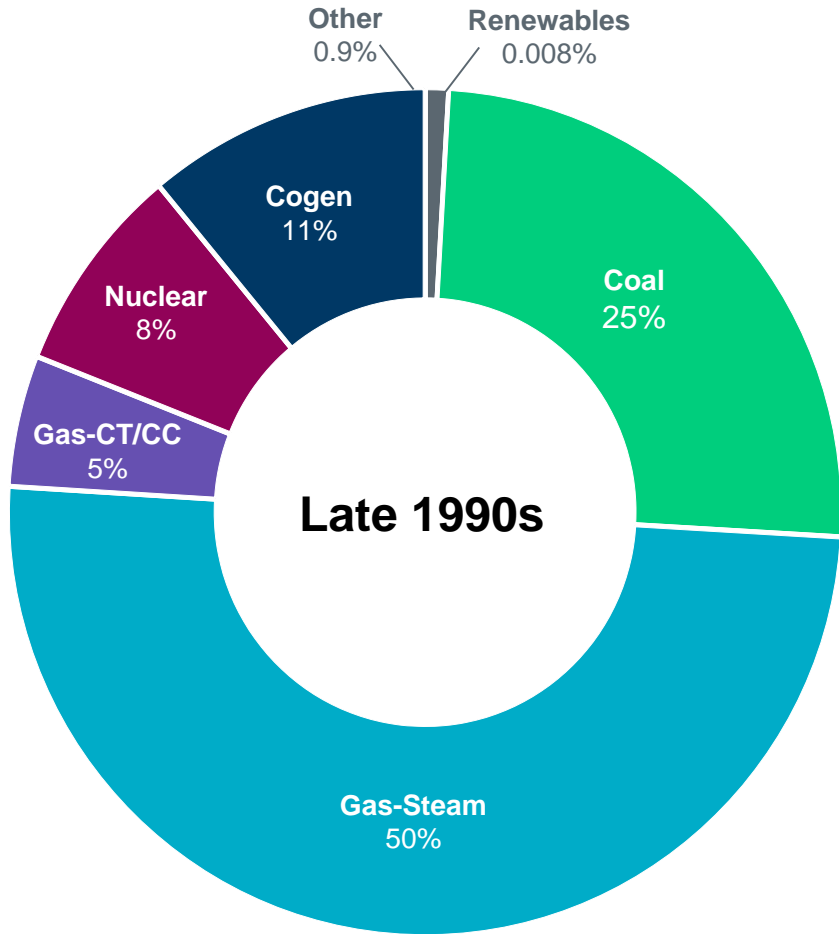
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  - Generation Resources
  - Demand Response
  - Distribution Level Resources
2. Provide thought leadership in support of continued improvements to operational reliability and markets
3. Deliver channels and tools to stakeholders for enhanced communication and increased transparency and access
4. Continually enhance our cyber and physical security posture
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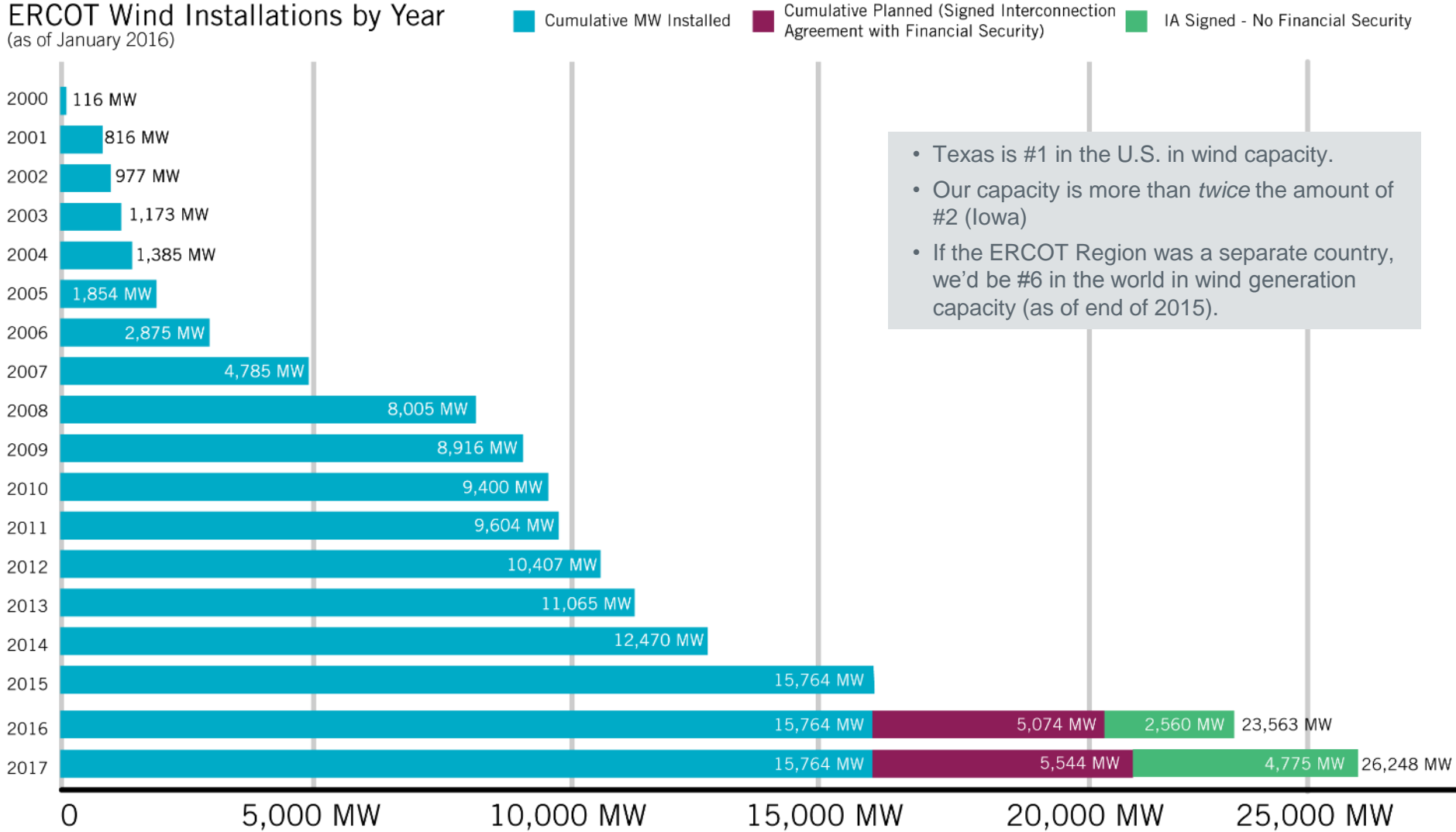
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# Changing Resource Capacity Mix



