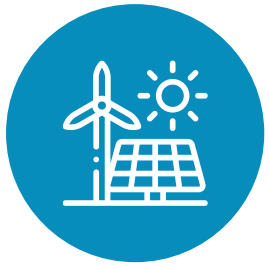
STATE OF RHODE ISLAND
OFFICE OF
ENERGY RESOURCES

Integrated Grid Planning in RI

Rhode Island Office of Energy Resources

For NCEP 9/13/2021

Mission statement

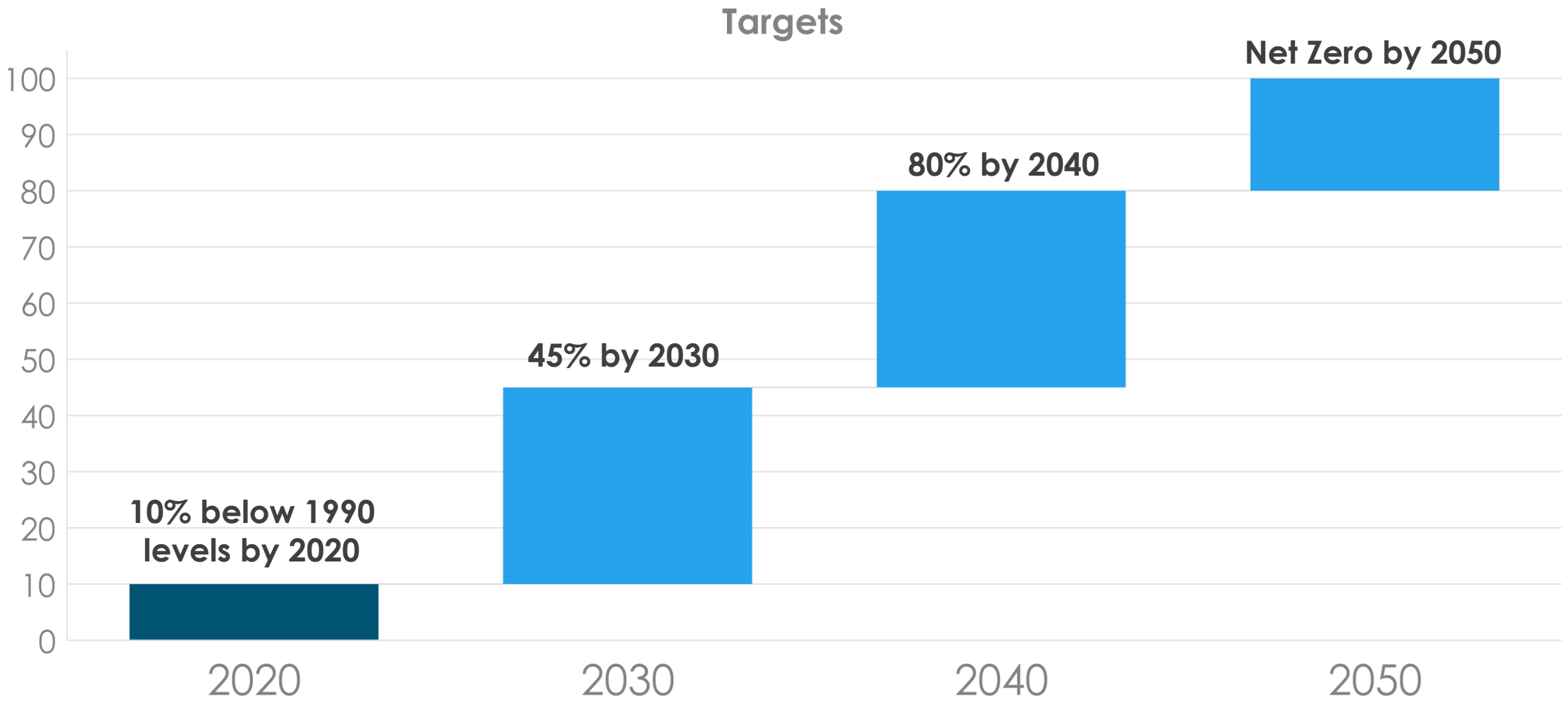


The Rhode Island Office of Energy Resources' (OER) mission is to lead the state toward a **clean, affordable, reliable**, and **equitable** energy future.

OER develops policies and programs that respond to the state's evolving energy needs, while advancing **environmental sustainability**, **energy security**, and a vibrant **clean energy economy**.

OER is committed to working with public- and private-sector stakeholders to ensure that all Rhode Islanders have access to cost-effective, resilient, and sustainable energy solutions.

