Pacific Northwest National Laboratory (PNNL) Demonstration Project

VELCO Operating Committee Update

March 17, 2022

The Evolving Grid

- New operational challenges associated with increasingly complex T&D system
  - Additional DER development
  - Increasing electrification
  - New regulatory requirements

- VELCO has initiated several capital projects to help VELCO and DUs prepare

- To aid the effort, we have been provided the opportunity to advance a billable R&D project with DOE/PNNL
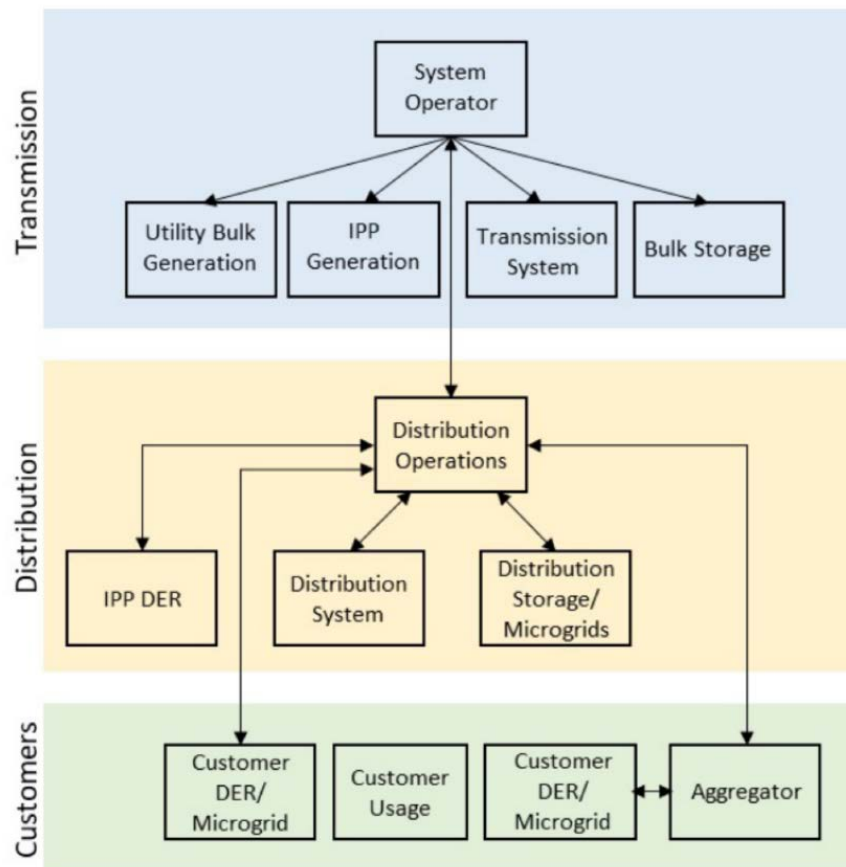
Project Background

- Project funds issued by Senator Leahy's Office directed to:

  - Execute "sensor demonstration" activities in partnership with PNNL and VELCO

- The 3-year project seeks to demonstrate through a simulation that:
  - A standards-based model can help utilities use sensor data to collaboratively coordinate and make more informed decisions

Project Demonstration Activity

Projected DP 2025 Peak Load (MW)	UFLS Feeder ID	Trip Setting *	Feeder Load Tripped (MW)	% of Peak
1000	X1	59.5 (fast)	1.17 MW	1.17%

