



STATE OF RHODE ISLAND

ENERGY EFFICIENCY & RESOURCE MANAGEMENT COUNCIL

SRP 101:

The value of non-wires alternatives

Carrie A. Gill, Ph.D.

Office of Energy Resources

Carrie.Gill@energy.ri.gov

Ron Gerwatowski

Division of Public Utilities and Carriers

ronald.gerwatowski@dpuc.ri.gov

Mark Kravatz

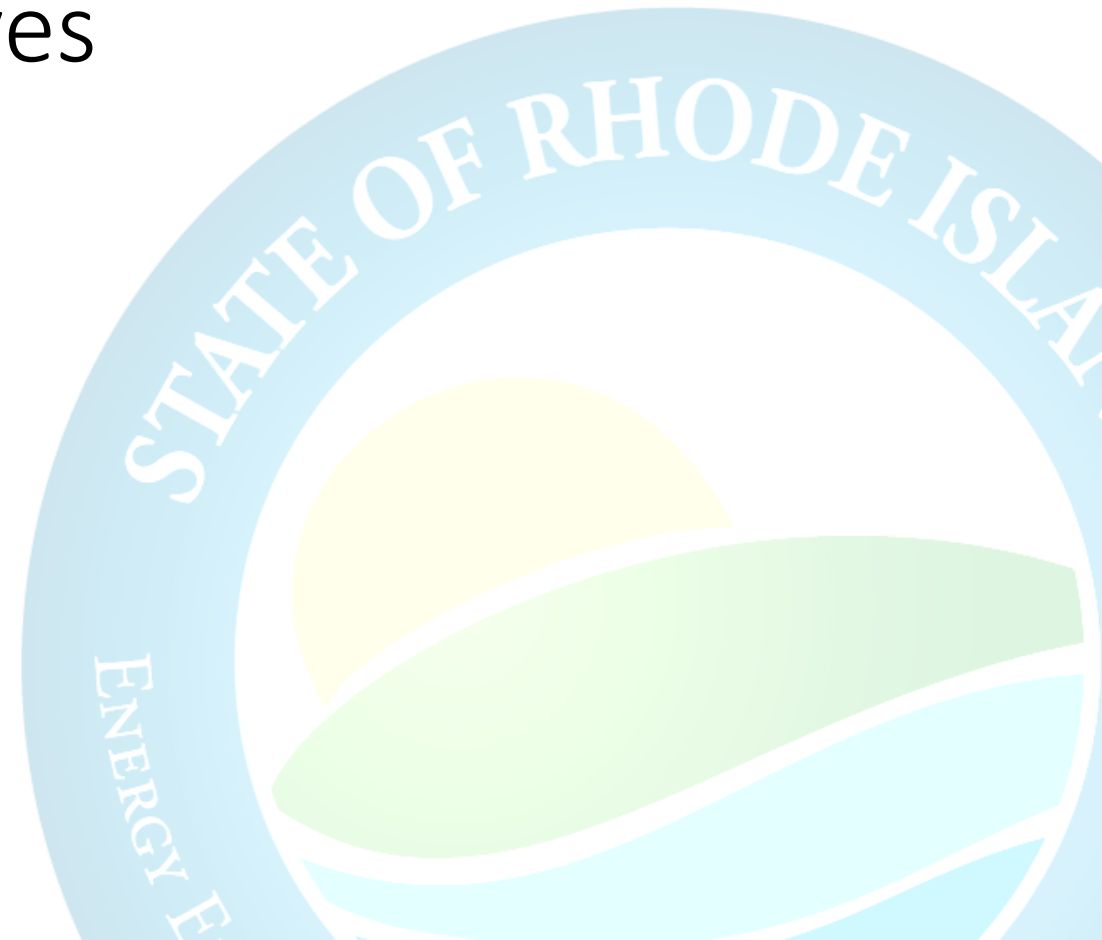
EERMC Consultant Team

kravatz@optenergy.com

Matthew Chase

National Grid

matthew.chase@nationalgrid.com



National Grid is an Electric & Gas **Distribution** Company

National Grid's responsibility is to make sure every customer gets electricity when the customer wants it, safely and reliably.



3 Ways to Manage the Distribution System

Distribution System Load Management

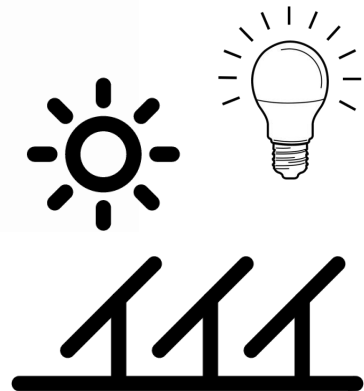
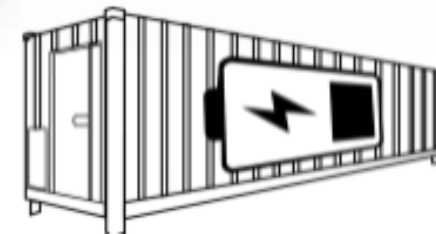


Traditional capital investments into infrastructure, wires (ISR Plan)