2021 Act on Climate



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RI Greenhouse Gas Emissions

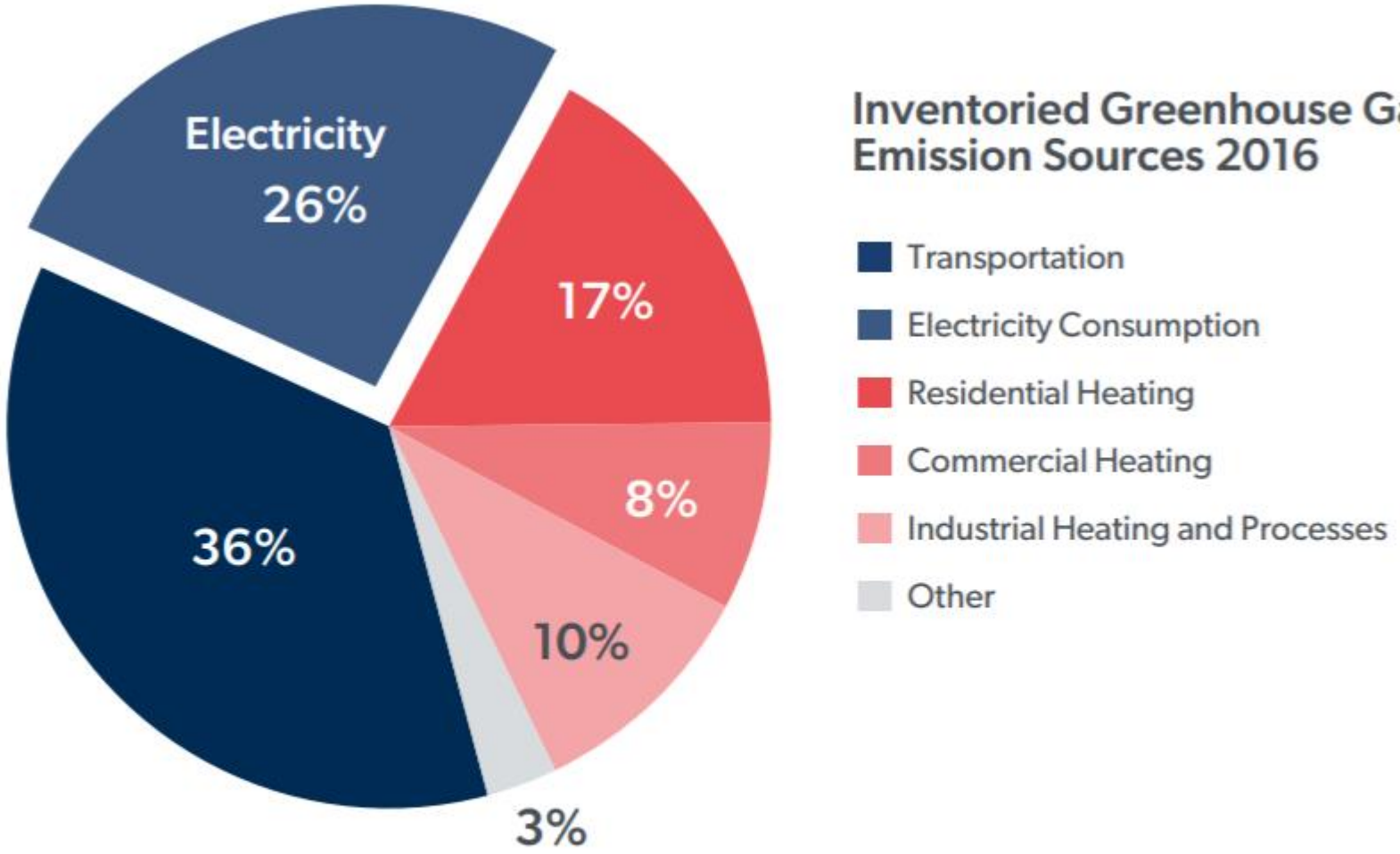


FIGURE 1: COMPOSITION OF RHODE ISLAND GHG EMISSIONS

Source: Rhode Island Department of Environmental Management, Rhode Island's 2016 Greenhouse Gas (GHG) Emissions Inventory Update, EC4 Meeting, September 12, 2019.

The Road to 100% **Renewable Electricity** 2030

Complete project materials available www.energy.ri.gov/100percent/

Estimating the Gap

We forecasting renewable energy growth from existing programs and contracts. The difference between demand and renewables is the gap: we will need to build or procure ~4,600 GWh of renewable energy by 2030

