# Facts on the Ground

FTC Distributed Solar Generation Workshop

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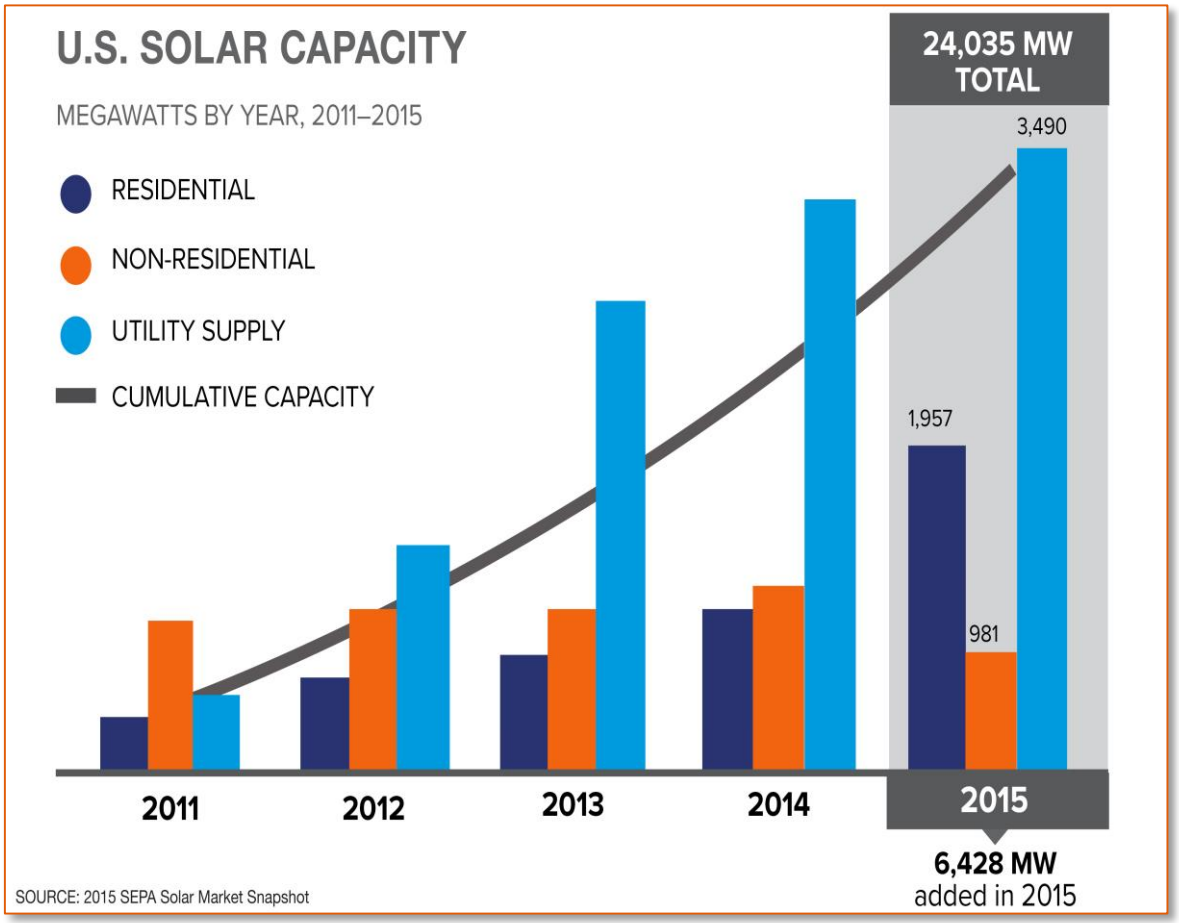
# Solar Growth, Utility Response




**Mainstream Utility Solar Strategies:**

- Large Scale Solar PV in IRPs
- Exploring Community Solar
- Redesigning Rate Structures
- Investing in Grid Edge Visibility