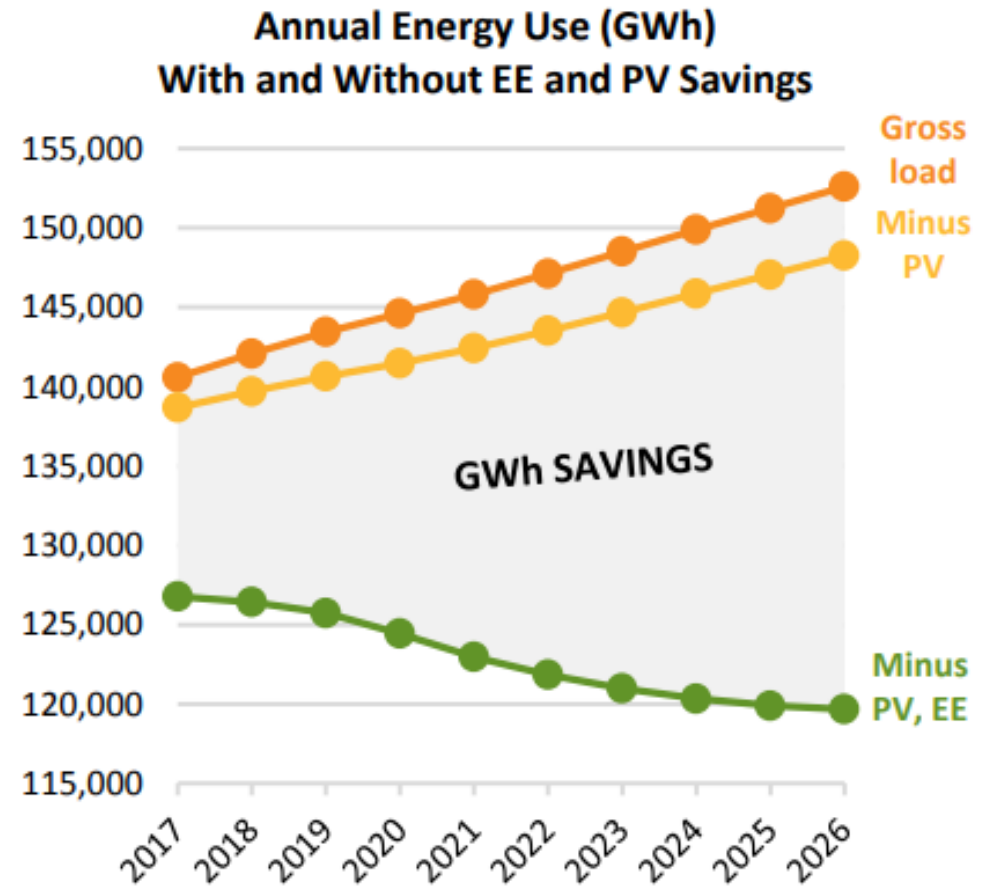
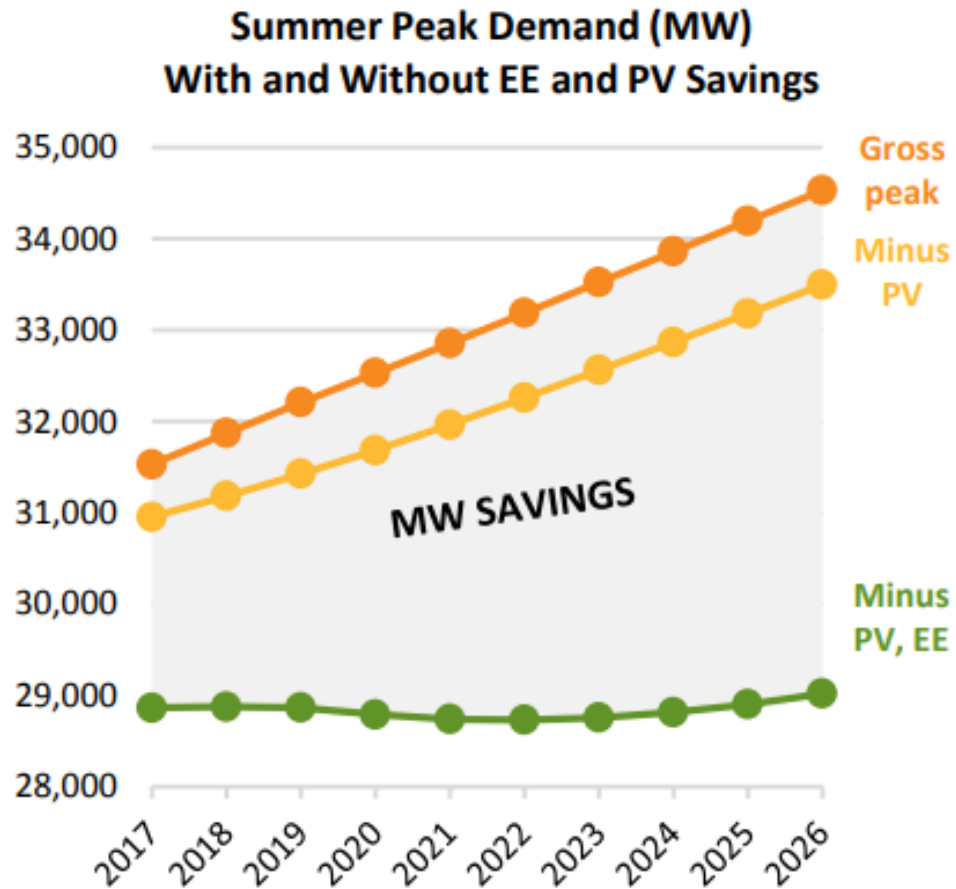


Keep demand low with energy efficiency and demand response (EE Plan)

Invest in non-wires alternatives (SRP Plan)



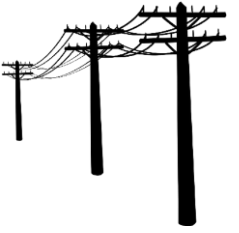
Energy Efficiency Mitigates Load Growth



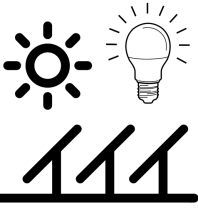
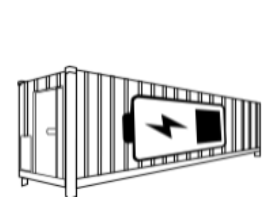
Traditional Investments (Substations)



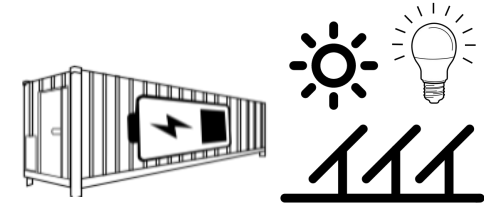
Traditional Investments (Poles and Wires)