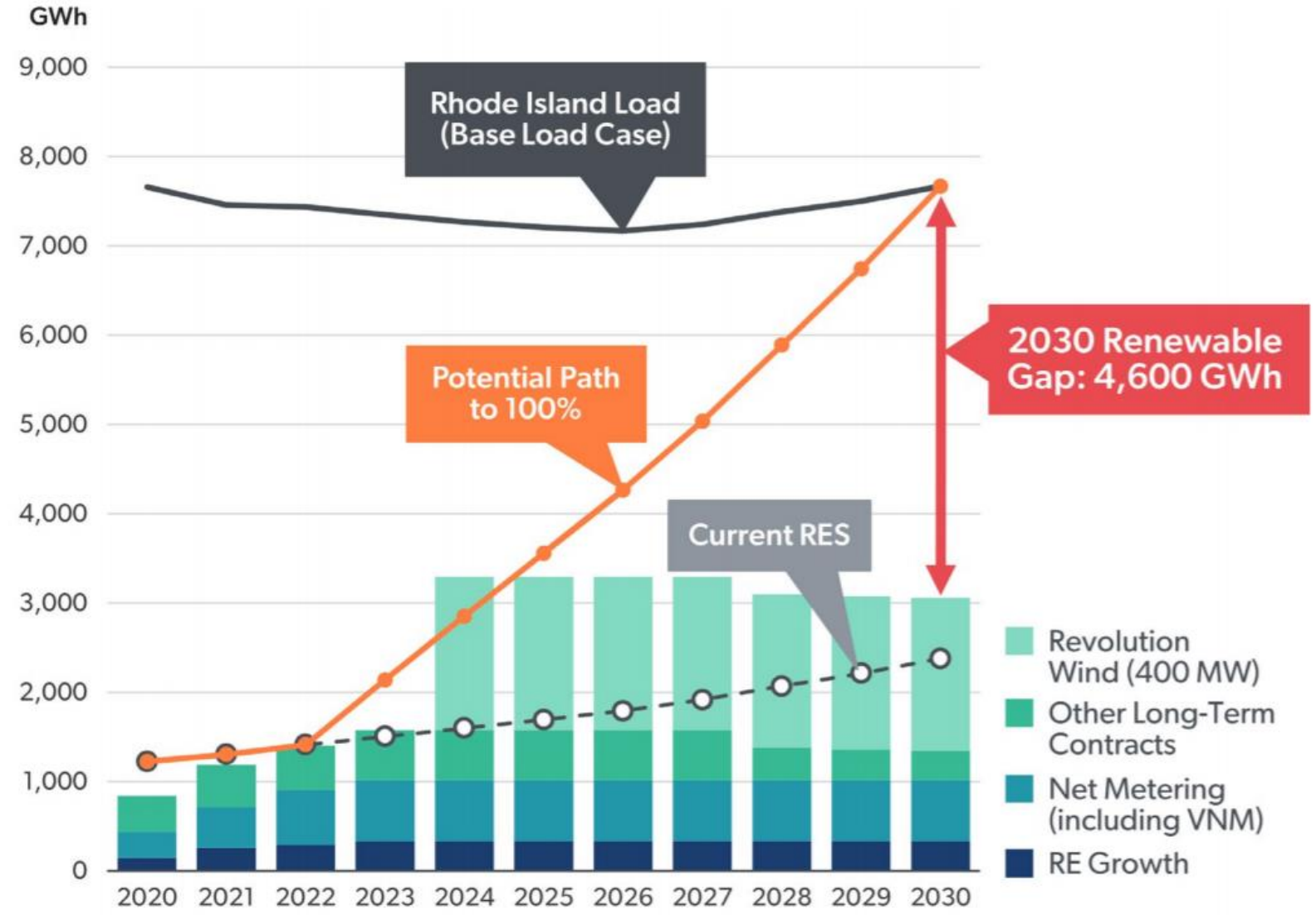


FIGURE 3: RENEWABLE ELECTRICITY GAP TO ACHIEVE 100% RENEWABLES

Sustainable through 2050

Note that continued thermal and transportation electrification will add load and grow the gap from 2030-2050.

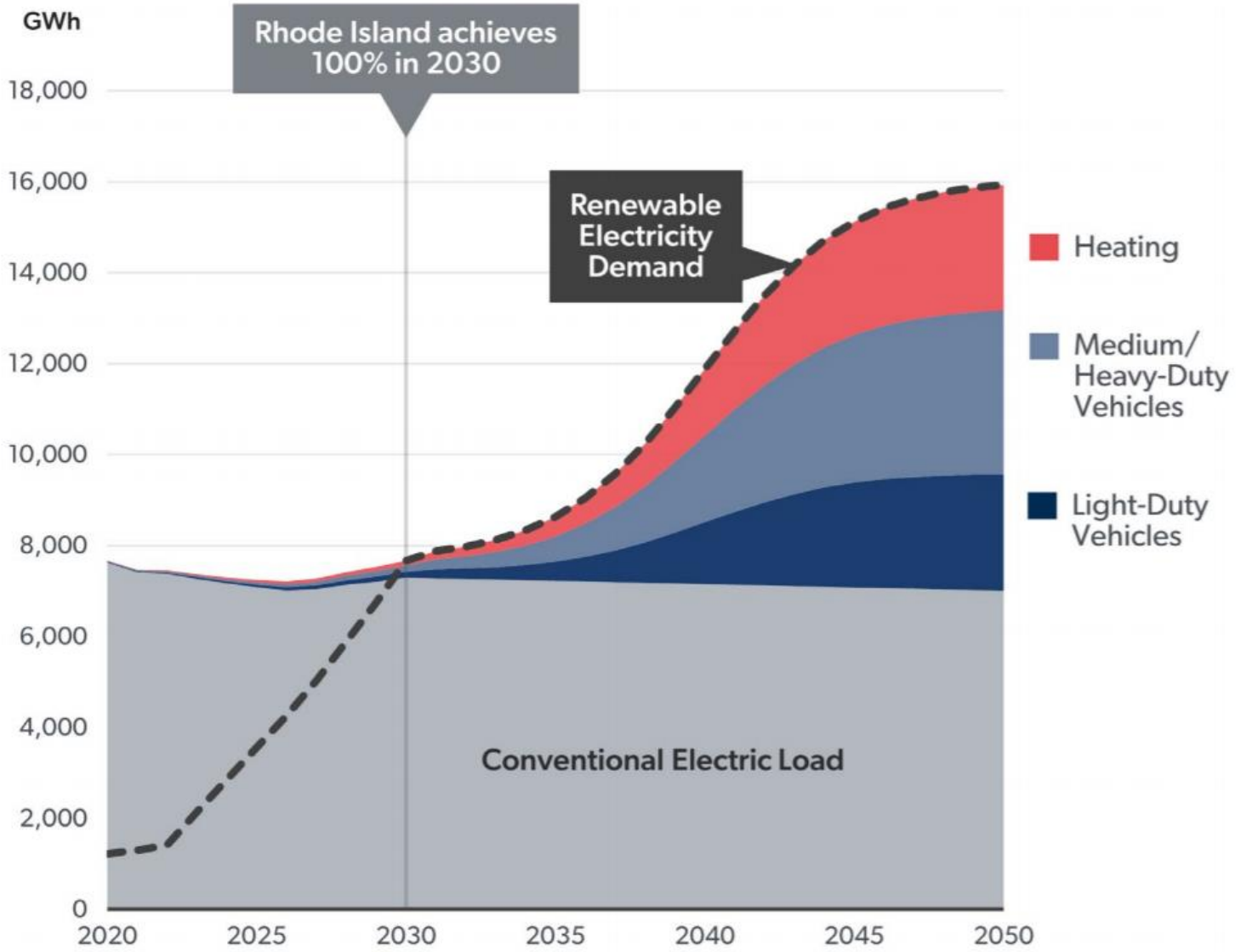


FIGURE 4: POTENTIAL RHODE ISLAND ELECTRICITY DEMAND PROJECTION TO 2050

Filling the Gap in 2030

We consider four renewable energy resource types, first as "technology bookends" and then as pieces of mixed portfolios.

