Item 8: Independent Market Monitor (IMM) Report

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Board of Directors Meeting

ERCOT Public
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2021 Energy Prices

Average real-time energy prices up more than six-fold in 2021

- Winter Storm Uri had a significant impact
- Average natural gas prices up considerably

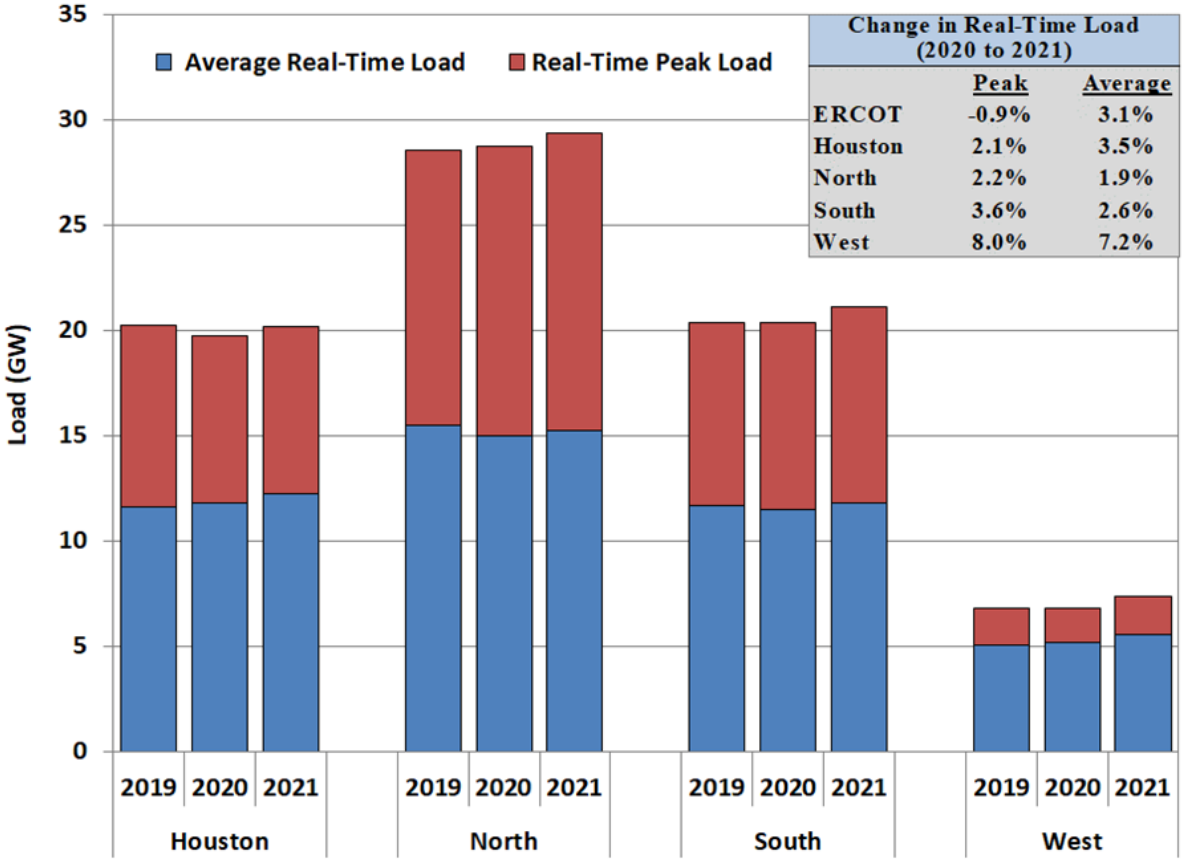
($/MWh)	2014	2015	2016	2017	2018	2019	2020	2021	2021 w/o Uri
ERCOT	**$40.64**	**$26.77**	**$24.62**	**$28.25**	**$35.63**	**$47.06**	**$25.73**	**$167.88**	**$40.73**
Houston	$39.60	$26.91	$26.33	$31.81	$34.40	$45.45	$24.54	$129.24	$42.78
North	$40.05	$26.36	$23.84	$25.67	$34.96	$46.77	$23.97	$206.39	$41.57
South	$41.52	$27.18	$24.78	$29.38	$36.15	$47.44	$26.63	$187.47	$39.98
West	$43.58	$26.83	$22.05	$24.52	$39.72	$50.77	$31.58	$105.27	$35.51
($/MMBtu)									
Natural Gas	$4.32	$2.57	$2.45	$2.98	$3.22	$2.47	$1.99	$7.30	$3.62

