ROOFTOP SOLAR OPTIONS & OPPORTUNITIES

IMPROVING MASS-MARKET DER TARIFFS

MAY 2019

NAVIGANT

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CURRENT STATUS

- Residential: Installed Capacity: 295 MW
- Number of Customers: 44,703

- Commercial: Installed Capacity: 53 MW
- Number of Customers: 1,239

PSEG LONG ISLAND

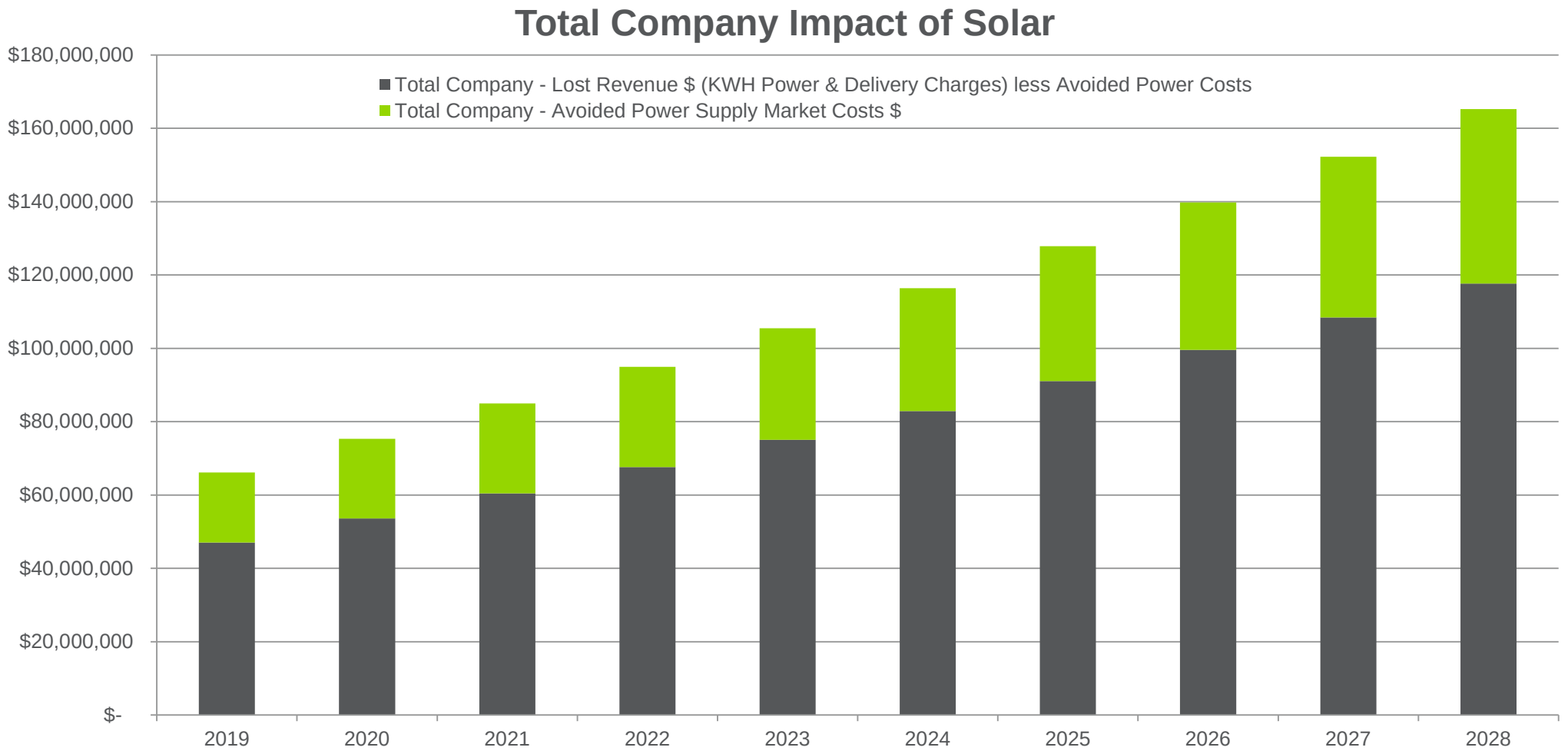
We make things work for you.

