

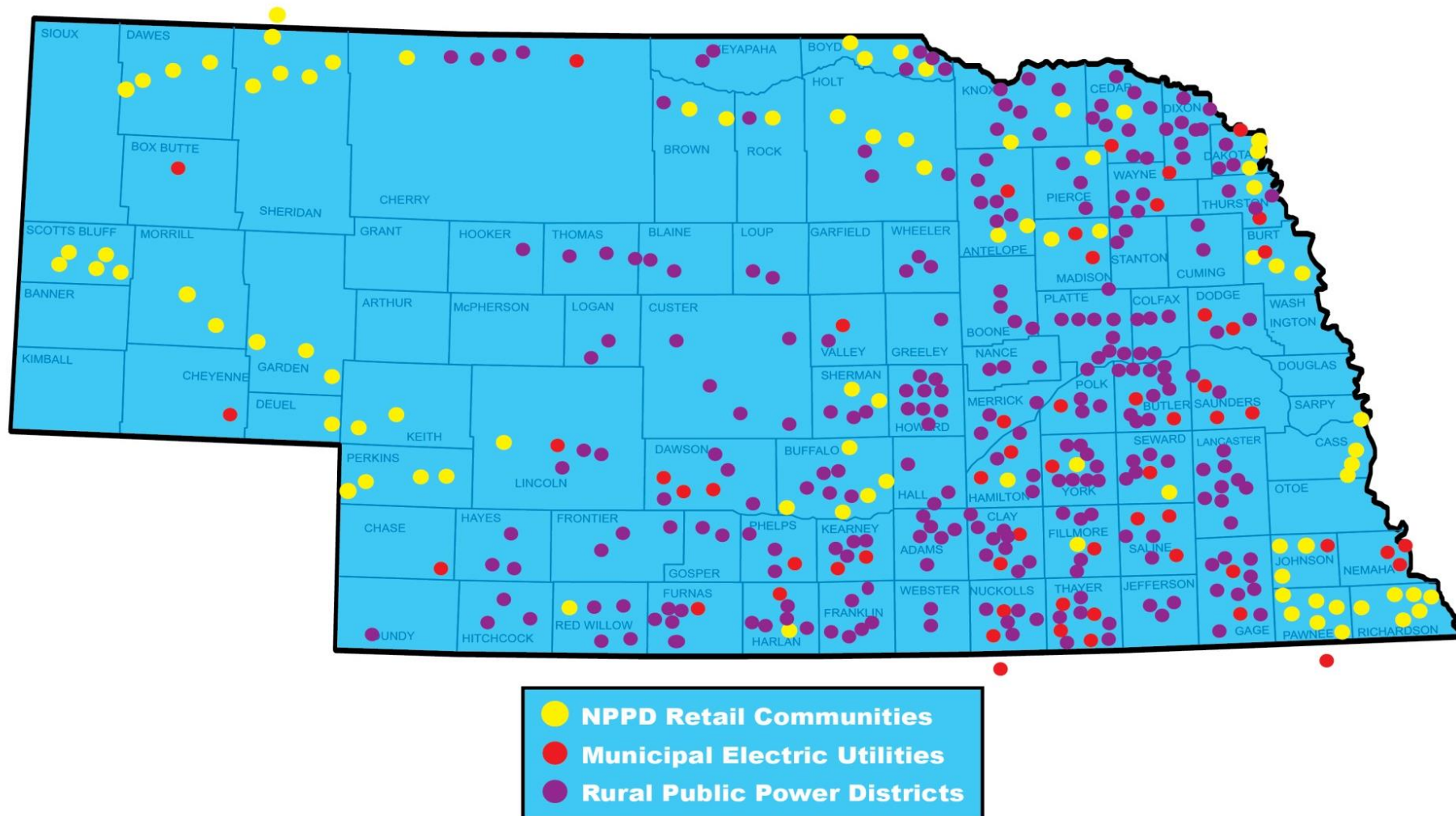
Nebraska Public Power District (NPPD) Long Term Energy Storage