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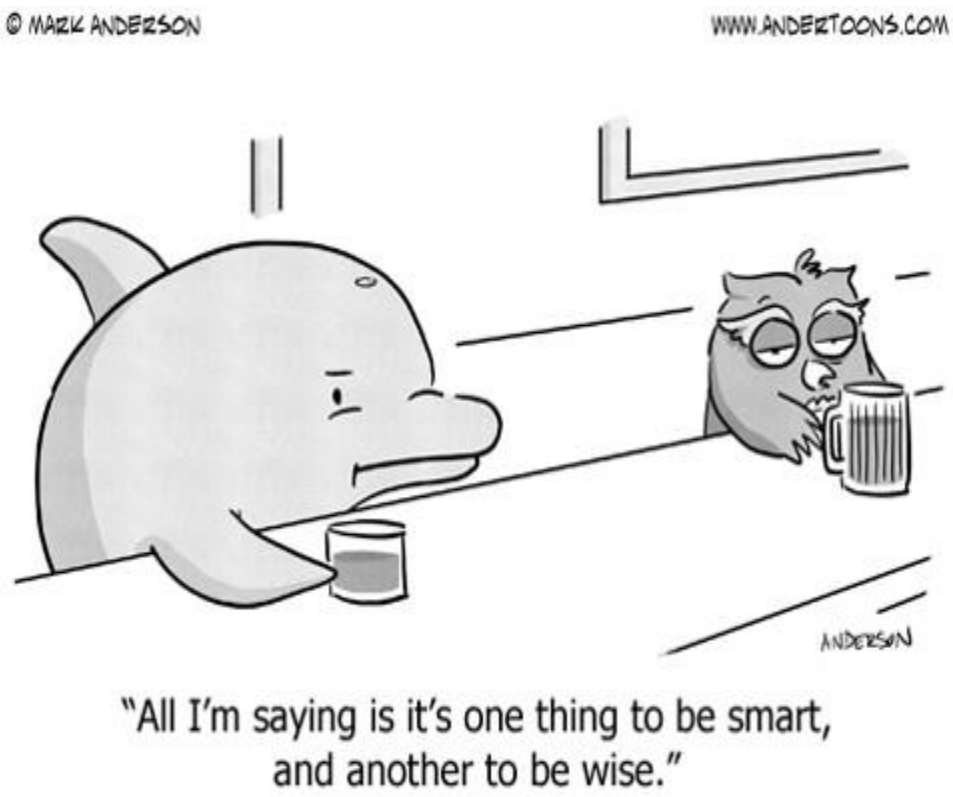
# Thinking Beyond the Meter

**Responses to the new ~~solar~~ DER Paradigm:**

- Integrating Customer Insight
- Enhanced Distribution System Analysis & Planning,
- Rewiring the Utility Standard Operating Practices

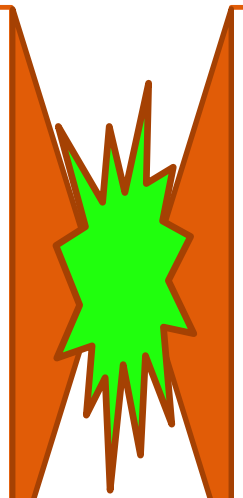


# Fundamental Challenges

**Grid Perspective:**

System = Value
DGPV = Cost

Measured Expectation of Change



**Consumer Perspective:**

System = Cost
DGPV = Value

Rapid Expectation for Change

- Obligations under the regulatory compact
- Dynamic societal expectations
- Requirements to add generation
- Flat demand
- Pace of regulatory processes
- Concerns about portfolio diversity & stranded assets

- Trade between equity and efficiency
- Uncertainties on definitions of fairness
- Inadequate valuation tools (incl markets)
- Rapid technological advances
- Limited consensus about the nature and role of the regulated monopoly
- Lack of clarity on conflicting expectations

# Starting with a Blank Slate for the Future

**CHOOSING THE DESTINATION**

**Phase I**

Hypothetical electricity marketplace

**THE DESIGNING THE ROADMAPS**

**Phase II**

Journey from current state to future state

**STARTING THE JOURNEY**

**Phase III**

Creation of customized roadmaps & implementation of "no-regrets moves"

**Crowdsourced visions for the future, starting from a blank slate**

**Crowdsourced roadmaps that articulate how we get from "here" to "there"**

**Stakeholder-guided development of bespoke plans for electric power sector transformation**

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# 51st State Phase II: Developing a Roadmap

| | |
|---|---|
| **Retail Market Design** | Describe how customers participate (opt-in versus opt-out) of the future state technology enablement provisions, what assets are at their disposal, and how those assets interact with the grid) |
| **Wholesale Market Design** | Describe impacts and modifications, if any, to wholesale markets, central station generation, transmission assets and services, etc. |
| **Utility Business Model** | Describe how the utility industry needs to evolve from current to future state in order to support the new market while maintaining safe, reliable, and cost-effective service |
| **Asset Deployment** | Address any required technologies (e.g., AMI, smart inverters, load tap changers, etc.) that utilities will need to deploy to support the future state, the timing/triggers for those deployments, and how costs would be recovered |
| **IT** | Describe the software and communications platforms needed for all parties to enable the grid of the future, including those needed for the utility, the firmware required for devices, etc. |
| **Rates & Regulation** | Discuss how regulatory bodies, rules, and regulations must adapt from current to future state, and how retail rates must transform over time to allow for the continued economic health of the system and its participants |