Non-Wires Alternatives: Example of Battery Storage in Arizona



Non-Wires Alternatives: Targeted EE and DR in Tiverton NWA Pilot

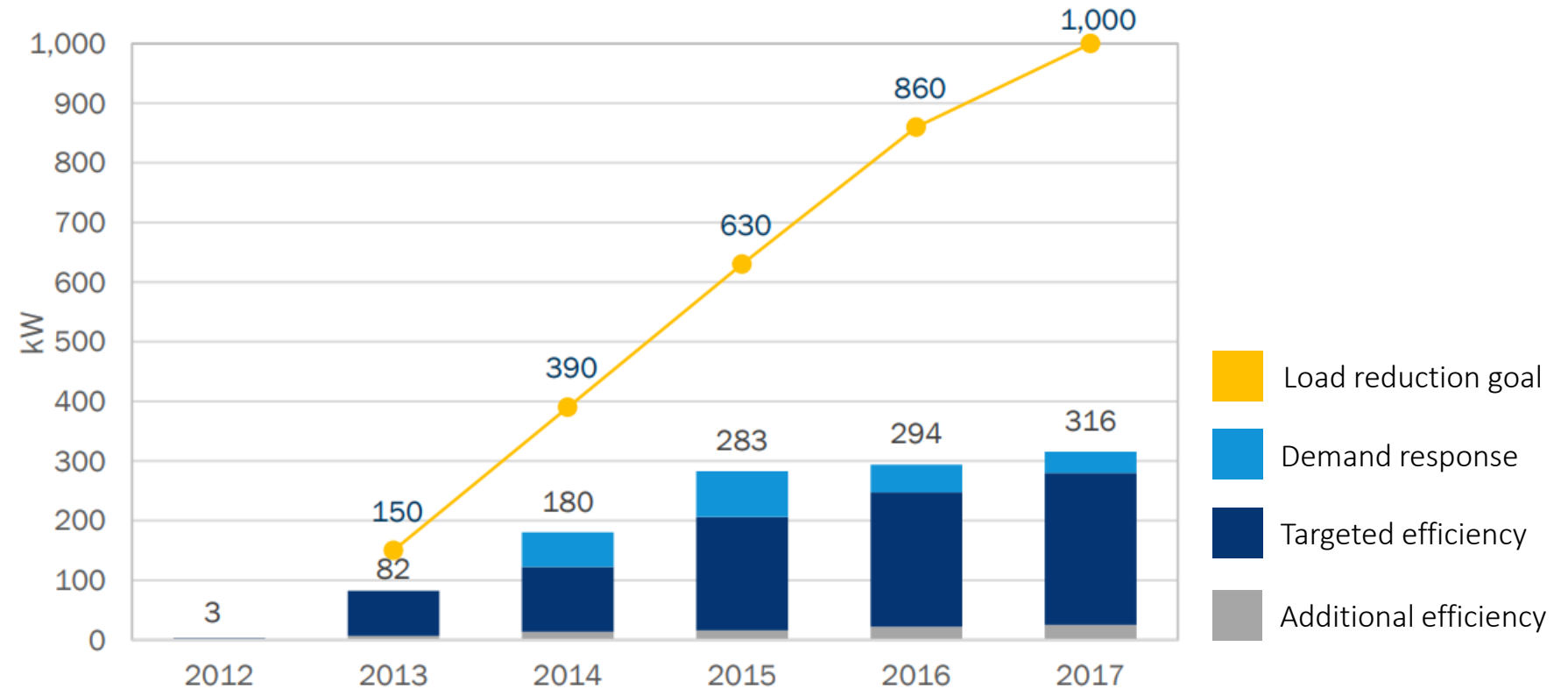


This NWA didn't reach the stated goal but its impact postponed traditional wires investment that would have occurred.

Further deferral of the wires investment from slower than expected load growth and cooler summer temperatures.

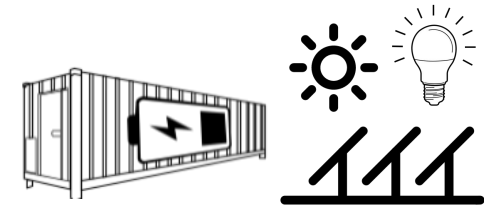
Battery storage was proposed in 2017/2018 but current forecasting shows NWA is not needed (a win!)

Figure ES-3. Cumulative Load Impacts (kW) Compared to Goal



From: Opinion Dynamics' impact evaluation *National Grid Rhode Island System Reliability Procurement Pilot: 2012-2017 Summary Report*

Non-Wires Alternatives: Brooklyn Queens Demand Management Program

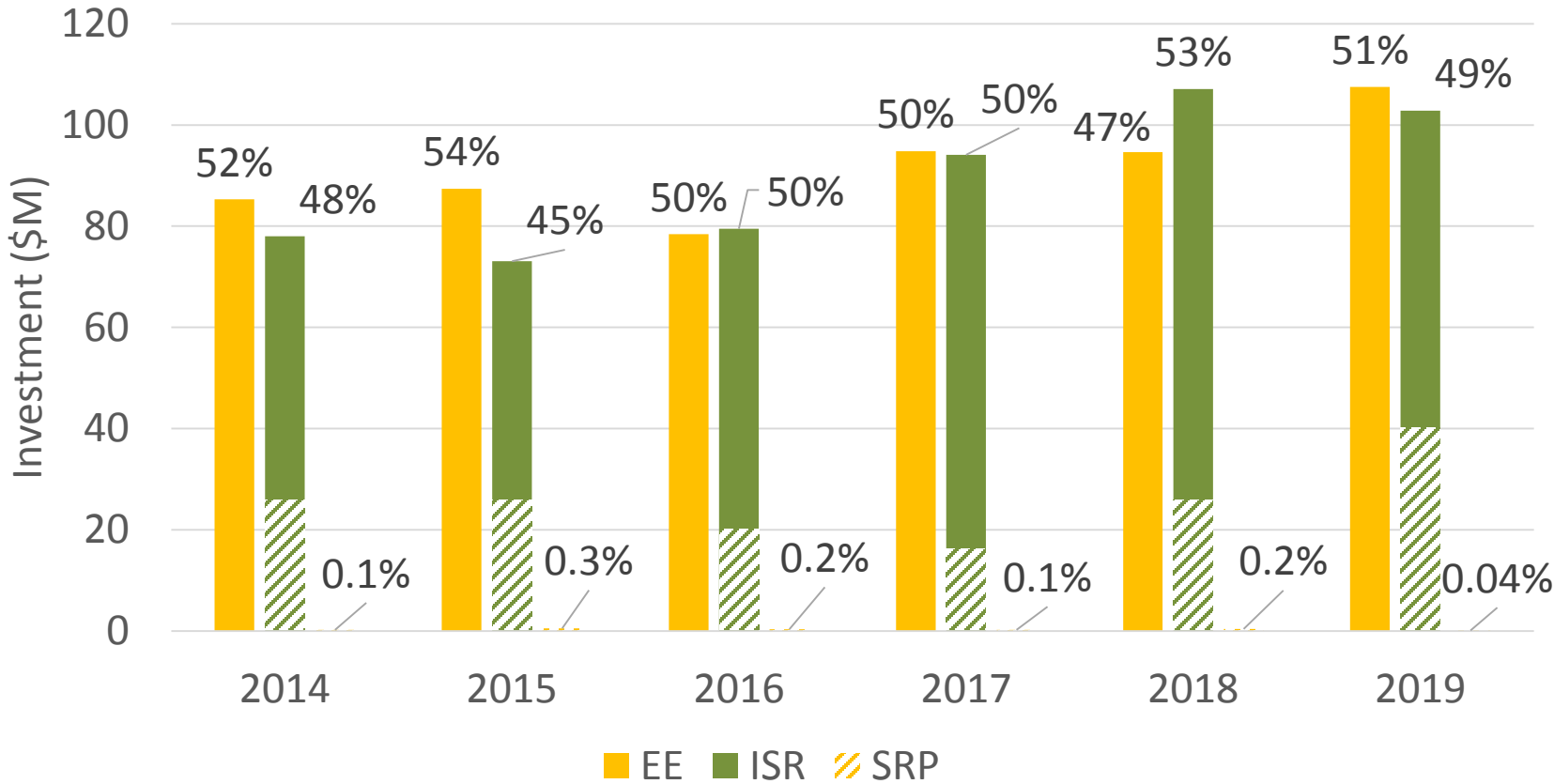
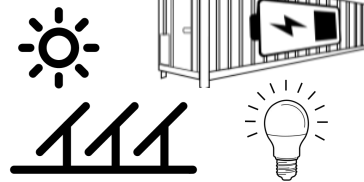
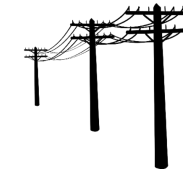


