PR100: Puerto Rico Grid Resilience and Transition to 100% Renewable Energy

Public Launch Event
February 16, 2022

National Renewable Energy Laboratory
Argonne National Laboratory
Lawrence Berkeley National Laboratory
Oak Ridge National Laboratory
Pacific Northwest National Laboratory
Sandia National Laboratories

Opening Remarks

Director Martin Keller
National Renewable Energy Laboratory

Secretary Granholm
U.S. Secretary of Energy

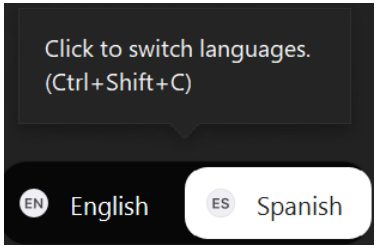
Administrator Criswell
Federal Emergency Management Agency

Agenda

1. **Introductory Remarks**
   - U.S. Secretary of Energy Granholm
   - NREL Lab Director Martin Keller
   - FEMA Administrator Criswell
2. **Study Background and Context**
3. **Community Perspectives, Part 1**
4. **Study Overview**
5. **Community Perspectives, Part 2**
6. **Q&A**

Housekeeping

- Toggle to Spanish for live interpretation.
- American Sign Language interpretation is provided.
- Audio and video are muted for participants.
- Ask questions in the Q&A. We will answer some in writing and discuss other questions at the end.
- Written responses to all questions will be provided after the event.



Note: Today's event is being recorded.

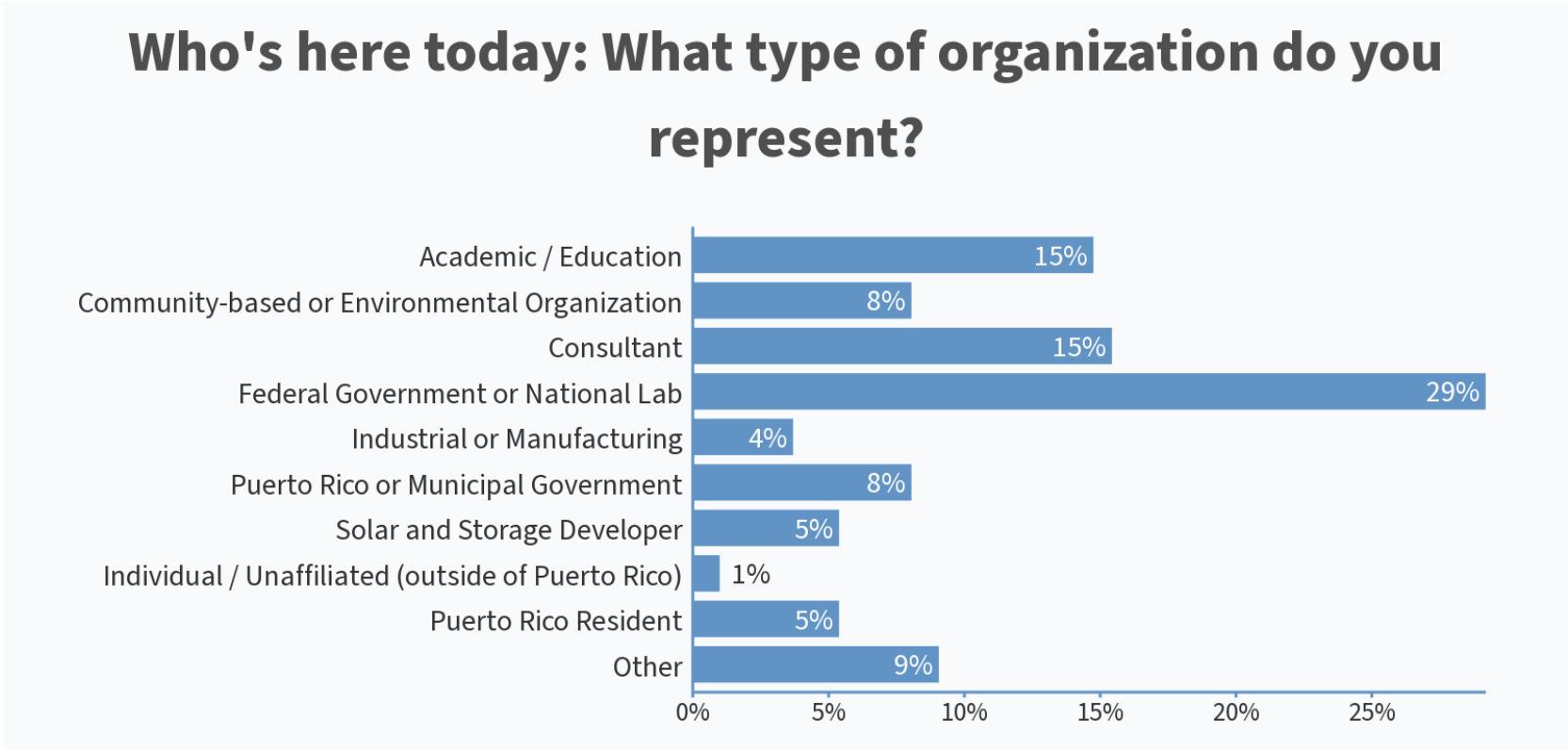
Poll Question #1

Click link in the chat.

Who's here today: What type of organization do you represent?

- Academic / Education
- Community-based or Environmental Organization
- Consultant
- Federal Government or National Lab
- Industrial or Manufacturing
- Puerto Rico or Municipal Government
- Solar and Storage Developer
- Individual/Unaffiliated (outside of Puerto Rico)
- Puerto Rico Resident
- Other

Poll Results



Background and Context

Marisol Bonnet

Recovery Coordinator for Puerto Rico

U.S. Department of Energy

Energy Sector Recovery: DOE's Role

Interagency Agreement with FEMA

DOE and its national laboratories will provide support to:

1. Conduct **technical analyses and modeling** to support the successful interconnection, integration, and operation of federally funded distributed and utility-scale energy generation on the PR grid system;
2. Assist in **planning to meet performance goals** designed to enhance the resilience of the power system, including review of technology types and sizes along with optimal dispatch schedules;
3. Develop and review **feasibility studies, RFPs, and responses** for federally funded projects identified to support the resilient recovery of the PR power system.