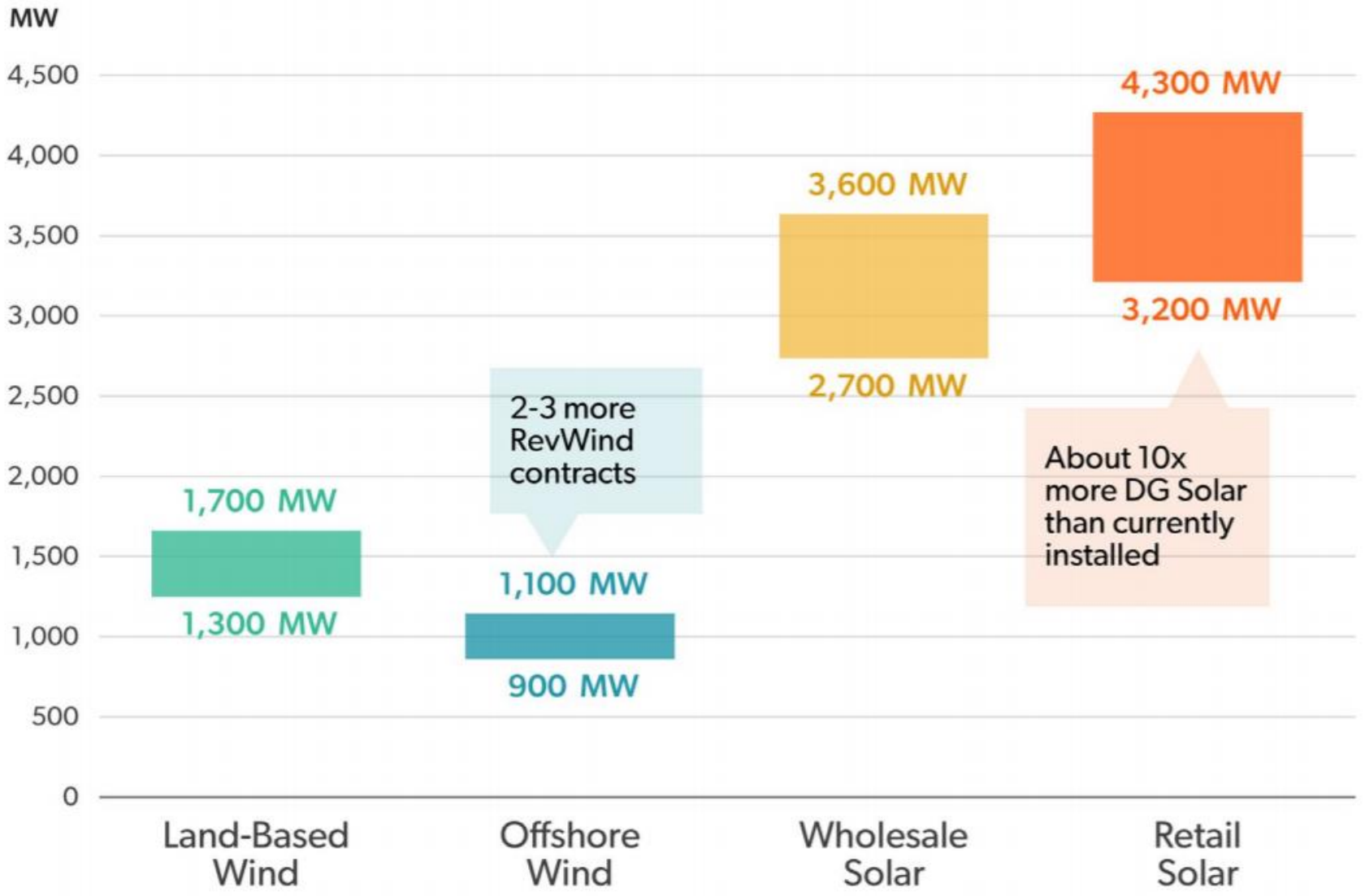


FIGURE 5: CAPACITY OF EACH TECHNOLOGY NEEDED TO FILL 2030 RENEWABLE ENERGY GAP

Portfolio Costs

These bars represent net costs, after accounting for market revenues, to achieve each portfolio. Technology bookend costs are compared to meeting the 100% goal by purchasing RECs in lieu of developing local renewable energy resources.