# Finding the Potential "No Regrets" Moves


**Distribution System Investments**

- Advanced metering and communications functionality
- System analysis tools (ex: hosting capacity)
- Interconnection protocols (both information & energy)

**Customer Insight & Engagement**

- Improving education and communications interfaces
- Advanced load profile segmentation
- Increasing availability of customer options

**Evolving Rates & Regulation**

- Exploration of time varying rate designs
- Evaluating opportunities to cross-leverage DER incentive programs
- Implementing decoupling and performance trackers

# Thank You

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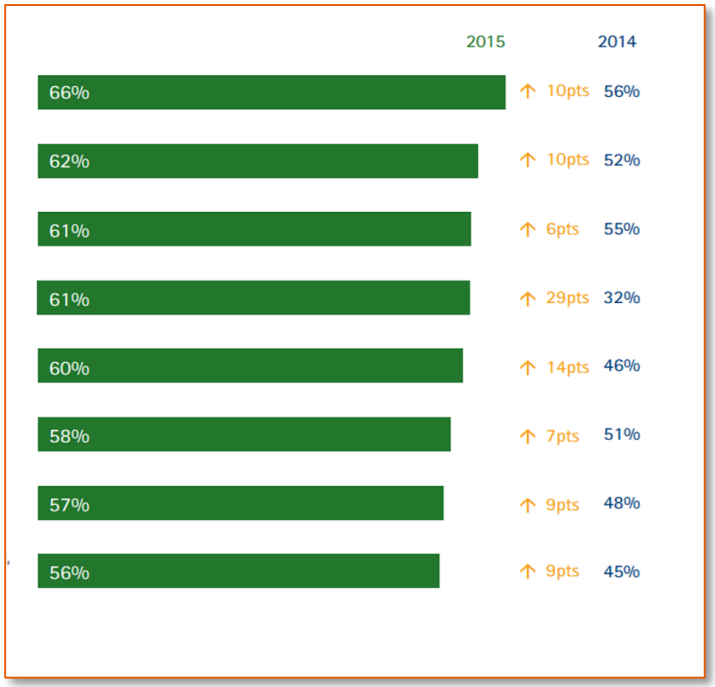
# Back Up / Additional Reference Slides

- Utility DER Strategies
- 51st State Additional Details

# Utility Approaches to Combined DER Customer Offerings

## Customers Crave More Options…




**Which new and emerging revenue streams is your regulated utility pursuing? Choose all that apply.**

| | |
|---|---|
| **66%** | Offering energy management and efficiency services to customers |
| 56% | Offering community solar to customers |
| 52% | Deploying electric vehicle charging infrastructure |
| 47% | Offering green pricing programs to key accounts |
| 40% | Deploying distributed energy storage |

## …And Utilities Want to Provide Them.

Source: Accenture, Utility Dive

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# Utility Approaches to Combined DER Customer Offerings

