Docket No. E-7, Sub 1306
Presson Exhibit 13

DC Microgrids / DC Homes

Feb 21, 2024



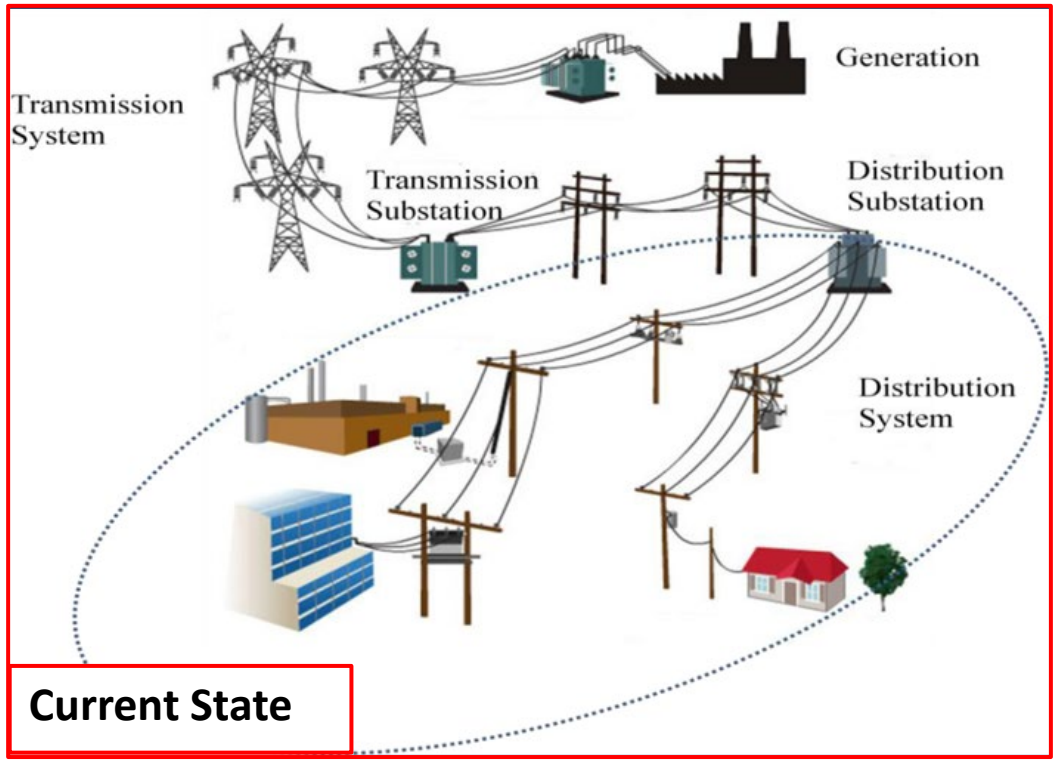


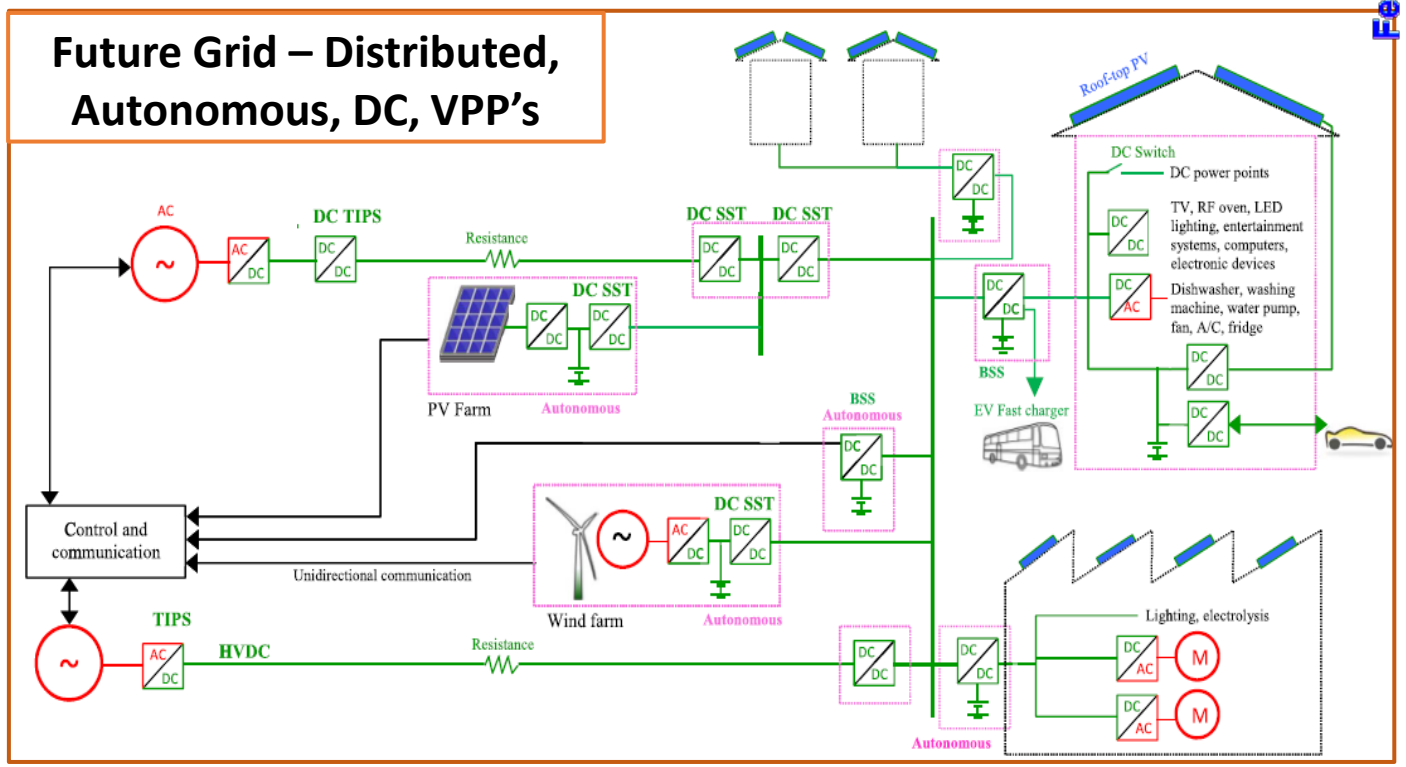


DUKE ENERGY®

Duke Energy Grid Emission Goals

- 50% reduction in CO_2 emissions from electricity generation by 2030
- Net-zero methane by 2030; Net-zero CO_2 by 2050
- Modernize our electric grid to be more reliable & resilient while embracing Distributed Energy Resources and DC Microgrids
- Improve energy efficiency with DC systems and create energy equity for renewables
- Enable Energy Orchestration