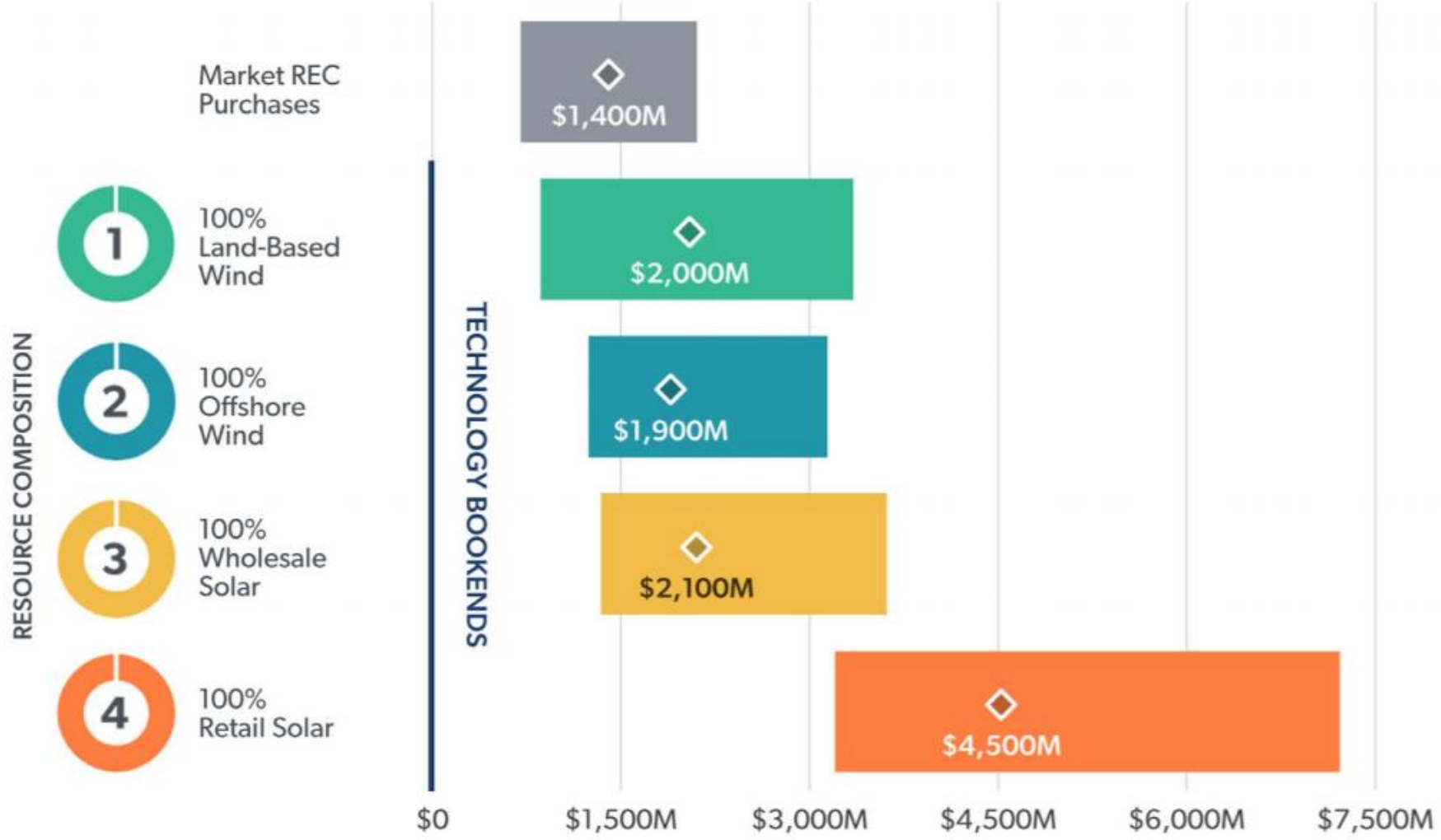


FIGURE 13: NPV OF ABOVE-MARKET COSTS (2020–2040) OF ACHIEVING 100% RENEWABLES; BOOKENDS
(NET OF ENERGY AND CAPACITY REVENUES, NOT RECS)

Note: Ratepayer costs reflect the total incremental costs of achieving 100% net of energy and capacity revenues.

Ratepayer Costs

Portfolio costs will flow to ratepayers through electricity rates. Meeting 100% renewables will result in incremental costs relative to 2020 rates.