GREENTECH MEDIA

**What's the Value of a Tesla Powerwall? $50 per Month, Bets Green Mountain Power**

UTILITY DIVE

**National Grid demand response pilot nets participants 20% energy savings**

UTILITY DIVE

**Minnesota co-op bundles community solar, demand response programs**

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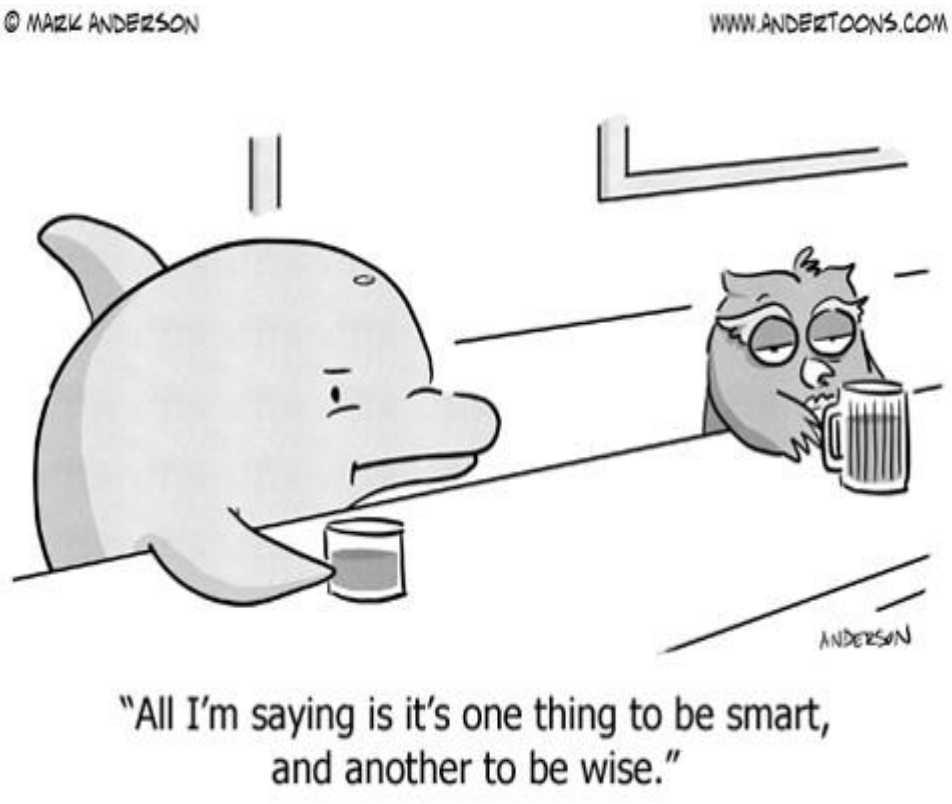
# Thinking Beyond the Meter

**Responses to the new ~~solar~~ DER Paradigm:**

- Integrating Customer Insight on Load Profiles, Propensity to Adopt, and Messages that Resonate
- Enhanced Distribution System Analysis, Planning, and Operations, with DER as “Non-Wires” Assets
- Rewiring the Utility Standard Operating Practices

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# Moving Beyond Combined Programs into a Truly Holistic DER Strategy

**Integrator**
Primary utility investment is technical; i.e. planning and operations

But...is this sufficient for grid effective operations?

**Educator**
Utility establishes itself as the trusted energy advisor

But…is there a sustainable revenue model for this role?

**Solution Provider**
Utilities provide sales and/or financing for deployment

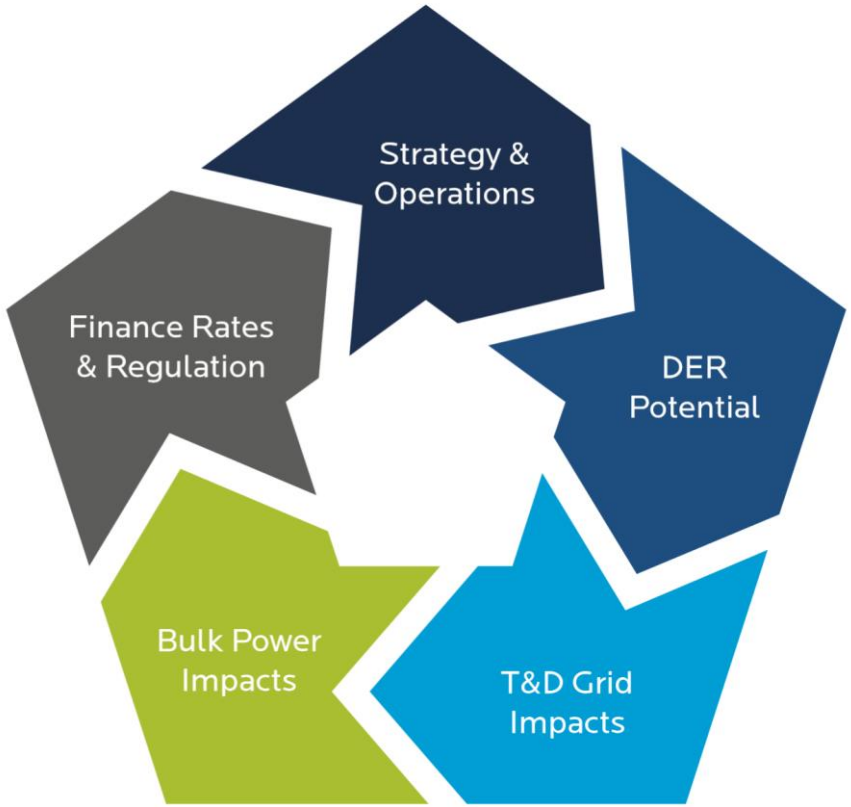
But...are utilities equipped to provide this service?