IS THE CURRENT COMPENSATION STRUCTURE SUSTAINABLE?

- When a customer installs a rooftop PV system on a fully volumetric rate a revenue shift occurs

- Revenue shifts are not inherently bad if equitable, modest, and justified.
  - Can a large majority of customers participate?
  - Are dollar amounts and bill impacts reasonable?
  - Does the long-term value of the program out weigh the revenue shift?

PROJECTED COSTS



LIPA

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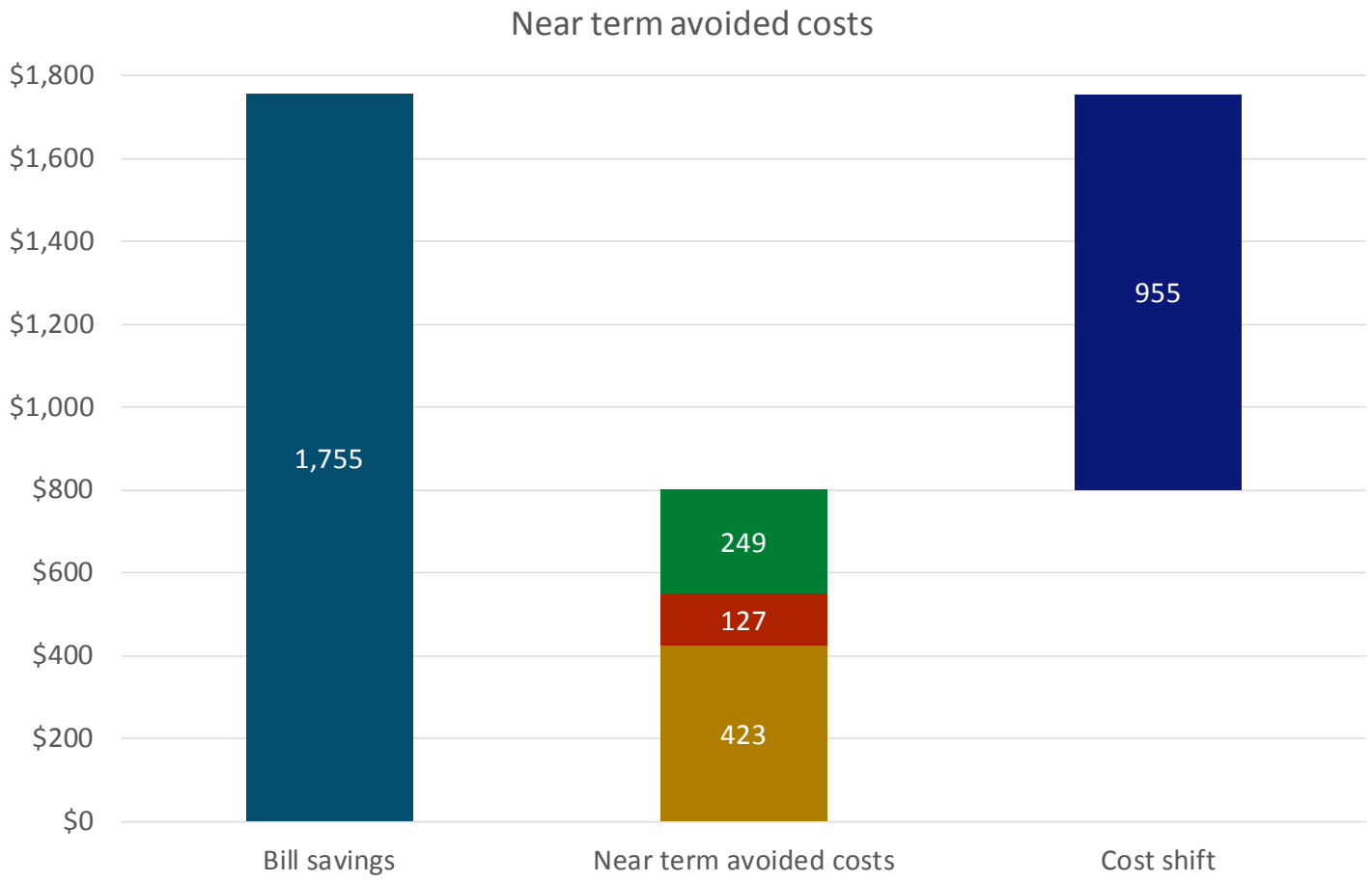
NEAR TERM AVOIDED COSTS

