



EGADE Business School
Tecnológico de Monterrey



KAPSARC
مركز الملك عبدالله للدراسات والبحوث البترولية
King Abdullah Petroleum Studies and Research Center

In “defense” of the energy-only market

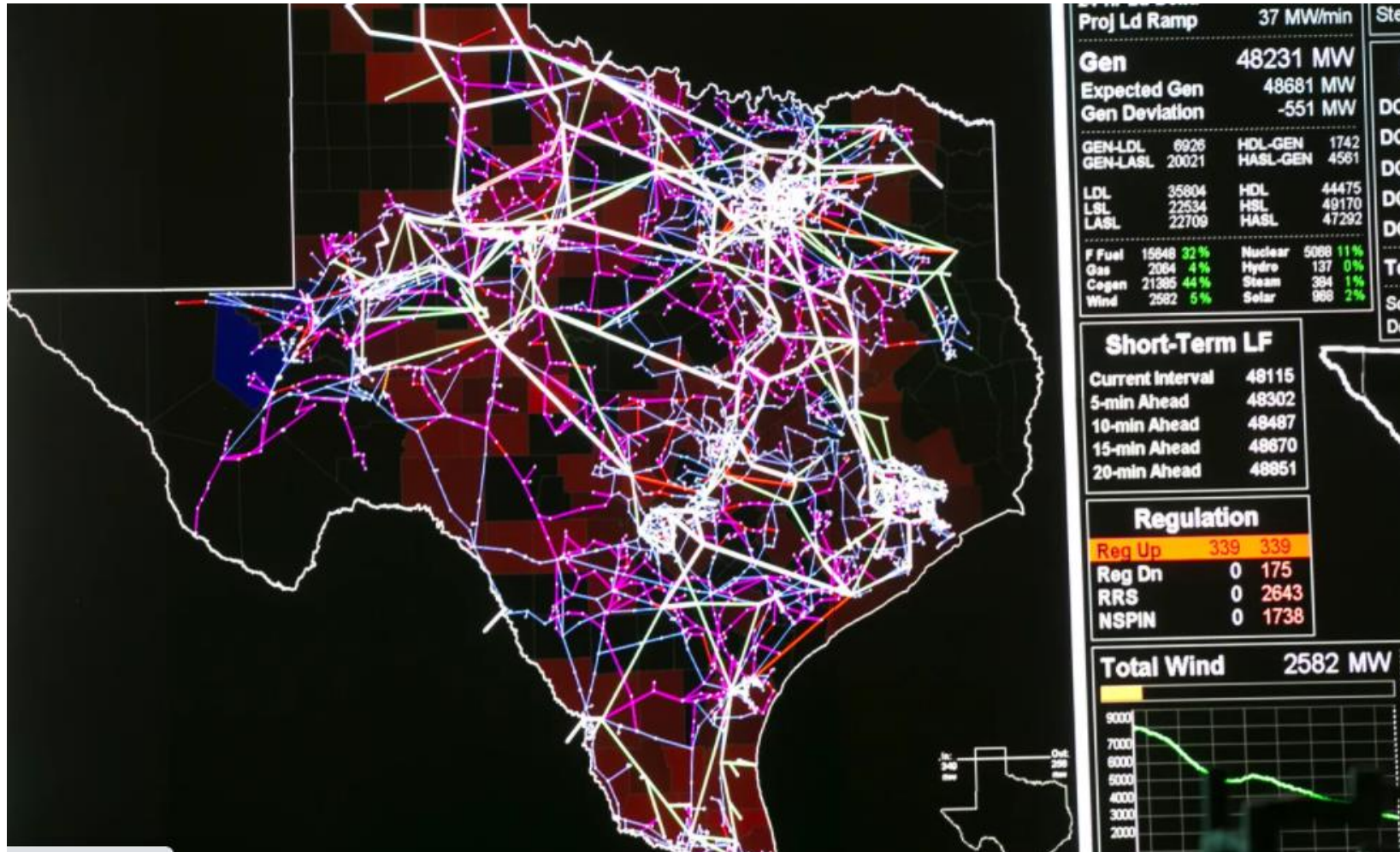
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Texas' electricity 'energy-only' market design was considered a role model of electricity reform

- The ERCOT model is close* to the theoretical energy-only model.



- *In a theoretically-ideal energy-only market, the value of loss load (VOLL) and loss of load probability (LOLP) would be set by the market. Instead, the VOLL is prescribed by regulators and the LOLP is calculated by ERCOT.

Climate Capital **Electric power**

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Blackouts spread beyond Texas as frigid weather knocks out power plants

Millions left without electricity as arctic air sweeps central US

Gregory Meyer in New York, **Justin Jacobs** in Washington and **David Sheppard** in London

FEBRUARY 15 2021

- Natural gas production and delivery companies did not invest in winterizing their equipment.
- 25% of Texas' generation capacity comes from renewable sources, like wind.
- ERCOT can only import small amounts of electricity from other regions, which severely limits neighboring regions from providing emergency power.

Immediate reactions? Some end-of-pipe solutions...

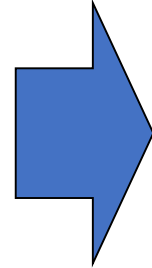
- Raise scarcity pricing
- Incentivize winterizing equipment through penalties or benefits.
- Create a capacity market or establish a mandatory capacity requirement.
- Increase interregional trade by investing in interconnections with other grids.
- Promote grid storage to increase the ability of renewable generation to contribute to supply and demand balancing.



