

Synapse
Energy Economics, Inc.

Resource Planning in Puerto Rico's Transforming Electric System

Clean Energy Solutions Center

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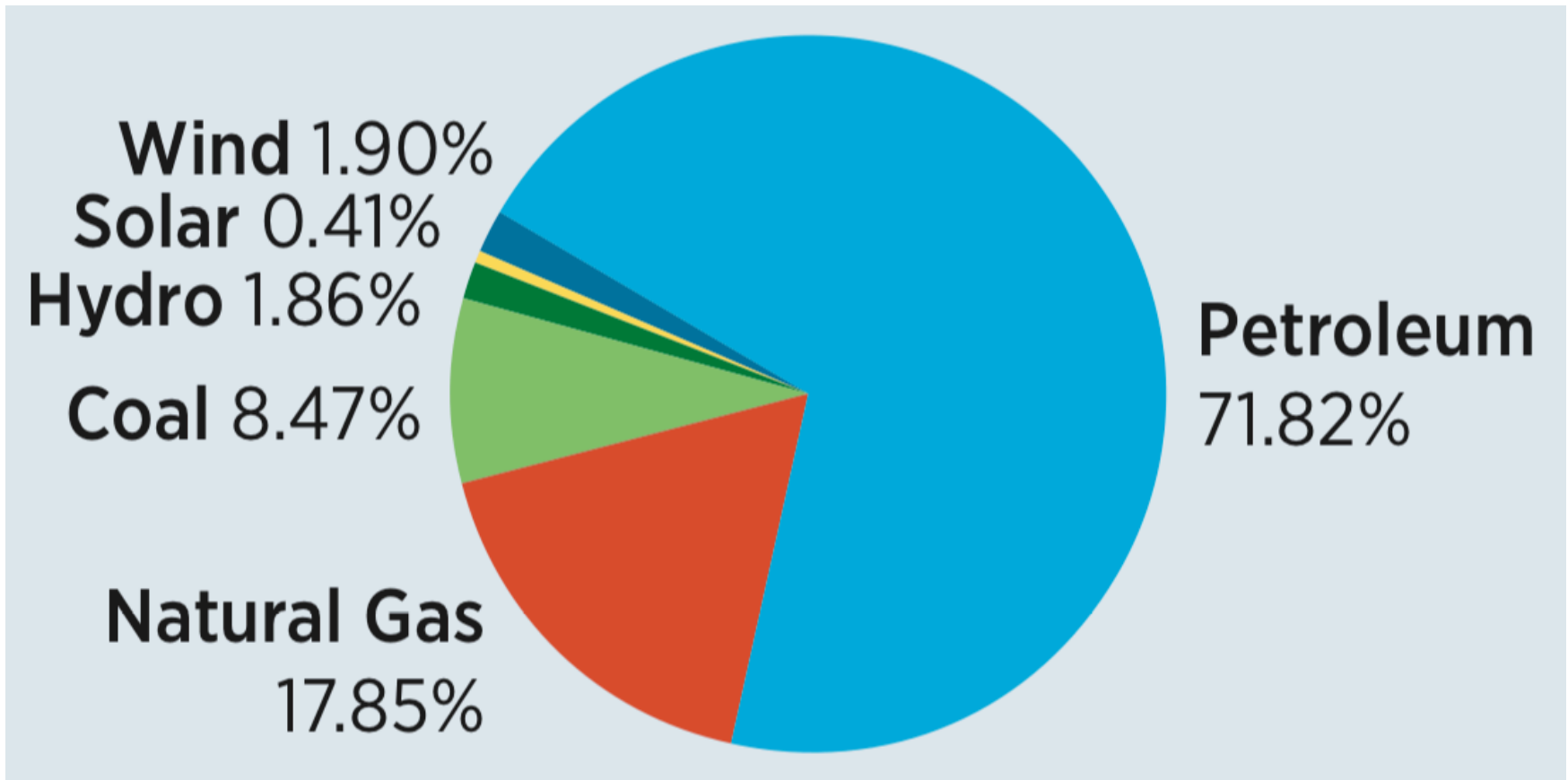
Outline

- Pre-hurricane resource planning challenges
- Hurricanes' impacts on resource planning approaches
- Electric sector transformation
- Integrated resource planning
- Ongoing planning processes

Synapse Energy Economics

- Founded in 1996 by CEO Bruce Biewald
- Leader for public interest and government clients in providing rigorous analysis of the electric power sector
- Staff of 37 includes experts in energy and environmental economics and environmental compliance
- Providing technical, analytical, and policy support as regulators and utilities recognize the need to proactively plan for emerging technologies, enable customers to optimize their consumption, and promote innovative approaches for providing electricity services