**VPP Owner / Operator**
Utilities reasserts traditional holistic role in provision of electricity

But...are regulators comfortable with this model?

# The Rise of Distributed Resource Planning

- Increasing regulator and customer demand for DER choices
- Utility policies and procedures designed to react to out-of-date paradigms
- Improved economics of key technologies:
  - Sensors
  - Data management
  - Software
  - Communications
  - Power electronics




Source: *Planning the Distributed Energy Future*, SEPA and Black & Veatch

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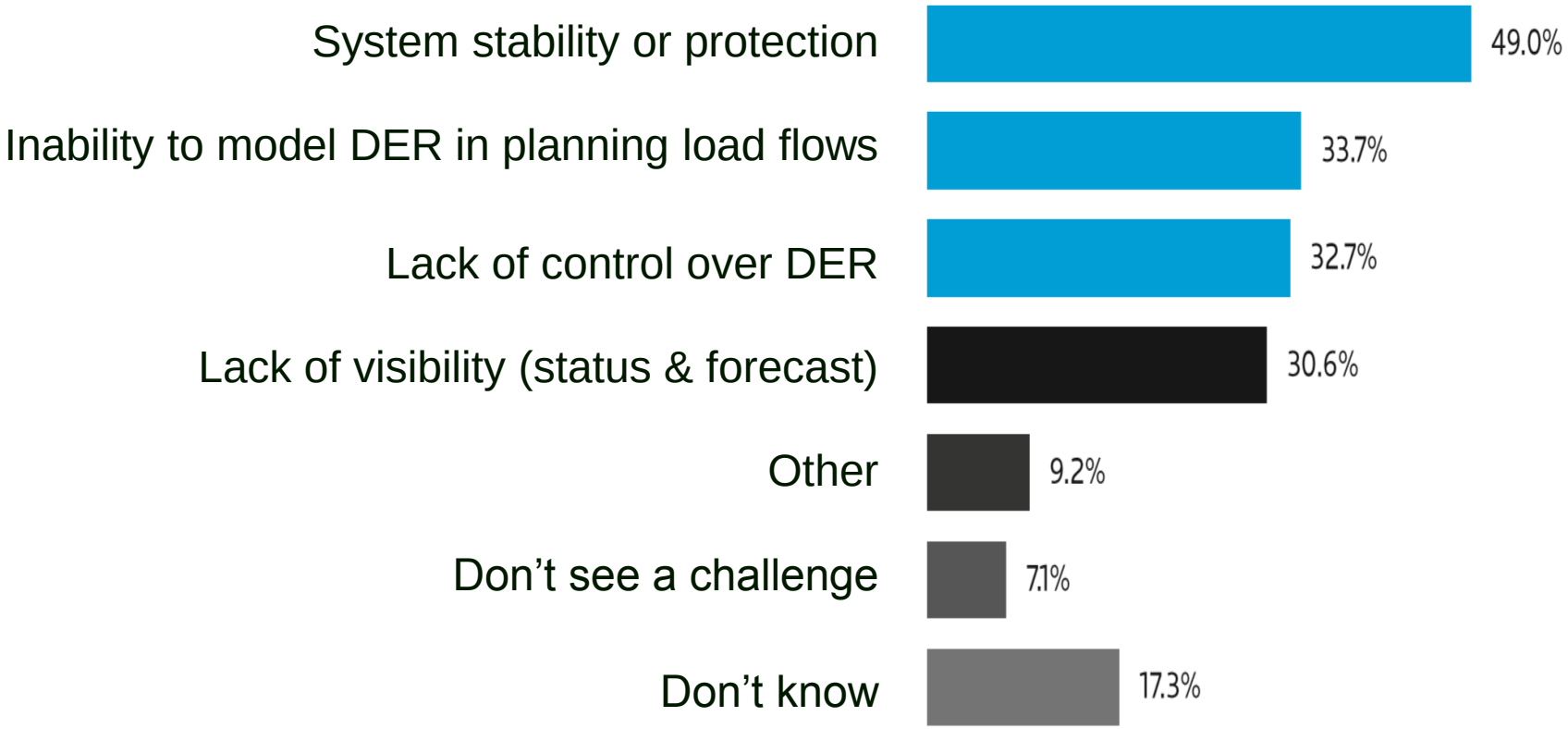
# The Rise of Distributed Resource Planning