Energy Sector Recovery: Funding Sources

FEMA Hazard Mitigation Grant Program	FEMA Public Assistance	HUD CDBG–Disaster Recovery: Electric Grid	Other HUD CDBG-DR and CDBG-MIT disaster assistance programs
Amount: **$832.5M** Purpose**: Improve the resilience of disaster-damaged or undamaged facilities.** Recipient: **Central Office for Recovery, Reconstruction and Resiliency (COR3)** Subrecipient: **PREPA (and LUMA as an agent)**	Amount: **$9.5B** Purpose**: Restoration and hazard mitigation for disaster-damaged public utilities.** Recipient: **Central Office for Recovery, Reconstruction and Resiliency (COR3)** Subrecipient: **PREPA (and LUMA as an agent)**	Amount: **$1.9B** Purpose: **Unmet needs after FEMA funds, insurance, and other federal or private sources are accounted for. Mitigate risks and improve resilience, sustainability, and financial viability for electrical power systems.** Recipient: **Puerto Rico Department of Housing (PRDOH)** Subrecipients: **Grantees of PR DOH Grant Programs, including local agencies, authorities, trusts, and governing boards; municipalities and local governments; private, for-profit entities; nonprofits, and homeowners.**	**Community Energy and Water Resilience Installations ($300M):** Support resilient design and improvements that incorporate modern technology for life-sustaining purposes. R3 eligible. **Community Energy and Water Resilience Installations ($500M):** Same as above, but from CDBG-MIT with broader eligibility **City Revitalization Program ($1.29B):** Funding directly to municipalities for repairs of urban centers

Federal Policy

Executive Order 14008: Tackling the Climate Crisis at Home and Abroad

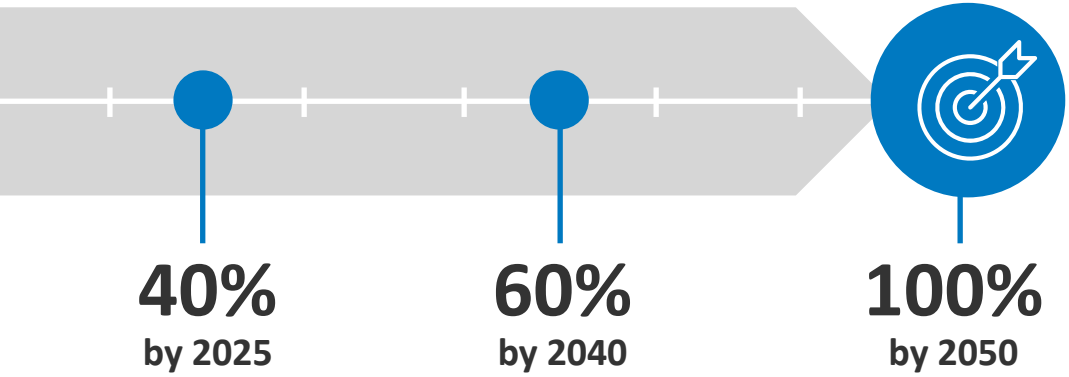
Pursue green recovery efforts, initiatives to advance the clean energy transition, sectoral decarbonization, and alignment of financial flows with the objectives of the Paris Agreement, including with respect to coal financing, nature-based solutions, and solutions to other climate-related challenges.

EO 13990: Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis

To listen to the science; to improve public health and protect our environment; to ensure access to clean air and water; to limit exposure to dangerous chemicals and pesticides; to reduce greenhouse gas emissions; to bolster resilience to the impacts of climate change; and to prioritize environmental justice.

Act 17 2019 Puerto Rico Energy Public Policy Act

PREPA is required to procure the following portion of its power needs through renewable energy:



Other requirements:

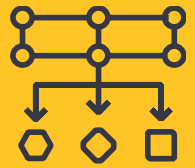
- **Reduce energy use by 30%** by 2050
- **Replace 100% of public lighting with LED** by 2030
- **Eliminate coal-fired generation** by January 1, 2028
- **Comply with the Integrated Resource Plan** approved by the Puerto Rico Energy Bureau (PREB)

2020 Integrated Resource Plan

- **Retirement of a significant number of oil-fired thermal units** in the next 5 years:
  - Palo Seco 1, 3, and 4
  - San Juan 7, 8, 9, and 10
- **Retirement of Aguirre diesel-fired Combined Cycle Units** 1 and 2 by 2030
- **Limits the development of new gas turbine peaking units** to 81 MW
- **Integrate renewable generation projects** to achieve RPS in Act 17

Procurement Tranche	Solar PV or Equivalent Other Energy (MW)		4-hr Battery Storage Equivalent (MW[1])	
	Minimum	Cumulative	Minimum	Cumulative
1	1000	100	500	500
2	500	1500	250	750
3	500	2000	250	1000
4	500	2500	250	1250
5	500	3000	125	1375
6	750	3750	125	1500

More Changes Ahead



Demand Response Programs

Vegetation Management Plan

Interconnection Regulations

Performance Metrics

System Remediation Plan

Distribution System Planning

Wheeling Regulation

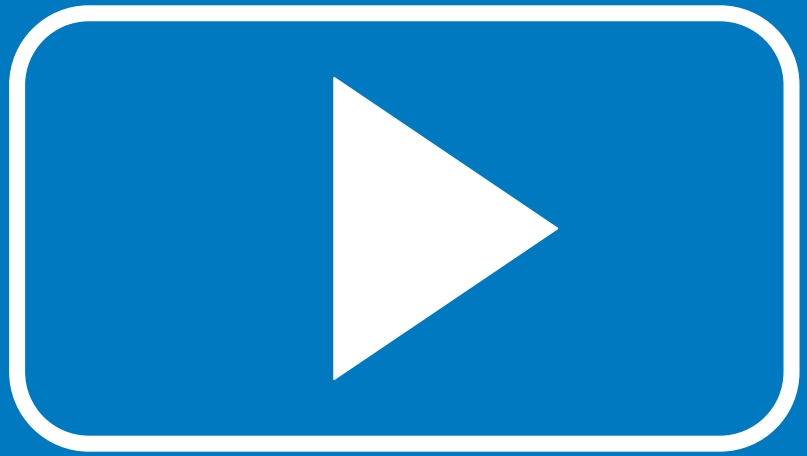
Energy Efficiency Programs

Electric Vehicles (EVs)

Complex Questions Require Complex Analyses

- What are possible pathways to achieving Puerto Rico's 100% renewable energy target by 2050?
- Does reaching 100% mean big changes locally—like building new transmission lines?
- If Puerto Ricans adopt energy technologies like EVs and air-conditioning, how might that change total demand for electricity?
- How can Puerto Rico make sure that the new system is resilient under extreme weather events?
- What about impacts on jobs and the local economy?
- And what might all this cost?