2014-present

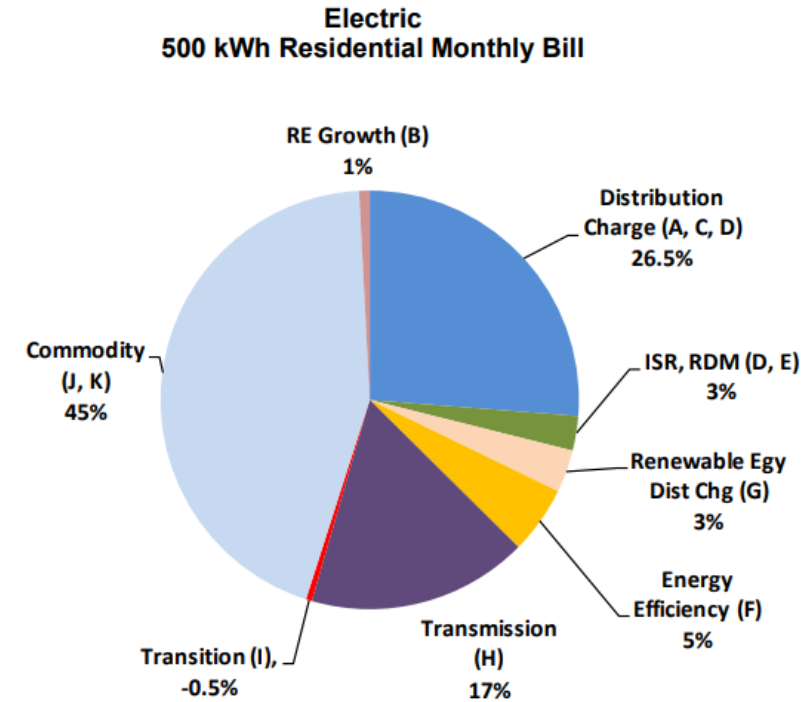
Successfully deferred traditional wires investments with a portfolio of targeted energy efficiency, demand response, distributed generation, and energy storage.

52 MW load reduction included 11 MW utility-side investments and 41 MW customer-side solutions.

National Grid's Investments by Category



▨ System Capacity and Performance: Proportion of the total ISR budget
 33% 35% 25% 17% 24% 39%



State Energy Policy and Non-Wires Alternatives

- OER's mission → "to lead RI to a secure, cost-effective, and sustainable energy future"
- 1,000 MW by 2020 → More renewable energy
- Resilient RI Act: GHG emissions reduction → Less fossil energy
- 20,000 clean energy jobs → NWA procurement is market driven
- Power Sector Transformation → Modern grid that controls long-term costs, gives customers choices and information, and is flexible enough to integrate clean energy technology

Non-Wires Alternatives help advance state energy and environmental policy

Division of Public Utilities and Carriers (DPUC)

The DPUC is a regulatory agency for electricity, gas, water and wastewater, and advocates on behalf of Rhode Island customers before the Public Utilities Commission.

DPUC Statutory Mission



To promote safe, reliable and affordable utility service on behalf of all Rhode Islanders

Power Sector Transformation Goals



To give customers more control over their energy wallet

To control the long-term costs of the electric system

To enable R.I.'s electric system to integrate more renewable energy



Non-Wires Alternatives advance the DPUC statutory mission and Power Sector Transformation goals

Division of Public Utilities and Carriers (DPUC)

Non-Wires Alternatives can reduce the need for utility capital investment, controlling long-term system costs

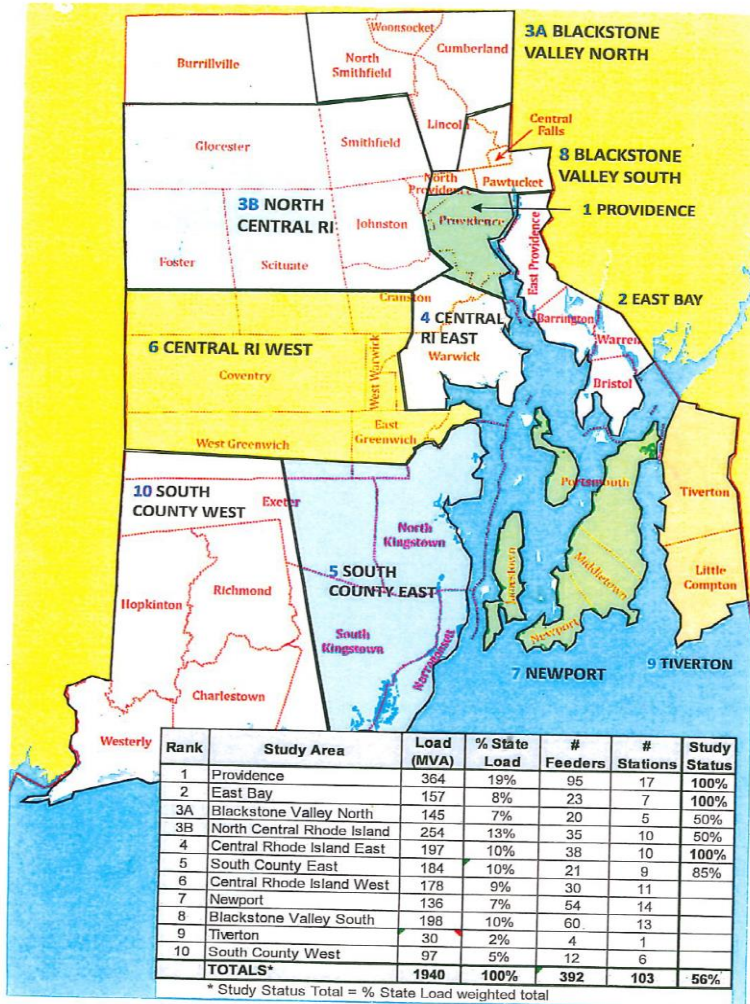
- Use knowledge about customers to deliver energy when customers need it, not when they don't
- Include new technologies, such as batteries, to make existing distribution system assets do more
- Harness customer-sited energy to provide benefits to the distribution system with two-way power flow