**Perceived Challenges to Integrating High Levels of DER**




Source: Black & Veatch

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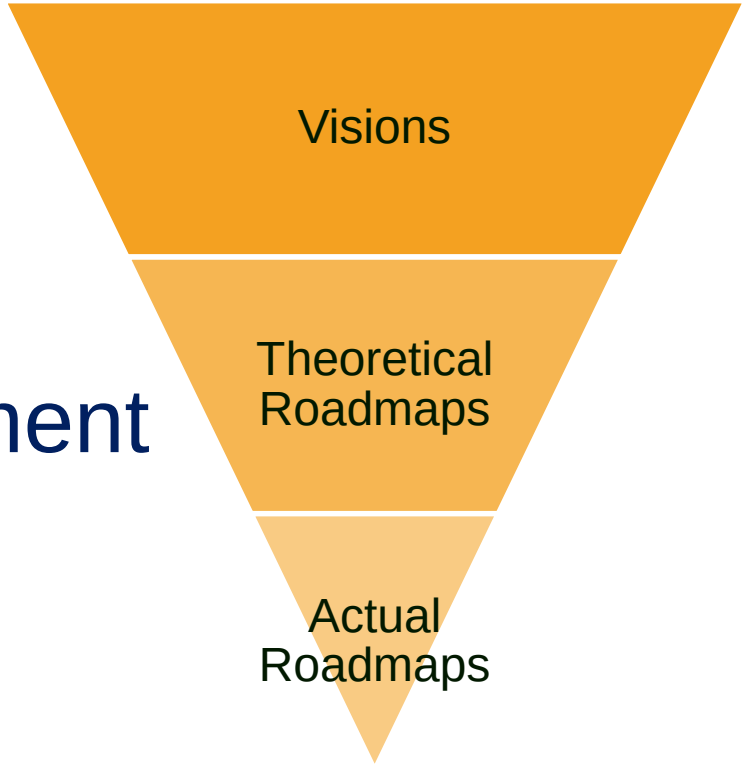
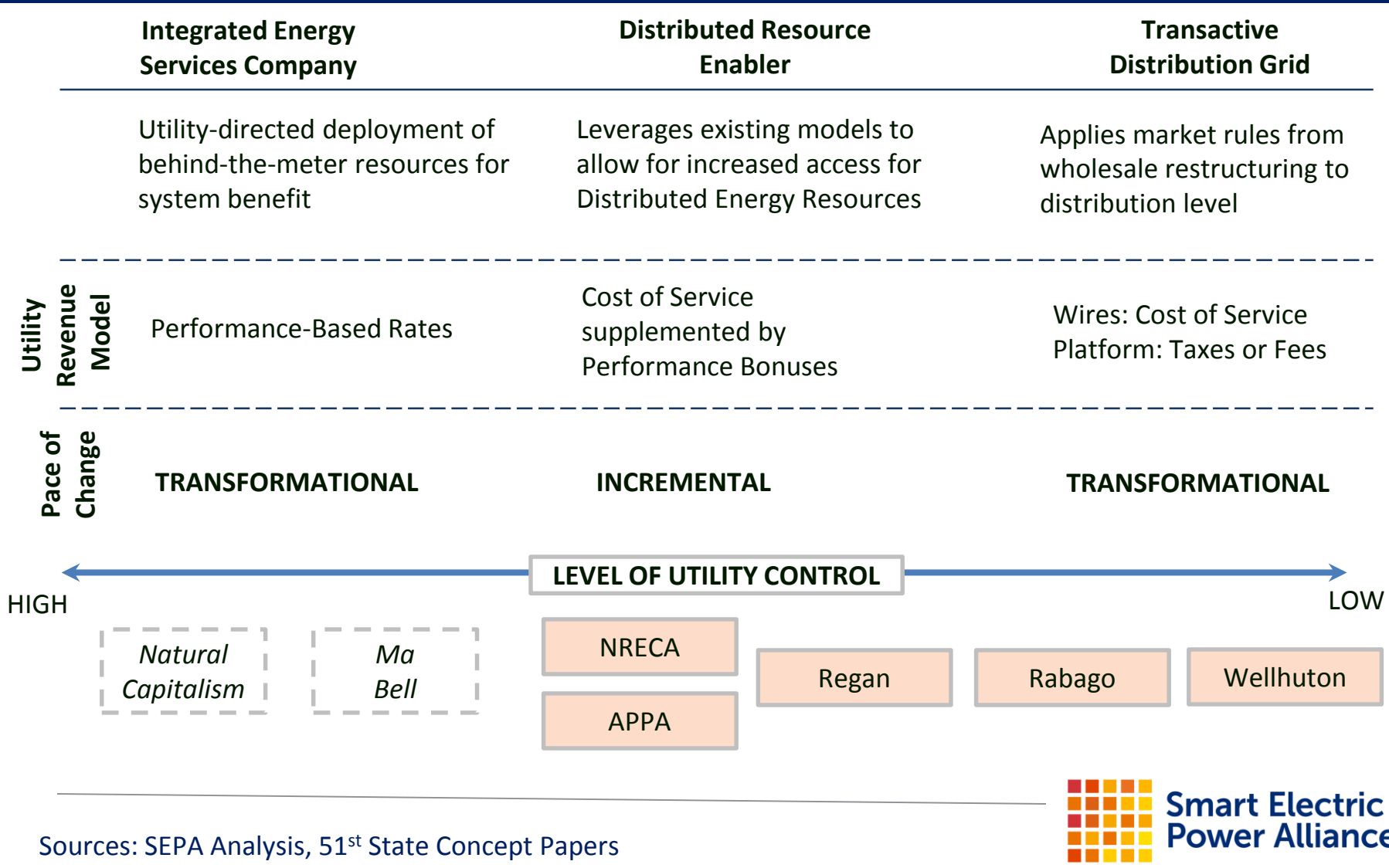
# What makes 51st State unique?

