

SOLUTIONS FOR ENERGY TRANSFORMATION OF PUERTO RICO

PLEXOS[®] Summary

IRP Resource Modeling Software

February 28, 2024



Agenda

- Introduction
- PLEXOS® Overview
- PLEXOS® Modeling Phases
- Conclusion



The importance of PLEXOS® Modeling for Puerto Rico

The use of advanced modeling techniques will allow SETPR to gain insights into complex interactions within the energy grid, anticipate challenges and devise optimal strategies for sustainable development.

By using PLEXOS® modeling, decision-makers gain practical knowledge to tackle the complexities of energy planning, guaranteeing a strong, eco-friendly, and affordable power system for Puerto Rico.

This have the final objective of paving the way towards a brighter and more resilient energy future for Puerto Rico.



What is PLEXOS®?

PLEXOS® is an energy industry modeling tool used by utilities, regulators, and stakeholders to analyze energy markets.

PLEXOS® is a versatile and powerful tool capable of:

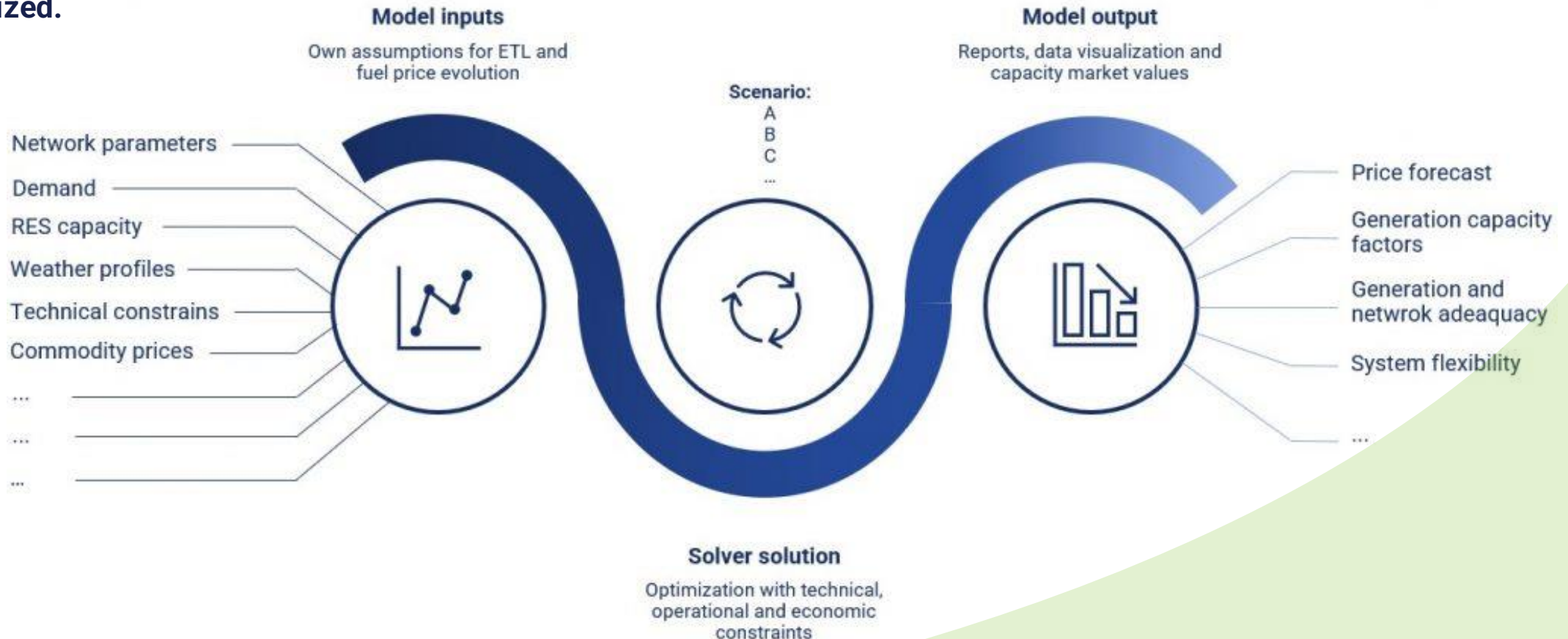
- Creating modules for modeling gas, water, and electric systems and their interplay.
- Analyzing an electric system over varying time frames (From decades to days)
- Determining optimal capacity expansions in the long-term, as well as generation on a 1-minute basis to respond to intermittent renewables.
- Allowing the user to create very customizable models and perform scenario analysis.