- 7.2 kW - $1,755 in bill savings
  - $423 in avoided energy costs
  - $127 Capacity
  - $249 Environmental

$955 in value gap



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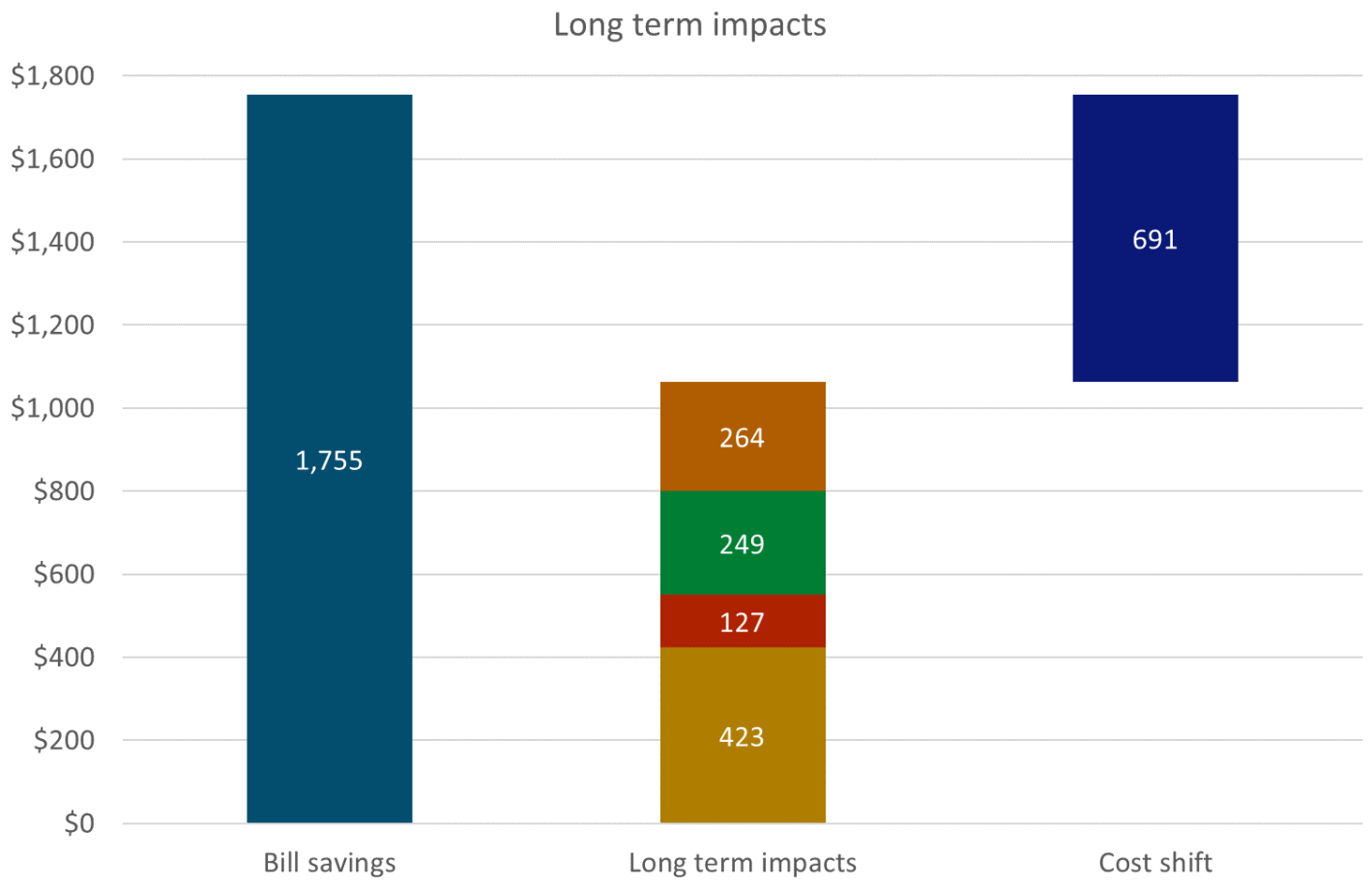
LONG-TERM AVOIDED COSTS