# Wind Generation – January 2016

ERCOT Wind Installations by Year  
(as of January 2016)



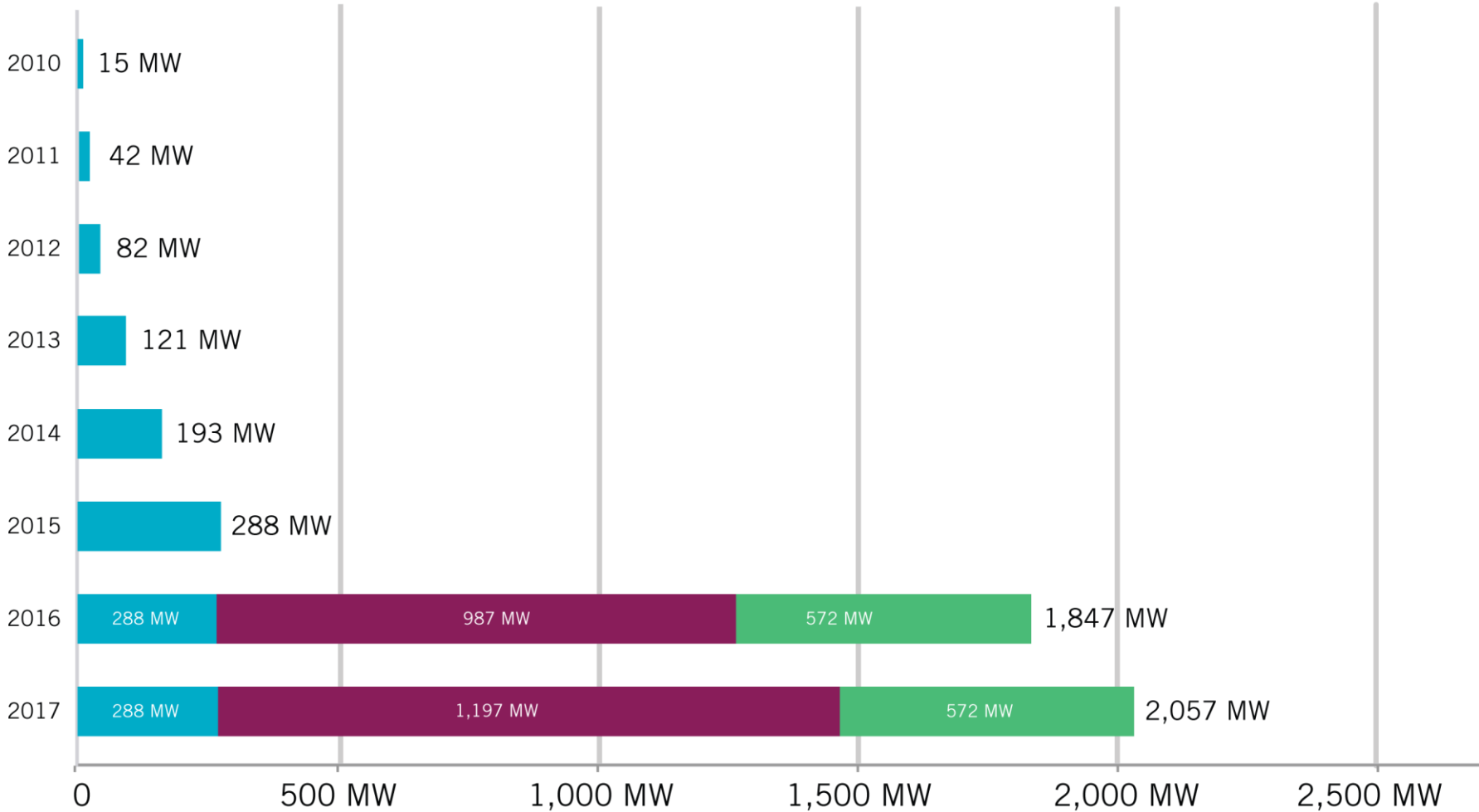
- Texas is #1 in the U.S. in wind capacity.
- Our capacity is more than *twice* the amount of #2 (Iowa)