DC Microgrids and Services

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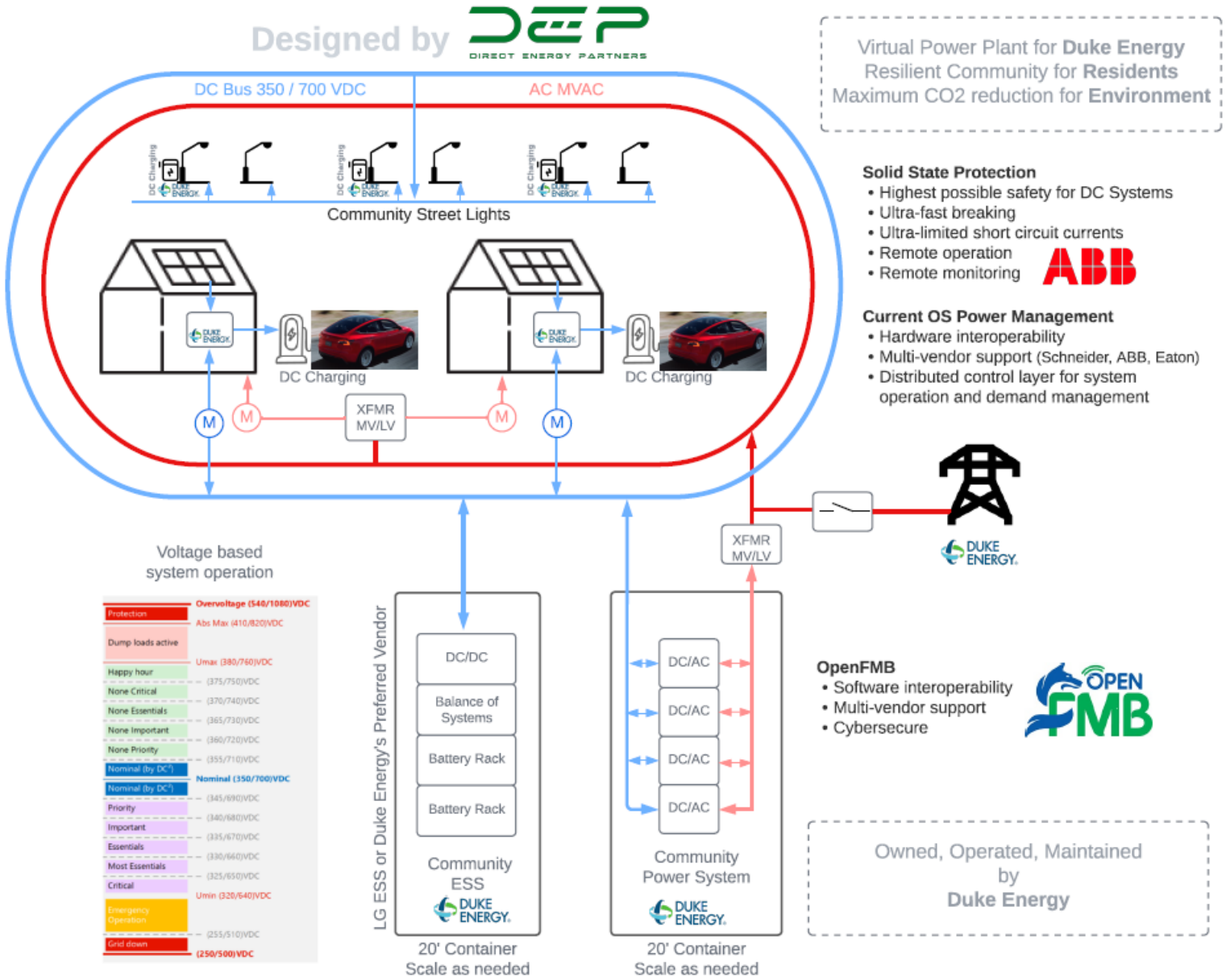
Benefits of DC

- **Eliminates conversion.** PV, Battery, EV, and modern loads are DC; why convert to AC?
- **Matches existing load.** ~85% of loads found in buildings / homes are DC.
- **Avoids conversion losses.** Typically, 5-20% on DC/AC and AC/DC conversions. Round trip can easily be > 15%.
- **Improves energy efficiency.** DC motors and appliances have better power to size ratios and DC lighting is 75% more efficient than incandescent lighting.
- **Reduce Wiring Costs.** Savings of 55% by reducing copper used.

Bay5 DCMG Capabilities

- **DC Panel.** Solar canopy, EV charger, and loads are all coupled through a DC panel, and balanced by the CE+T Power conversion system (PCS).
- **System cold start from solar.**
- **Fast EV charging:** Solar direct to EV charger through the DC Panel at 350VDC, ~20kW.
- **All loads are DC.** USB-C, USB-A sockets, lighting, displays, computers, 350VDC wall sockets, LG appliances (Dryer and Robo-Vacuum)
- **Battery:** Savant POMCube (Li-ion) and Adena (molten salt) provide power reliability

Community Microgrids



- **Innovation and Leadership**
- **Improved grid efficiency**
- **Enhanced resiliency and reliability**
- **Opportunities for load management**
- **Integration of renewable energy sources**
- **Scalability**
- **Improved grid management Opportunities with Microgrids and VPP's**

Status

- Design for the community energy center and DC home integration – complete.
- Messaging interface to DC microgrid controller in-test.
- Scripting control of PLCNext controller in-test.
- Electrical connection preparation to Adena Power battery – complete.
- Adena Power solid state “Molten Salt” Battery - Delayed
- Savant POMCube is on-site – implementation in-progress.
- NCREPS final report out – in-progress.

Mock DC Home at Mount Holly Bay 5

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