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November 8, 2022

MEMORANDUM

TO: Council Members

FROM: Tina Jayaweera

SUBJECT: Portland General Electric Virtual Power Plant

BACKGROUND:

Presenter: Franco Albi, Director Regional Integration, PGE

Summary: With the regulatory requirements to eliminate carbon-emitting resources and limited availability of transmission from where much of the new wind and solar plants are being sited, utilities are exploring how to enhance the value of demand-side resources to meet system needs. One example is Portland General Electric. As it is transitioning into a carbon-free electric utility, PGE is engaging a variety of available resources, particularly for energy storage. PGE is implementing demand-side options and working to expand the capabilities of its “virtual power plant” (VPP). The VPP-enabled future provides visibility to resources in front of and behind the meter and enables PGE to orchestrate the dispatch of DERs and flexible loads to participate in grid services through the identification, scheduling, and utilization of various resources from with the distribution system. The tools which make up the VPP are necessary to ensure resource adequacy as we decarbonize, particularly with more variable energy supply-side resources coming on-line. Franco will speak to PGE’s progress on creating and growing a VPP and how it works to maintain a reliable and adequate electric system for its customers.

Relevance: The 2021 Plan resource strategy calls for the region to build at least 3,500 MW of renewable resources within the action plan period. However, there

are concerns about available long-term firm transmission contracts to support the delivery of the needed carbon-free electricity. The VPP offers a partial solution to the need for resources but avoiding the transmission constraints.

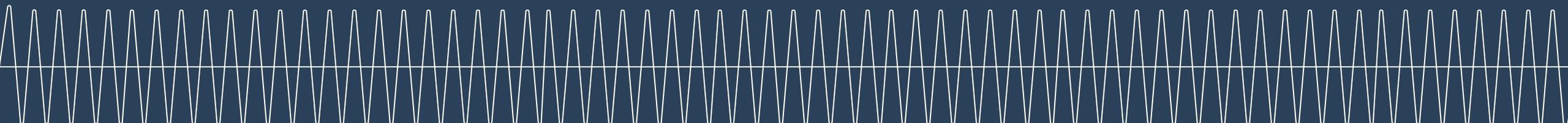
Background: At the April 2021 Council meeting, PGE presented on their Smart Grid Test Bed https://www.nwcouncil.org/sites/default/files/2021_0406_2.pdf

More Info: <https://portlandgeneral.com/news/2020-07-01-pge-program-will-transform-hundreds-of-homes-into-a-virtual-power>

PGE Virtual Power Plant

Prepared for the Northwest Power and
Conservation Council

Franco Albi, Director, Regional Integration
November 16, 2022



VIRTUAL POWER PLANT

FROM

TO

un·cer·tain·ty

(ən- 'sər-tən)

- Not known beyond doubt
- Not having certain knowledge
- Not clearly identified or defined

con·fi·dence

(kän-fə-dən(t)s)

- The quality or state of being certain
- A feeling of reliance on one's circumstances