- 7.2 kW - $1,755 in bill savings
  - $423 in avoided energy costs
  - $127 Capacity
  - $249 Environmental
  - $264 Distribution

$691 in value gap



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PUBLIC BENEFIT PROGRAMS

Included in the gap between compensation and system value are the costs of public benefit programs

1. Renewable Power
2. Low income programs
3. Regional Greenhouse Gas Initiative
4. Efficiency & Renewables Program
5. Storm Restoration

Amounts to $42/year or $3.50 per month for a 7.2 kW system

NEW APPROACHES

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APPROACHES FROM OTHER STATES

1. Net billing
2. Non-volumetric charges
3. Time-of-use rates
4. Buy-all, sell-all

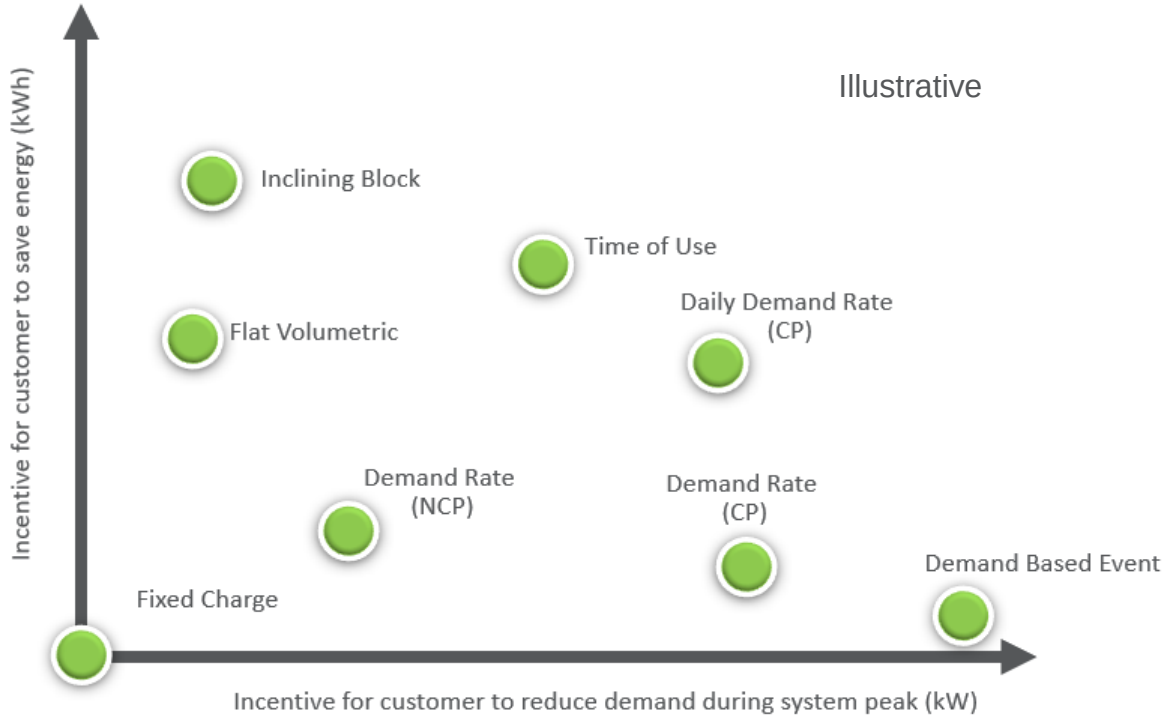
GUIDANCE

- **Cost causation**: Rates should reflect cost causation, including embedded costs as well as long-run marginal and future costs. Fixed charges should only be used to recover costs that do not vary with demand or energy usage.
- **Encourage outcomes**: Rates should encourage desired market and policy outcomes including energy efficiency and peak load reduction, improved grid resilience and flexibility, and reduced environmental impacts in a technology neutral manner.
- **Policy transparency**: Incentives should be explicit and transparent, and should support state policy goals.
- **Decision-making**: Rates should encourage economically efficient and market-enabled decision-making, for both operations and new investments, in a technology neutral manner.
- **Fair value**: Customers should pay the utility fair value for services provided by grid connection, and the utility should pay customers fair value for services provided by the customer.
- **Customer-orientation**: The customer experience should be practical, understandable, and promote customer choice.
- **Stability**: Customer bills should be relatively stable even if underlying rates include dynamic and sophisticated price signals.
- **Access**: Customers with low- and moderate-incomes or who may be vulnerable to losing service for other reasons should have access to energy efficiency and other mechanisms that ensure they have electricity at an affordable cost.
- **Gradualism**: Changes to rate design formulas and rate design calibrations should not cause large abrupt increases in customer bills or delivery rate impacts.
