



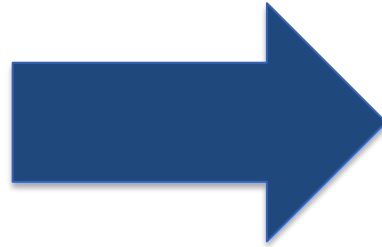
Grid Modernization and Distributed Resource Integration

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A revolution waiting to come to the power grid?



The grid of the future: more dynamic and complex

Greater customer engagement

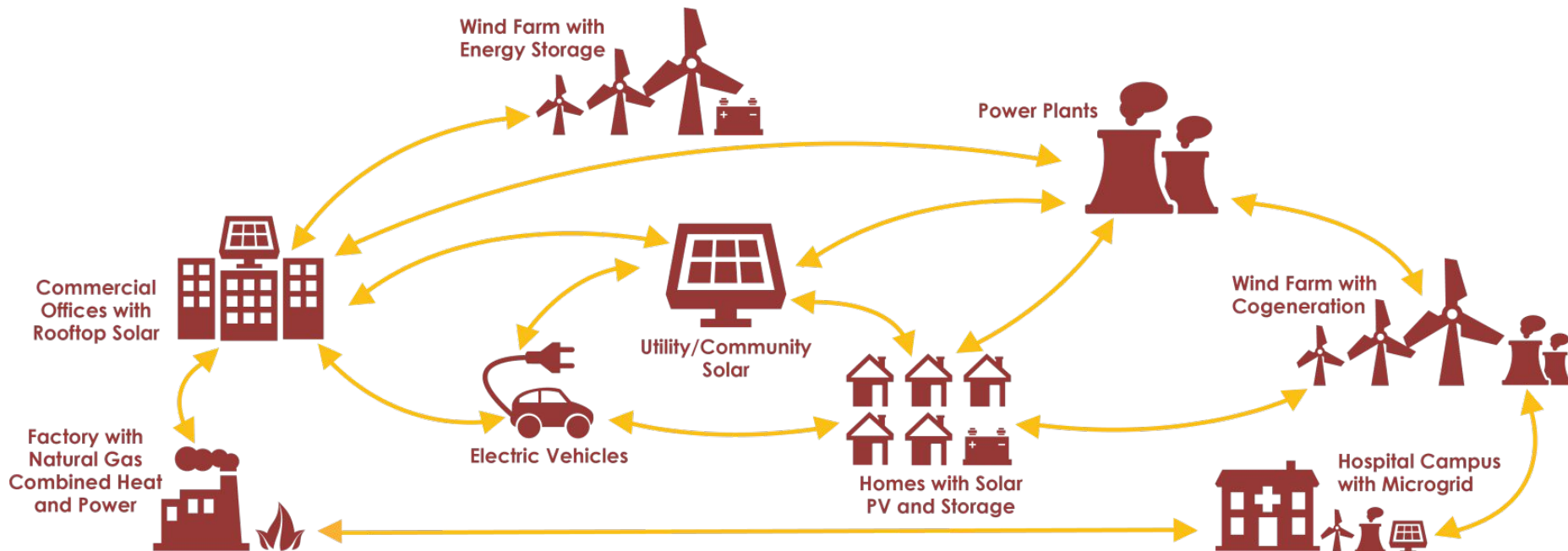
New products and services

Greater focus on value vs. cost

High DER penetration

Two-Way Energy Flows

Digitalization of the Grid



Source: Navigant, 2015



Roadmap for Utility Business Model Reform

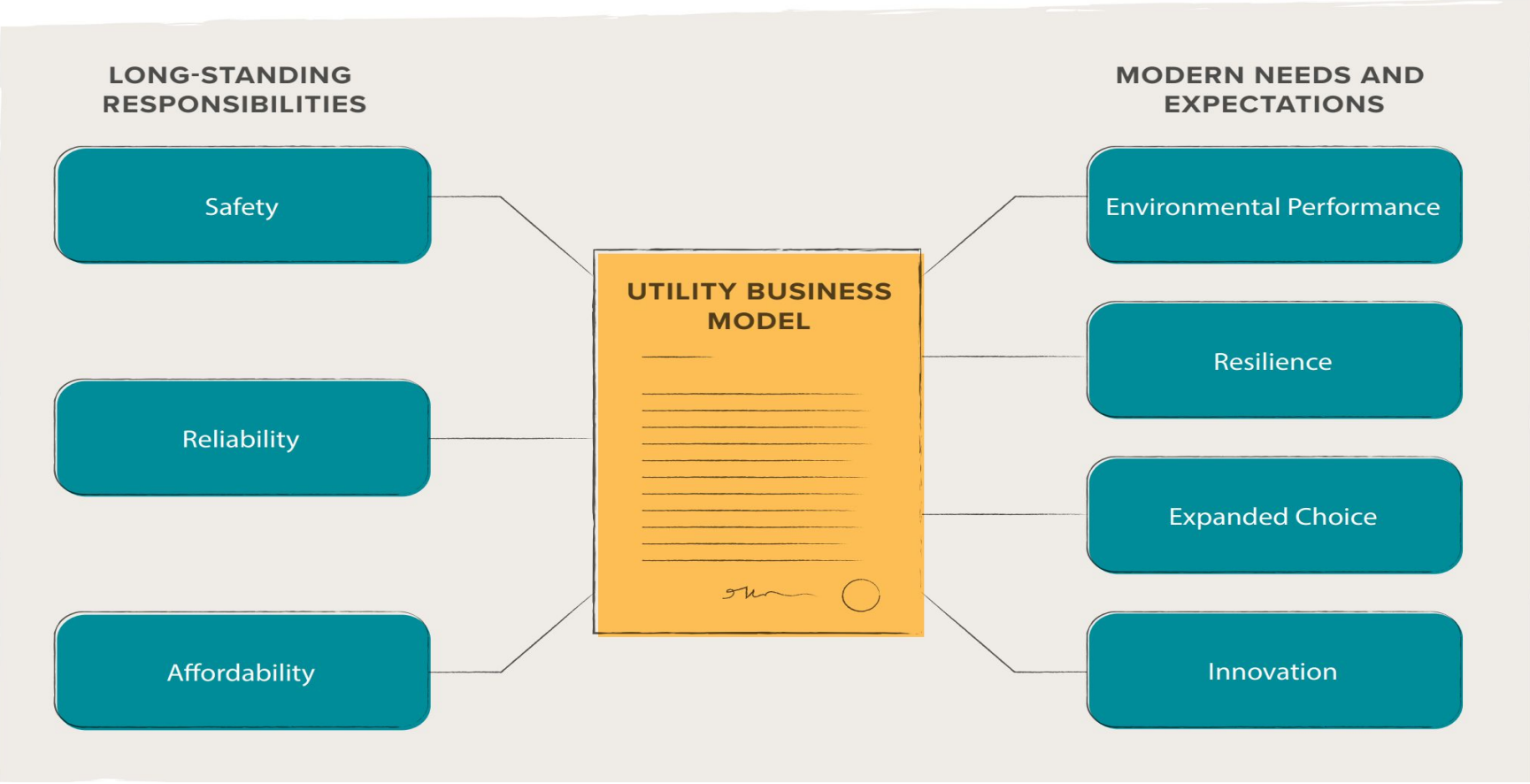
In November, AEE, RMI and America's Power Plan released this “practical guide to regulatory design,” along with 5 case studies.