Load Trends

Total ERCOT load increased in 2021

- Up by more than 1,300 MW per hour on average

Annual Load Statistics by Zone



Change in Real-Time Load (2020 to 2021)	Peak	Average
ERCOT	-0.9%	3.1%
Houston	2.1%	3.5%
North	2.2%	1.9%
South	3.6%	2.6%
West	8.0%	7.2%

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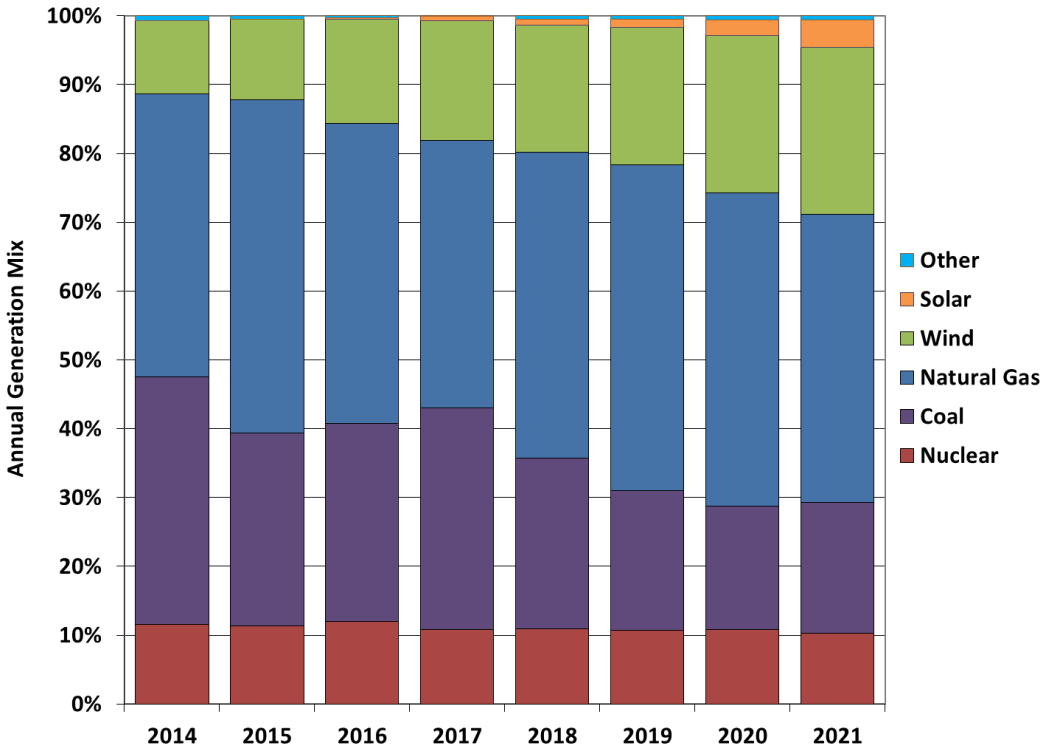
Supply

Approximately 8,800 MW of new generation resources came online in 2021

- Most were intermittent renewable resources with an effective peak serving capacity totaling 2,400 MW
- The remaining capacity was:
  - 660 MW from combustion turbines;
  - 70 MW from combined cycle; and
  - 820 MW of energy storage resources.

The percentage of total generation supplied by wind resources increased to more than 24% of all annual generation



