Kansas City BPU 2023 Electric Revenue Requirements

BPU Rate Case Public Hearing
Technical Session

June 15, 2023

Sarah Shenstone-Harris on behalf of Sierra Club

Credentials

Sarah Shenstone-Harris

- Senior Associate at Synapse Energy Economics
- Specialize in integrated resource planning, energy economics, energy project evaluation, electrification of transportation
- Previously employed at Reading Municipal Light Department (MA) – helped manage its wholesale energy procurement and ratemaking processes

Synapse Energy Economics

- Leader for public interest and government clients in providing rigorous analysis of the electric power and natural gas sectors
- Staff of 40+ includes experts in energy, economic, and environmental topics

BPU Requesting Costs for Nearman in this Rate Case

- Reviewed BPU's proposal to increase electric rates
  - Focus on Nearman Creek Power Station Unit 1
- BPU seeks to include Nearman's operations & maintenance, capital, and fuel costs in rate increases for 2023 and 2024 fiscal years

Category	July 1, 2023 – June 30, 2024 ($millions)	July 1, 2024 – June 30, 2025 ($millions)
Nearman Common	$0.9	$1.0
Unit 1 Capital	$6.8	$6.0
Unit 1 Maintenance	$9.7	$9.9
Unit 1 Operations	$9.9	$10.1
Unit 1 Engineering	$3.9	$3.9
Unit 1 Fuel	$27.7	$27.7
Total	**$58.9**	**$58.6**

