

Battery Energy Storage Systems (BESS)

Land Use Policy Committee
January 28, 2025

Jacqui Kamp, Zoning Administration Division

Project phases


Credit: Dominion Energy
Chesterfield County

July 2024

- Topic included on approved Work Program

September - December 2024: Initial research

- Background research
- Information gathering meetings (industry and county stakeholders)

January 2025

- Continue meeting with stakeholders
- Board Land Use Policy Committee January 28
- PC Infrastructure Committee January 30

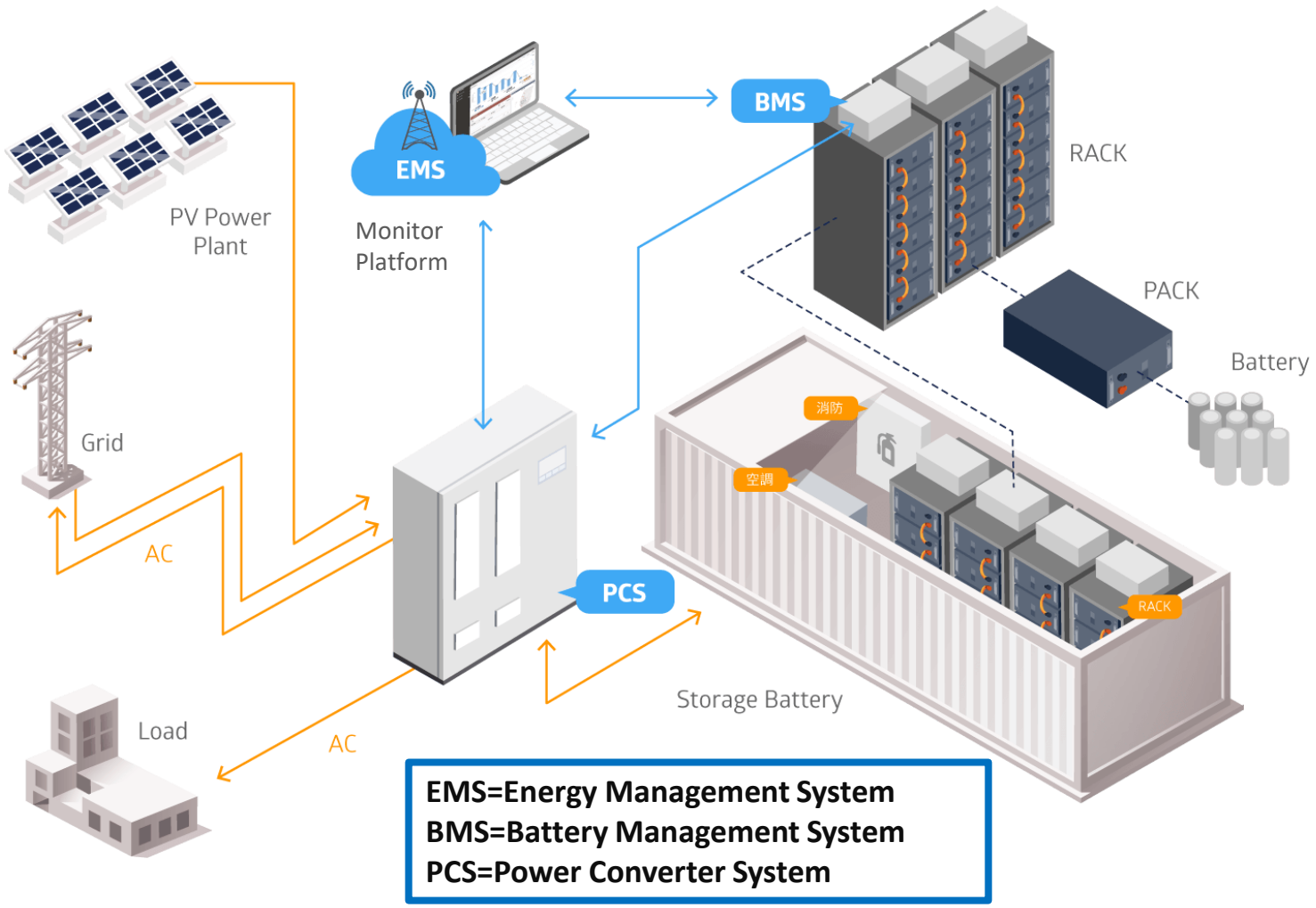
February - July 2025

- Draft white paper; draft text
- Public engagement; committee presentations

September - November 2025

- Zoning Ordinance amendments authorization and public hearings TBD

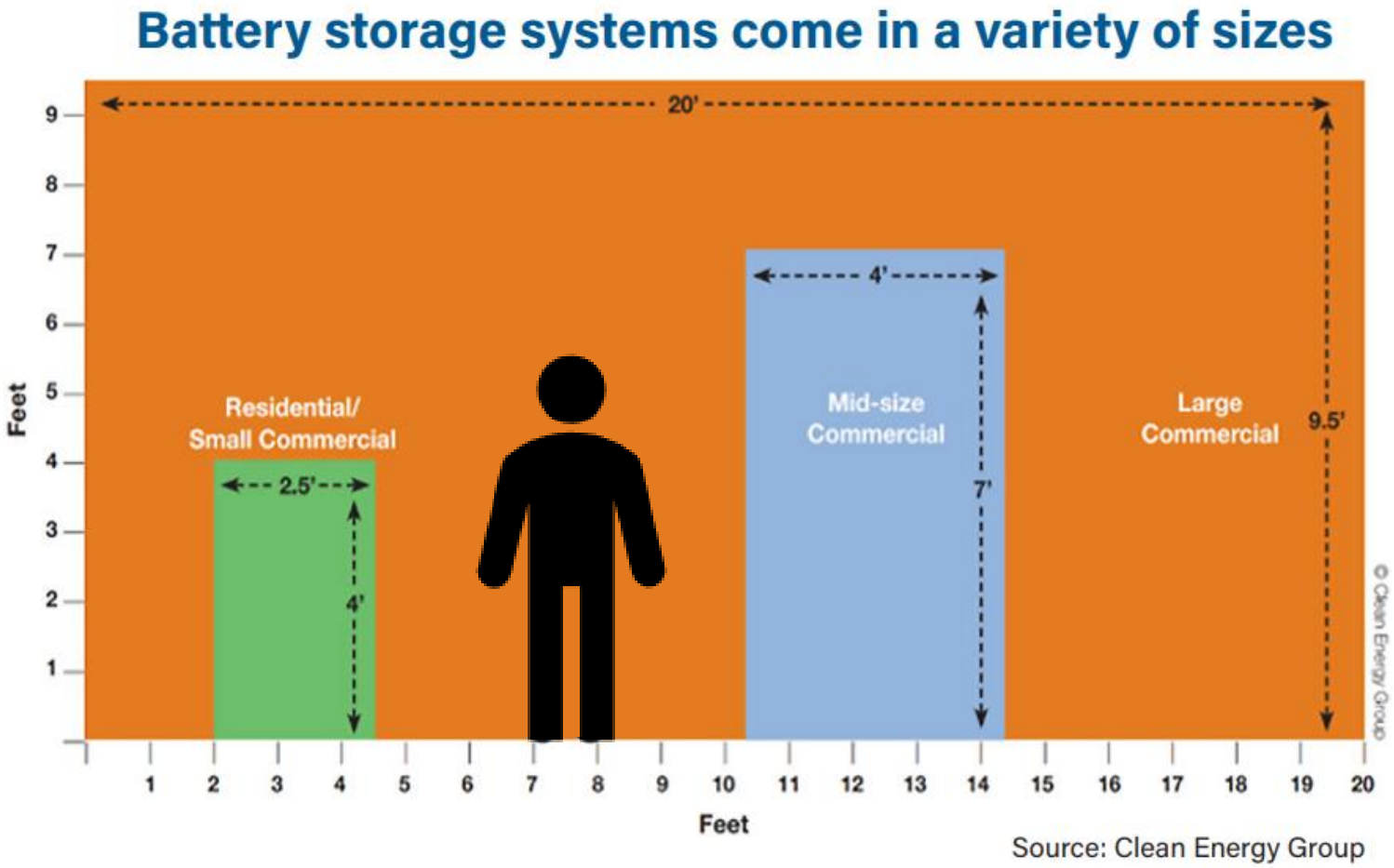
What is a battery energy storage system (BESS)?