VIRTUAL POWER PLANT

Why

ICY
CONDITIONS
EXIST

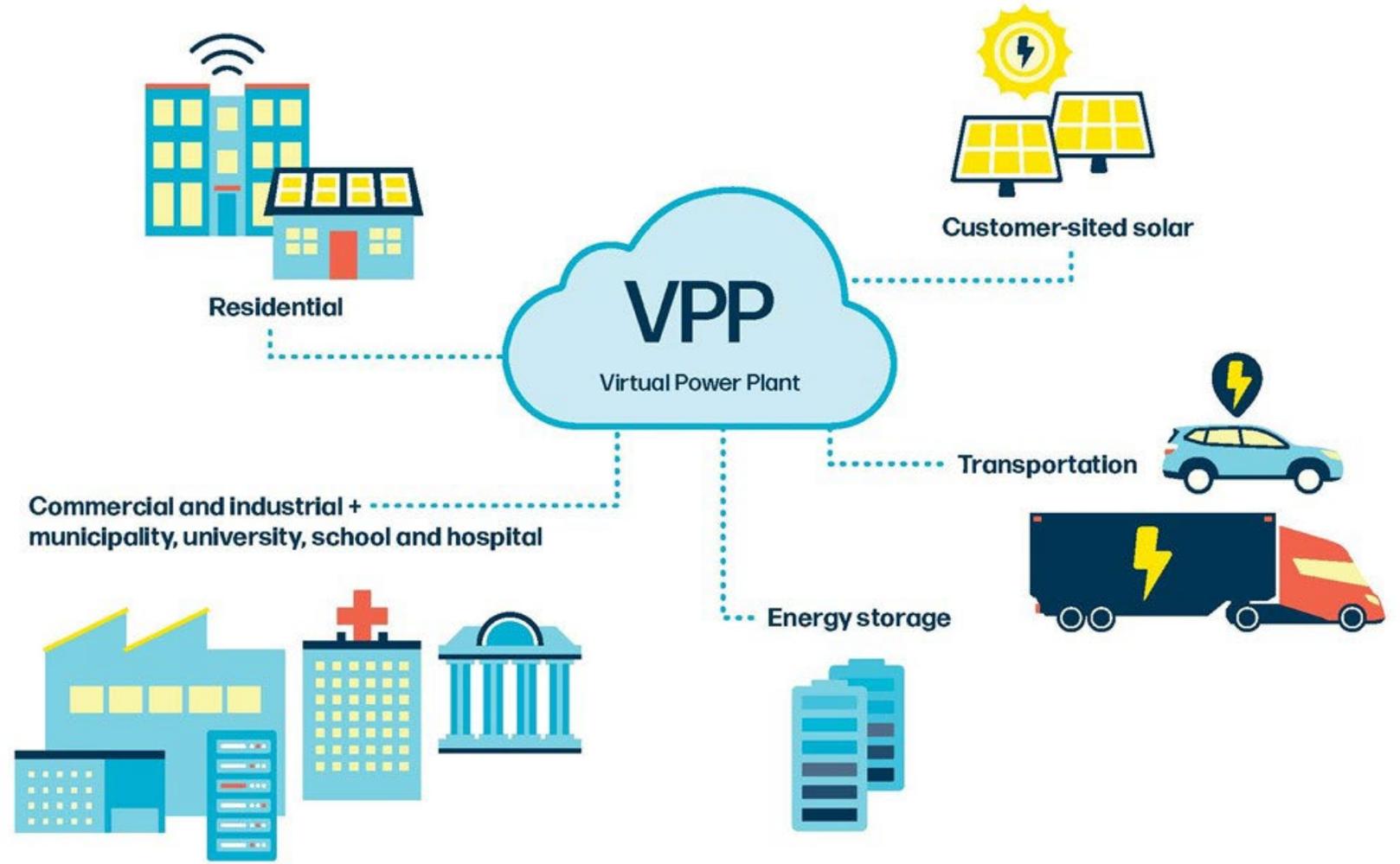
EXTREME HEAT
SAVE POWER
AFTER 4 PM

WILDFIRE
OR126E MP 10
HIGHWAY CLOSED



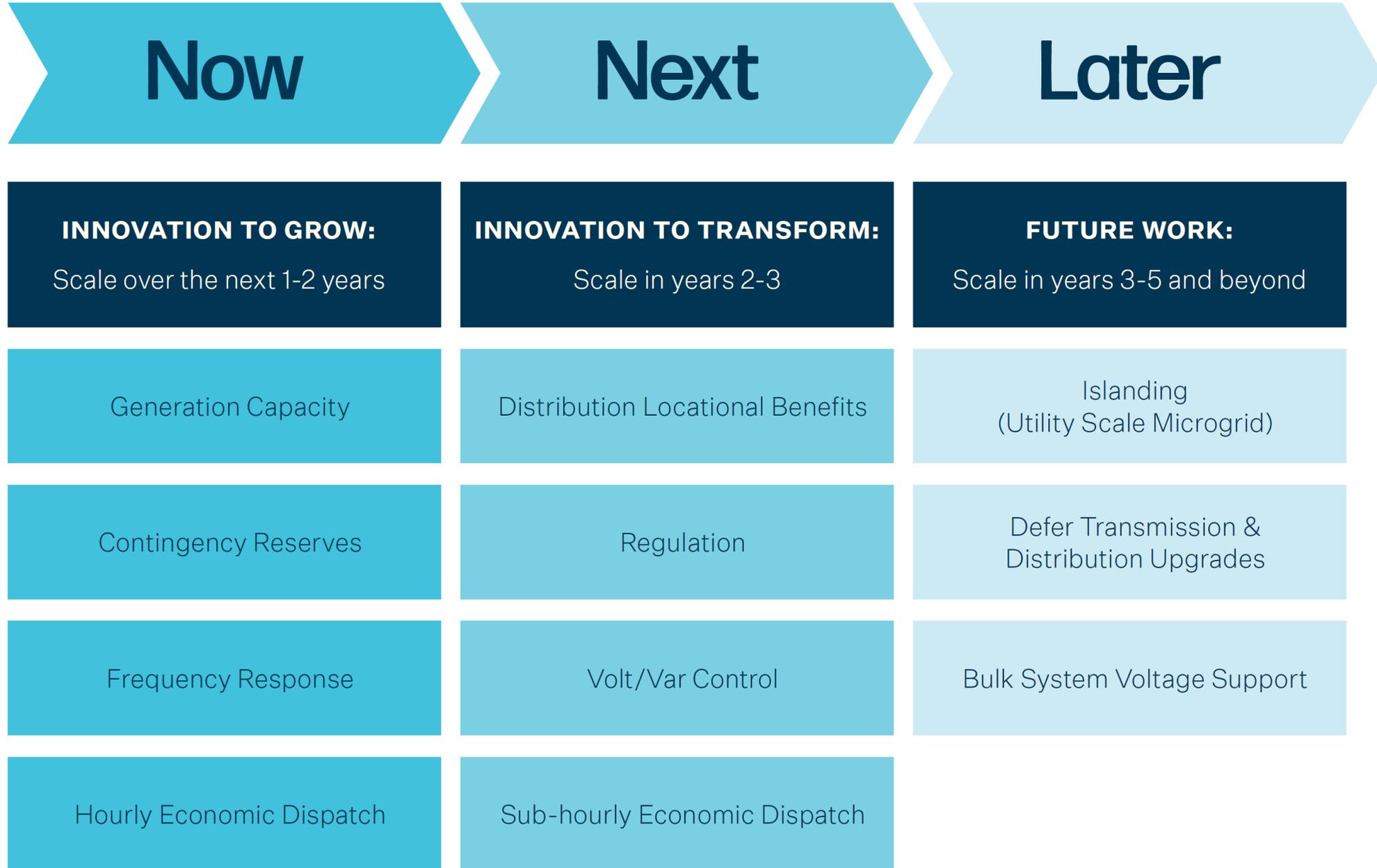
VIRTUAL POWER PLANT Definition

A power plant,
consisting of Distributed
Energy Resources (DERs)
and Flexible Loads,
orchestrated through a
technology platform,
to provide grid and power
operations services.



VIRTUAL POWER PLANT

Grid Services



VIRTUAL POWER PLANT

“Capability Progression”

PGE operates a Virtual Power Plant today.

Capability Progression is how we continuously improve confidence in the provision of grid and power operations services and exceptional customer experiences.

The Capability Progression framework considers two dimensions of resource maturity - Acquisition and Progression.

- 1) **Acquisition** captures the number of MW of resources on PGE’s distribution system.
 - Acquisition is binary. It says nothing about the ‘quality’ of the MW (e.g., duration, flexibility, number of calls, etc.). The MW is not necessarily managed through the VPP platform, and not is necessarily providing a grid/power ops service... today.

- 2) **Progression** measures the ability of the acquired MW to provide grid and power operations services through the VPP platform.
 - Progression is a matrix tracking the level of **procedure/process documentation**, ability to **provide grid and power ops services**, level of **VPP platform integration**, and ability to **participate in market** transactions. The matrix is under development.

Capability Progression offers visibility to the ability of each resource to provide Grid and Power Operations services based on the resource’s level of enablement through the VPP platform.

VIRTUAL POWER PLANT

Putting it all together



VIRTUAL POWER PLANT

Ensuring Resource Adequacy as we Decarbonize

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