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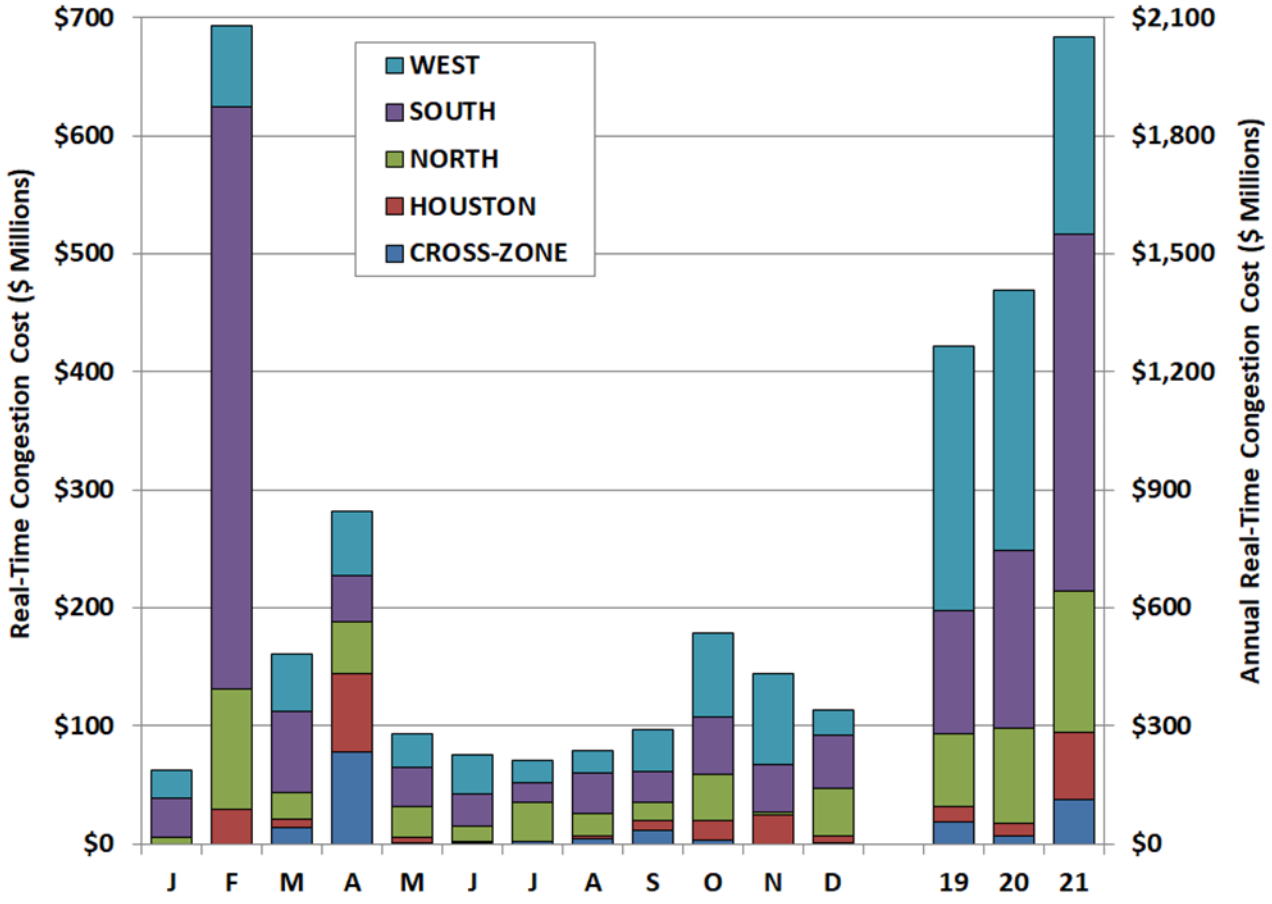
Transmission Congestion

Real-time congestion costs were up 46%, to $2.1B

- High congestion in South zone during Uri
- Higher gas prices
- GTC contribution up ($400M, from $190M in 2020)



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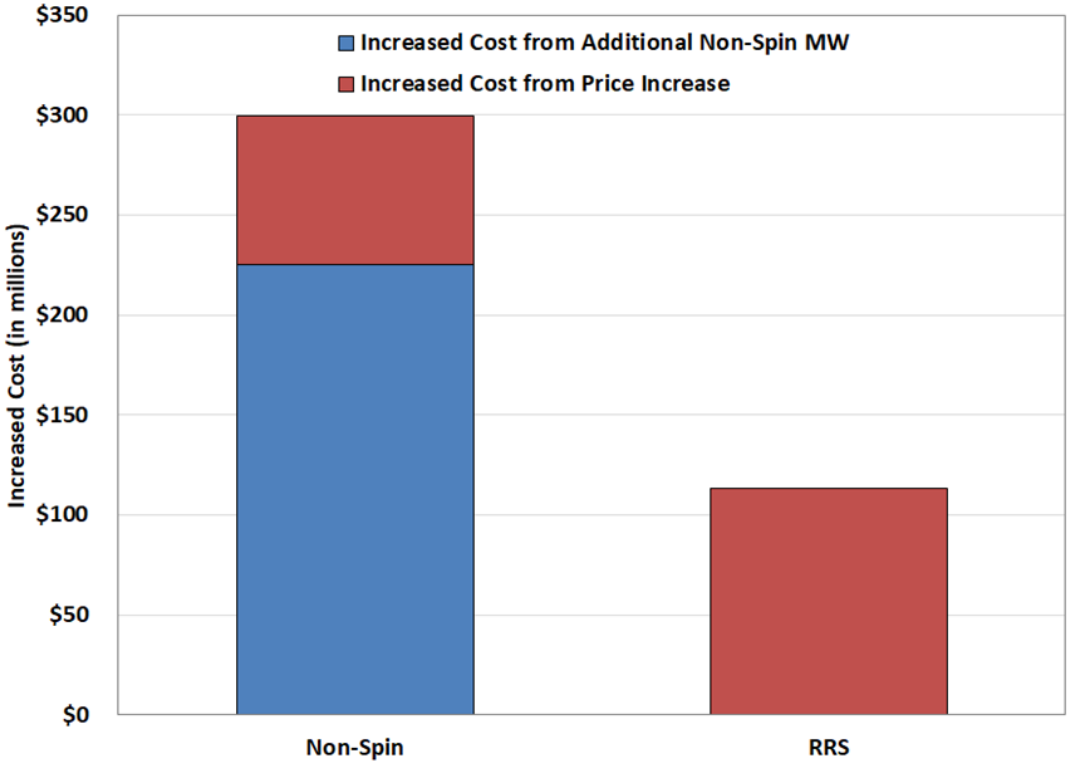
Operational Posture