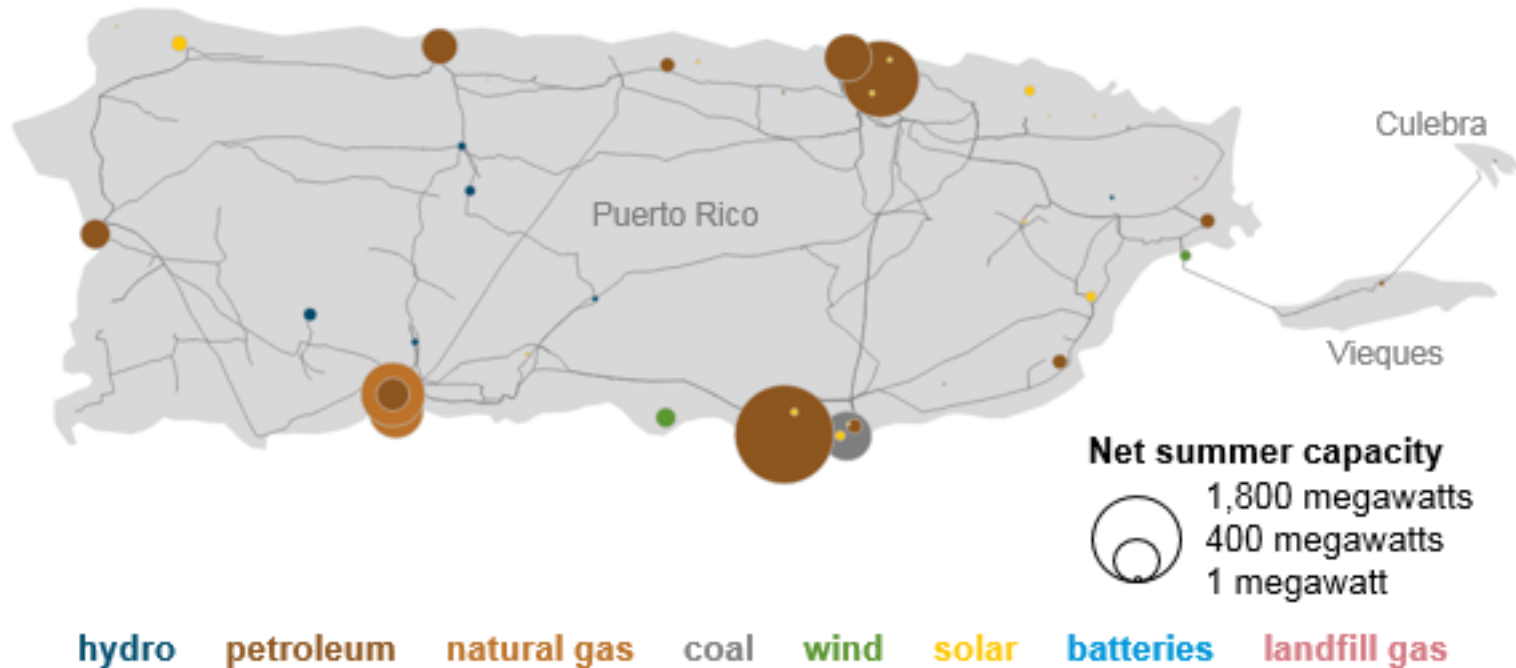
PR Electric Portfolio as of 2015



Source: Energy Transition Initiative; <https://www.nrel.gov/docs/fy15osti/62708.pdf>