- **Economic sustainability**: Rate design should reflect a long-term approach to price signals and the ability to build markets independent of any particular technology or investment cycle.

Track Two Order, Appendix A.

IMPORTANT CONSIDERATIONS

- **Technology applicability –** Which technologies are spurred or hindered by different price signals within the rate?
- **State Goals** – How is cost causation and economic sustainability balanced with gradualism and customer orientation (i.e., that the customer experience be practical, understandable, and promote customer choice)?
- **Data** – Is there adequate data availability for residential and small commercial customers?



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NEAR-TERM OPTIONS

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CASE STUDIES

	Interim Rate	Jurisdiction	
1	**Volumetric TOU rate with consideration for public benefit funds**	California	
2	**$/kW DC monthly fee to close the value gap (some public benefit fund capture)**	Arizona	
3	**Volumetric TOU rate and grid supply option**	Hawaii	

EVALUATION FRAMEWORK

	System Alignment			Participant Customer		
Title	**Applicability**	**Economic Sustainability**	**Speed to Implement**	**Gradualism**	**Simplicity**	**Ability to save**
Descrip.	*Applicability to future technology*	*Level of linkage between system costs (marginal & embedded) and pricing*	*Estimated time frame to design, plan, and launch*	*Degree of value and structure change for rooftop solar from current rates*	*Level of effort and education needed by the customer*	*Number of ways to save on the bill*
High	Applies to all technology groups	Accurate price signals that avoid long run cost shifts while maintaining necessary grid investment	Less than 6-12 months	Strong similarity to pricing today	Limited efforts required	Reduce, shift, stagger
Medium	Applies to some demand and volumetric technologies	Subdued price signals that mitigate long run cost shifts but still lead to grid under recovery	Between 12-18 months	Medium similarity to pricing today	Moderate efforts required	Reduce and shift
Low	Only applies to demand or volumetric technologies	Masked price signals that propagate long run cost shifts and grid under recovery	Greater than 24 months	Weak similarity to pricing today	Significant efforts required	Reduce

