

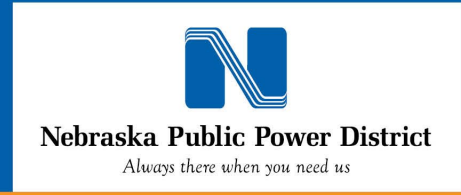


Board Policy Strategic Directive No. BP-SD-11 Research & Development Review

THE
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PEOPLE**

NPPD Board of Directors Meeting
Strategic Business Matters
May 2026

John Swanson
Director of Generation Strategies & Research



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

Partnership with University of Nebraska-Lincoln (UNL) for the Nebraska Center for Energy Sciences Research (NCESR)

- These research efforts were championed by then Director Darrel Nelson with broad board & NPPD management support
 - ✓ \$1.5 million invested annually for the UNL based Nebraska Center for Energy Science Research
 - NPPD Board approved a 5-year contract extension in 2025
- Activities include:
 - ✓ Cycle 21 Requests for Research Proposals, Summer interns' program, Letters of Support, Energy Center Chronicles, Biochar Research Cluster
 - ✓ Outreach activities includes presentations to UNL LEAD Fellows at Curtis, NE campus and participation in UNL Research Community Conference

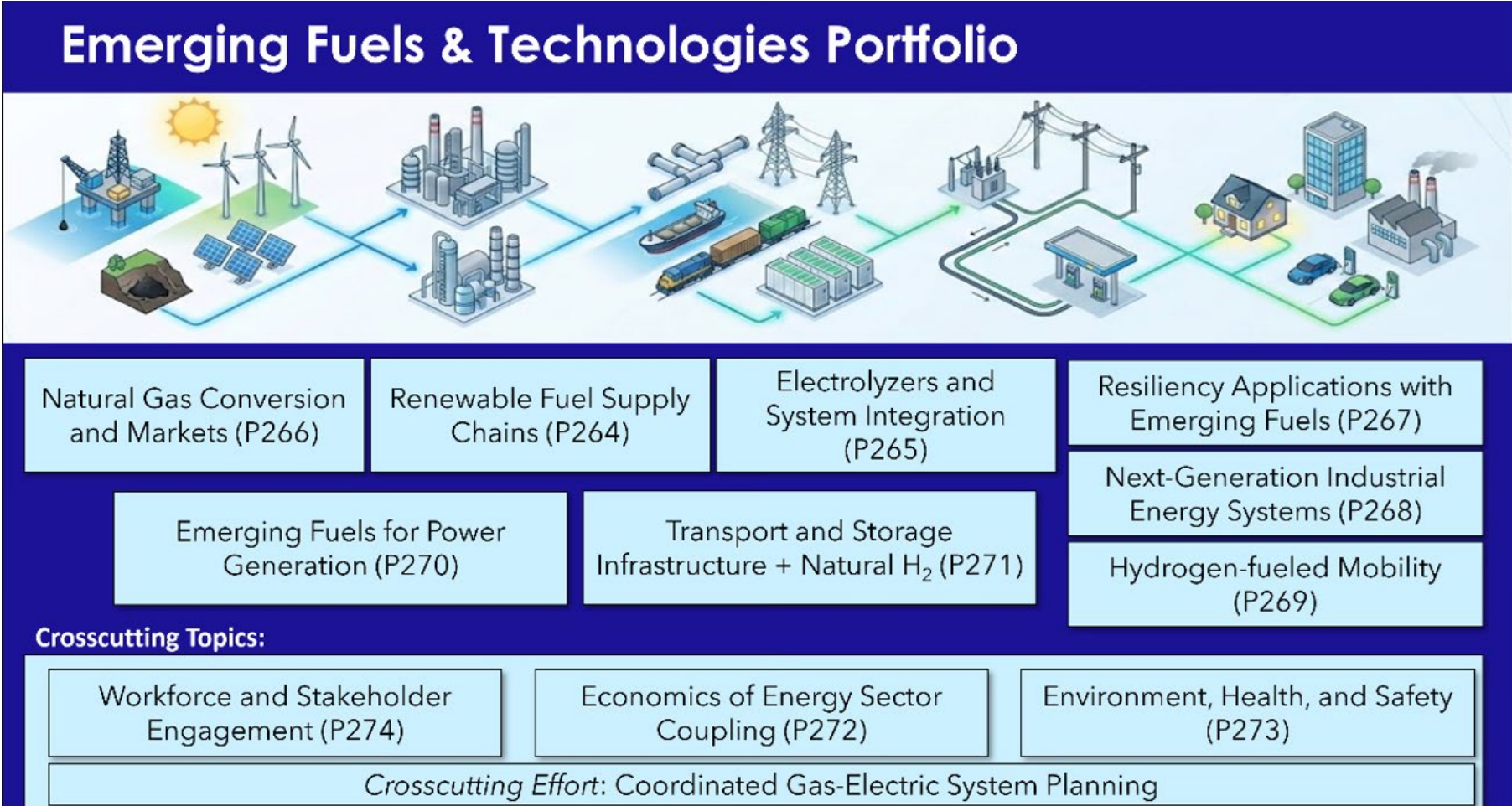
NPPD Alignment with Directive

Full Membership with Electric Power Research Institute (EPRI)

- Nuclear
- Low Carbon Resource Initiatives (LCRI) and Emerging Fuels and Technology (EF&T)
- Self-directed and Supplemental R&D Long Duration Energy Storage (LDES)
- Ethanol engines, Linear Generators, Wind/Energy Storage, Carbon Capture mediums, and Gas Turbines clean fuels/thermal energy storage
- Industry advisory support for Department of Energy (DOE) LDES projects

NPPD Alignment with Directive

Membership with Electric Power Research Institute (EPRI)



NPPD Alignment with Directive

Generation Strategies & Research Projects

- ✓ Engagement of National Universities
 - UNL, Iowa State University, North Dakota State University, Colorado School of Mines
- ✓ Engagement with major Architect/Engineering Consulting Firms
- ✓ National Labs, Energy & Environmental Research Center (EERC), U.S. Dept. of Energy (DOE)
- ✓ State of Nebraska
- ✓ Various National Industry Groups