Electric System Map

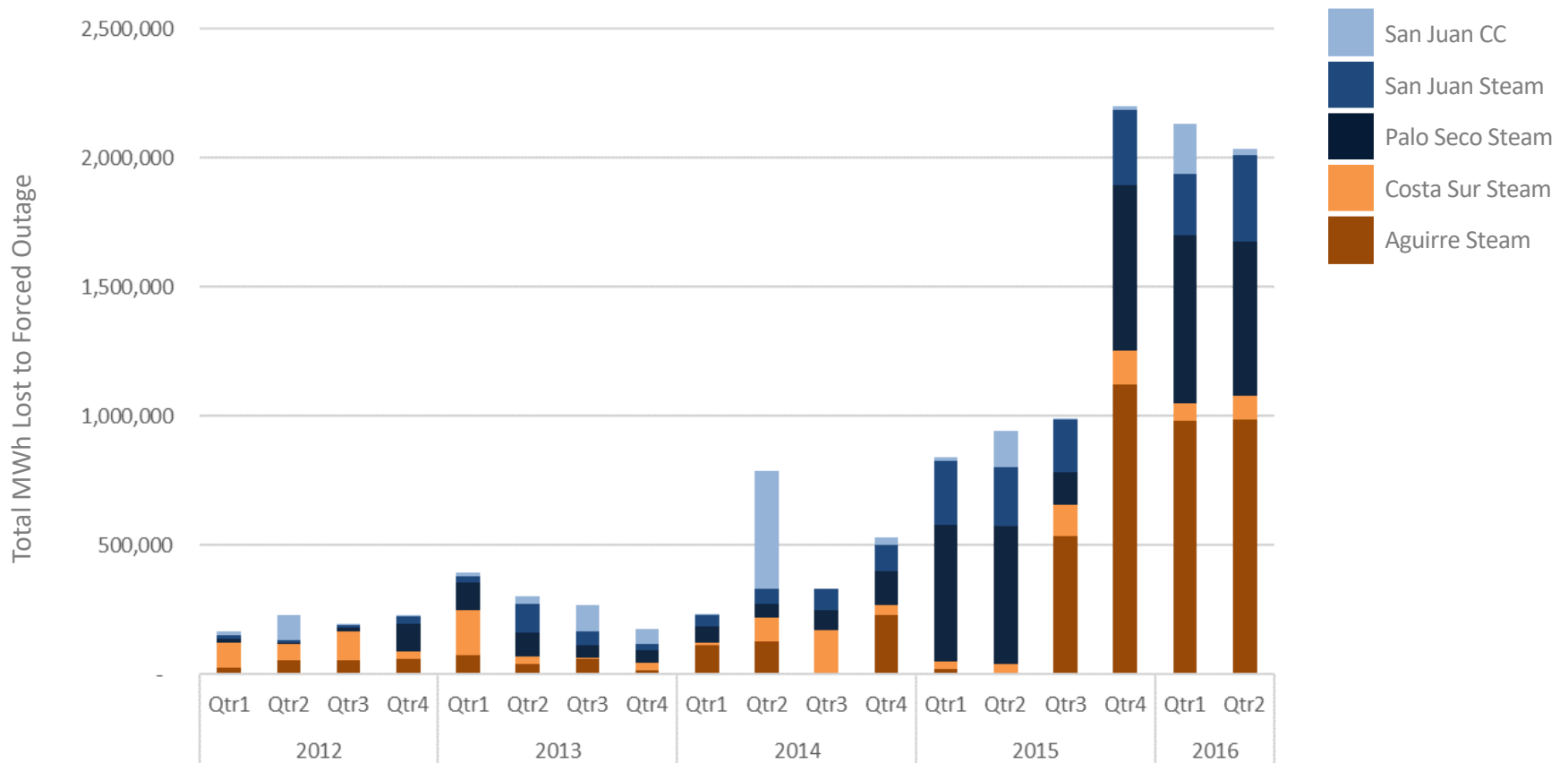
Electric power plants and transmission lines in Puerto Rico



Source: U.S. Energy Information Administration; <https://www.eia.gov/todayinenergy/detail.php?id=36613>

Forced Outage Rates

- Deferred maintenance and reduced capital spending in power plants contributed to high, and rising, forced outage rates.



Source: Fischer and Horowitz, Expert Report in CEPR-2015-AP-2015-0001

Hurricane Impacts

- Generation fleet relatively unscathed by Hurricanes Irma and Maria
- But transmission connecting plants to main load centers was severely damaged
- Impacts on resource planning:
 - Increased focus on resilience
 - Locate generation closer to load
 - Increased customer desire for self-generation and storage
 - Microgrids
 - Projections for flat GDP; falling population for the next 20 years

Transformation

- Act 120 – 2018 – Electric Power System Transformation Act
 - Set in motion the transition in ownership or control of PREPA’s assets
 - Generation to be sold/transferred
 - Transmission and distribution system to be operated by a concessionaire
- Act 17 – 2019 – Energy Public Policy Act
 - 100% renewable electricity by 2050
 - and 20% by 2022; 40% by 2025; 60% by 2040
 - Requires demand response plans from electric suppliers
 - Renews 30% by 2040 energy efficiency target; explicitly allows third-party administrator

