Strengths & Weaknesses of Traditional Arrangements for Electricity Supply

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Structuring an Impossible Assignment

- "Traditional (pre-1990s) Arrangements" varied enormously, even within the US
- "Strengths and Weaknesses" of what traditional arrangements, relative to what real (rather than ideal) alternatives?
- I took a aroad-brush approach in my chapter:
  - Restructuring always dramatically increased the role of competitive markets
  - The US has had restructured & "traditional" arrangements; a US focus holds much constant
  - So, looked at cross-section performance differences associated with restructuring, mainly in the US
- Following the Handbook's organization, I considered two different regimes:
  - The *historical* regime: thermal generation dominates, could draw on lots of experience/data.
  - The *emerging* regime: VRE generation dominates, mainly compared CA and HI (both moving toward carbon-free electricity by 2045)

Performance in the *Historical* Regime

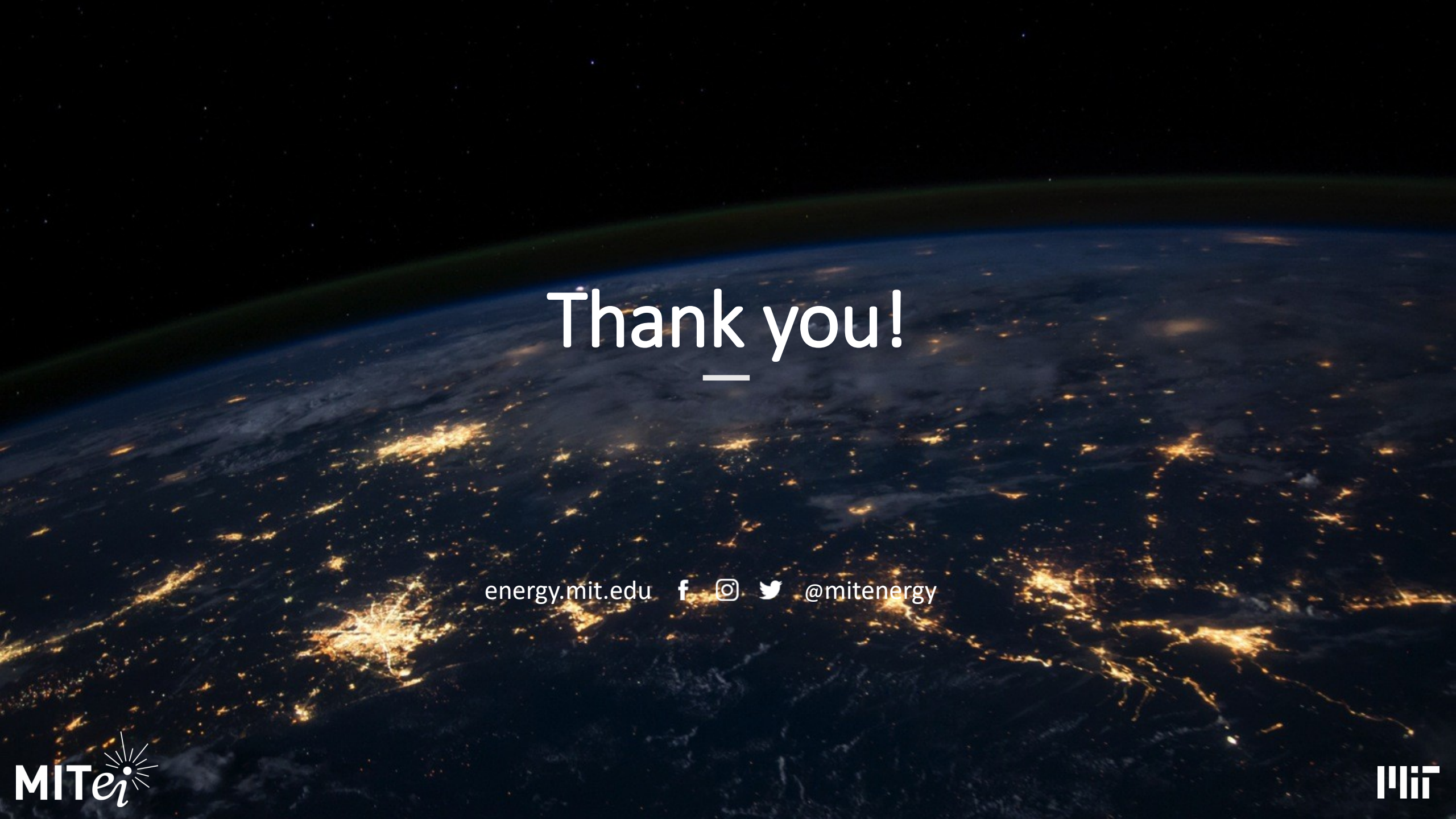
- Despite familiar technologies, experience with tight power pools that mimicked competition, making wholesale markets work was not simple(!)
- *Generation Operations*: restructuring/competition reduced costs, nodal pricing further increased efficiency (in the US…), but market power likely increased price-cost gaps
- *Generation Capacity*: the initial belief seems to have been that, as elsewhere, sales revenues would provide adequate investment incentives, but price caps & very high reliability standards were imposed. Capacity now largely administratively determined, *as in traditional systems.* We have *hybrid* systems.
- *Retail Pricing*: Large US customers have access to time-of-use pricing with or without restructuring; retail competition has not generally led to more efficient pricing (and has not always worked well, at least in the US)

Performance in the Emerging Regime

- Planning & operating efficient high-VRE systems will require solving new problems
  - Traditional systems & their regulators (e.g., HI): grope toward efficient outcomes
  - Regulators of restructured systems (e.g., CA): modify historical regime market designs to attempt to *induce* efficient outcomes
- *Generation Operations*: *storage* novel & important; organized markets developing new rules & CA issuing mandates; HI working project-by-project, no general rules
- *Generation Capacity*: capacity mechanisms need major reform for VRE and storage. HI proceeding project-by-project; CA mandating flexible capacity, storage
- *Retail Pricing*: wholesale spot prices will have more highs & lows, so real-time pricing will be more valuable. CA & HI don't have retail competition; neither regulator moving rapidly toward real-time pricing.

Some Tentative Conclusions

- In the *historical* regime, restructuring has led to more efficient operations, but
  - Capacity mechanisms, hybrid systems are not textbook ideal, and
  - Restructuring has not generally led to more efficient retail prices, at least not in the US
  - It is hard to see a large performance gap between traditional and restructured systems
- In the *emerging* regime, traditional systems may have more flexibility *in principle* to meet novel challenges via IRP, without the need to devise new market designs
- But dealing with new challenges may increase utilities' information advantages and slow regulatory proceedings; traditional systems' advantages, if any, may be temporary
- The US will continue to have both traditional & restructured systems, so we'll be able to see how "Strengths and Weaknesses" evolve as the energy transition continues!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