- If the ERCOT Region was a separate country, we'd be #6 in the world in wind generation capacity (as of end of 2015).



# Utility Scale Solar Generation – January 2016

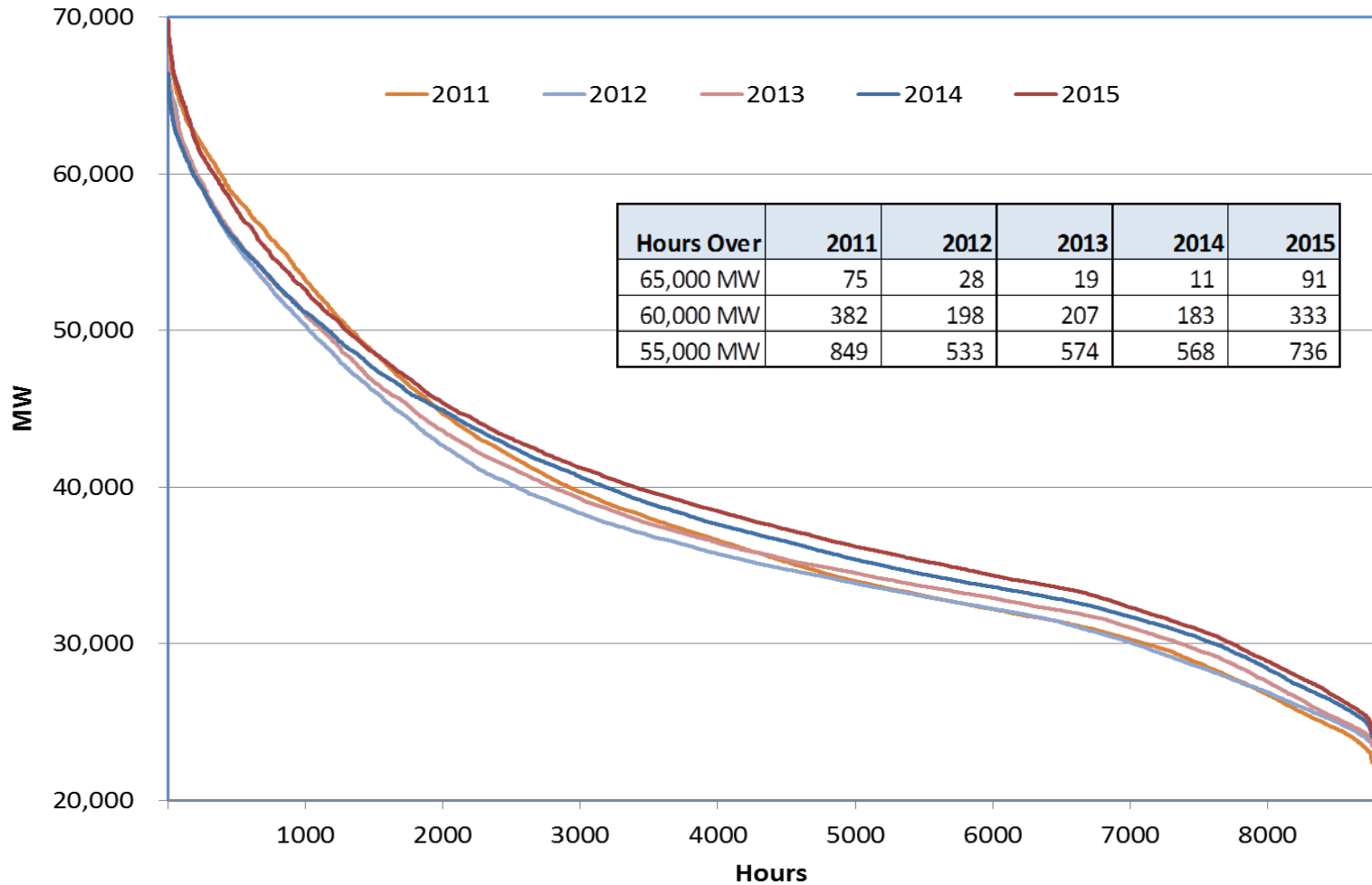
ERCOT Solar Installations by Year  
(as of January 2016)