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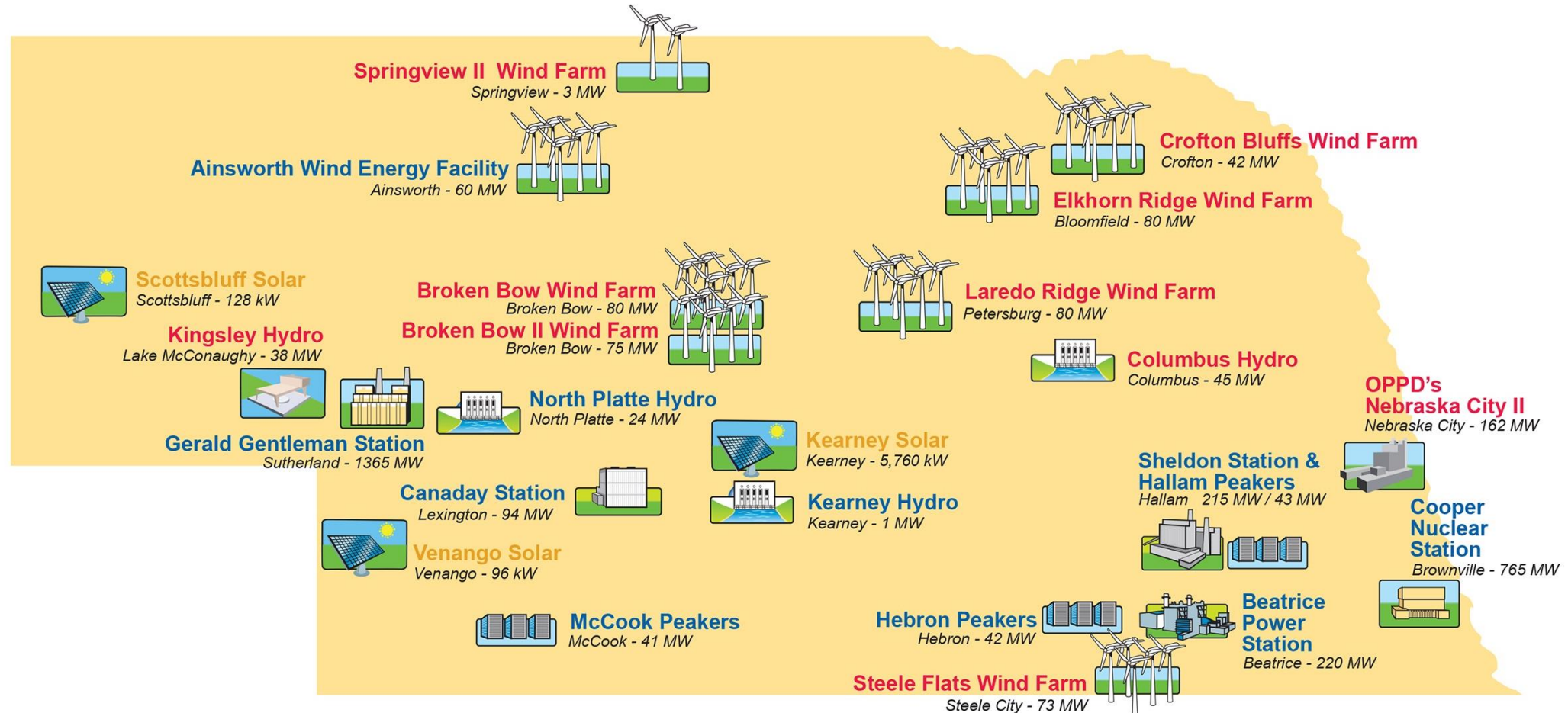
Generation Research Sr. Program Manager

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NPPD Generates Power for 403 of Nebraska's 530 Cities and Villages either Directly or Indirectly



NPPD's Diverse Generation Mix



LEGEND

- NPPD Owned
- Power Purchase Agreement (All or Part)
- Retail Community Solar Locations

NPPD Decarbonization Expectations

- Strategic Directive SD-05
 - Carbon emissions and emissions regulation are a significant business risk for Nebraska Public Power District (NPPD) and its customers. NPPD recognizes the importance of balancing affordability, reliability/resilience, and sustainability when addressing the business risks related to carbon emissions and emissions regulations.
 - NPPD adopts the goal of achieving “net zero” carbon emissions from NPPD’s generation resources by 2050.

NPPDs Plan to Decarbonize Generation

- This will be achieved by continuing the use of proven, reliable generation until alternative, reliable sources of generation are developed and by using certified offsets, energy efficiency projects, lower or zero carbon emission generation resources, beneficial electrification projects, or other economic and practical technologies that help NPPD meet the adopted goal at costs that are equal to, or lower than, then current resources
- NPPD's Current R&D focus areas for low carbon generation
 - LDES (8-24 hours)
 - Biomass
 - Biofuels (ammonia, methanol, ethanol, renewable diesel)
 - Carbon Capture
 - Wind and Solar
 - BESS
 - Hydrogen

NPPD needs for LDES

- Grid Support
 - Have a new BESS Li-ion installation set for 2025 in remote location where grid support needed for summer irrigation peaks
- Wind and Solar PPAs
 - Have several PPAs with wind now and getting a lot of solar interest in Nebraska
 - Not just microgrids but large (>100 MW) solar coming to prospect in Nebraska
- Coal unit support or replace
 - Would like to see a viable option where LDES technology can adequately do this
- Feasibility Aspects
 - Commercial readiness accurate
 - Have tech providers provide cost share for LDES pilots
 - TEA CAPEX should be focused on current costs to help provide realistic funding needed to build LDES
 - Can these systems truly follow the grid due to recharge/discharge rates
 - Must handle desert heat to arctic cold in the Plains
 - These need to be 15 years or more assets, not like BESS