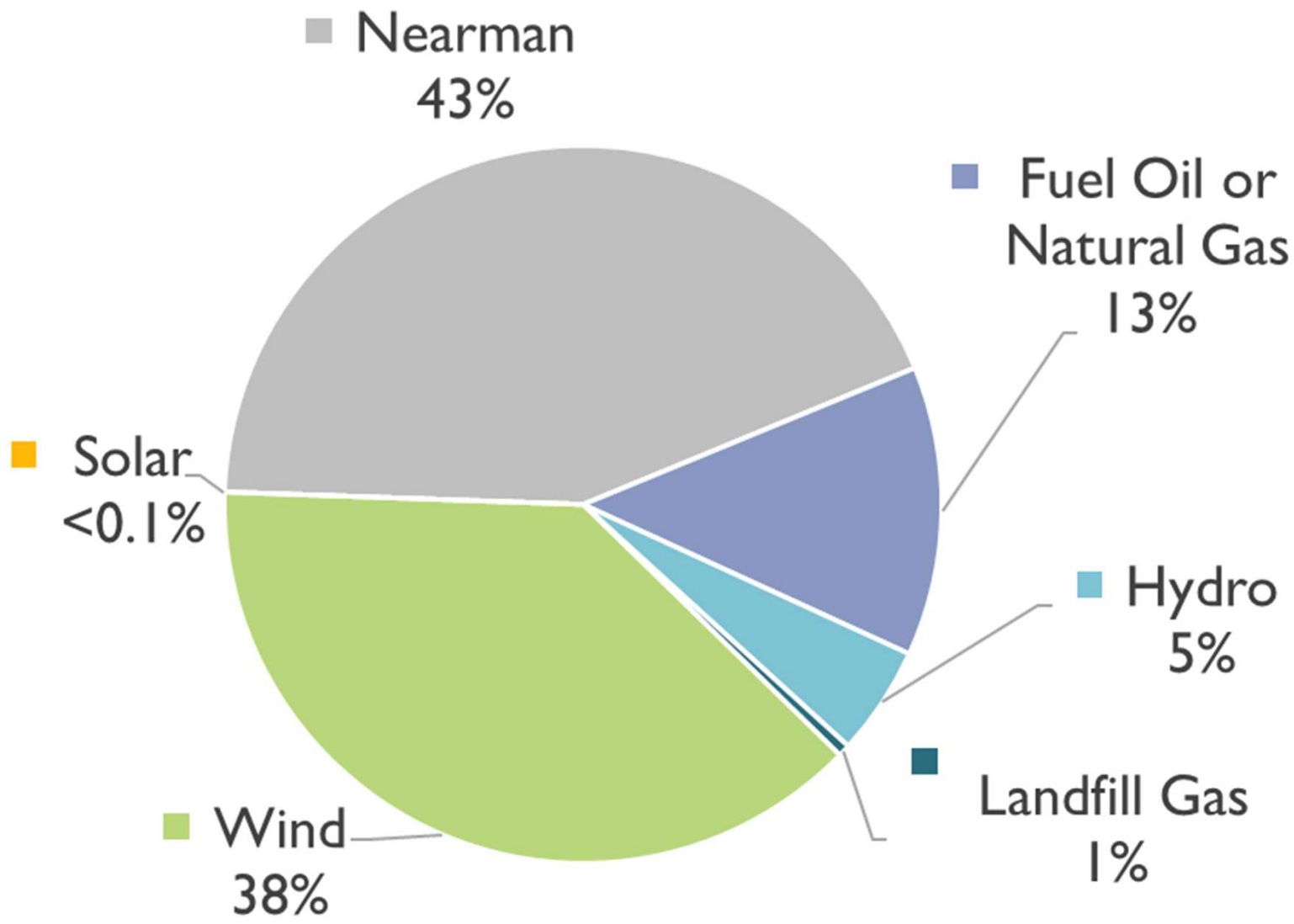
Recommendations

- **Recommendation 1:** Determine the most economic retirement date for Nearman
  - Nearman's costs exceed its value to ratepayers
  - Continuing to operate Nearman poses increasing risks
- **Recommendation 2:** Proactively procure replacement resources
  - Procuring and building new generation takes time