Cumulative MW Installed    IA Signed - Financial Security Posted  
IA Signed - No Financial Security





# Actual Load Duration Curves – 2011 to 2015



# Examples of Distributed Energy Resources (DERs)

Capable of Providing:

- Backup (emergency) power
- Demand charge reduction (e.g., 4CP)
- Response to wholesale market prices
- ERCOT Emergency Response Service
- An offset to energy consumption
- Ancillary Services



Photos courtesy Acclaim Energy



# Current Records – Feb. 19, 2016

## Peak Demand Record: 69,877 megawatts (MW)

- 69,877 MW, August 10, 2015

## Weekend Record

- 66,530 MW, Saturday, August 8, 2015

## Winter Peak Record: 57,265 MW

- 57,265 MW, February 10, 2011

## Wind Generation Records (instantaneous)

- 14,023 MW, February 18, 2016, 9:20 p.m.
  - Non-Coastal Wind Output = 9,206 MW
  - Coastal Wind Output = 1,521 MW
  - Supplying 39.5% of the load
  - Active Wind Capacity = 16,246 MW
- 45.14% Wind Penetration, February 18, 2016, 11:08 p.m.
  - Total Wind Output = 13,907 MW
  - Total Load = 30,809 MW

## Summer 2015 monthly peaks

**June:** 61,732 MW (June 10)

**July:** 67,650 MW (July 30 –  
new July record)

**August:** 69,877 MW (Aug. 10 –  
new all-time record)

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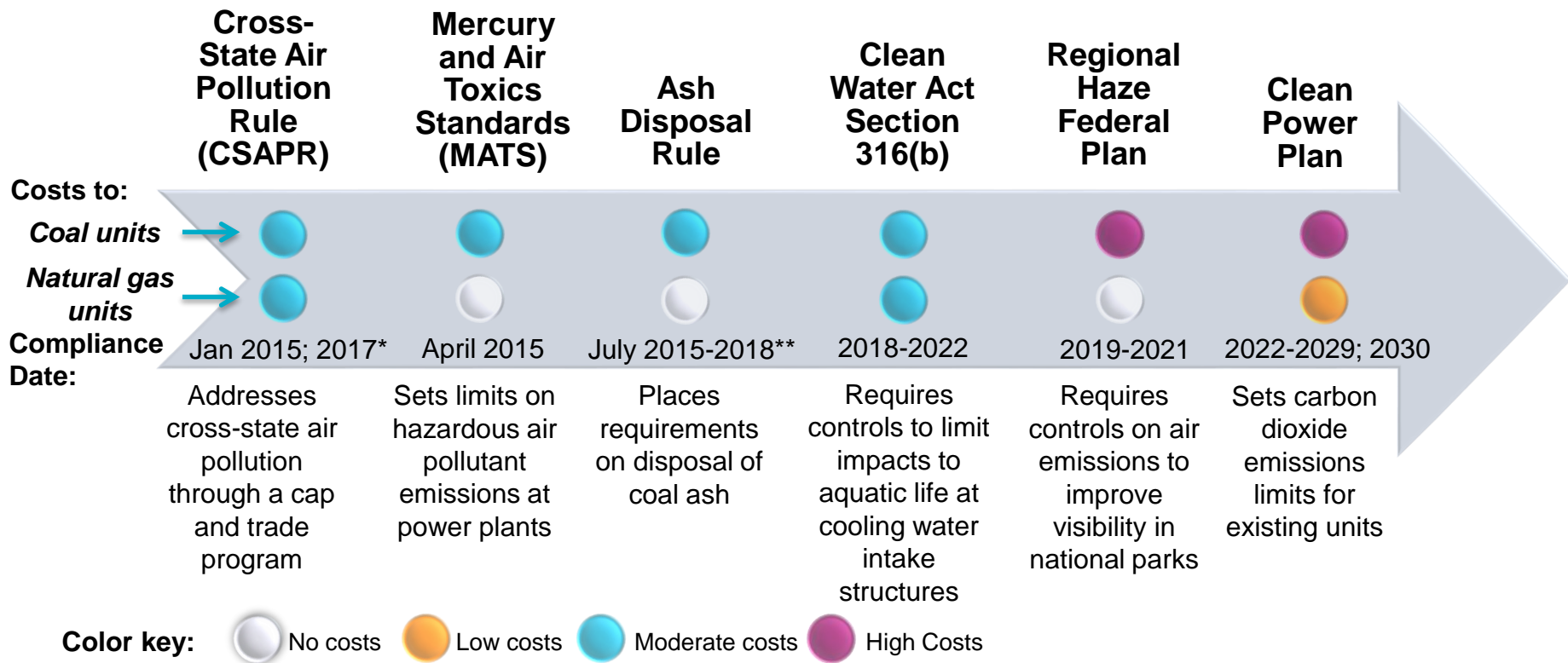
# Integrating and Managing Renewables

- Wind generators started to assist in frequency control for ERCOT after 2009, having an automatic response to frequency deviations
- Started real-time monitoring of inertia in 2014
- Enhancements to improve the performance of wind forecast
  - Added 7-day wind forecast