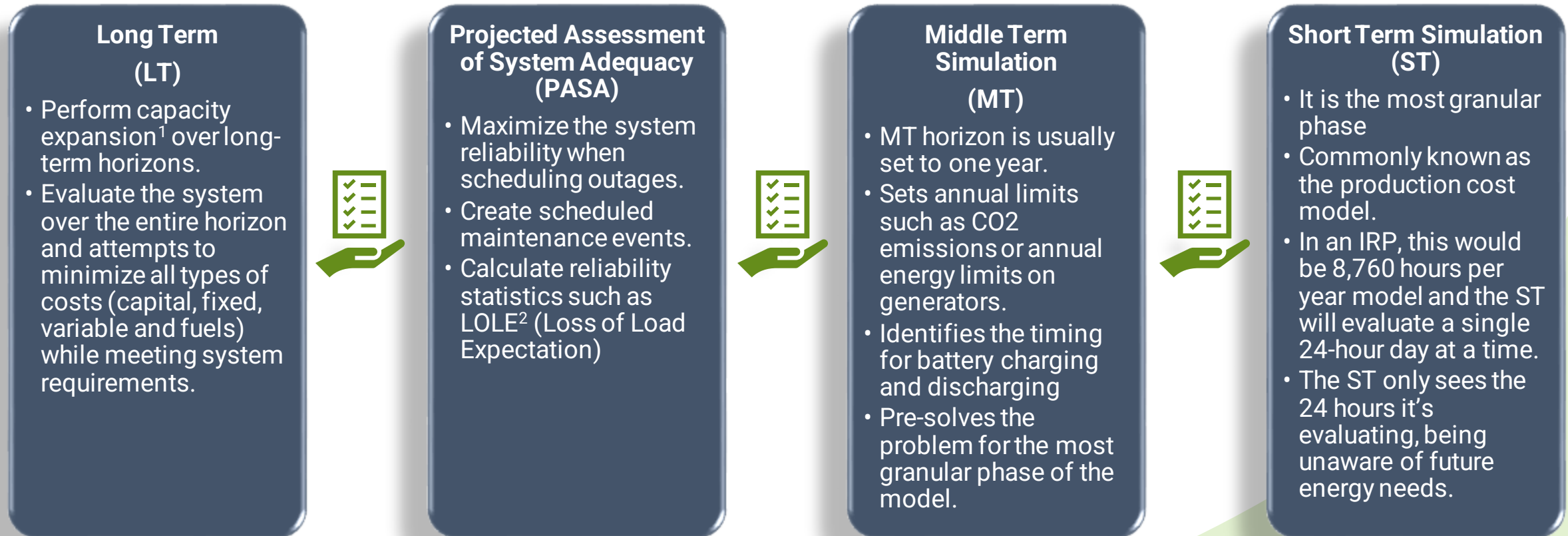
PLEXOS® Modeling Phases

PLEXOS® takes all the inputs to the electric model such as system electric demand, minimum reserves requirements, as well as all the generator characteristics and uses these constraints to develop linear equations to represent the system.

It then attempts to solve these equations simultaneously such that all the system requirements are met while costs are minimized.



PLEXOS[®] works by dividing modeling into phases. Each phase performs a “handoff” and passes its results to the next phase. Below is a brief description of the phases of the PLEXOS[®] models.