MW

Hour of Day
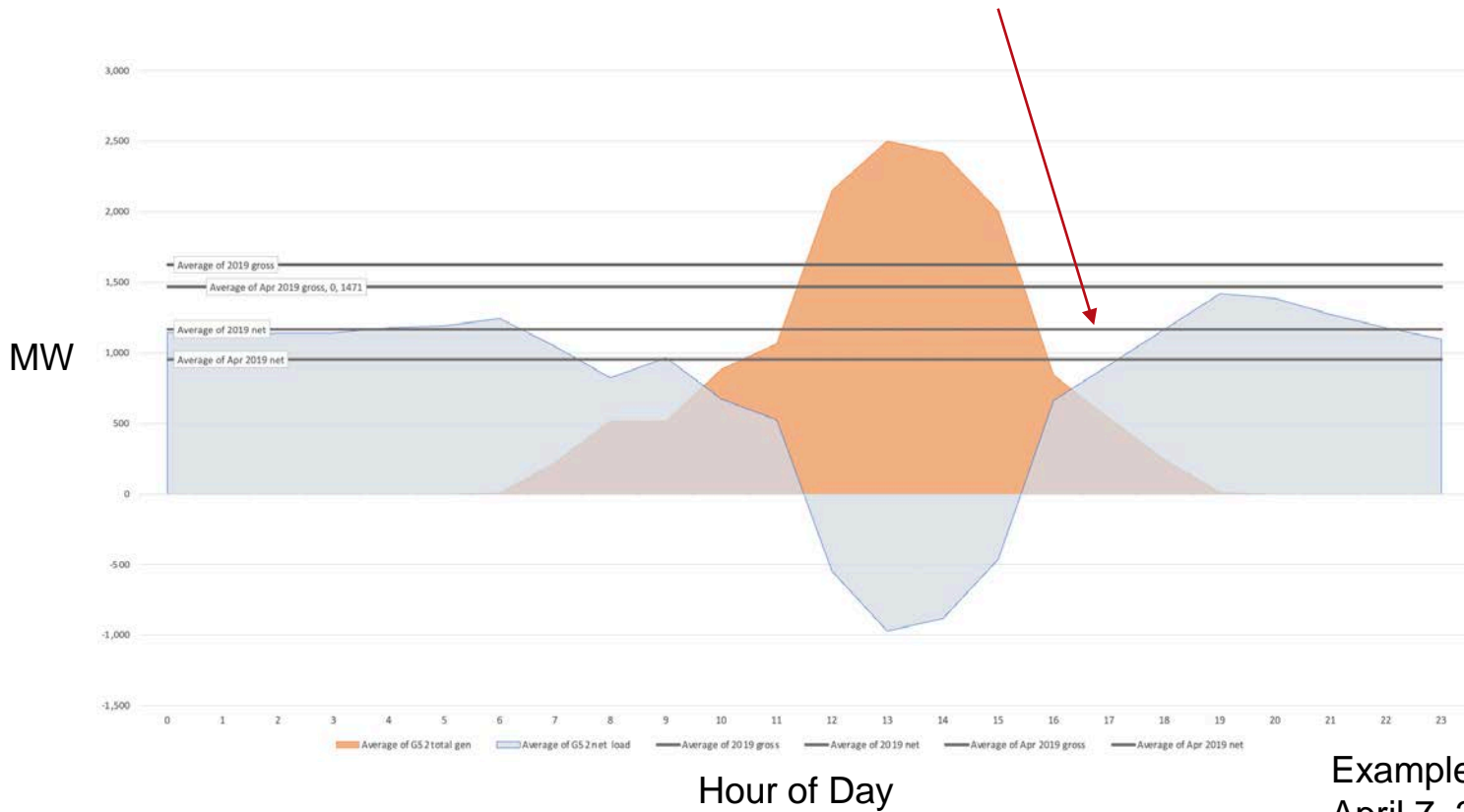
Example Day
April 7, 2019

Project Demonstration Activity

- Demonstration project will involve Under Frequency Load Shedding (UFLS) given an evaluation of current power-flow (net generation vs net load of chosen feeders)

- Demonstrate that with data conveyed over VELCO's fiber optic system, utility operators can better pre-position and prepare the system for a UFLS event differently given DER at the time of an event

- Demonstration item aligns with on-going collaboration work and is expandable to other Vermont utility needs and beyond, i.e. FLM

Project Team and Current Status

- Project will be managed by Battelle, operator of PNNL
  - UVM & VELCO to be subcontracted to Battelle
  - VELCO to receive $1.5M to cover labor and costs of subcontractors

- VELCO's proposal included the option to form VDU subcommittee to allow for wider participation without contractual obligations

- VELCO's proposal, with GMP, BED and VEC remains under review, with award expected soon