  - Addressed large forecast errors caused by icing by adding new capability to manually overwrite the forecast
- Started a project for utility-scale solar forecast in 2015
- New ancillary service design to meet the need of the future power grid with low inertia and high variations in “net-load”

Peak Average Wind Capacity Percentages		
<i>Report</i>	<i>Coastal</i>	<i>Non-Coastal</i>
Summer and Fall Seasonal Assessments	55%	12%
Winter and Spring Seasonal Assessments	37%	18%
Capacity, Demand and Reserves (10-year outlook)	55%	12%

# Environmental Regulations

- There are several proposed and recently finalized environmental regulations that could impact grid reliability in ERCOT:



\*Proposed CSAPR update rule would take effect beginning in January 2017.

\*\*Longer timeframes for facilities required to close. Does not include the Steam Electric Effluent Limitation Guidelines (ELG) rule, which has compliance dates between 2018-2023.

## Planning Summary – January 2016

- ERCOT is currently tracking 241 active generation interconnection requests totaling 57,422 MW. This includes 24,472 MW of wind generation.
- ERCOT is currently reviewing proposed transmission improvements with a total cost of \$1.1 Billion.
- Transmission Projects endorsed so far in 2016 total \$18 Million; \$477.6 Million total in 2015.
- All projects (in engineering, routing, licensing, and construction) total approximately \$6.74 Billion.
- Transmission Projects energized in 2015 total about \$652.9 Million.

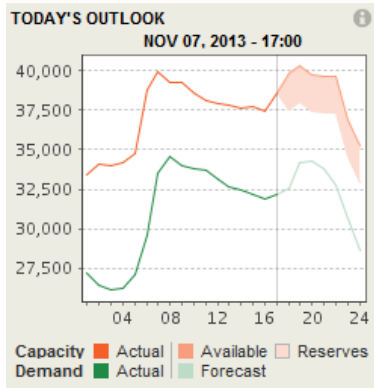
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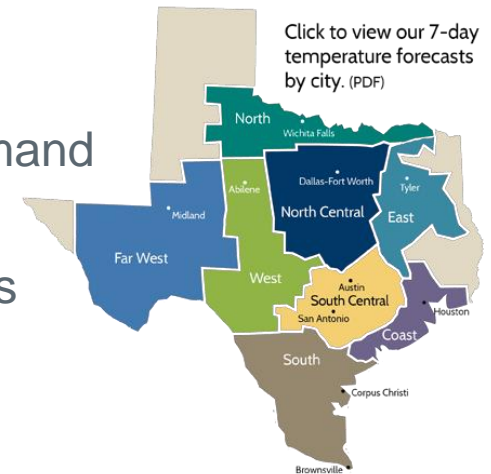