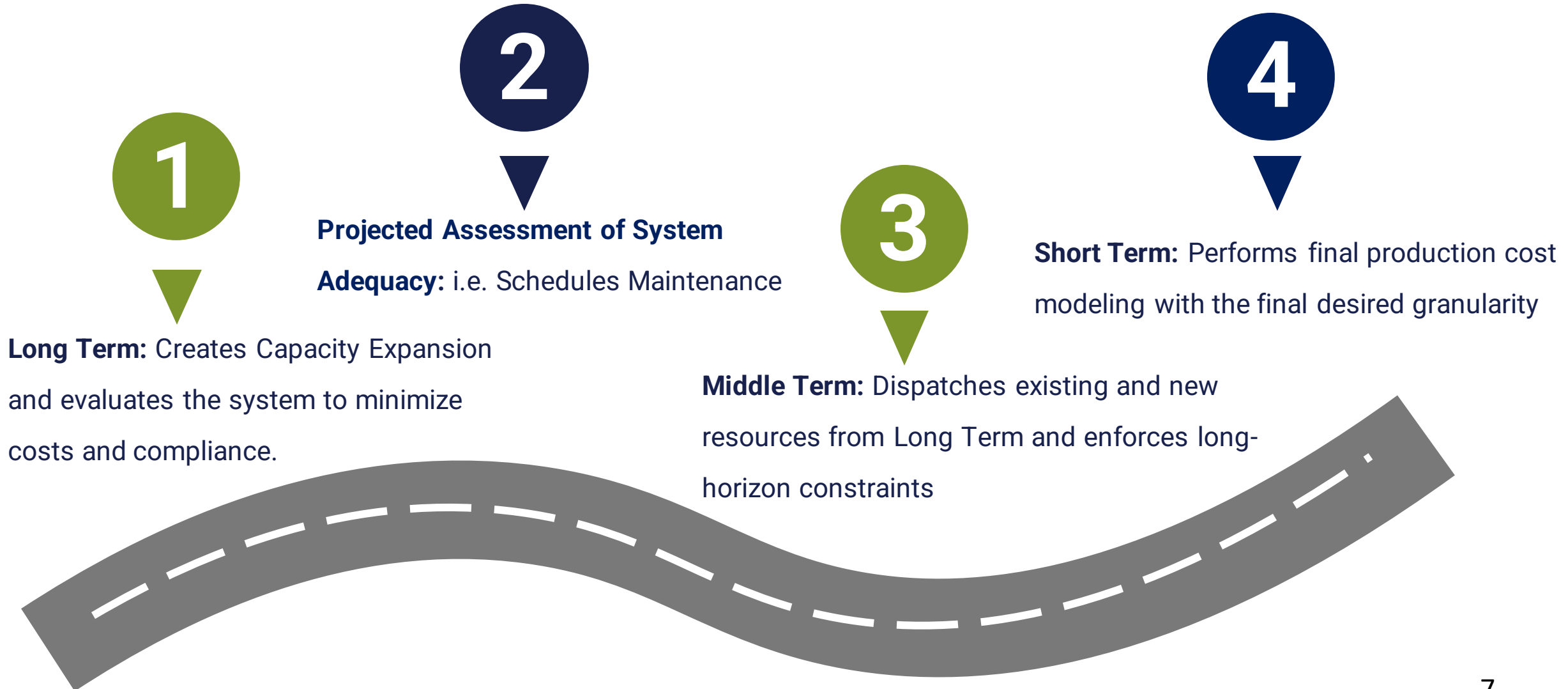


¹ Capacity Expansion refers to the problem of finding the optimal combination of new generation, generation retirements and transmission upgrades that minimize the total costs of the system over a long-term planning horizon.

² LOLE: Loss of Load Expectation

PLEXOS[®] Modeling Phases

PLEXOS[®] creates resource plans by dividing the modeling into four main tasks:



What is the value enhancement of this process for Puerto Rico?

- **Resilience Enhancement:** By simulating various scenarios, we can identify vulnerabilities, strengthen critical infrastructure and enhance disaster preparedness.
- **Renewable Integration:** Modeling facilitates the integration of solar, wind and other renewables to the grid. Through scenario analysis, we evaluate the impacts on system stability and optimize resource utilization.
- **Cost Optimization:** By modeling different investment options and operational strategies, we optimize capital expenditure, minimize operating costs, and deliver reliable electricity services at competitive rates,



Soluciones Energéticas para Transformar a Puerto Rico



Thank you!

Wednesday, May 29, 2024