Non-Wires Alternatives highlight today's toughest regulatory policy questions

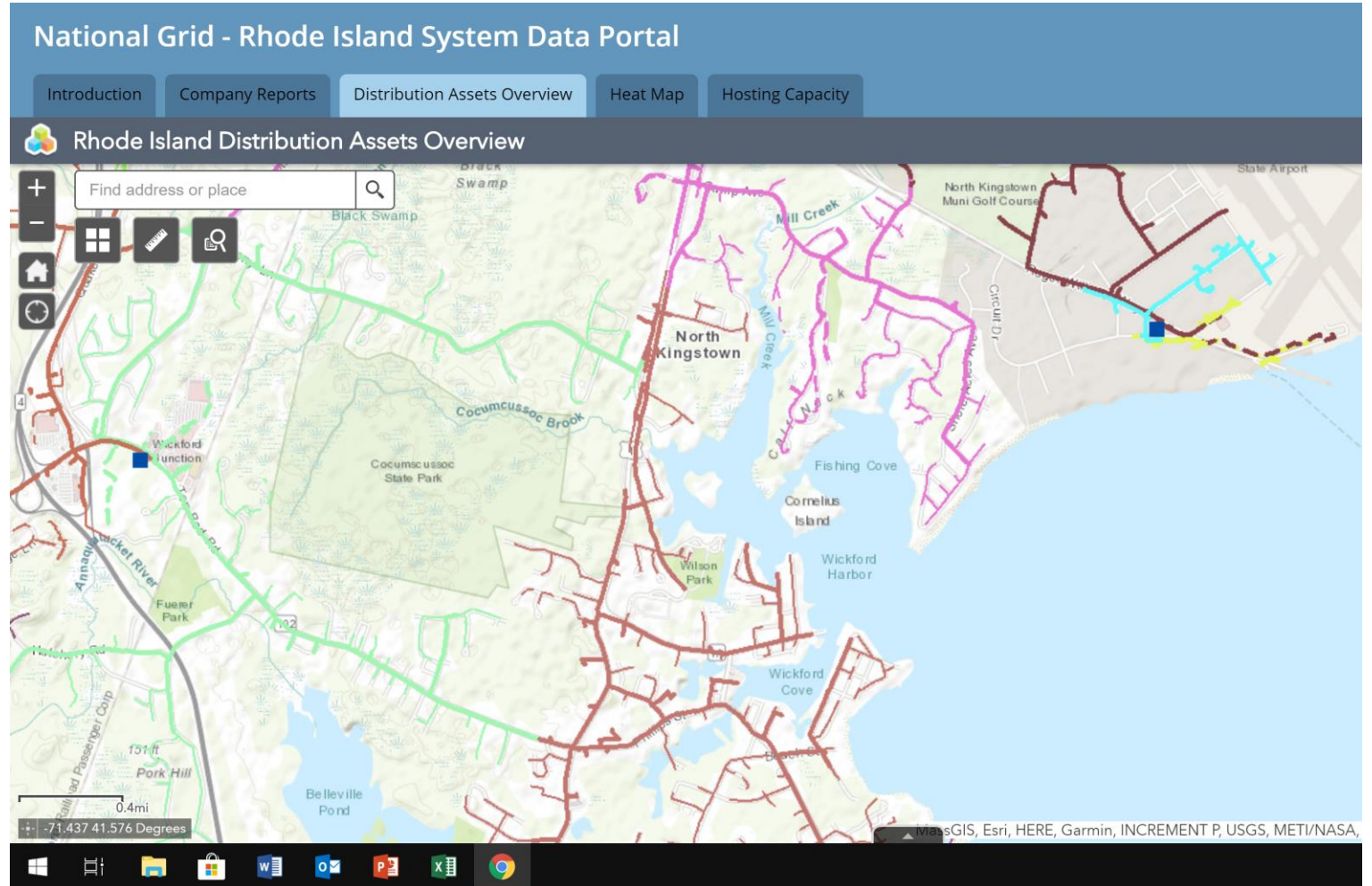
- How can we make information available to encourage NWAs?
- What is a capital asset and what is not?
- How can utilities best partner with NWA developers?

Practical steps to integrate Non-Wires Alternatives in distribution system planning

Area Studies
2014



Distribution System Data Portal
2017



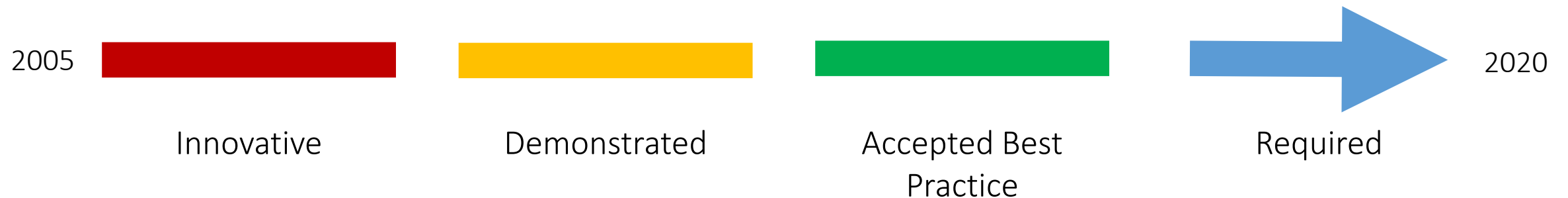
Grid Modernization
2018

Division of Public Utilities and Carriers (DPUC)

The way we support Non-Wires Alternatives in Rhode Island should continue to evolve over time to encourage utility adoption.

Non-Wires Alternatives engage customers and data in new ways to manage electric demand.

Like many areas of utility practice, demand management is becoming more common among electric utilities across the United States.



As Non-Wires Alternatives become more common (and less risky), the way we encourage and regulate them should continue to evolve to require utilities to use least cost approaches.

National Grid

Prior Years

Tiverton NWA Pilot

- An NWA Pilot project to defer the Tiverton Substation upgrade by curtailing load demand in the Tiverton-Little Compton area.
- Implemented from 2012 to 2017.
- NWA Portfolio of energy efficiency and demand response.

Rhode Island System Data Portal

- The Portal's development, marketing, and implementation.