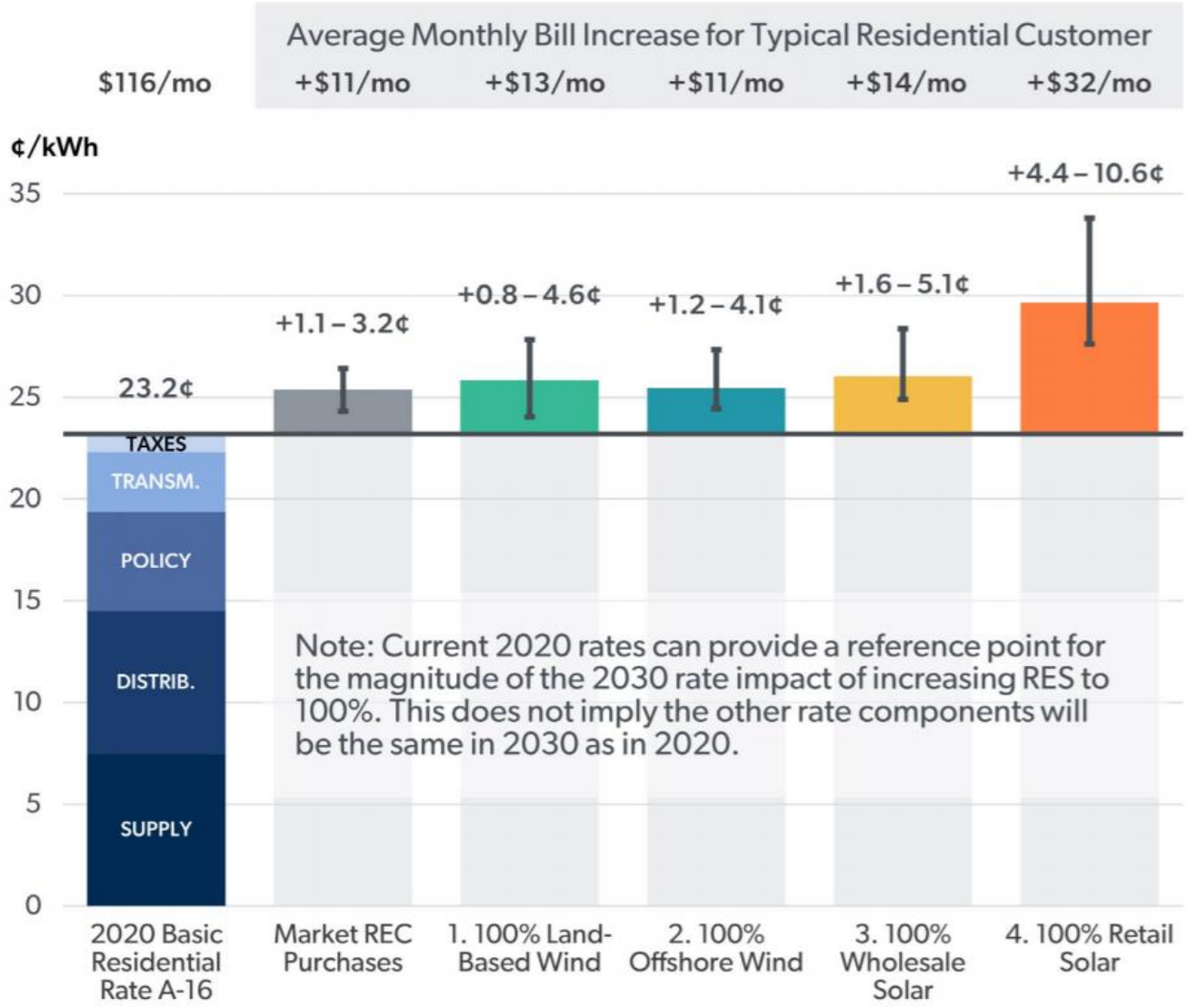


FIGURE 15: 2030 RATE IMPACTS OF 100% RENEWABLE ELECTRICITY

Notes: Assumes typical residential customer consumes 500 kWh/mo.

Policy Recommendations

Policy is needed to establish a strong, statewide framework and reach our goals in ways that align with our foundational principles.

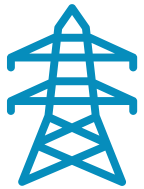
We must ensure we meet our clean energy goals by advancing a **100% Renewable Energy Standard.**

Continued efforts to decrease energy consumption necessitate extension of **Least-Cost Procurement and Nation-Leading Energy Efficiency Programs.**

Maintaining continued support for in-state development, while supporting **programmatic evolution** to deliver more affordable and sustainable outcomes.

Planning and Enabling Recommendations

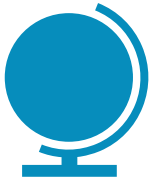
We need to advance innovative, integrated, and collaborative **planning** to **enable** interconnection of clean energy onto the grid while minimizing costs and optimizing land use.



Optimize the electric grid through collborative, **integrated grid planning**.

Facilitate integration of distributed energy resources by advancing **Power Sector Transformation** and **Grid Modernization**.

Build out a strategic role for **energy storage** technologies.



Continue **regional collaboration** on wholesale markets and interstate transmission.

Equity Recommendations

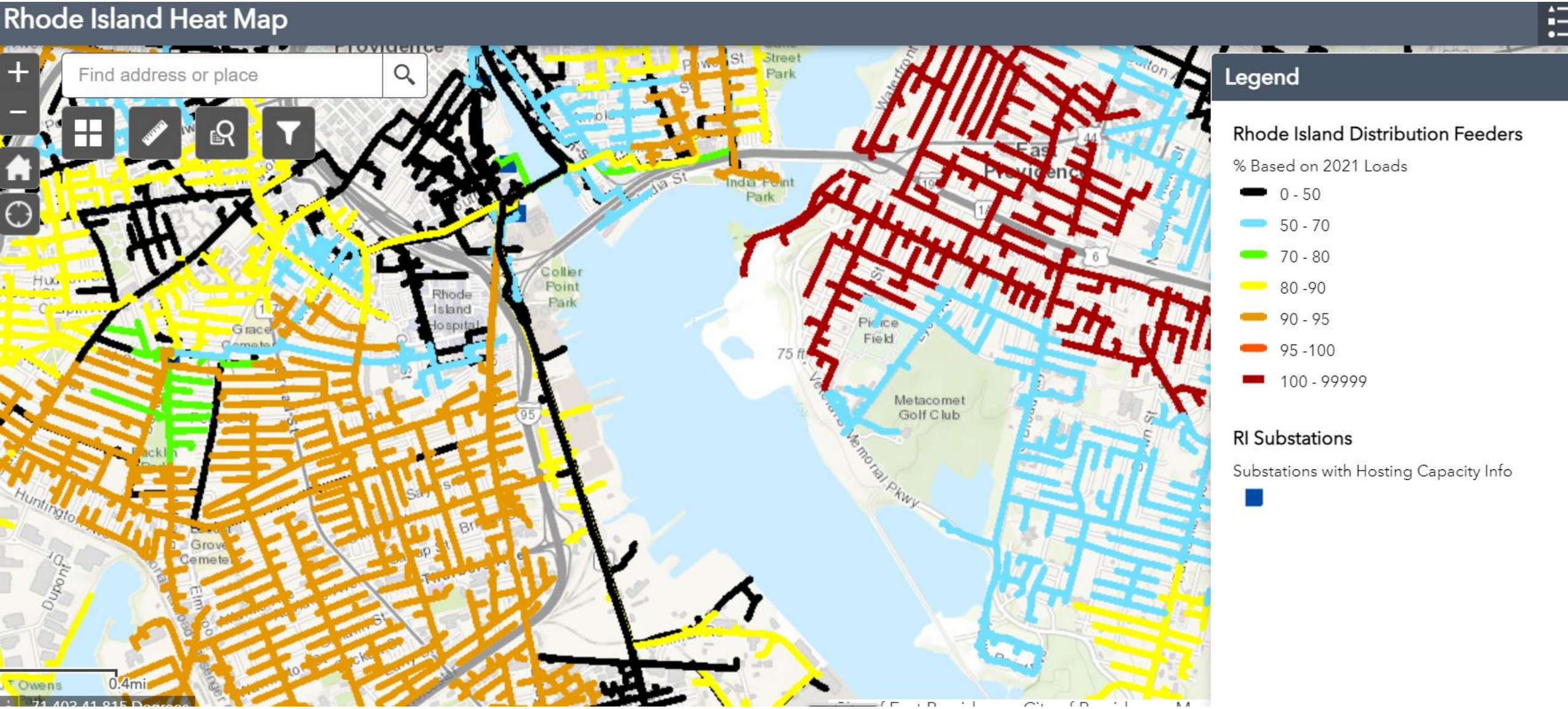
We must center **equity** and include community engagement in program design to improve access to clean energy benefits for all Rhode Islanders. Throughout this effort, we will identify and address systemic racism and historic inequities.