  - Federal incentives are available now
- **Recommendation 3:** Avoid long-term coal contracts and contracts with must-take clauses
- **Recommendation 4:** Avoid self-commitment into the SPP energy market as much as possible

Background

Nearman generates ~ 40% of BPU's Energy

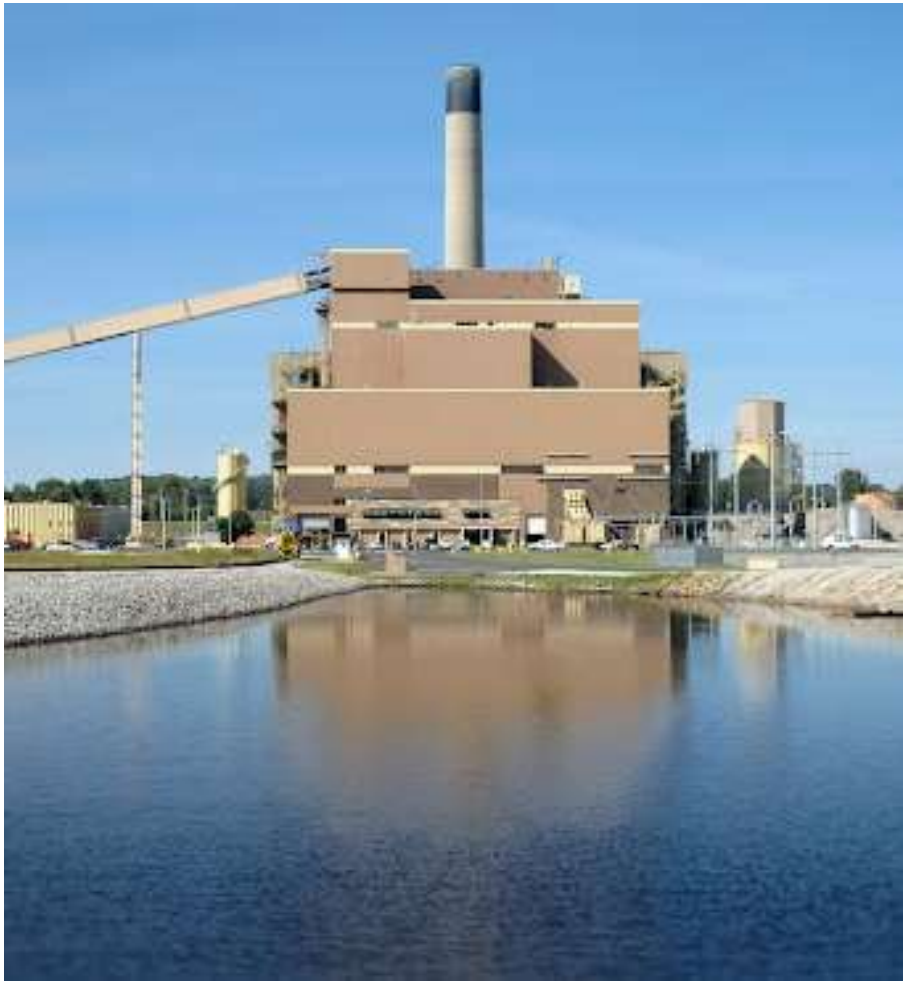
Unit 1, 250 MW coal-fired generator, commissioned in 1981 (42 years old)