2019 SRP

Plan for doing outreach on the System Data Portal

Updates to the Portal, including posting Area Studies

Requests for Proposals (RFPs) for all Non-Wires Alternative projects on the Portal

Determine the value of Non-Wires Alternatives based on where they are located

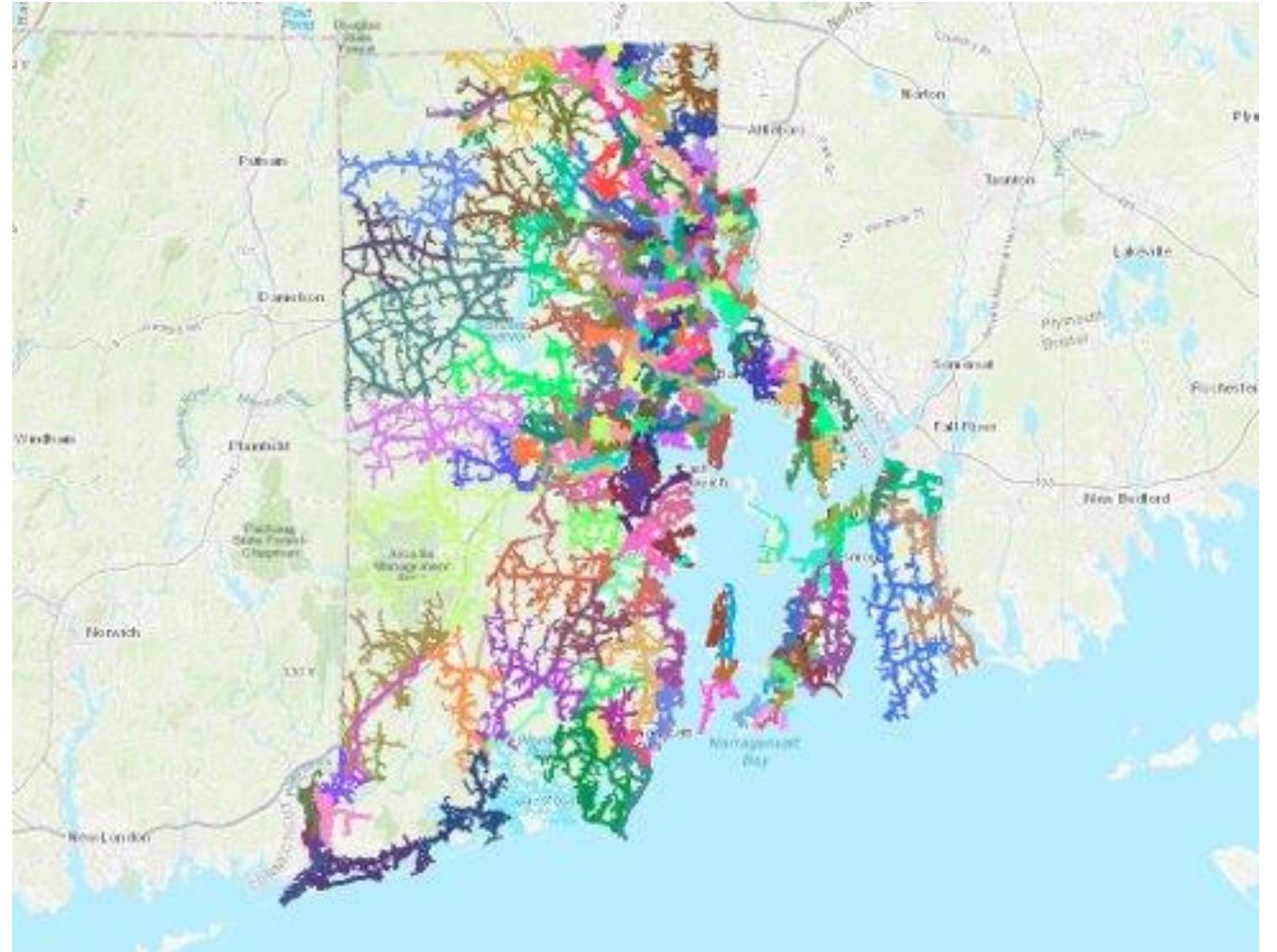
Aligning SRP with Docket 4600 and Power Sector Transformation initiatives

National Grid's System Data Portal

A new web-based tool developed by National Grid that houses a collection of maps.

Each map provides the location and specific information for selected electric distribution lines and associated substations within the National Grid electric service area in Rhode Island.

Colloquially goes by a few different terms: "Rhode Island System Data Portal", "RI Portal", "Portal"



<https://www.nationalgridus.com/Business-Partners/RI-System-Portal>

National Grid's Engagement with Vendor Stakeholders

Rhode Island System Data Portal

- Quarterly webinars, 2nd Wednesday of the 2nd month of each quarter
- Quarterly email campaigns
- In-person demonstrations every six months