<https://info.aee.net/navigating-utility-business-model-reform-case-studies>



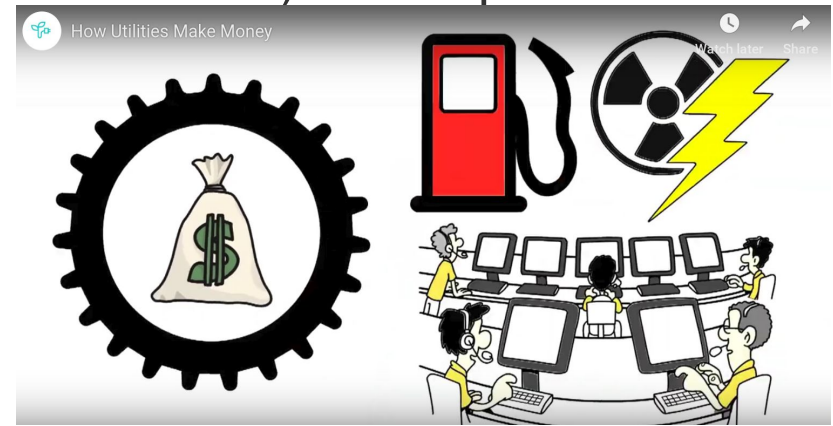
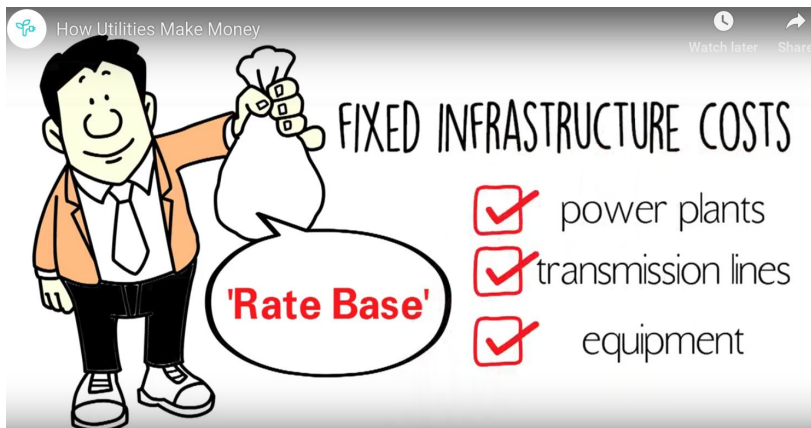
Modern expectations and technologies driving grid modernization



How utilities make money: the “cost of service” model and why it drives everything

- **“Cost of Service” Utility Revenue Model -**

(Infrastructure Assets x Allowed Rate of Return) + Expenses



Source: “How Utilities Make Money” YouTube

- **Explains everything (well almost!)**

- Why some utilities invest in DR - while other don't
- Why some utilities aggressively support EE - while others don't
- Why some utilities embrace renewables - while others don't

With apologies to Nancy Drew....