- ✓ Approximately 25 active NDAs (Non-Disclosure Agreements)

NPPD Alignment with Directive

Current Generation Strategies & Research Project Activities:

- Carbon Capture & Storage technologies
- Ethanol to other products, i.e. SAF**, methanol, renewable diesel, hydrogen, etc.
- Linear Generators utilizing renewable fuels
- Small Modular Reactor (SMR) Siting studies
- Gas turbines use of clean fuels (ethanol, hydrogen)
- Long Duration Energy Storage pilots – non-battery > 10-hour duration

**Sustainable Aviation Fuel

NPPD Alignment with Directive

Current Project Activities (Cont'd):

- Monolith – water, steam
- Geologic Hydrogen – acquired mineral rights. Continue work with EPRI and NCESR
- Geothermal Energy
- Carbon Sequestration, Terrestrial Sequestration, Carbon Credits, Carbon Offsets, Biochar
- Alternate Fuels / Chemicals – Methanol, Ammonia, Dimethyl Ether, Renewable Diesel, Urea
- Renewable Natural Gas and Synthetic Natural Gas
- Gasification, Pyrolysis, Torrefaction, Autothermal Pyrolysis (ATR)
- Biomass generation using stover (co-fire or standalone)

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

EF&T – Emerging Fuels & Technology

CHFC – Clean Hydrogen Future Coalition

NPPD Alignment with Directive

Current DOE Project Activities:

- DE-FOA-0003473- Carbon Capture Demonstration Projects - CO₂ Capture at GGS Unit 2 - Concept paper submitted 3/1/25
 - DOE removed - Pulled funding into new nuclear grants
- DE-FE0031993 - 21st Flexible Gasification of Coal and Biomass to Generate Electric Power and Carbon Free-Hydrogen Co-Product - Awarded
 - FEED phase cancelled in October 2025 by DOE
- DE-FOA-0003485 - Generation III+ Small Modular Reactor Early Site Permit - Application issued 1/17/25
 - Reissued by DOE and sent to DOE prior to April 23, 2025
 - Still open Tier 2 grant with Tier 1 grants awarded (i.e., TVA)



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Questions

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Nebraska Public Power District

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