Credit: osmbattery.com

BESS is an electrochemical device that charges (or collects energy) from the grid or a power generation facility, like solar and wind power, and then discharges that energy later to provide electricity when needed.

BESS Types:
Accessory and Principal Uses





Accessory use

Residential



Accessory use

Mid-size Commercial



Principal use

Large Commercial/Utility-Scale

Benefits of BESS



- Balances supply and demand with intermittent renewable energy sources.
- Lower costs by storing excess energy during off-peak hours.
- Backup power in emergency situations.



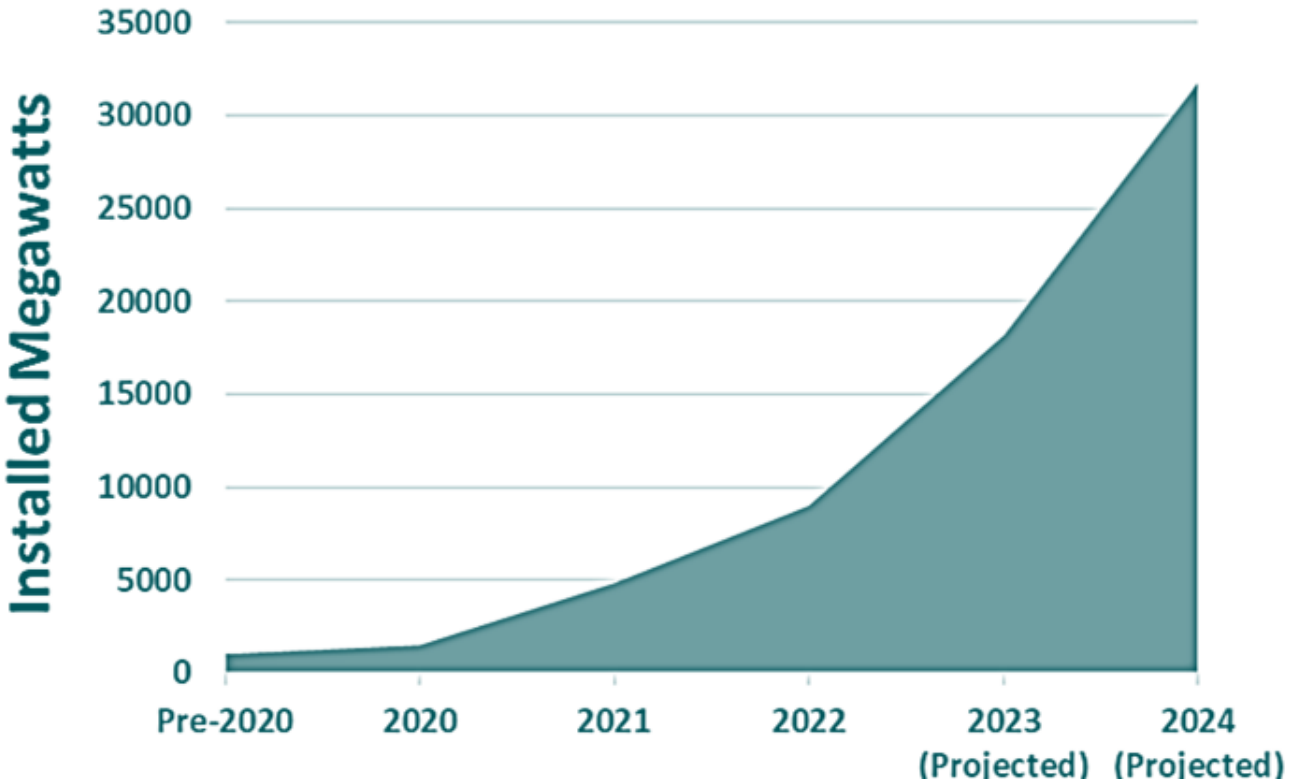
Scott Solar + Storage: Powhatan County
Credit: Dominion Energy

Where are BESS located?