Source: BPU

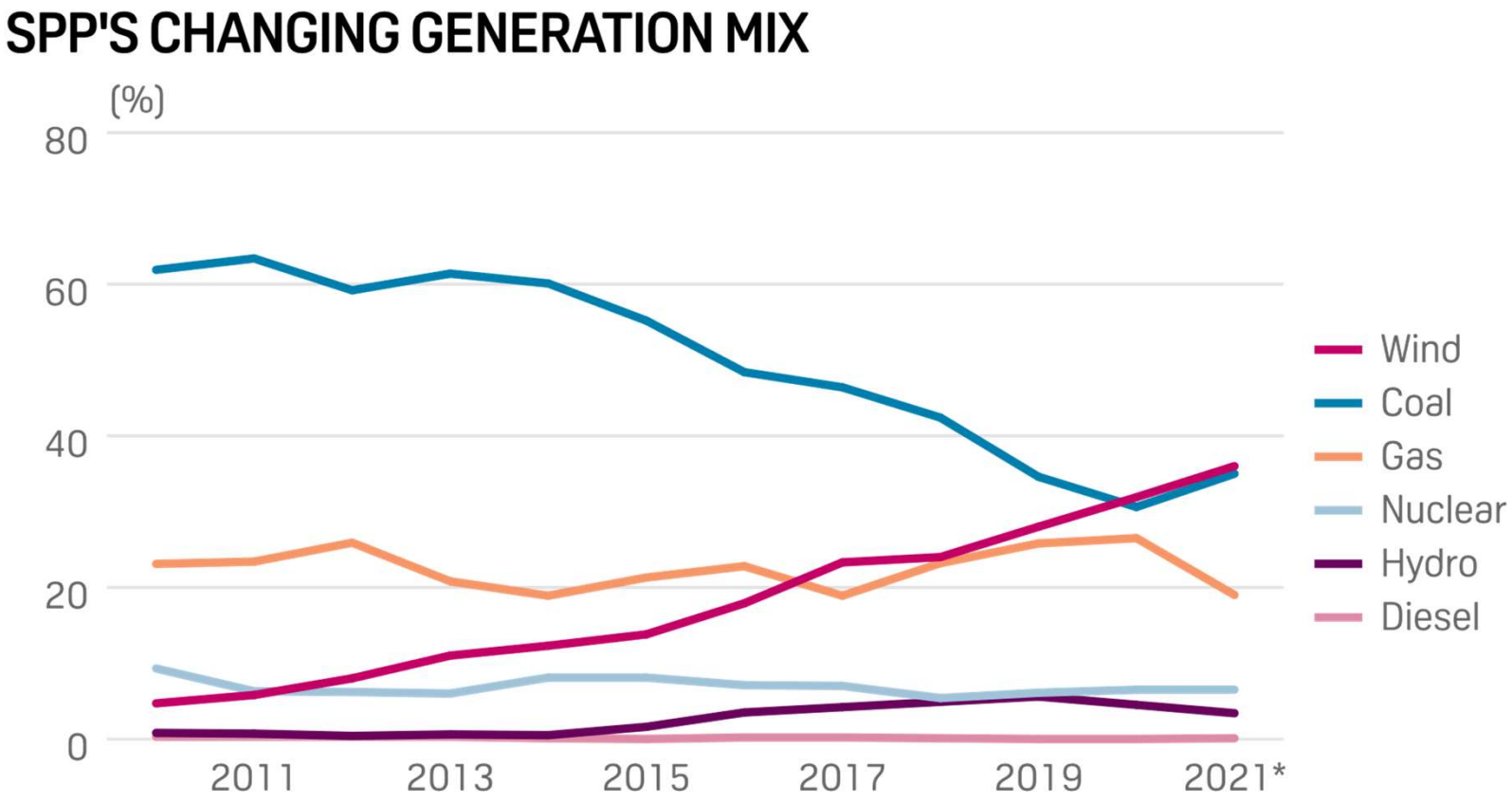
Nearman's Retirement Date is Not Based on Economics