Non-Wires Alternatives Vendor Stakeholder Outreach Meetings

- The 4th Monday of each month

EERMC's Responsibility

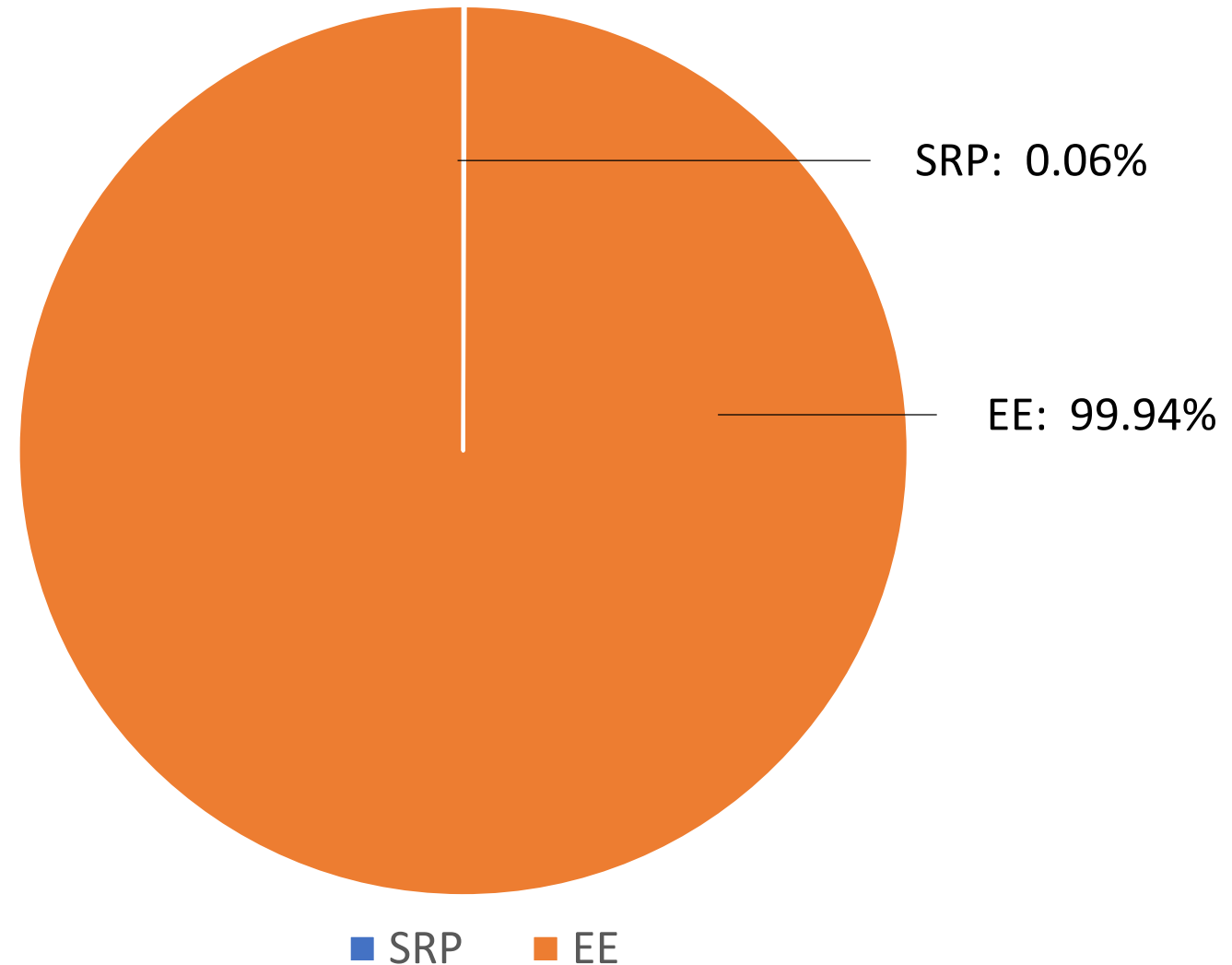
Least Cost Procurement Legislation states:

- The EERMC, “shall provide the commission findings and recommendations with regard to **system reliability** and energy efficiency and conservation procurement.

The EERMC's Role with SRP

- Make recommendations on the annual and triennial plans
- Ensure plans are cost-effective
- Monitor and evaluate efforts
- Engage stakeholders
- Ensure public benefit

2019 SRP and EE Budgets



Acronyms Cheat Sheet

Technology

DER – Distributed Energy Resources
DG – Distributed Generation
DR – Demand Response
DSM – Demand-Side Management
EE – Energy Efficiency
ESS – Energy Storage Service (e.g. a battery)
EV – Electric Vehicle
EVSE – Electric Vehicle Service Equipment (e.g. a charging station)
NWA – Non-Wires Alternative
PV – PhotoVoltaic (e.g. solar panels)
RE – Renewable Energy

Units of Demand (amount of energy at any given instant)

kW – kilowatt
MW – megawatt (=1,000 kW)
GW – gigawatt (=1,000 MW)

Units of Energy Consumption (amount of energy used over time)

kWh – kilowatt-hour
MWh – megawatt-hour

Plans/Reports

EE – Energy Efficiency Program Plan
ISR – Infrastructure, Safety, and Reliability Plan
SRP – System Reliability Procurement

Agencies and Laws

DPUC – Division of Public Utilities and Carriers
LCP – Least-Cost Procurement
OER – Office of Energy Resources
PUC – Public Utilities Commission

Miscellaneous

EDC – Electric Distribution Company
RFP – Request for Proposals
T&D – Transmission and Distribution

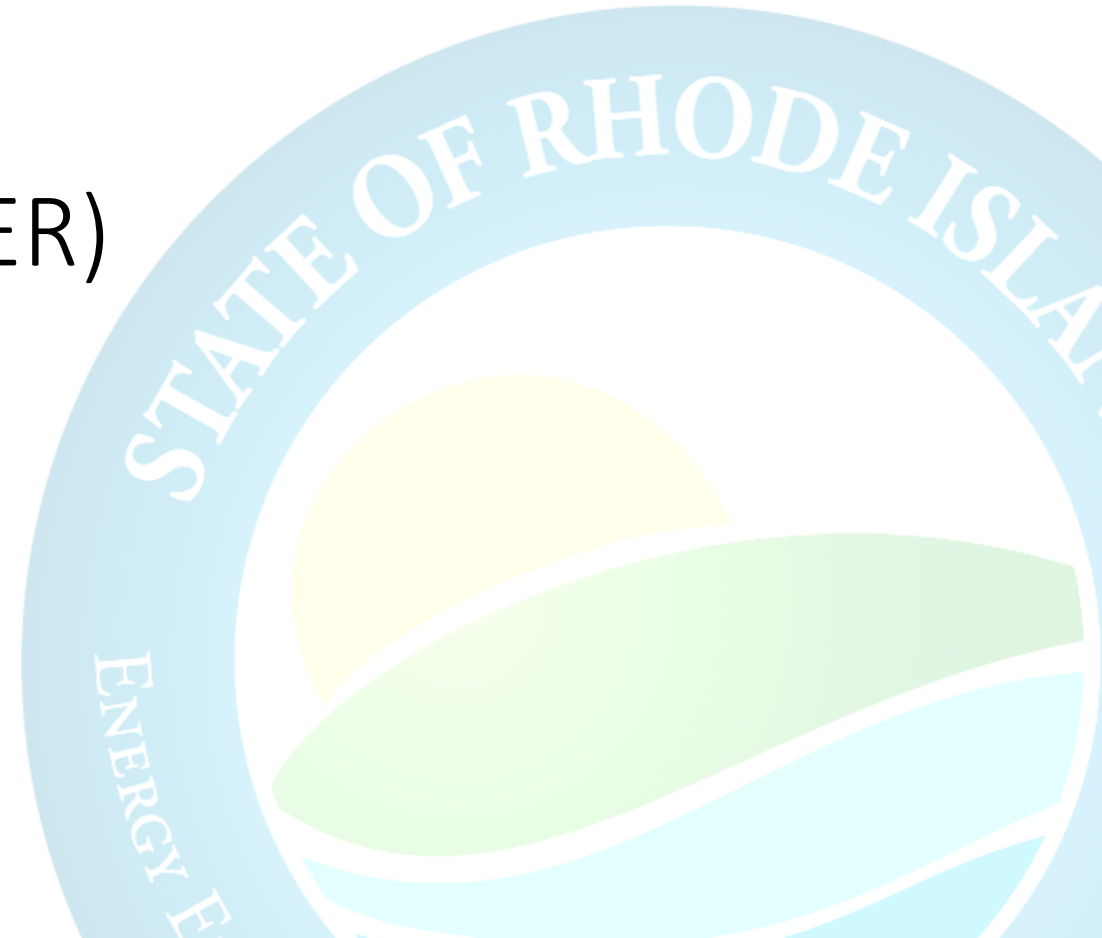


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Appendix:

Examples of
Distributed Energy Resources (DER)



Distributed Energy Resources: Rooftop Solar



Distributed Energy Resources: Solar Carport



Distributed Energy Resources: Small-Scale Solar



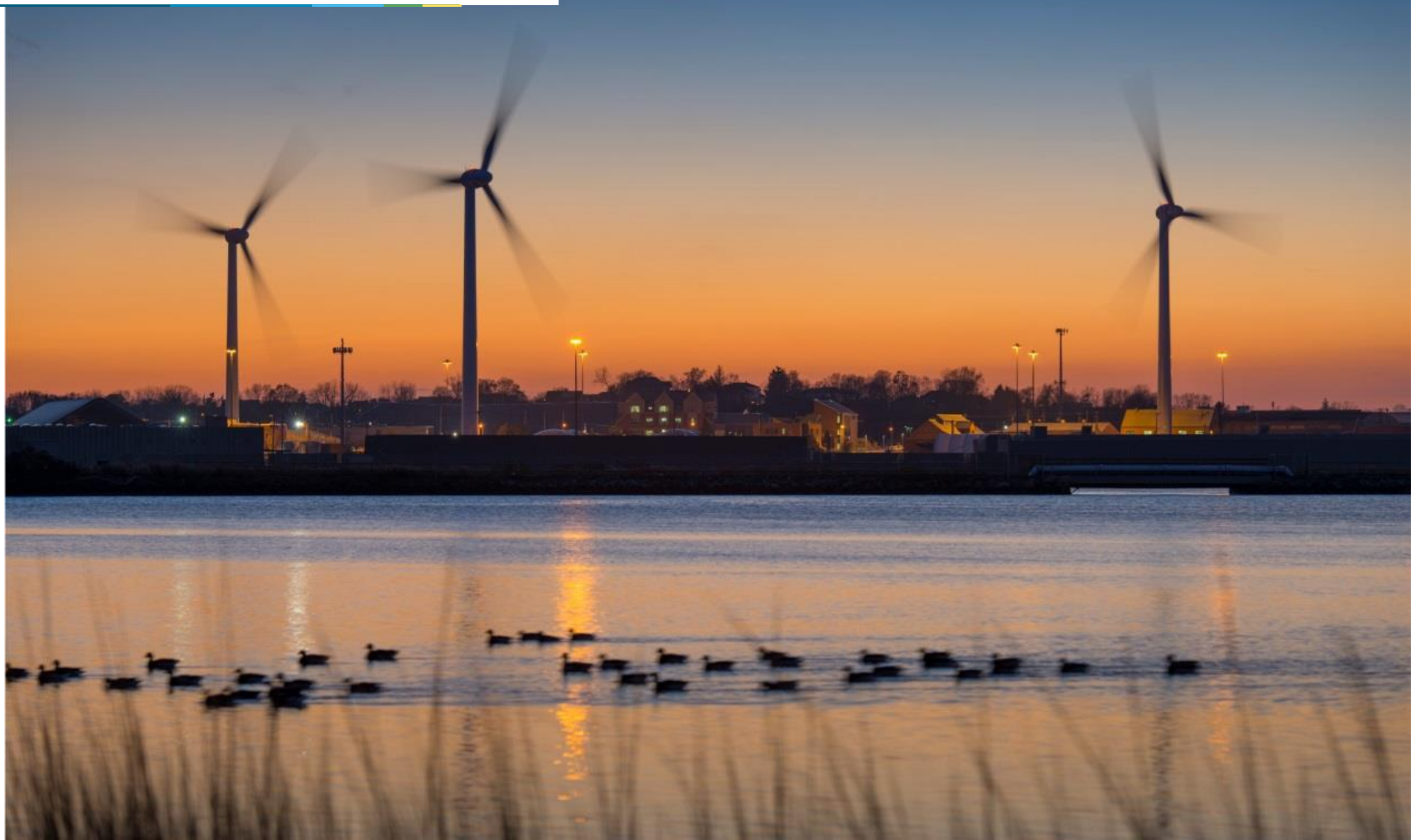
Distributed Energy Resources: Large-Scale Solar on a Brownfield



Distributed Energy Resources: Wind



Distributed Energy Resources: Wind



Distributed Energy Resources: Battery Storage



Distributed Energy Resources: Residential Battery Storage



Distributed Energy Resources: Electric Vehicles and Charging Infrastructure



Distributed Energy Resources: Energy Efficiency (LEDs shown)



Distributed Energy Resources: Energy Efficiency



Distributed Energy Resources: Demand Response



Chart 7
Capital Spend by Category FY 2012 – FY 2020
(\$000)

Spending Rationale	FY 2012 Actual	FY 2013 Actual	FY 2014 Actual	FY 2015 Actual	FY 2016 Actual	FY 2017 Actual	FY 2018 Actual	FY 2019 Budget	FY 2019 Forecast	FY 2020 Proposed Budget
Customer Request/Public Requirement	\$13,075	\$10,410	\$17,138	\$17,760	\$17,412	\$20,233	\$19,627	\$19,005	\$25,384	\$27,025
Damage Failure	\$12,993	\$17,515	\$14,374	\$3,044	\$14,531	\$15,614	\$19,184	\$13,674	\$15,032	\$13,505
Asset Condition	\$10,320	\$8,071	\$20,905	\$25,141	\$20,877	\$16,204	\$17,074	\$23,348	\$22,227	\$31,625
Asset Condition (Southeast Sub)	\$0	\$0	\$0	\$0	\$74	\$0	\$167	\$2,700	\$2,599	\$6,250
Asset Condition (South Street)	\$0	\$0	\$0	\$0	\$6,228	\$15,070	\$24,737	\$3,720	\$4,072	\$1,800
Non-Infrastructure	\$149	\$2,269	(\$346)	\$1,216	\$457	\$622	\$363	\$556	\$507	\$550
System Capacity & Performance	\$13,995	\$11,249	\$25,972	\$25,890	\$19,920	\$16,371	\$25,906	\$39,764	\$39,039	\$21,045
Total Capital Investment in Systems	\$50,532	\$49,514	\$78,043	\$73,051	\$79,499	\$84,114	\$107,058	\$102,767	\$108,860	\$101,800