Community Perspectives



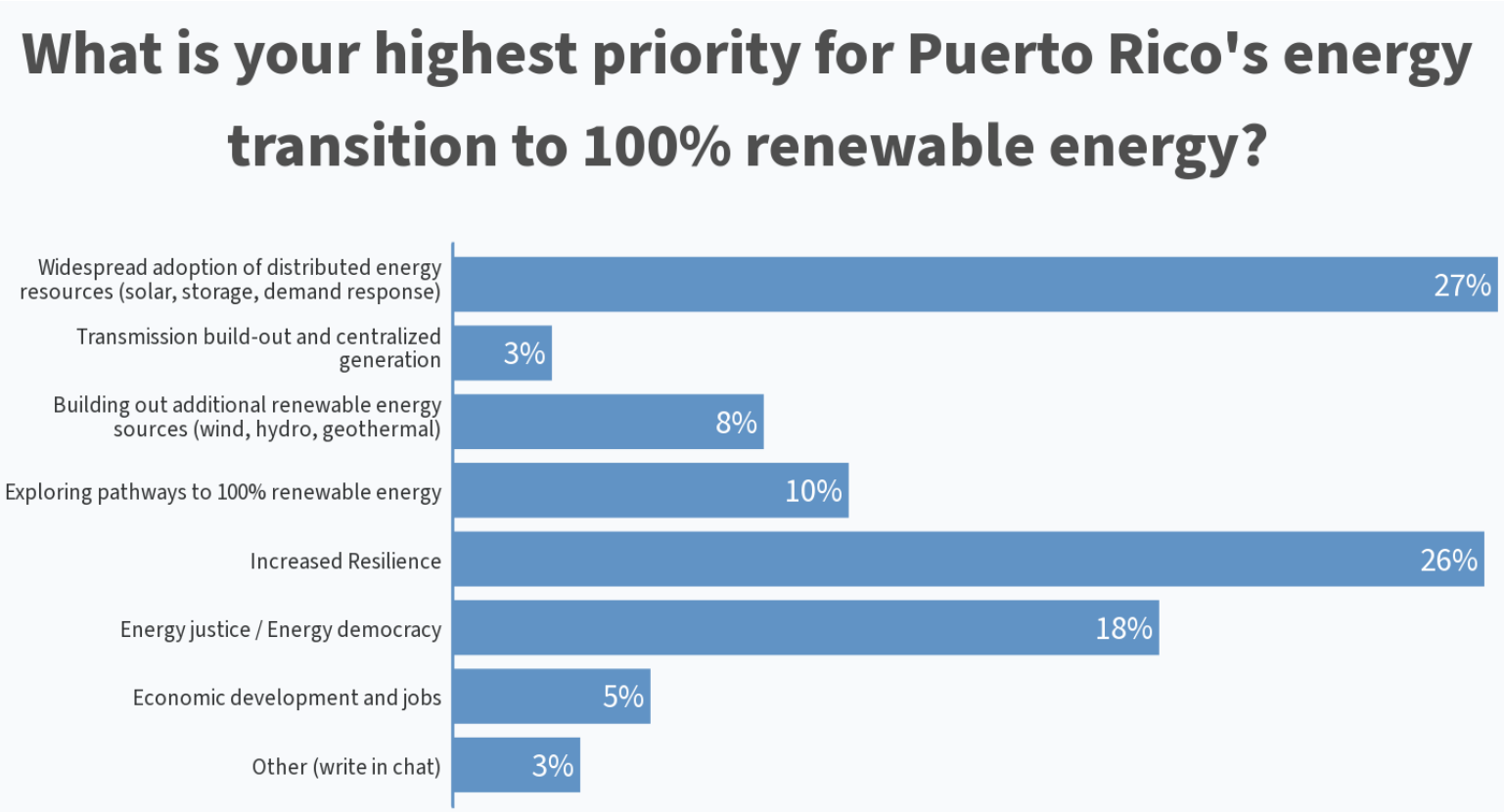
Poll Question #2

Click link in the chat.

What is your highest priority for Puerto Rico's energy transition to 100% renewable energy?

- Widespread adoption of distributed energy resources (solar, storage, demand response)
- Transmission build-out and centralized generation
- Building out additional renewable energy sources (wind, hydro, geothermal)
- Exploring pathways to 100% renewable energy
- Increased resilience
- Energy justice/energy democracy
- Economic development and jobs
- Other (write in chat)

Poll Results



PR100 Study Overview

Murali Baggu
Laboratory Program Manager for Grid Integration

National Renewable Energy Laboratory

Robin Burton
Strategic Energy Analysis

National Renewable Energy Laboratory

Nate Blair
Distributed Systems and Storage Analysis

National Renewable Energy Laboratory

Matt Lave
Renewable and Distributed Systems Integration

Sandia National Laboratories

Project Team

PR100 Study

PR100 is a comprehensive analysis of stakeholder-driven pathways for Puerto Rico to achieve its goal of 100% renewable energy by 2050.

Key Activities

- Community Engagement
- Scenario Generation and Modeling
  - Demand Projections
  - Distributed and Central Generation
- Impact Analysis

Key Considerations

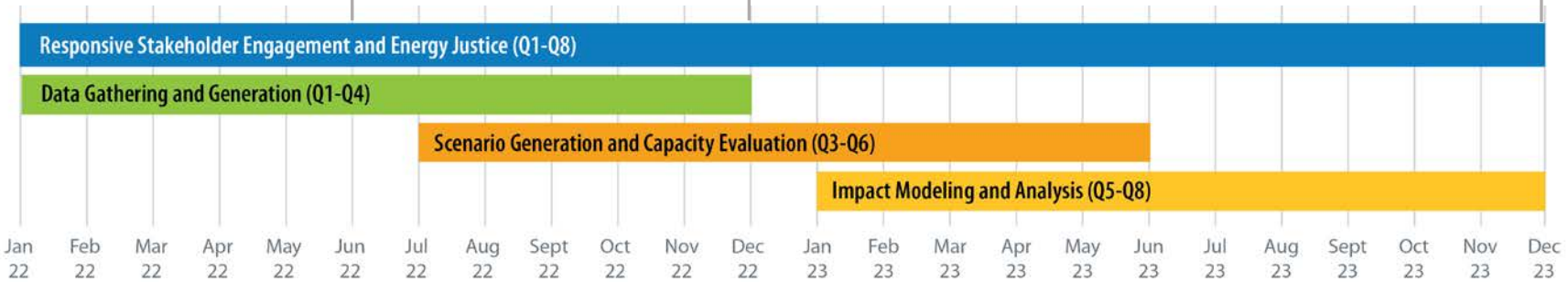
- Energy Justice – Equitable Access to Planning Process and Benefits
- Affordability, Reliability, and Resilience
- Climate Risk Assessment
- Economic Impact and Jobs

Project Timeline

6 Months (by June 2022) **:**
- **Established stakeholder group** meets monthly to inform scenarios
- **Four initial scenarios** to achieve Puerto Rico's goals

Year One (by December 2022):
- **High-resolution data sets** for wind and solar resource for 10 years
- **Three feasible scenarios** with high-level pathways

Year Two (by December 2023):
- **Comprehensive report** and web-based visualizations
- **Outreach** and public engagement



Community Engagement and Energy Justice

- How are we planning to engage the community in the PR100 study?
- How will we incorporate principles of energy justice throughout the study?