- BPU estimating a 2040 retirement date for Nearman
  - 17 years from now
  - Nearman will be 59 years old
- BPU selected date to align with when Nearman's bonds will be paid off → based on sunk costs
- ***Current retirement date is <u>not</u> based on the most "economic" retirement for Nearman and BPU ratepayers***



Renewables Increasing in SPP

- Result of changing economics of renewables, policy, aging fossil fuel plants
- High potential for wind and solar throughout SPP territory



*Data is through March 29

Source: S&P Global: Commodity Insights, 2021 (via SPP)

Grid Needs Flexibility – Nearman is not a Flexible Resource

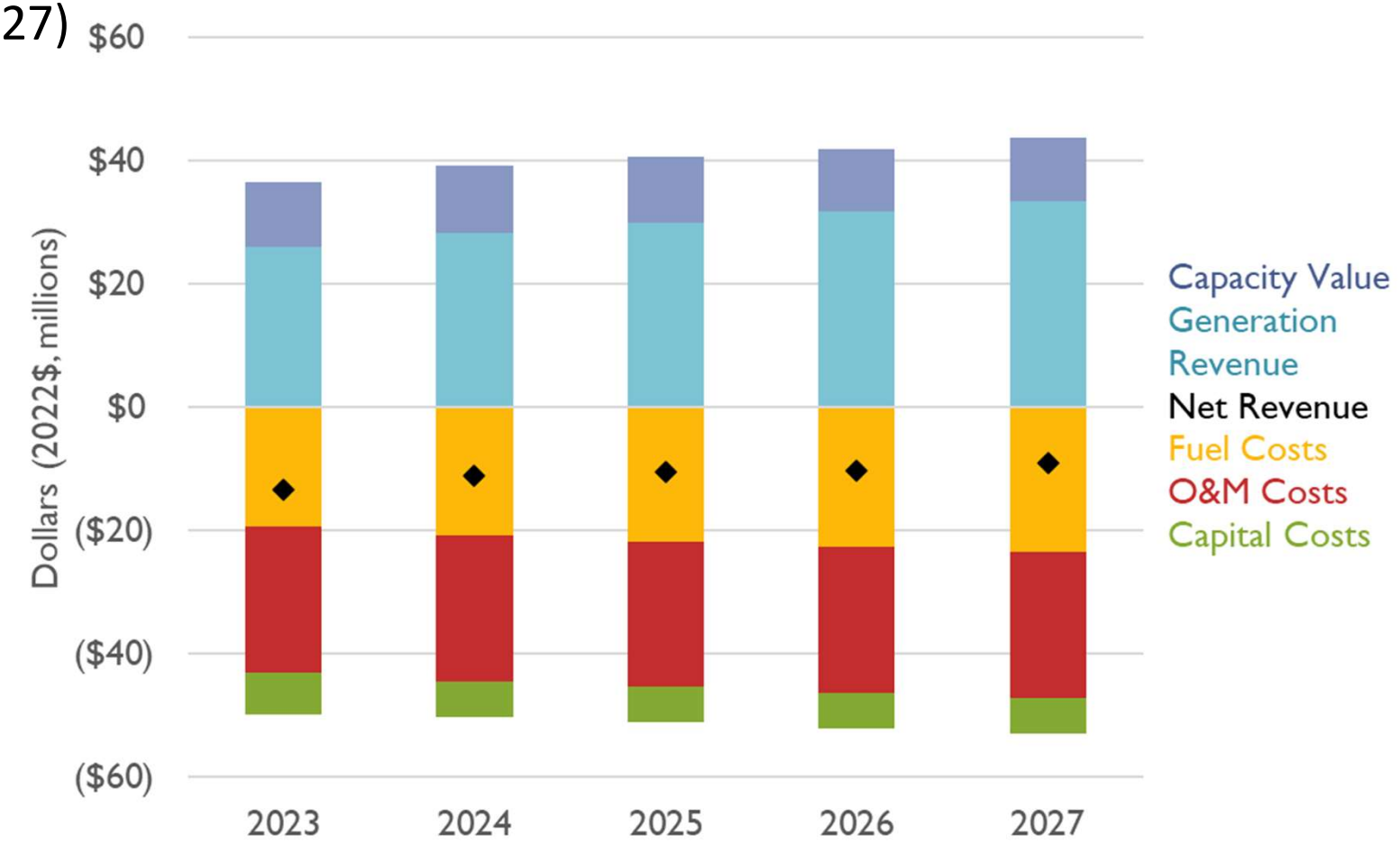
- Continuing trend
  - Renewables represent 80% - 100% of resources in SPP interconnection queue
  - Changes grid operations
- Renewables are zero-cost to generate, outcompete marginal resources
- Energy system needs flexible and nimble resources
  - Balance the supply of solar and wind
- Nearman was not designed to be a flexible resource
  - Long ramp-up times
  - Expensive start-up costs
  - Cycling increases wear and tear, costs
  - Does not follow load well