Partner with trusted community organizations to listen, learn, support, and establish foundational definitions.

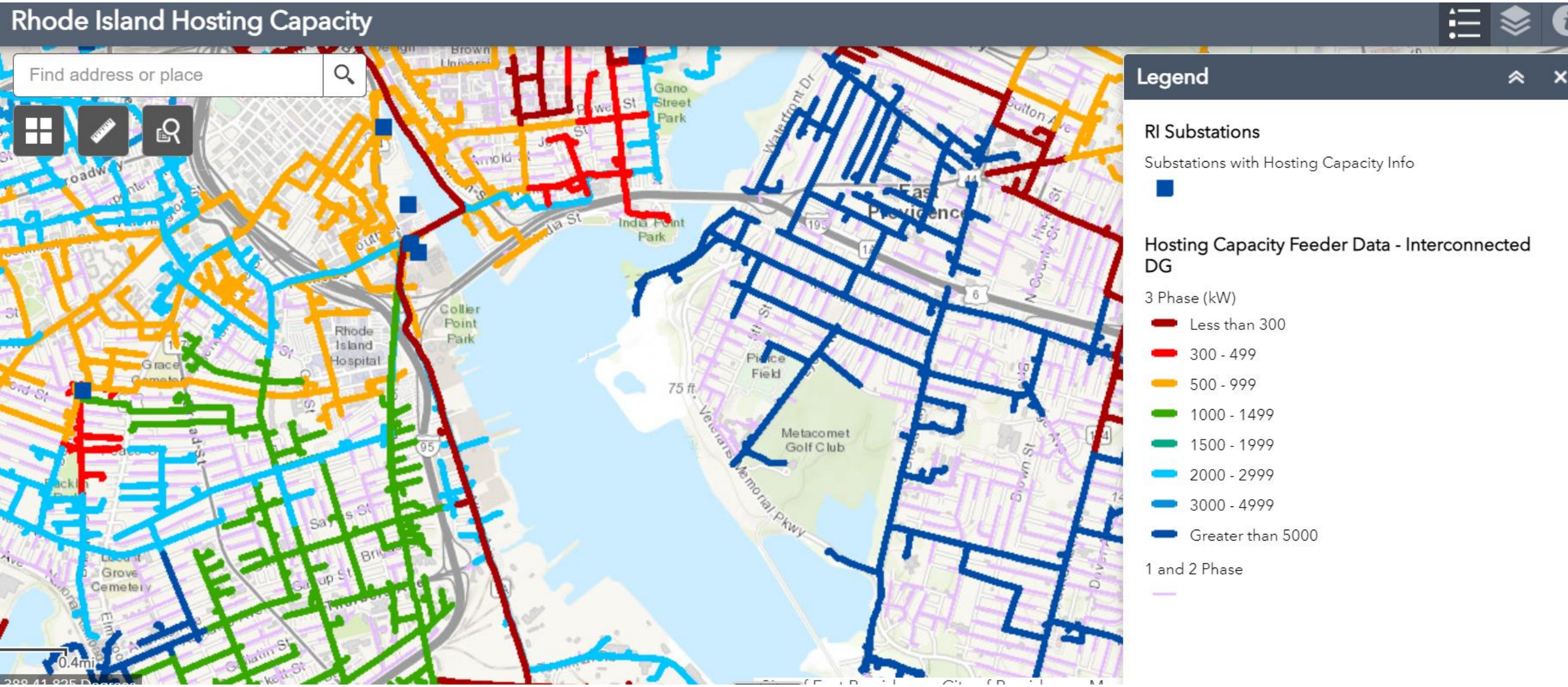
Based on foundational definitions, develop **equity metrics** with the community to track and monitor progress towards equitable outcomes.

Improve **outcomes** identified and prioritized by commuities through rate design, program adjustments, and policy.

Vision for Integrated Grid Planning



Vision for Integrated Grid Planning



Vision for Integrated Grid Planning

How do we manage investment costs to enable electrification and renewable energy penetration in areas that match local preferences and achieve multiple policy objectives?

Should these investments be made ad hoc or are the **cost/time efficiencies** to larger upfront investments?

To what extent can **stakeholder engagement** in the planning process lead to preferred outcomes for all?