The second half of 2021 was affected by ERCOT's operational changes

- Increased non-spinning reserve requirements;
- More routine use of RUC, including issuing instructions earlier in the day and committing more longer-lead time resources; and
- Adjusting the selection of forecasts to more frequently rely on the highest load forecast and the lowest wind and solar forecasts.



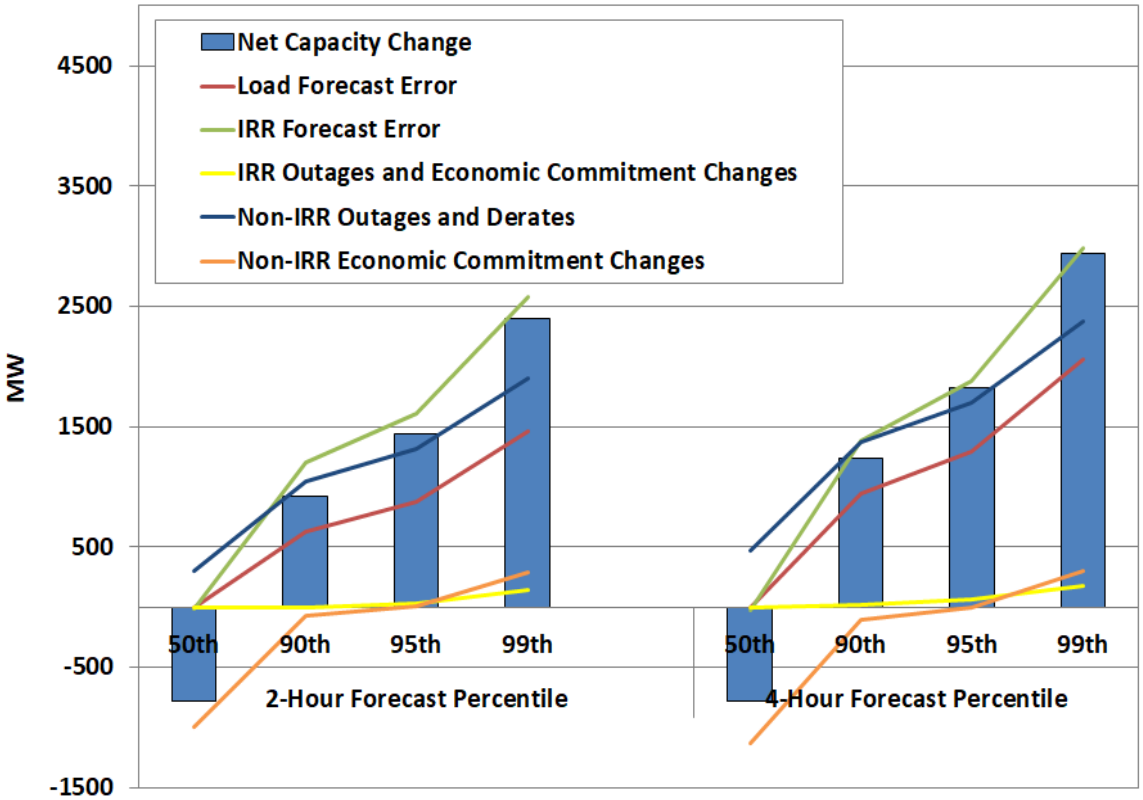
2022 Effects

- The operational posture changes made in 2021 continue to impact market outcomes into 2022
  - We estimate $210M-$385M YTD* due to the increased non-spin procurement and its affect on ancillary services prices
- Due to frequent use of RUCs, the contribution of the reliability deployment price adder YTD* has been approx. $460M
- Another change in 2022 is the Operating Reserve Demand Curve
  - System-wide offer cap lowered to $5,000/MWh
  - Minimum contingency level increased to 3,000 MW effective January 1
  - We estimate the impact of this shift on energy costs to be approx. $475M YTD*
    - For reference, the total ORDC adder impact in 2022 YTD* has been ~$900M.

*as of 5/31/22

Key recommendations

- Prioritize implementation of Real-Time Co-optimization project
- Implement an uncertainty product (2- to 4-hour ancillary service)



Conclusion

Full 2021 State of the Market Report can be found here