Recommendation #1

Determine Nearman's most economic retirement date

Nearman's Future Costs Exceed its Value

- BPU's own numbers show Nearman is expected to cost more than its energy revenue and capacity value
- Expected to incur net losses of $11 million per year ($47 million from 2023-2027)



Source: BPU

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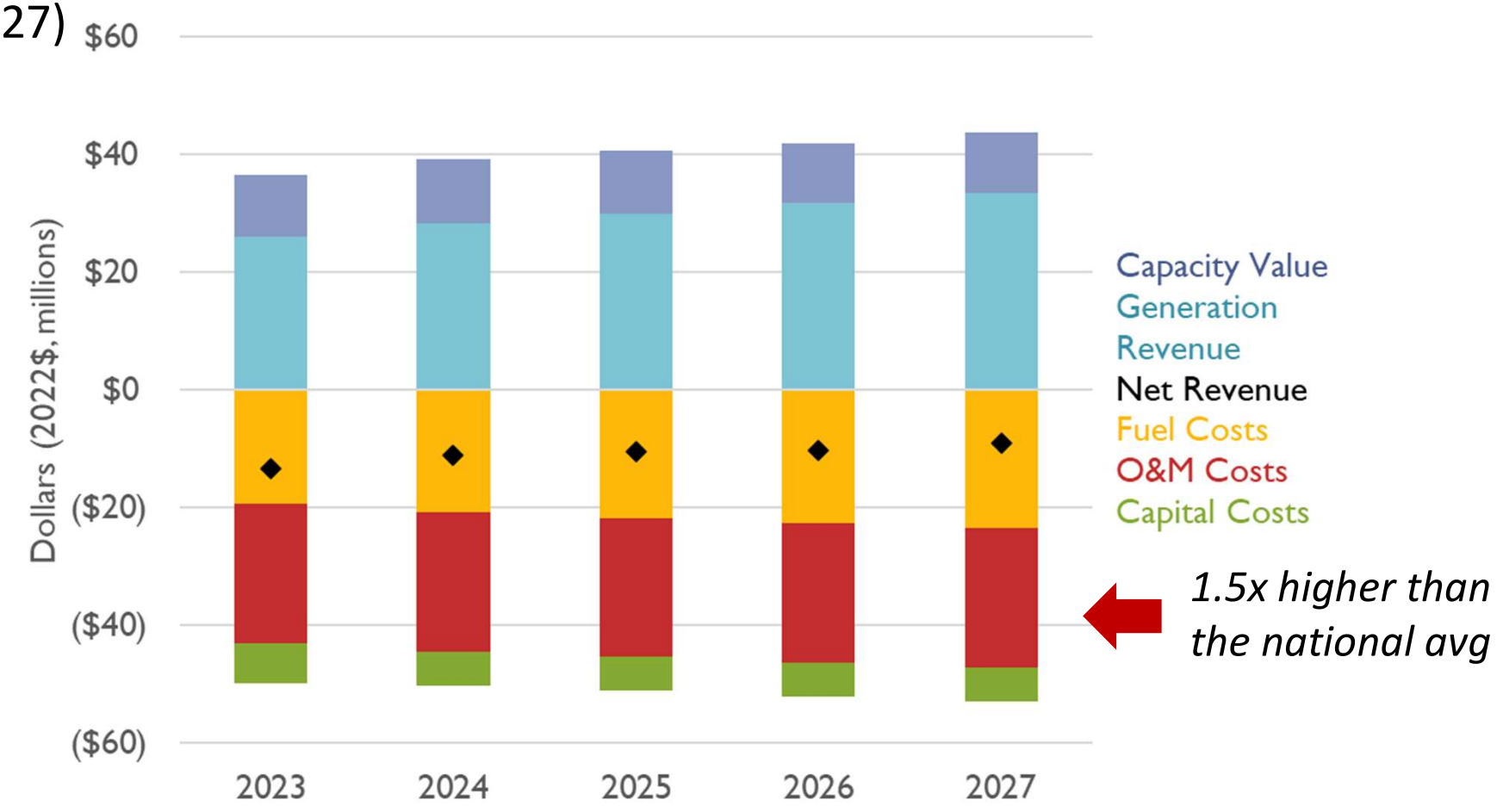
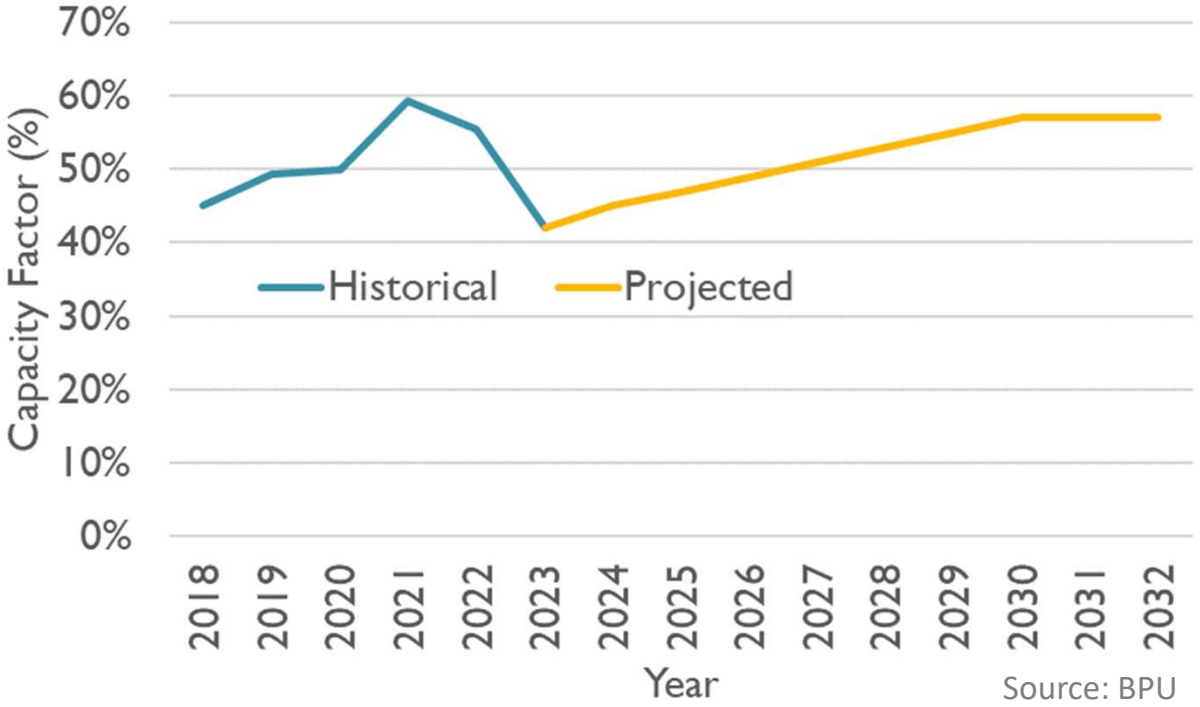