How can we best use the **suite of distribution management tools** available, including from third party providers?

Non-Infrastructure Distribution Management Tools

Statewide EE/DR and RE Programs

Support statewide supply cost reductions, home and business utility bill management

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Non-Wires Solution

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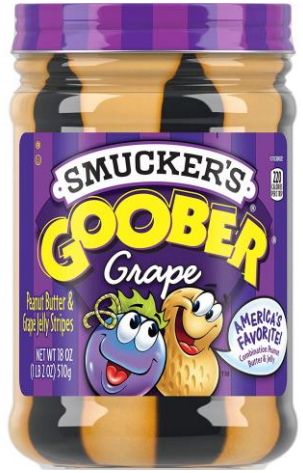


Cross-Utility Grid Management

Electric EE/DR/RE programs may support non-pipe solutions for gas utility business

An Under-Utilized Tool: Locational Outreach for EE/DR

Cost-effective EE/DR

- We already know the EE/DR program is cost-effective, so additional outreach will – at minimum – result in net benefits

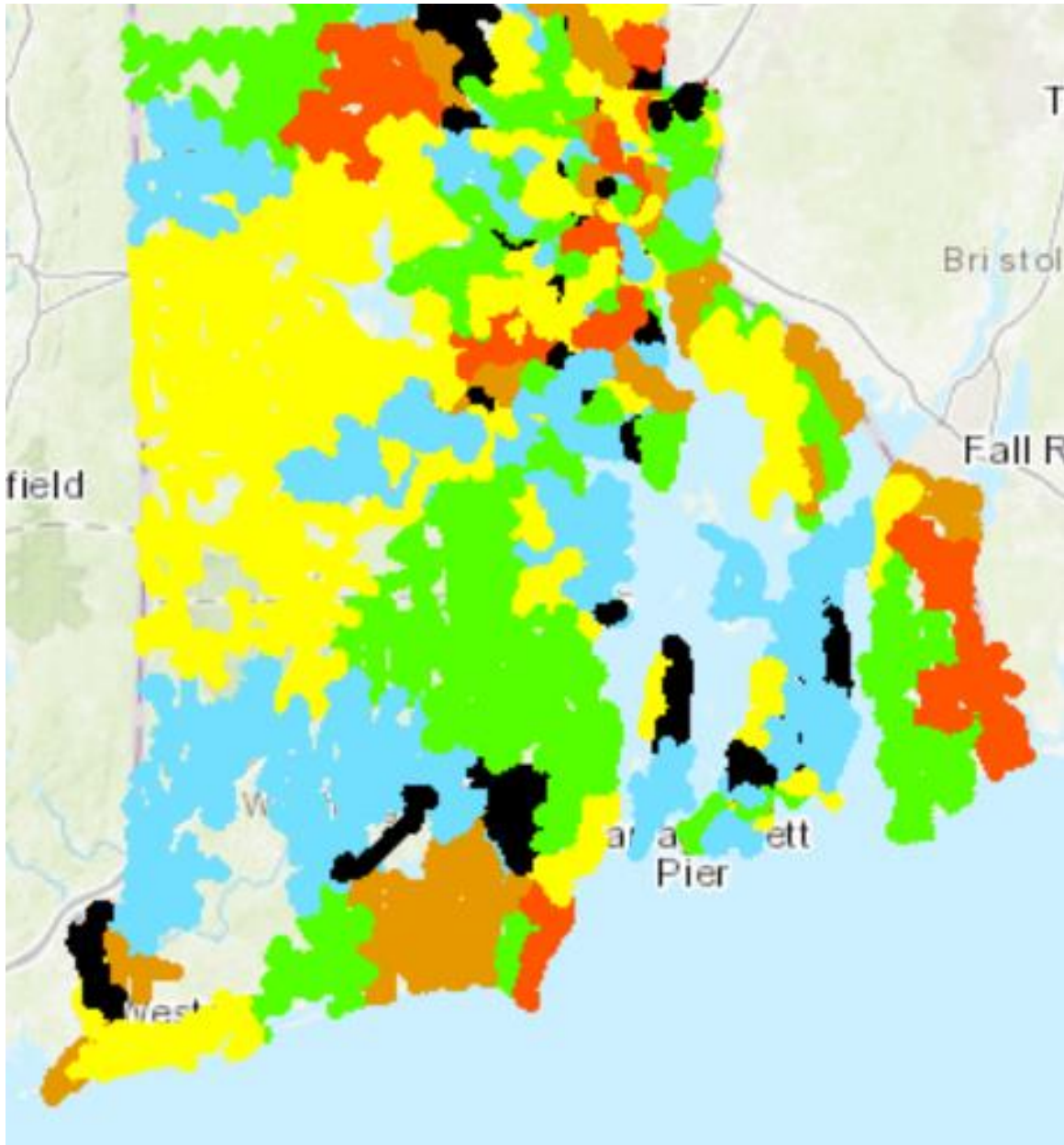
May avoid NWA or Wires investment

- Non-wires solutions only considered once feeder is forecasted to reach >100% summer normal rating
- Locational outreach can slow a feeder's loading
- May avoid investment expenses

Option value

- Slower load growth on heavily-loaded feeders may buy time to improve load forecast certainty
- May result in cost savings or process efficiency

RI System Data Portal – Heat Map:
https://ngrid.apps.nationalgrid.com/NGSysDataPortal/RI/index.html



Contact information

Carrie A. Gill, Ph.D.

Administrator, Grid Modernization and Systems Integration

Rhode Island Office of Energy Resources

401-574-9121

Carrie.Gill@energy.ri.gov

www.energy.ri.gov