



Board Policy Strategic Directive No. BP-SD-11

Research & Development Review

THE
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PEOPLE**

NPPD Board of Directors Meeting
Strategic Business Matters
April 2024

John Swanson
Director of Generation Strategies & Research



Nebraska Public Power District

Always there when you need us

BP-SD-11, Research & Development

“The Board encourages management to actively pursue investments in research and development in the energy industry that aligns with the District’s strategy, considering both the relative risks and possible benefits to Nebraska Public Power District customers”

NPPD Alignment with Directive

- 1. Partnership with University of Nebraska-Lincoln (UNL) for the Nebraska Center for Energy Sciences Research (NCESR)**
 - Cycle 19 Requests for Proposals, Summer interns program, Letters of Support, Energy Center Chronicles, Biochar Workshop
- 2. Membership with Electric Power Research Institute (EPRI)**
 - Full Membership, Nuclear, Low Carbon Resource Initiatives (LCRI), Self-directed and Supplemental R&D (Reciprocating Internal Combustion Engine (RICE), Concrete Thermal Storage, Bulk Energy Storage, Mainspring, ClearFlame, etc.
- 3. Generation Strategies & Research Projects**
 - Universities, Engineering Firms, National Labs, Energy & Environmental Research Center (EERC), U.S. Department of Energy (DOE), State of Nebraska, Various Industry Groups

NPPD Alignment with Directive

R&D funding

- Funding for energy related research was envisioned with the establishment of NPPD's Domestic Energy Research and Application Initiative in 2005
- These research efforts were championed by then Director Darrel Nelson with broad board & NPPD management support
 - ✓ \$1.0 million annually for the UNL based Nebraska Center for Energy Science Research (now \$1.5 million)
 - ✓ \$1.0 million annually for internal NPPD Research & Development (R&D) type projects – over time, funding for these types of projects became known as “Dostal Dollars” (now \$500,000)

NPPD Alignment with Directive

Current Generation Strategies & Research Project Activities:

- ✓ 35+ NDAs signed over last couple of years
- ✓ Nebraska Environmental Trust (NET) grants with UNL on Western Nebraska Carbon Sequestration geological sequestration opportunities
- ✓ B&W* Study – bubbling fluidized bed (BFB) – transition the cyclone fired Unit 2 boiler at Sheldon Station using biomass
- ✓ Ethanol to other products, i.e. SAF**, methanol, etc.

* Babcock & Wilcox

**Sustainable Aviation Fuel

NPPD Alignment with Directive

Current Project Activities (Cont'd):

- ✓ Small Modular Reactors (SMRs)
- ✓ Monolith – water, steam, ammonia
- ✓ Hydrogen – blend with natural gas and stand alone fuel for gas turbines / power generation
- ✓ Carbon Sequestration, Terrestrial Sequestration, Carbon Credits, Carbon Offsets, Biochar
- ✓ Alternate fuels / chemicals – Methanol, Ammonia, Dimethyl Ether, Renewable Diesel, Urea
- ✓ Renewable Natural Gas
- ✓ Gasification, Pyrolysis, Torrefaction, Autothermal pyrolysis (ATR)
- ✓ Energy Storage – Electric (Battery), Thermal, Compressed Air Energy Storage (CAES), Gravity, Pumped Storage Hydro

NPPD Alignment with Directive

Industry Touch Point / Contacts / Working Groups

FCHEA – Fuel Cell & Hydrogen Energy Association

PCOR – Plains CO2 Reduction

PCOC – Plains CO2 Capture

CH4 Connections – Methane

CURC – Carbon Utilization Research Council

RFN – Renewable Fuels Nebraska

CHS – Center for Hydrogen Safety

AEA – Ammonia Energy Association

MI – Methanol Institute

HCN – Hydrogen Cyanide

ACE – American Coalition for Ethanol

NEB – Nebraska Ethanol Board

USBI – United States Biochar Initiative

IBI – International Biochar Initiative

LCRI – Low Carbon Resource Initiative

NPPD Alignment with Directive

Current DOE / USDA Project Activities:

- **DE-FOA-0002962** – Carbon Capture Demonstration Projects – CO₂ Capture at GGS Unit 2 – **expecting new solicitation Fall 2024**
- **DE-FE0031993** – 21st Flexible Gasification of Coal and Biomass to Generate Electric Power and Carbon Free-Hydrogen Co-Product - **Awarded – starting full FEED phase**
- **Fixed ERA USDA - low carbon fuel w/ RICE**
- **DE-FE0032176** – **Mixed Waste Gasification - biomass co-fire testing with coal and MSW*** – EPRI lead, NPPD host site

* Municipal Solid Waste



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Questions

Stay connected with us.



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