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Oregon

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](https://www.nwcouncil.org/sites/default/files/2021_0406_2.pdf)

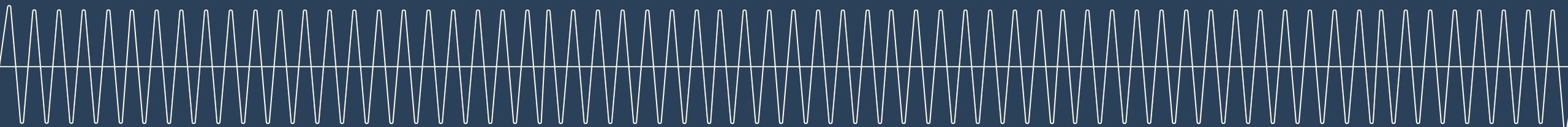
More Info: <https://portlandgeneral.com/news/2020-07-01-pge-program-will-transform-hundreds-of-homes-into-a-virtual-power>

# 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

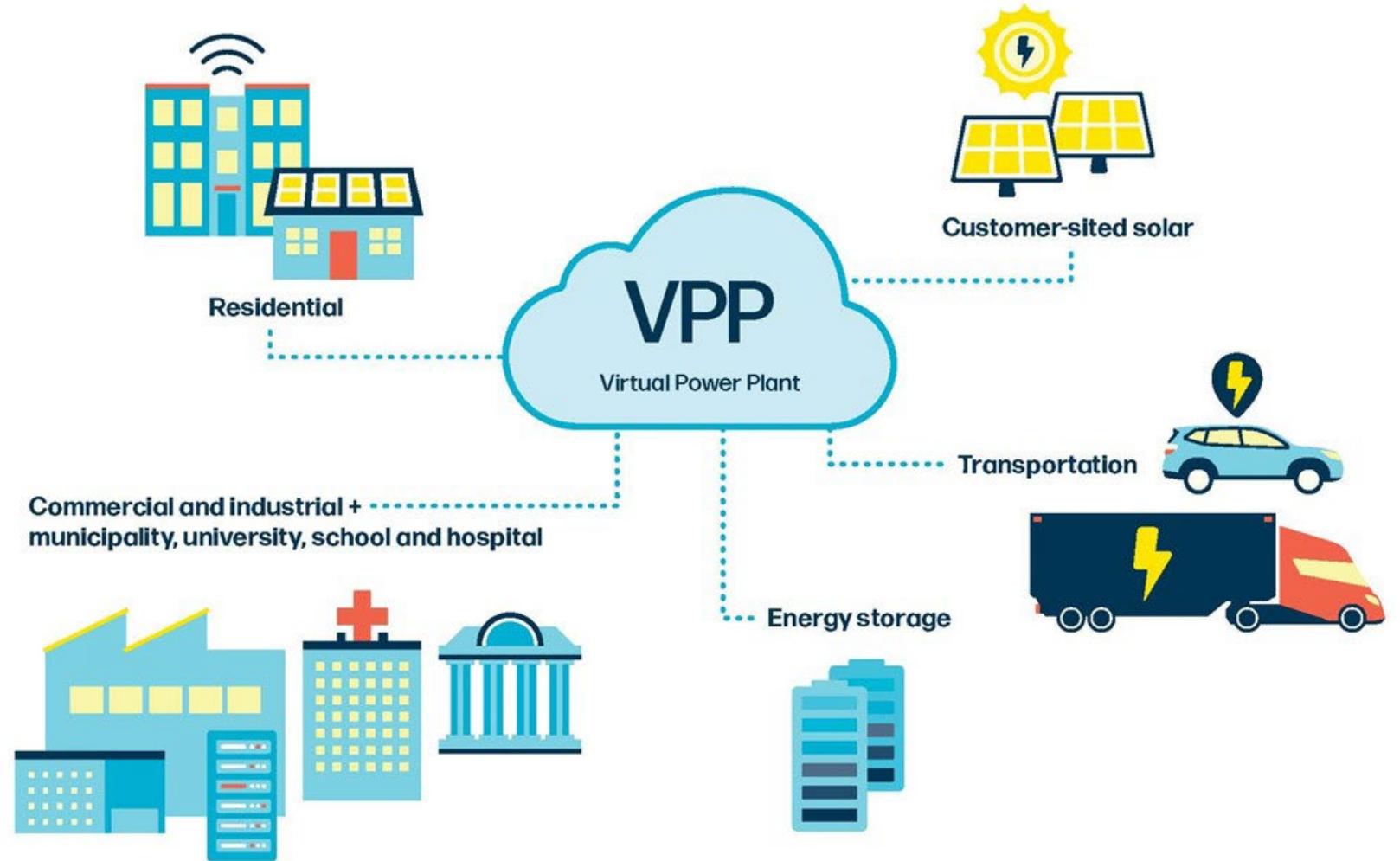
EXTREME HEAT  
SAVE POWER  
AFTER 4 PM

WILDFIRE  
OR126E MP 10  
HIGHWAY CLOSED



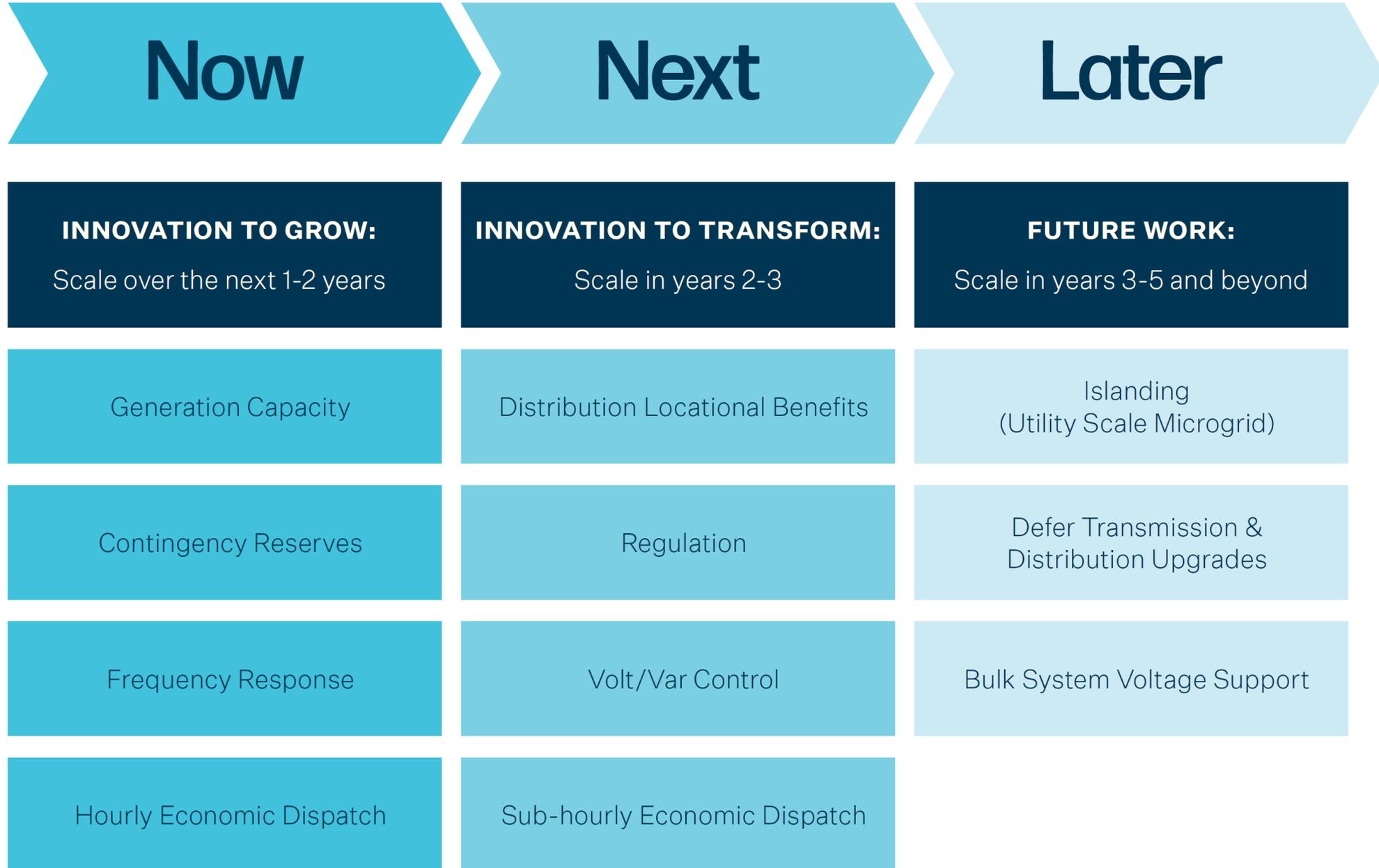
# VIRTUAL POWER PLANT Definition

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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