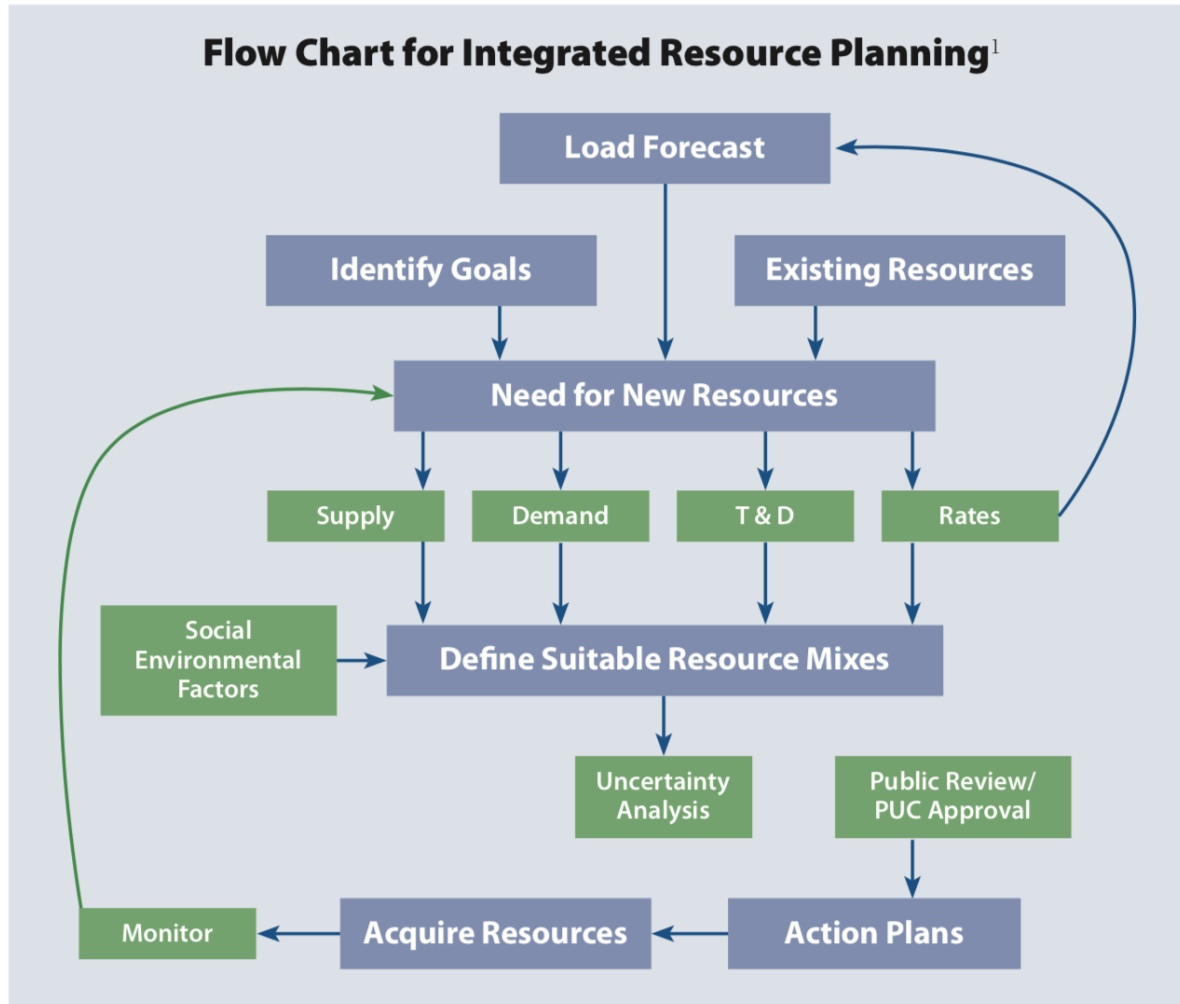


Integrated Resource Planning

An integrated resource plan, or IRP, is a utility plan for meeting forecasted annual peak and energy demand, plus some established reserve margin, through a combination of supply-side and demand-side resources over a specified future period.

- If correctly implemented, IRP locates the lowest practical costs at which a utility can deliver reliable energy services to its customers.
- IRP differs from traditional planning in that it requires utilities to use analytical tools that are capable of fairly evaluating and comparing the costs and benefits of both demand- and supply-side resources.

IRP Process



Reference: *Integrated Resource Planning for State Utility Regulators*.
Available at: <http://www.raonline.org/document/download/id/817>

Integrated Resource Planning in PR

- PR and Federal laws establish “consistency with the approved IRP” as a key threshold for utility and third-party actions in Puerto Rico
- 2015 IRP (Modified version approved in 2016) is still the controlling document
- PREB issued new IRP rule after the first IRP, to be more explicit about exactly what is required for IRP
- PREB and PREPA both recognize that a new IRP is necessary for the transforming island and a post-hurricane environment

2019 Integrated Resource Plan

- PREPA filed a version in February that PREB ruled was not in compliance with the regulation
- PREPA filed a new version in June; PREB is now evaluating it for compliance
- Expect examination of the IRP to take place over the second half of 2019
- Goal is to have an approved IRP that is high quality and reflects the island's needs as soon as practicable, so that subsequent actions can be judged against an up-to-date plan
- June draft evaluates options that are consistent with Act 17's renewable energy and energy efficiency policies
- PREPA proposes investments to allow segmentation of the PR grid into “minigrids” so that critical and priority loads will have resilient local electric supply in the event of catastrophic hurricane

Energy Efficiency and Demand Response Rules

- PREB is developing rules to implement Act 17's policies on energy efficiency and demand response
- Building from the Third-Party Administrator approach already described in the IRP rules
- Expects to release rules and implementation approach for public comment shortly, with the objective to have robust programs in place starting in 2020

Thank You

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