Energy justice: Enlisting broad community participation to reflect local priorities and model pathways to equitable distribution of benefits and burdens associated with the energy transition

Steering Committee

Steering Committee guides technical assistance. Engagement is essential for generating scenarios that are reflective of existing or anticipated policies for potential funding and implementation.

Members include:

- Federal recovery funders: FEMA, HUD
- Local public implementers: PREPA, LUMA, PREB, PRDOH, and COR3

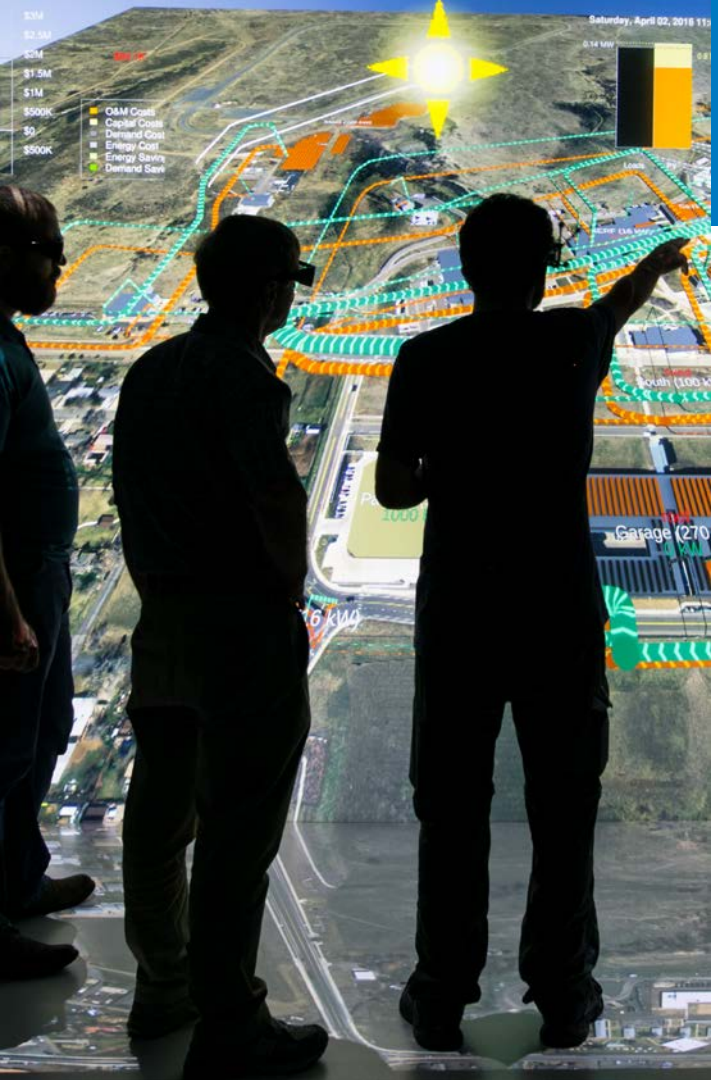
Advisory Group

Advisory Group (AG) provides input to DOE & national labs. AG members will be engaged early for input on scenario formulation and data gathering. Working groups will provide input to modeling and impact analysis tasks throughout the study.

Represented sectors include:

- Academia
- Business community and professional associations
- Community-based and environmental organizations
- Generation owners, solar and storage developers
- Municipalities; Puerto Rico and federal government agencies not represented on steering committee.

Additional opportunities for public engagement and input throughout the study. Sign up for updates at https://bit.ly/3BrO2Xk

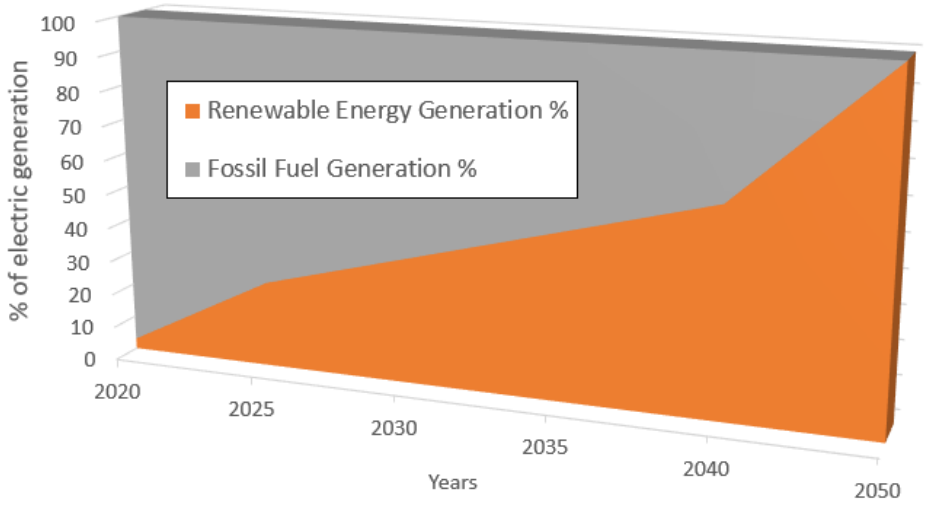


Scenario Modeling

- What is a scenario, and what does scenario modeling involve?
- How are we planning to incorporate multiple inputs to achieve 100% renewable energy?

Scenario Modeling: What Is a Scenario?

A scenario is a possible pathway toward a clean energy future driven by a set of inputs.



Variable Scenario Inputs (examples):

Energy Demand

How will demand for electricity change over time?

- Economic inputs
- Expected energy efficiency and EV adoption
- Value of backup power

Energy Supply

How will demand be met with 100% renewable energy?

- Distributed solar and storage
- Large scale solar, wind, etc.
- Public Policy (like Act 17)
- Resiliency requirements
- Transmission cost