A counterintuitive approach would be that we need more markets, not less.

Consumers

- They can change their minds
- Better products that more closely reflect their preferences.
- New needs**



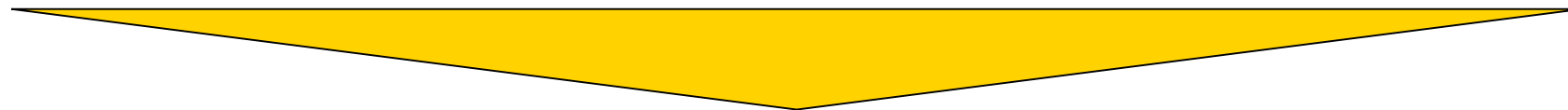
Entrepreneurs

- Profits and losses.
- Continuously deploy their skills and capital to improve products due to competition.
- Spot new needs***



Prices

- Decentralized system where individuals partially reveal private knowledge



Learn, adapt, reallocate resources, and innovate.

How can markets contribute to ameliorate this problem?

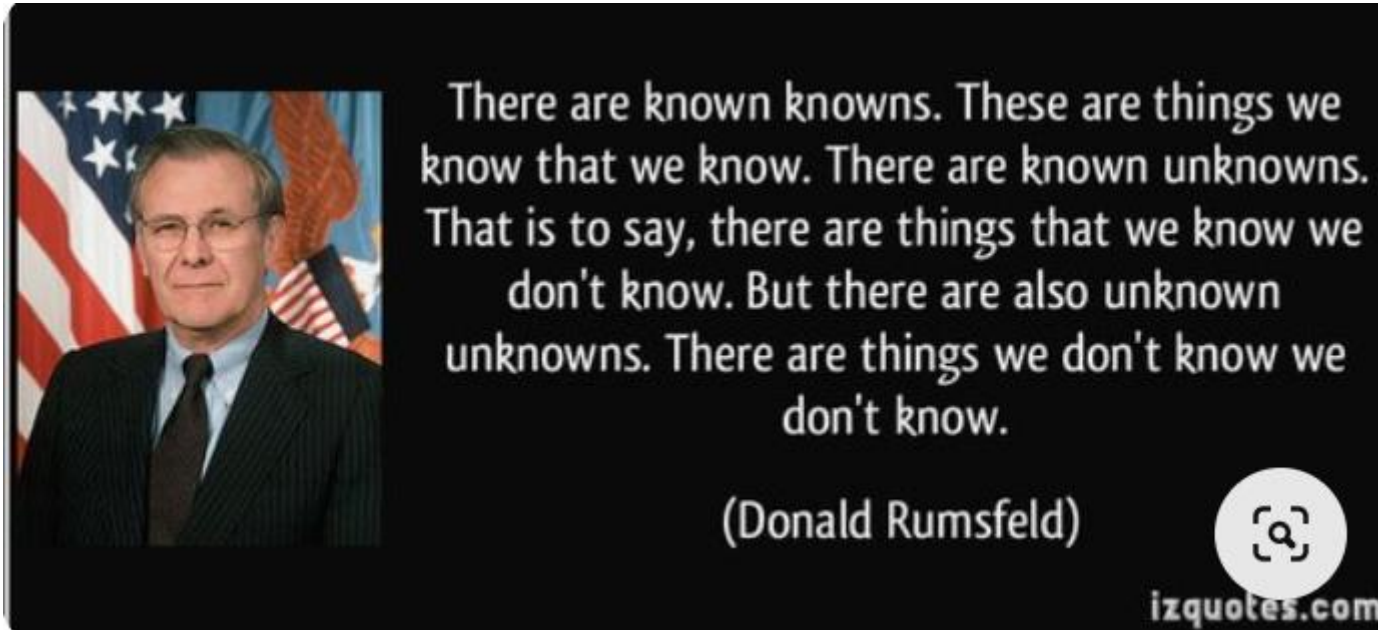
General objectives

- What is the aim? Zero blackouts vs recover more quickly from a blackout vs avoid long blackouts.
- The aim would be to better discover the preferences and capabilities of the various market participants and to stimulate them to explore new ways of dealing with extreme events and resulting reliability.

Some ideas

- Demand participation
- Improved flexibility
- Not all blackouts are equal: Customers can increasingly choose to accept what would otherwise be inconvenient blackouts and brownouts, and manage them to their advantage, including by reducing costs.
- Consider different scarcity prices for different parts of the system (By region, by function, by....?)
- More tailor-made solutions using improved technology in data analytics.

Markets are not in a steady state but reflect new conditions of complex systems



- What do we know about probabilities and damage costs of extreme weather events?
- Will they be just more frequent and more damaging but with the same shape of probability distribution? Or are we transitioning to a new probability distribution of extreme events?
- Can we fine-tune reliability/costs trade off or is there an step change in the relationship of these variables?

Food for thought

New normal



More and
more
frequent
extreme
events

- 1. Markets:** No one can stop catastrophic events. Can markets help to mitigate their impacts, for instance, drive quicker recoveries?
- 2. Products:** what kind of new products should the industry develop to cater for consumer preferences in light of extreme events?
- 3. Planning:** to what extent the answer to reliability in light of extreme events is a mix of markets-new technologies-planning? What if there is a discontinuity in new probability distribution where trade offs at the margin would be difficult to make?



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