1. Phased approach
2. Collaborative process
3. Wide-spread engagement
4. Replicability



# Utility of the Future
# Sample Paradigms




Sources: SEPA Analysis, 51st State Concept Papers

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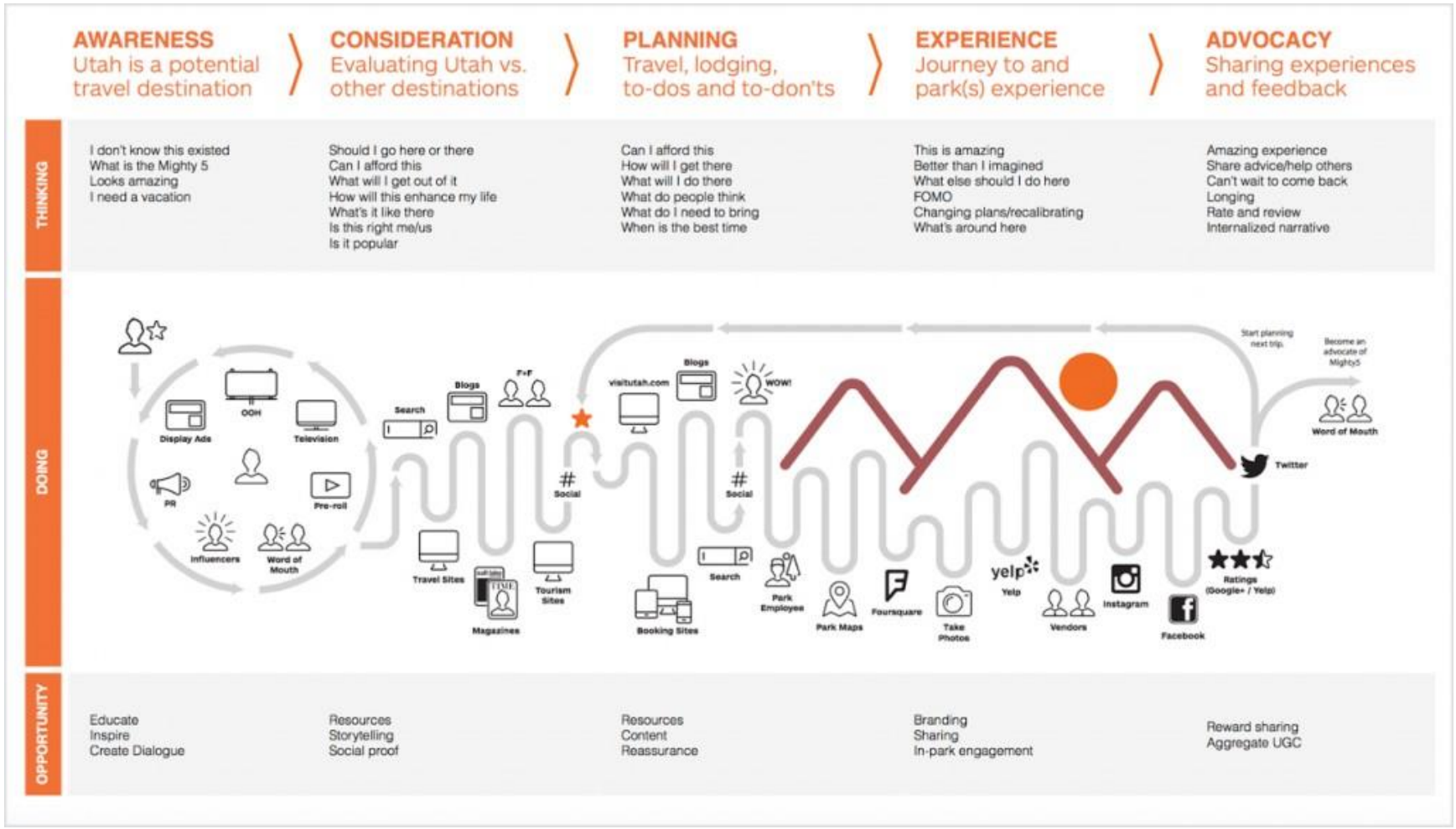
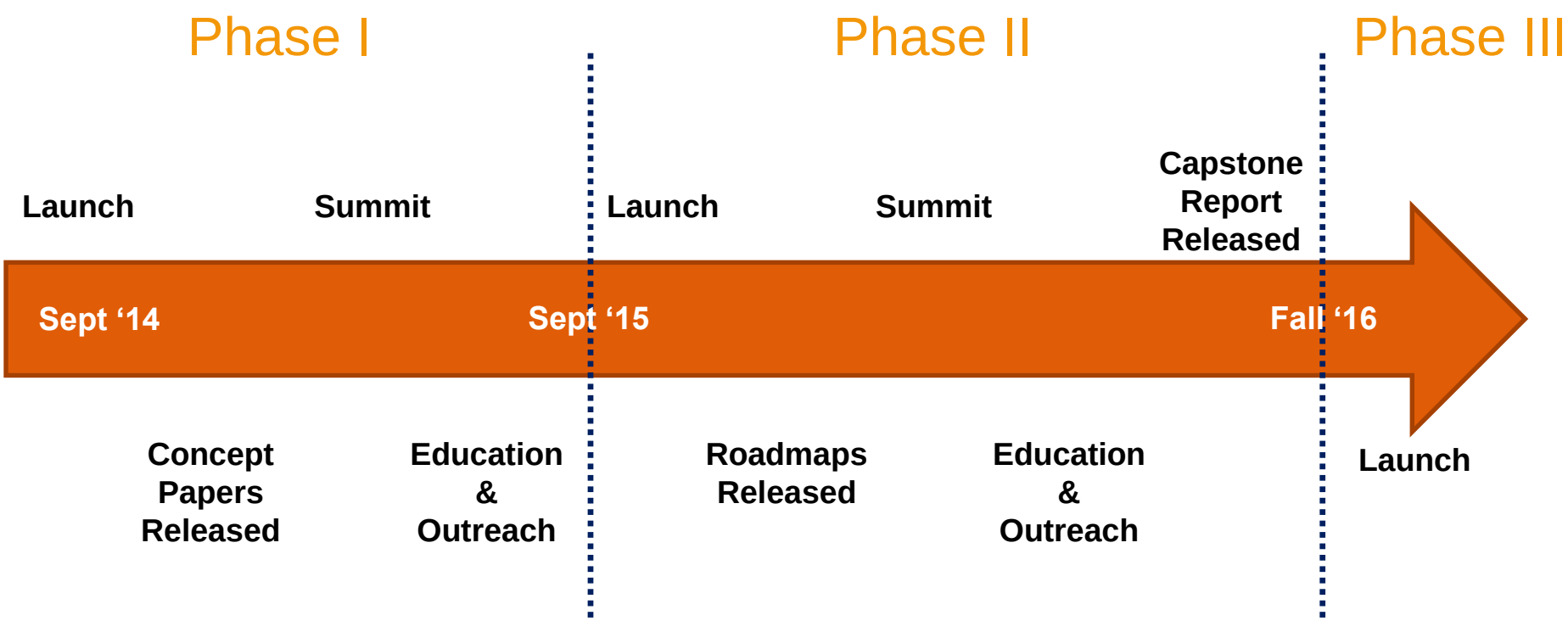
# Capstone Report Outline & Feedback (cont.)
# Customer Journey Map Example



# Initiative Timeline

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