Overall Project Team
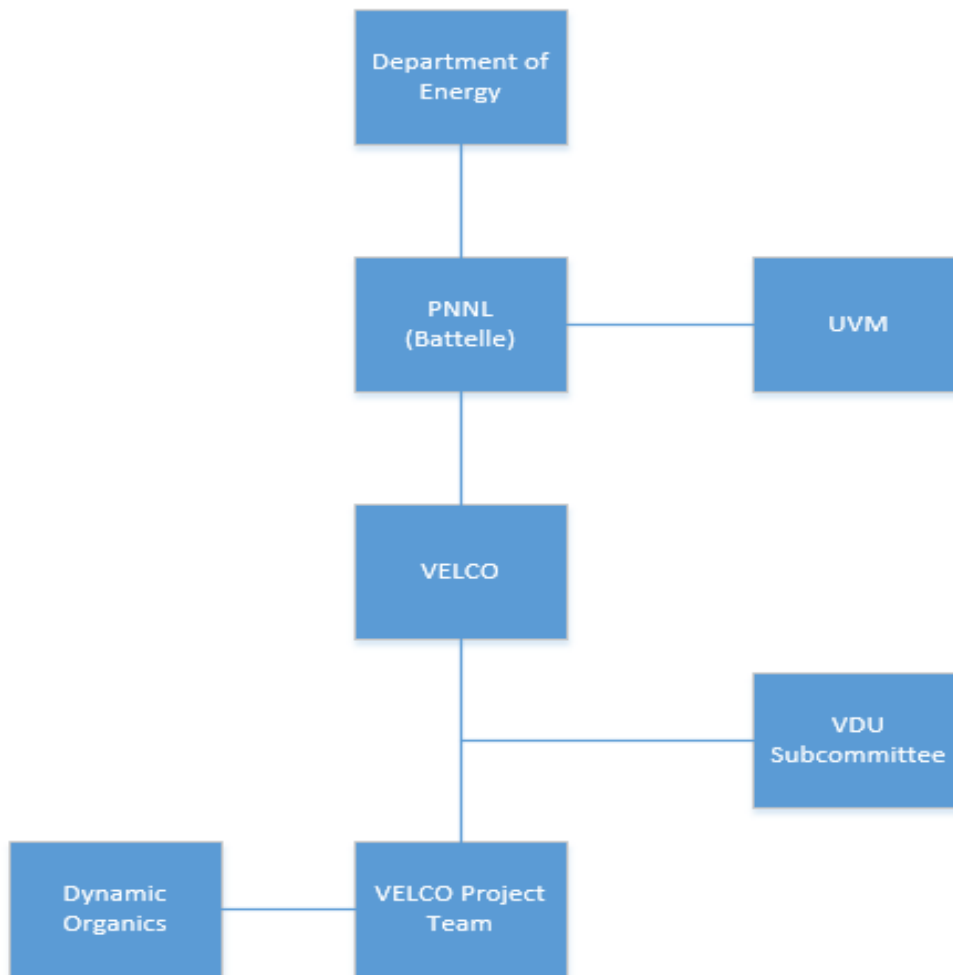
OC Subcommittee Proposal

- Create Subcommittee to support project and to collaborate with OC

- Provide opportunity for VDUs to participate to support/guide project outcomes

  - Final scope of project informs makeup of committee

  - Representative should have a technical background

  - Engage with additional technical subject matter experts

  - Assume monthly meeting to discuss project status, data needs and to provide VDU perspectives

Team Vermont

- Chair – VELCO Project PM/Sponsor

- Co-Chair – Cyril Brunner – VEC

- Members & Alternates - Participating VDU Staff

- SME Consult – Morgan Casella (DO), etc.

Coordinates with overall project team members

- PNNL PM – Kevin Schneider

- UVM PM - Mads Almassalkhi

Proposed Subcommittee Acton Plan

- Form committee by April

- Outline data requirements and framework for data sharing

- Data discovery, extract, common information model process

- PNNL work scope and expected outputs from subcommittee collaboration
  - Outline of simulation and analysis (needs and wants by team)
  - Concept of Operations – outline options & process with PNNL
  - Identify other opportunities

- Establish overall subcommittee work plan

Other Opportunities for Team VT

Sources

SCADA

AMI

GIS

DER

Data

PI

Oracle

CIM

Operations

DERMS

MDM

Modeling

Increased Situational Awareness,

More Informed Decisions,

Evolved Grid Architectures