- In the transmission network
- In the distribution network
- Co-located with solar/wind

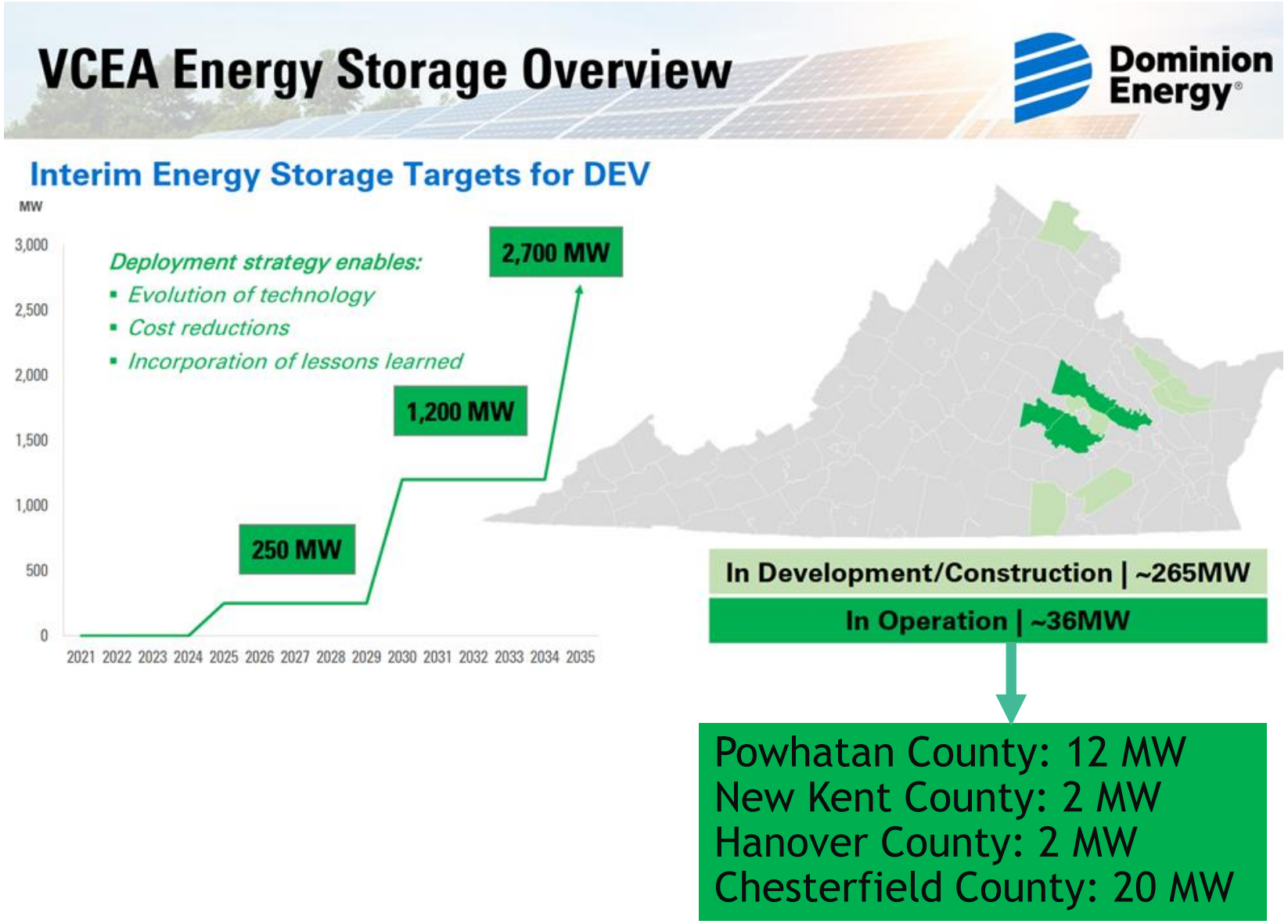
Market forces and trends

- Increase in solar/wind development (variable renewable energy)
- Battery cost and improved performance
- Government incentives
  - 2020 Virginia Clean Economy Act
  - 2021 Infrastructure Investment and Jobs Act
  - 2022 Inflation Reduction Act



Existing and Projected U.S. Battery Energy Storage System Installations, 2016-2023 (Credit: PNNL)