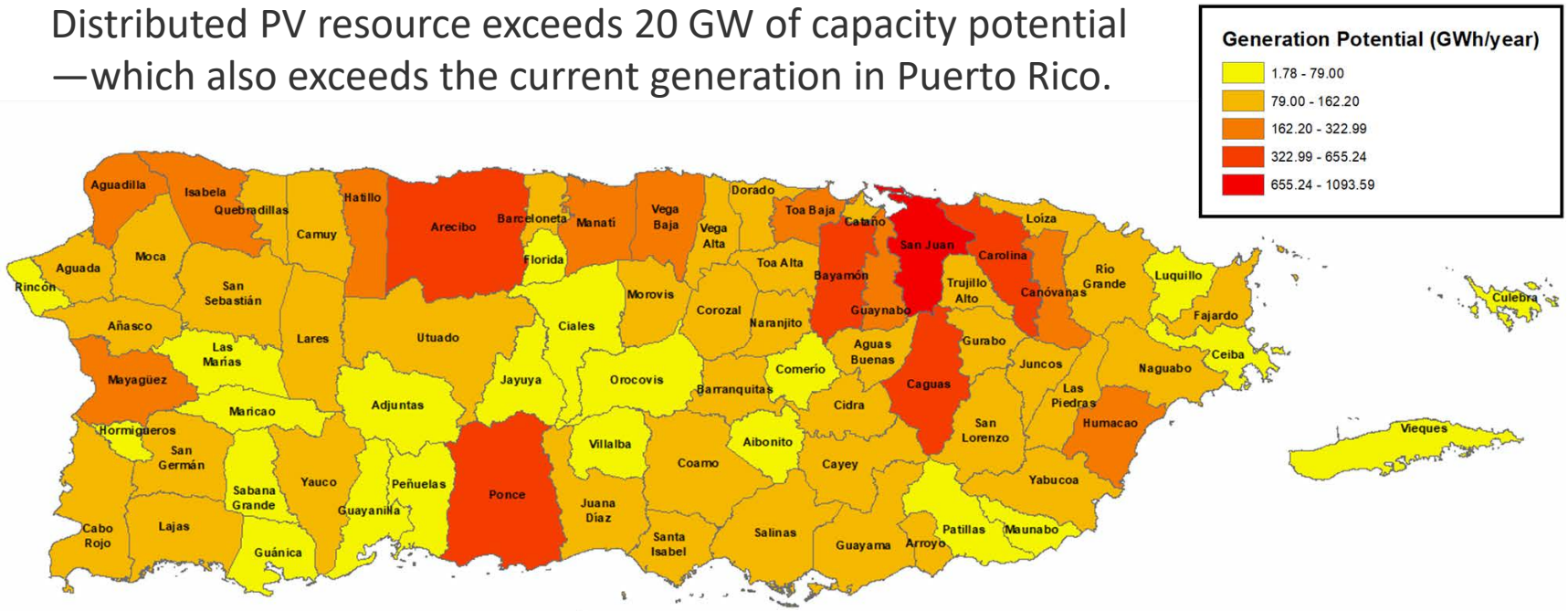
Utility-Scale Solar PV Development Potential

NREL Analysis of Utility-Scale Solar PV Development Potential Found Greater Than 20 GW Total

Sources: Grue at al. (2019), Solar Resource and Technical Potential Modeling (NREL Presentation); Grue et al. (2021), Quantifying the Solar Energy Resource for Puerto Rico (NREL Technical Report)

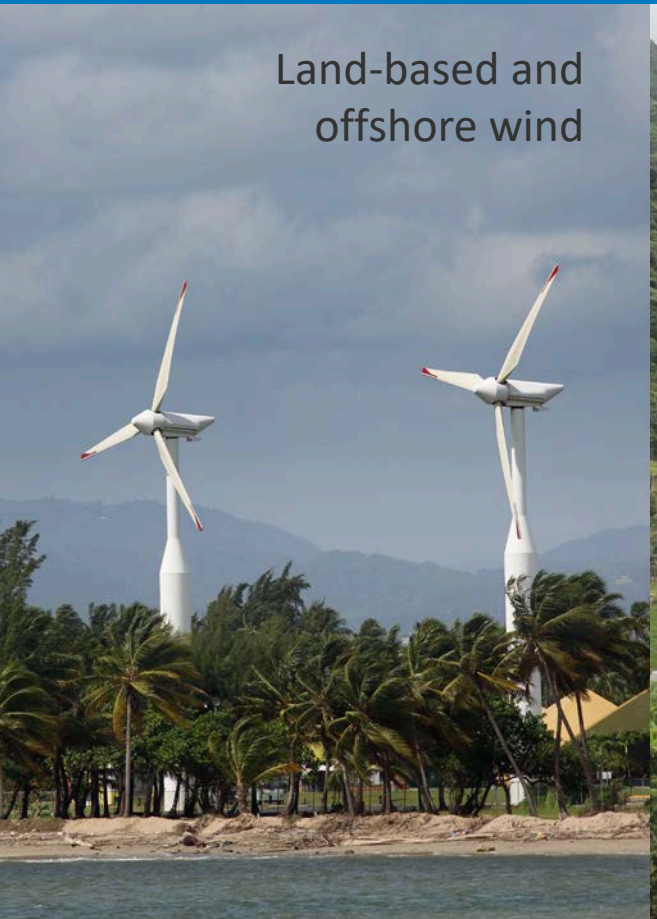
Residential Rooftop Solar Potential by County

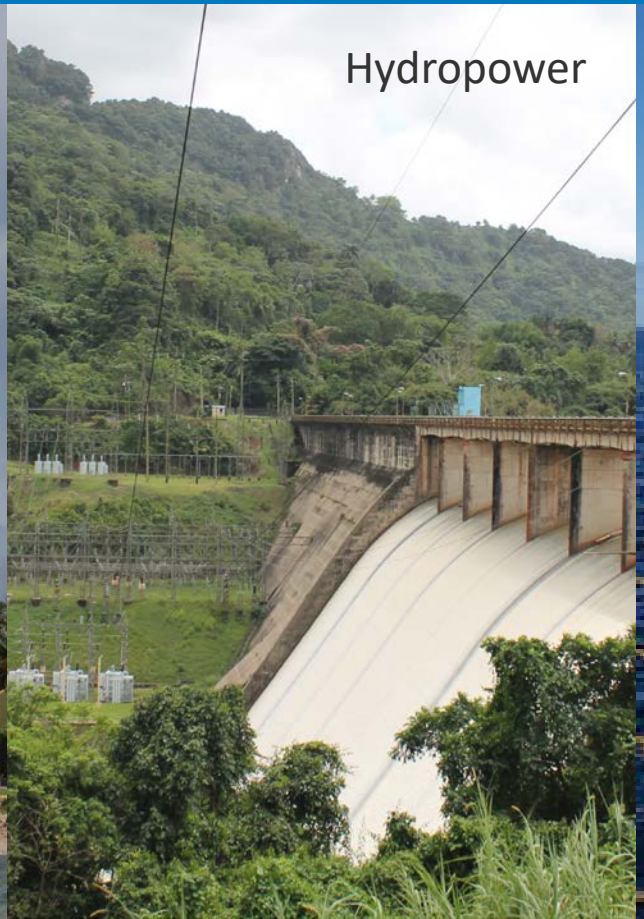
Distributed PV resource exceeds 20 GW of capacity potential —which also exceeds the current generation in Puerto Rico.