BRIDGE OPTIONS – ALL OF THE ABOVE

1. Standard rates with public benefit fund recovery

- Start to reduce the value gap and fairly recover public benefit costs

2. Volumetric TOU Rate

- Start the transition to more accurate price signals

3. Value Stack

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Thank You

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Update on Value of DER

UPDATE ON VALUE OF DER

Oversight and REV Committee of the Board of Trustees

May 22, 2019

Long Island Power Authority

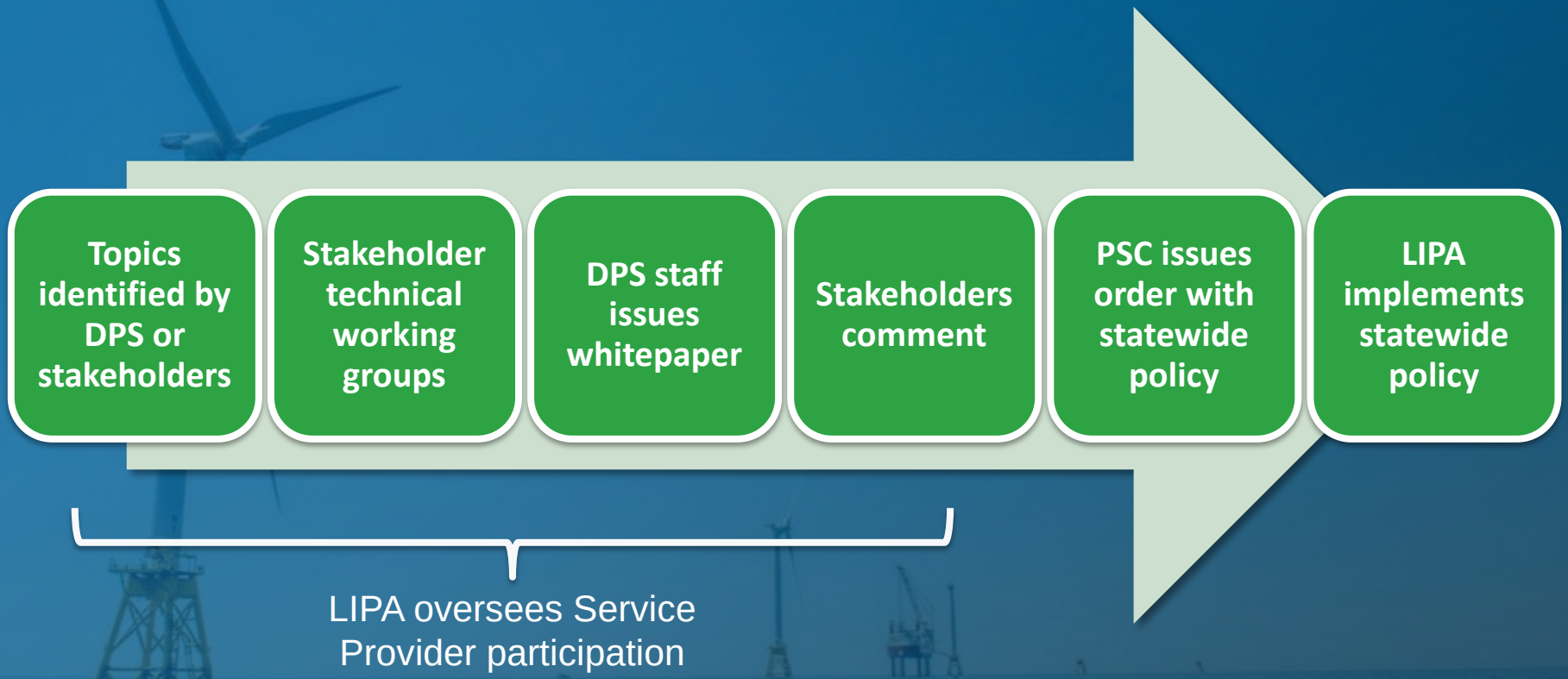
REFORMING THE ENERGY VISION

TIMELINE

April 2014	New York REV is launched
May 2016	Track Two order outlines utility business model modernization
August 2016	PSC adopts Clean Energy Standard
March 2017	PSC issues VDER Phase 1
December 2017	LIPA adopts VDER Phase 1
June 2018	Energy Storage Roadmap
April 2019	PSC issues Value Stack Compensation Updates
July 2019	LIPA to make Value Stack Compensation Updates

OUR PROCESS

New York's Reforming the Energy Vision Proceedings



VALUE OF DISTRIBUTED ENERGY RESOURCES

New York's path to the grid of the future

TODAY:

Value stack

Non-wires alternatives

Phase 1 Net Metering

Rate design pilots

TOMORROW:

Value stack improvements

Continue statewide rate design working groups

FUTURE:

Distributed System Platform

Dual participation with wholesale markets

Bridge & mass market tariffs

RECENT PSC CHANGES TO VALUE STACK

- **Increase certainty and predictability** of distribution value compensation
  - **Lock in the Demand Reduction Value compensation rate** for ten years and set **pre-defined peak hours**
  - Move to **call system for Location Specific Relief Value**
- **Encourage anchor tenant participation** in Community Distributed Generation projects with added **Community Credit**
- **Standardize capacity payment approach** across utilities
- **Extend to Phase One Net Metering** availability to small (under 750 kW) onsite projects for demand-metered commercial customers
- **Expand eligibility** to additional clean energy technologies, storage, and electric vehicle-to-grid

QUESTIONS?