Virginia Clean Economy Act – Dominion Energy Targets



- Construct/acquire 2,700 MW energy storage capacity by 2035
- 35% energy storage facilities purchased from private entity
- Project size max: 500 MW, except one single project up to 800 MW

Existing guidelines - Comprehensive Plan

Public Facilities Element of the Policy Plan

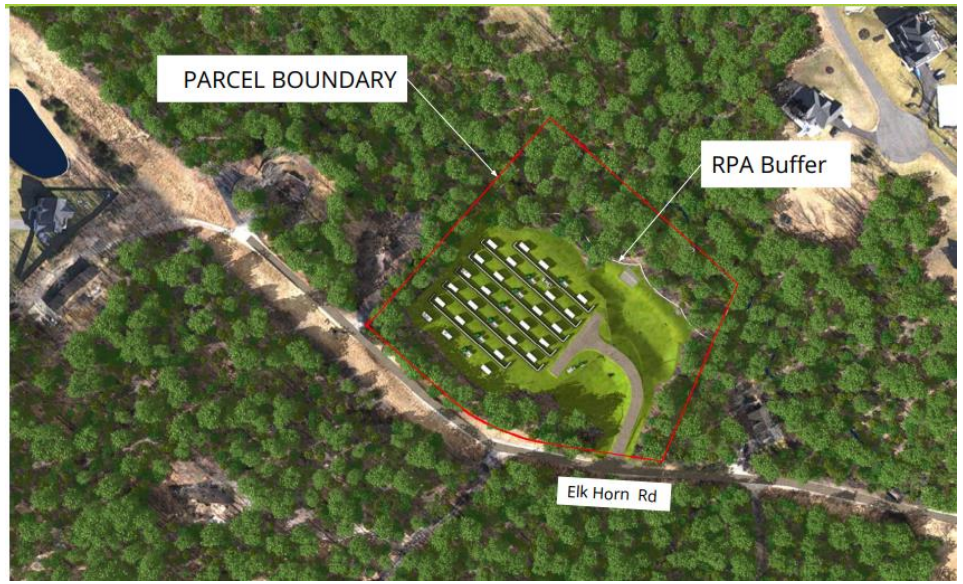
- 2232 Review Process – Public Hearing
- Objectives and policies related to:
  - Environmental considerations
  - Colocation with other electrical infrastructure
  - Location, noise, screening, and safety
  - Underground distribution and transmission lines



Credit: Dominion Energy
Powhatan County
Scott Solar Facility

Existing regulations - Zoning Ordinance (principal use)

- Use: Light utility facility
- Permissions that would apply to a BESS facility:
  - Not allowed: R-A, I-I
  - Allowed by right: I-3, I-4, I-5, I-6
  - SE: all other districts
  - Development plan or SE: all P districts (except PCC)





Credit: New Leaf Energy

Research topics



Permitted zones



Visual, noise, and aesthetics



Safety



Environmental impacts

Preliminary amendment considerations

Use definition

- Revise light utility facility definition

Permissions/locations

- Require SE in most zones
- Consider by right in I-5, I-6
- Require large accessory BESS to meet principal use standards



BESS at the National Renewable Energy Laboratory's National Wind Technology Center (Photo by Dennis Schroeder, NREL 47215)

Preliminary amendment considerations, cont'd

Visual, noise, and aesthetics

- Add BESS-specific standards for setbacks, fencing, noise (study), and landscaping/screening
- Use existing ZO standards for height, lighting, and signage
- Require undergrounding of power lines where feasible
- Encourage co-location



National Renewable Energy Laboratory's grid integration research facility in Colorado. *(Photo: Dennis Schroeder / NREL 47220)*

Preliminary amendment considerations, cont'd

Safety/Environmental

- Require hazard mitigation analysis and emergency response training
- Require any safety standards as recommended by Fire Marshal
- Require decommissioning plans/ funds
- Require liability insurance



Credit: Werner Slocum/NREL 68385

PLANNING & DEVELOPMENT

Email: Jacqui.Kamp@fairfaxcounty.gov

Webpage: https://www.fairfaxcounty.gov/planning-development/zoning-ordinance/amendments