Sources: Visualization generated using NREL's Distributed Generation Market Demand (dGenTM) model; Residential rooftop solar PV potential for Puerto Rico from Mooney and Waechter (2020), Puerto Rico Low-to-Moderate Income Rooftop PV and Solar Savings Potential

Other Generation Options





Demand Impacts

- The electric usage on the island from estimates in the 2019 IRP.
- The electric usage will be reduced by energy efficiency improvements.
- The electric usage will be increased by modeled electric vehicle adoption.
- The electric usage will be reduced by adoption of distributed solar and storage.
- The remaining (net) electric usage will be met by large solar, wind and other RE sources.

Impact Analysis

- How will we evaluate climate, resilience, and economic impacts?

Impact Analysis: Weather to Grid Consequences
Transmission, Distribution, and Community Resilience Analysis

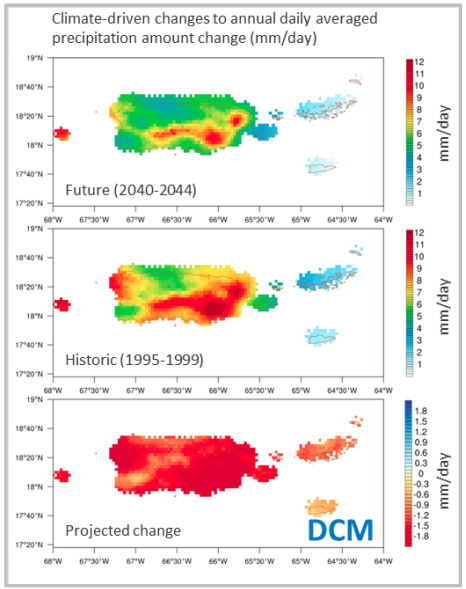


Image courtesy of ANL

1. Downscaled climate model

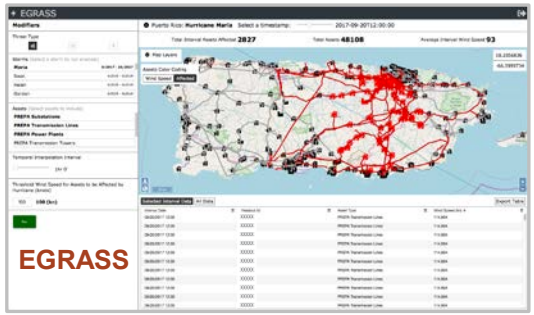


Image courtesy of PNNL

2. Asset's failure models

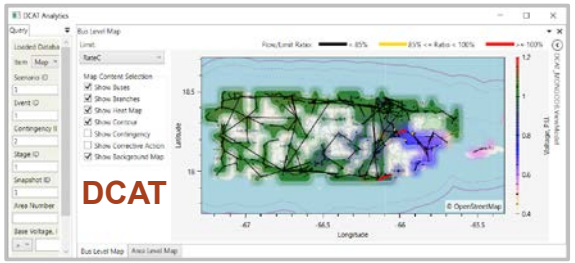


Image courtesy of PNNL

3. Transmission resilience

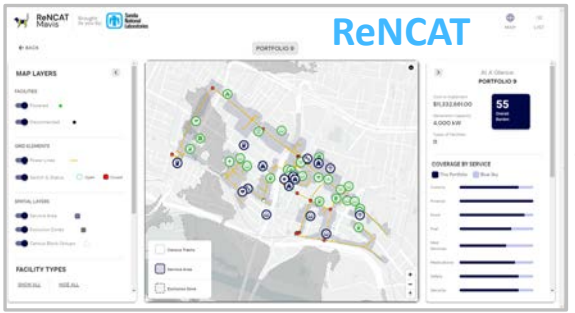
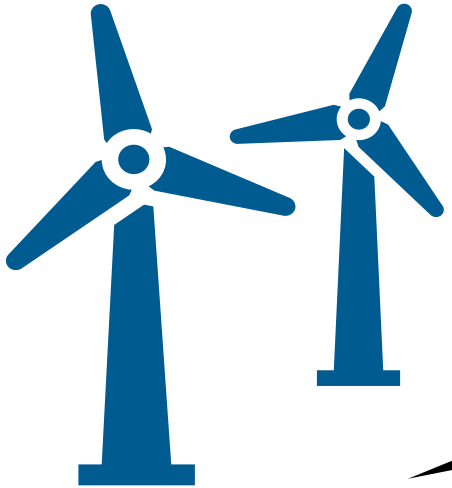


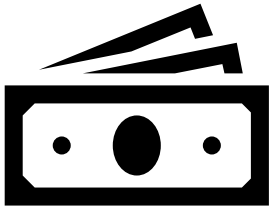
Image courtesy of Sandia

4. Distribution resilience

Impact Analysis: Economic Development and Jobs

Wind Energy's Economic "Ripple Effect"





Construction phase = 1-2 years
Operation phase = 20+ years

Source: Adapted from NREL's JEDI Factsheet

Poll Question #3

Click link in the chat.

What is your vision for Puerto Rico's energy future?

Poll Result: What is your vision for Puerto Rico's energy future?

A reliable energy system that is equitable - addressing the needs of the whole population, especially sensitive to the share below the median income level

Microgrids

community involvement for demand size management support for 100% renewable

Energy Democracy

GD plus EVs

How we will provide constant energy through another hurricane. How we are going to dispose of hundreds of thousands of solar panels and batteries at the end of their life cycle.

Energy Assurance Plan Integrated with Efforts

Virtual Power Plants

Emphasis on quality training of the needed workforce for maximum distributed impact

Virtual Power Plants

forecasted aided grid modernization supported by storage and renewable

Resiliency Island Wide

A rejection od spending $2 billion per year on imported fossil fuel insuring stranded assets continuing and inter generational debt!

Maximizing local workforce participation

More commint from local agencies ie govertmet AEE LUMA to achheve goal fast

500 thousand families with rooftop solar power in 5 years

Energy availability that can nourish economic development and investment.

Electric rates that offer equity to rate payers

Utilizing the renewable transformation to energize the cultural evolution that is needed to reduce use and increase efficiency

Affordability, Dependability and environmentally clean system that will contribute to the economic development of this island.

Proper funding for recently created Green Energy Trust

Showcase to the world

Micro Grids

100% RE, Efficiency, Resilience, Self help

Create a zoning framework to have a tangible view

Clean Energy

Microgrids with renewable, efficiency and chip energy

Equitable, resilient, and 100% distributed renewable energy before 2050.

Energy Storage Systems and overcapacity storage

Access to renewables for low and moderate income communities

100% Solar and other natural energy sources from/for a tropical paradise

100% energy equity... access to energy as a basic human right.

access and benefits for LMI communities (low and moderate income)

flexible and adaptable

Contracting opportunities

No more energy company monopoly

Clean energy jobs for local residents!

Communities that are able to chart energy pathways that support independent, autonomous, thriving local futures and economies.

State of the art technology

access for the poor

Social accountability to the population by the utilities.