# ERCOT Communication Channels



## ERCOT website – [www.ercot.com](http://www.ercot.com)

- **Today's Outlook:** Generation and demand
- **Weather page:** Daily and seasonal
- **Other:** Reports, news releases and lots more information



## Social media – join us!

- Twitter: @ERCOT\_ISO
- Facebook: Electric Reliability Council of Texas
- LinkedIn: ERCOT



## ERCOT Energy Saver mobile app

- System conditions – Real-Time updates
- Wholesale pricing information – Hubs and Load Zones
- Information sharing options and more

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# ERCOT Cyber & Physical Security Program

- ERCOT has a dedicated and integrated cyber/physical security organization and established strategy.
- ERCOT uses layered cyber and physical security architectures known as a defense-in-depth strategy along with careful monitoring.
- ERCOT is committed to external collaboration with relevant government agencies, law enforcement, industry and national labs to enhance its and the industry's security posture.

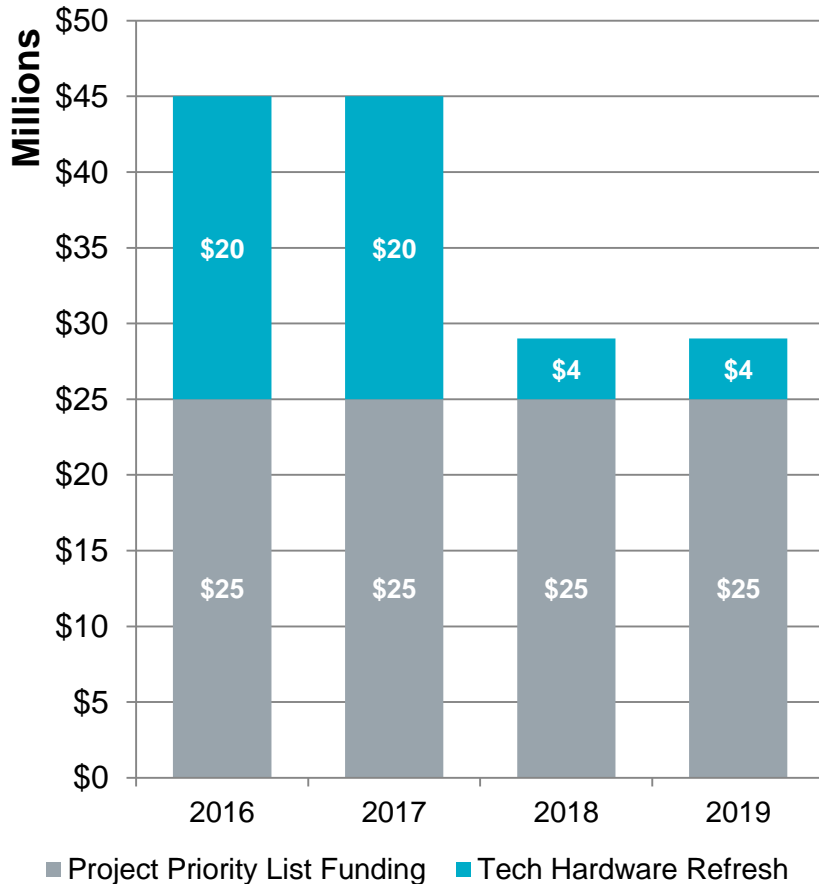


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# Funding Technology Initiatives



- **Tech Hardware Refresh drives project expenditures**
  - Required to replace obsolete, aging infrastructure in order to maintain reliable systems
  - Commission has approved a funding mechanism to support ongoing technology infrastructure needs
- **Project Priority List Funding**
  - \$25 Million average annual project expenditures
  - Consistent with recent years

# The Best Strategy is Great People



2015 IEEE  
Conference  
Presenters and  
attendees from  
ERCOT

Settlement System  
Upgrade Team  
Replaced the aging  
system with modern  
tools