Four case studies illustrating how business model reforms can accelerate grid modernization:

- Case study 1 - *Brooklyn Queens and the need to reduce CapEx bias*
- Case study 2 - *BGE and the case of the missing throughput incentive.*
- Case study 3 - *Cloud computing and the limits of traditional rate design*
- Case study 4 - *UK's RIIO and the promise of performance based incentives*



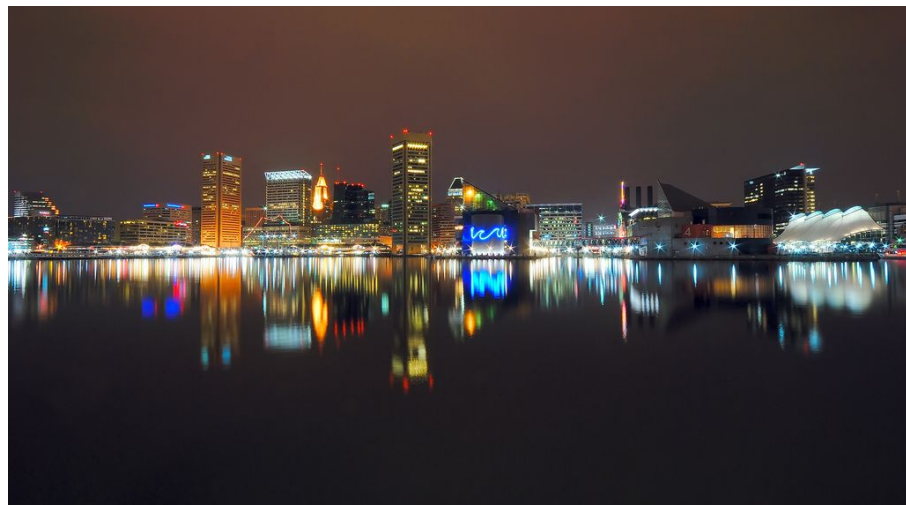
Case Study # 1- *Brooklyn / Queens and the Need to Reduce the CapEx Bias*

- **Problem:** Overload situation expected by 2018; anticipated ~\$1 billion traditional T&D upgrade needed
- **GridMod Solution:** ConEd to spend up to \$200 million to procure DER solutions
 - ConEd earns return on CAPEX and OPEX over ten years
 - ConEd can earn incentives for achieving specific metrics (eg, MW deployed; cost effectiveness; third-party participation)



Case Study # 2 - *BGE and the case of the missing throughput incentive*

- **Problem:** 10% of national infrastructure investments focus on serving demand during just 1% of hours annually.
- **GridMod Solution:** Voluntary customer rebates for reducing usage during handful of peak events
 - DR and EE decoupled & treated like CapEx
 - BGE able to sell into PJM
- **Results to Date:**
 - 300 MW annual peak savings (over 2.5%)
 - \$40M+ customer credits
 - 70%+ participation rate
 - \$400M+ wholesale mrkt revenues (2013-15)



Case Study # 3 - *Cloud computing and the limits of traditional rate design*

- **Problem:** Cloud-based software is typically treated as an OpEx expense that does not generate utility earnings.
- **GridMod Solution:** Treat cloud-based software and on-premises solutions equally.
 - NY clarified in 2016 that pre-paid software-as-a-service contract could be rate based.
 - IL in May 2018 issued a first notice order to provide more equitable financial treatment of cloud-based solutions.



Case Study # 4 - *UK's RIIO and the promise of performance based incentives*

- **Problem:** The UK launched RIIO (Revenue = Incentives + Innovation + Outputs), a performance based system to reward utilities achieving desired outcomes.
- **GridMod Solution:** Replacing traditional COSR, utilities earn performance incentives in 6 categories:
 - Reliability and availability;
 - Environment;
 - Connections;
 - Customer service;
 - Social obligations; and
 - Safety
- **Results to date:** Early results show utilities largely meeting targets; critics suggest targets were not sufficiently ambitious.



Options for Business Model Reform

REFORM OPTIONS CONSIDERED



I. Adjustments to the Cost-of-Service Model

- a. Revenue decoupling
- b. Multiyear rate plans (MRPs)
- c. Shared savings mechanisms
- d. Performance incentive mechanisms



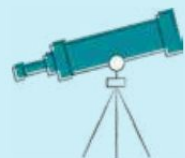
II. Leveling the Playing Field

- a. Changes to treatment of capital and operational expenditures
- b. New procurement practices



III. Retirement of Uneconomic Assets

- a. Securitization
- b. Accelerated depreciation



IV. Reimagined Utility Business

- a. Platform revenues
- b. New utility value-added services



Questions?

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