Smart Grid

a system like Power Utility

Affordable, clean, and resilient energy that helps to promote Puerto Rican jobs, science, technology, and labor!

Infrastructure that avoids creating unbalances o land use planning.

Resilience & Sustainability

free of fossil fuels and pollution

Open and transparent energy planning

Smart Grid integration!

Exploits endogenous resources (aka sun), as opposed to nuclear, or other technologies suitable for other geographies around the world.

An adaptable system that supports the economy of different communities

Focus on implementation of clean energy

a System USA like Power Utility

Affordable, clean, and resilient energy that helps to promote Puerto Rican jobs, science, technology, and labor!

Infrastructure that avoids creating unbalances o land use planning.

Resilience & Sustainability

Access to renewables for low-moderate income communities

100 percent solar

Poll Result: What is your vision for Puerto Rico's energy future?

Farmland nor natural protected areas should not be compromised

Reliable, clean, and affordable so we can focus on building a better future for us!

energy that does not require imports of fuels and can be built with local manufacturing in the long term

To have several ways to generate energy, not just one or two. Never doing anything that could damage habitats or human lives

A safe, healthy haven for economic prosperity and inclusive wealth creation

nontaxable solar energy use

Energy as an essential public service and access through rooftop solar plus storage, energy efficiency and other alternatives to centralized fossil-fired generation.

resilient, reliable, and equitable

Consideration of high-temperature superconducting transmission lines - minimal habitat destruction and maximum isolation from extreme weather

Proper funding for recently created Green Energy Trust

Offshore energy and solar energy focus

Community Center Energy Access

Open electric system with more producers of energy prosumers of all kind

Solar Loans For the Credit-less

Leapfrog vs constantly playing catchup

Resilient, reliable, and renewable energy

No apagones

No nuclear power

Renewable Energy Communities

Affordable, clean, and resilient energy that helps to promote Puerto Rican jobs, science, technology, and labor!

Reliability.

Energy Justice to save lives

prsolarmap.org is the vision statement a transparent and public process with a outside board of national experts to vet the process

100% distributed roof solar with conservation and agricultural lands protection

vision must be lead by Puerto Ricans

First, stabilize the existing power generation and grid with the ability to be augmented using alternative energy like solar by seeking funding from HMGP and BRIC for microgrids. Make sure that the wind fields and storm surge and riverine flooding is well understand as this poses risk to any asset whether conventional or alternative energy assets.

resilience

explore ocean energy options

Rational transition based on real needs and viable solutions (not picking winner and loser up front)

Major new economic development

Development of a grid and diverse renewable generation, traditional generation and energy storage resources that effectively integrate the resources and enhance resiliency and reliability at a cost that is not prohibitive. This last requirement will be the most difficult.

Resilience

Resilient to post 2- and 3-C climate change. Can't fall short.

renewable energy, storage, energy efficiency modeled on a community based leve and on the built environment (not using agricultural and ecological sensitive lands for construction of solar pv farms)

distributed rooftop solar

Equitable

High impact projects to support communities.

To have a state-of-the-art system compared to the most advanced cities: robust, reliable and smart.

solar on every roof

distributed wind!

Energy just

A Carbon Neutral and Fuel Oil Free Country.

storage needs for energy and resilience

Community Solar

protection of natural resources and agricultural lands

Engine of economic development for local populations

At consumer point energy generation.

Distributed generation as the major component of energy generation.

Solar everywhere, with some wind

A PR where energy costs are dramatically reduced thanks to renewable energy facilities clustered in geographic areas where it makes sense.

Resiliency and consistency

a safe, reliable, and affordable service that Puerto Rico's residents and businesses deserve.

Focus on implementation studies for clean energy

Local minigrids and energy cooperatives.

Just!

Efficient, reliable, and sustainable energy services and lower costs on energy.

To be wise and take advantage of the renewable energy sources on and around the island.

Generates jobs for small and medium business, not just large multi-nationals.

Poll Result: What is your vision for Puerto Rico's energy future?

a resilient grid that can withstand Cat5 hurricanes, magnitude 8 earthquakes, and large floods
social and economically "fair"
Clean, affordable, and resilient
A model for all states
A path to equity
Creation of a modernized economic efficient power system capable of withstanding the climate change impacting PR.
climate justice
Enough energy at a reasonable cost without environmental externalities.
Clean, Resilient, Corruption free.
Solid EV infrastructure
Affordable and Resilient Energy for all
reduce dependency on the electrical grid, use renewable energy sources, lower energy rates, and reliable energy system.
A global leader in clean, resilient energy
Resilient, renewable, fair, and avoiding conflicts with the protection of other natural resources
More resielient, more jobs and lower costs
100% renewable, 100% reliable, 100% just and fair, much more affordable and sustainable.
Equitable
100% renewables + resilience from all hazards and threats
resilient, robust, reliable
The study seems incomplete by not including all possible energy sources.
Climate Change Resilient PR
subsidized residential solar systems for poor people
I wanted an accesible and reliable Energy for Puerto Rico.
Learn from prior experience
100% renewable but also resilient to post 2- and 3- degree Celsius climate change. We can't fall short!
Showcase to the Nation and the World
Equitable
One that is most climate-resilient overall (e.g., to the most powerful storms), most socio-economically valuable (reducing the ultra-high energy burden families and business face), and reduces dependence on fuel imports.
Transparent Energy Invoicing
Hydro power.
Combination of energy democracy with renewable technologies to reduce fossil fuel dependence and imperial control by banks and oil companies and corrupt politicians
Distributed democratical energy production and consumption.
Rates must come down to $0.20 or less KWh
A resilient, reliable and renewable sustainable for everyone.
Every building with capacity to host a solar + storage system will have one so that power outages never again claim lives.
Independence
Act 17-2019 Compliance with existing federal budget.
Utilizing vieques and culebra as projects for resilient and renewable models.
Economic and reliable power system
to be a model for resilient clean energy worldwide
Adoption of EV cars
a Sustainable corporation
Quality of life improvements for everyday citizens
Resilient, Economic, and sustainable
Bold model for others to follow
Demonstration how distributed renewable resources can replace the traditional central power plant model.
Affordable energy
Just and Resilient
Maximizing our resources, a benefit-conscious society
Solar at home level
Cheaper Cost of Energy
Accessible
Citizen participation
sustainable revenue capability
Decentralized distributed roof-top solar generation with BESS for every residence. Consider wind generation if it proves to be cost-effective.
Mindful or waste generation (e.g. recycling, repurposing)
Clean, reliable, and flexible - a model for the Caribbean and abroad.
Microgrids, decentralized system, cleaner, cheaper system.
Mostly distributed rooftop solar generation with renewable base load source like ocean thermal
clean energy
Energy justice for everybody having solar plus storage in their roof (residential) and commercial/industrial microgrids.
Modern, Renewable, microgrids, and sustainable
100% renewable energy is the answer for all countries
resilient, renewable, affordable and accessible!
Competitive and streamlined for end users and developers
Resilient economy powered by local, green jobs.
Reliable Resilient and Scalable mix of energy generation assets
Solar panels on all grond houses. All hydro plants working.
Rooftop and community solar
"A resilient system that is accessible to all
100% renewable energy, no more fossil fuel dependability
low-debt options for energy consumers
Robust!!!!!!!!!!
100% renewable - that would be amazing!
Transition to large scale and distributed REs by 2050
Reliable energy for all

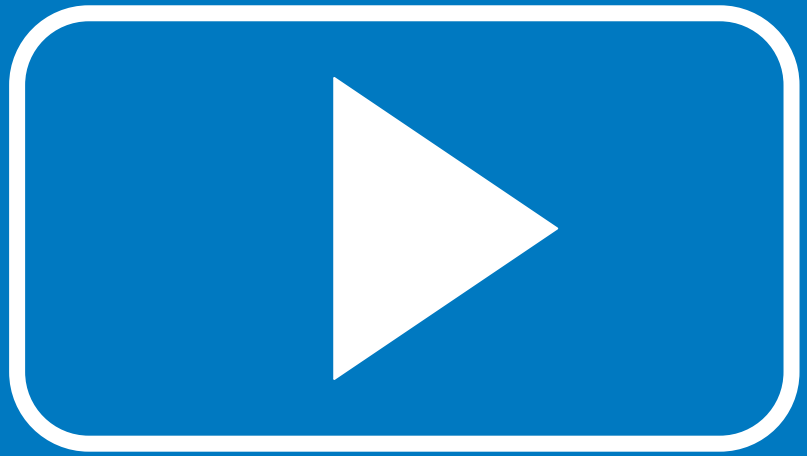
Poll Result: What is your vision for Puerto Rico's energy future?

Catalyst for economic and social transformation --> energy justice
If these is handled by PREPA and some interest groups will be done by Century 25
Large scale equitable adoption of Distributed PV and Storage
renewable energy
A clear path into compliance with Act 17
Hydropower
A Puerto Rico for Puerto Ricans
Offshore wind
EFFICIENCY, RESILIENCE ON OUR GRID
Inexpensive, always available energy that has zero impact on the world's carbon footprint
Robust and reliable
Electricity supply to fuel economic growth
Geothermal district heating/cooling systems!
Totally new green grid
self resilient grid modernization supported by storage and various renewable sources
self generation using PV + BESS
Cheap energy
Renewable, independent, resiliency energy.
clean energy
Reliable and contributing to community health and thriving
Maximize distributed PV
100% Renewables by 2050...Really!
World leading renewable integration.
Social and economic equity
Radical Power Decentralization for Energy Justice with Rooftop Solar Power
A resilient, lower cost and more reliable system, based on decentralized clean energy resources
Wind, solar, waves

Clean Energy for Everybody 👌
clean, just and resilient
Consistent energy
affordable and resilient energy
reliable, sustainable and economically viable
clean energy economic development
A resilient, distributed energy system that maximizes renewable energy.
Offshore wind
OTEC with associated water use.
Solar, Decentralized, and Distributed
As distributed and end-user-owned as possible
Energy democracy in a renewable and resilient way
Land reuse for solar energy!
A green energy paradise with robust economic development.
A solar system in small grids
decentrtalized, community focused, local automony
reliable, resilient, affordable, clean
Mini and micro grids
Resilient affordable energy that is reliable 24/7
Microgrids, rooftop solar, battery storage for all, resilient to hurricane damage
Distributed solar energy- providing cheap renewable energy for LMIs
Reduce emissions
Independent!!!!!!!!
Create independency and mixed of resources.
Reliable, clean and affordable.
reasonable price and consistent
Different sectors actively participating in planning
100% Energía Renovable
Modern controllability

100% renewable energy, energy resilience, job creation
Reliable energy.
Reliable just energy system with quick wins and not too much investments
mostly renewable, affordable, design to provide sustainable economic growth
transform existing infrastructure for future development
More solar and wind energy accessible to all residents
Reliable and safe
reliable, resilient, and equitable
energy independence
Consistent Availability
Reliability!
Equitable access
Reliable, sustainable, economical, equitable
Cheaper, clean renewable energy!
Distributed roof solar
100% renewable energy generation by 2040.
Example of how to quickly AND equitably transition to a clean energy future!
resilient and respectful of natural resources and historic, cultural resources
Renewables without government taxing it
Resilient & reliable electricity supply
Energy independence
Large scale equitable adoption of Distributed PV and Storage
Be an economic hub for blue economy using green energy
Sustainable, Resilient, Equitable
Robust grid
robust and reliable energy service for the island
Cheaper, dependable energy
New construction for growth

Community Perspectives



Q & A

- Please type your questions in the Q&A.
- Questions not answered during the webinar will be answered in writing after the event.

Contact Us

- Sign up for updates: https://public.govdelivery.com/accounts/USDOEELECTRICITY/subscriber/new
- For questions or our efforts in Puerto Rico, contact prprojects@nrel.gov.

Additional Resources

- **Recent Events**
  - DOE Press Release: DOE, DHS, HUD Launch Joint Effort with Puerto Rico to Modernize Energy Grid (February 2, 2022)
  - MOU among DOE, DHS, HUD and the Government Of Puerto Rico, Collaboration for the Recovery and Resilience of Puerto Rico's Energy Sector (February 2, 2022)
- **Web pages**
  - DOE: Puerto Rico Energy Recovery and Resilience
  - DOE: PR100 Study
  - NREL: Multilab Energy Planning Support for Puerto Rico

Thank you

www.nrel.gov

NREL/PR-6A20-82130

Dozens of talented researchers from DOE and the six participating National Laboratories will contribute to the PR100 Study. This presentation was authored by:

Robin Burton, Murali Baggu, Nate Blair, Jill Rhodes (NREL)
Marisol Bonnet (DOE)
Marcelo A Elizondo (PNNL)
Lawrence Paul Lewis (ANL)
Matthew Lave (Sandia)

This work was authored in part by the National Renewable Energy Laboratory, operated by Alliance for Sustainable Energy, LLC, for the U.S. Department of Energy (DOE) under Contract No. DE-AC36-08GO28308. Support for the work was also provided by the Federal Emergency Management Agency under Interagency Agreement HSFE02-20-IRWA-0011. The views expressed in the article do not necessarily represent the views of the DOE or the U.S. Government. The U.S. Government retains and the publisher, by accepting the article for publication, acknowledges that the U.S. Government retains a nonexclusive, paid-up, irrevocable, worldwide license to publish or reproduce the published form of this work, or allow others to do so, for U.S. Government purposes.