Source: BPU

BPU's Forecasting Unrealistic Capacity Factors

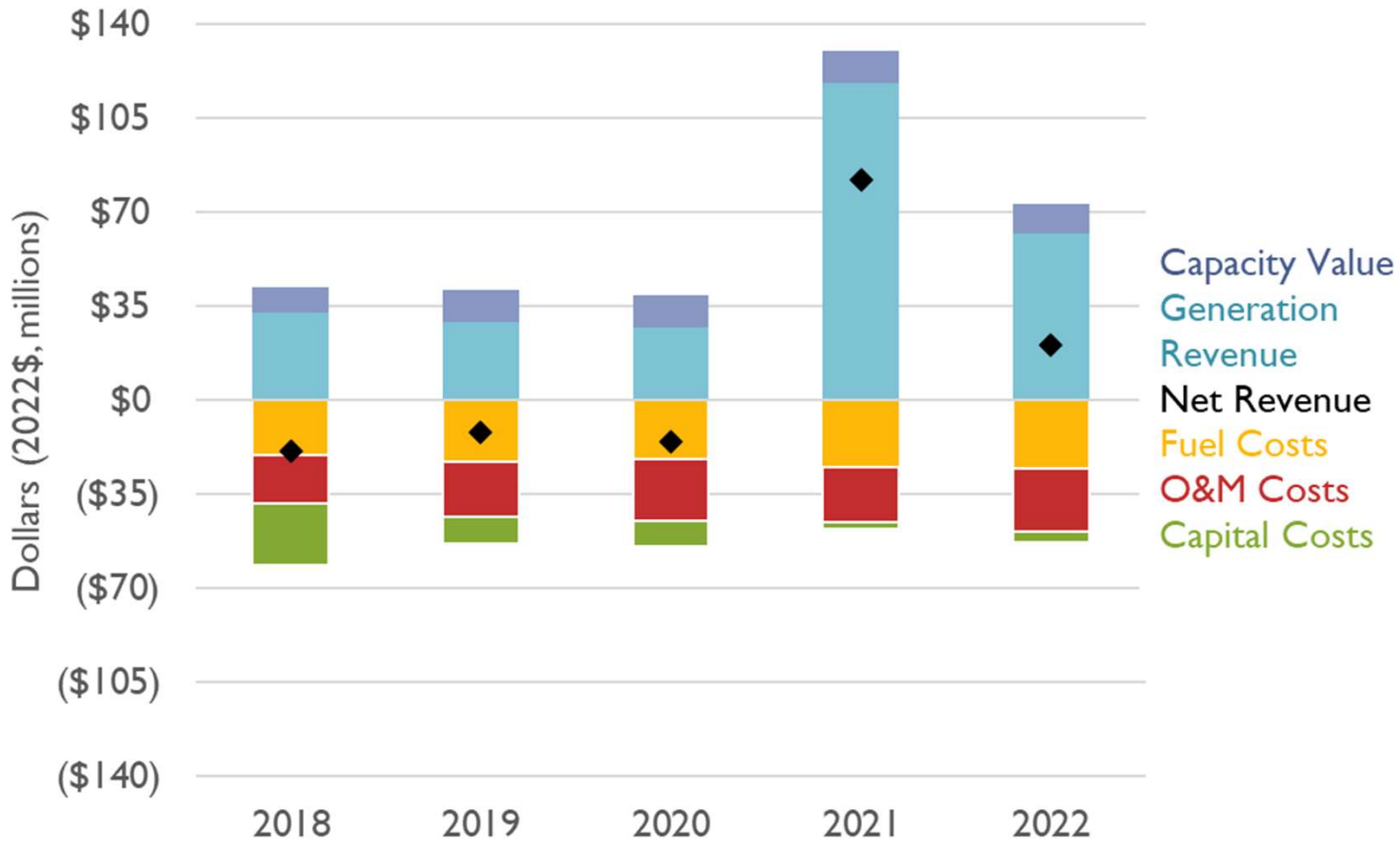
- BPU projecting increasing capacity factors for Nearman
  - SPP plant retirements, transmission congestion, natural gas prices, demand growth
- Goes against industry trends
- Does not consider:
  - Forced outages (42-year-old plant)
  - More renewable energy
- Unlikely to be achieved



Source: BPU

Nearman's Historical Costs Exceeded its Value

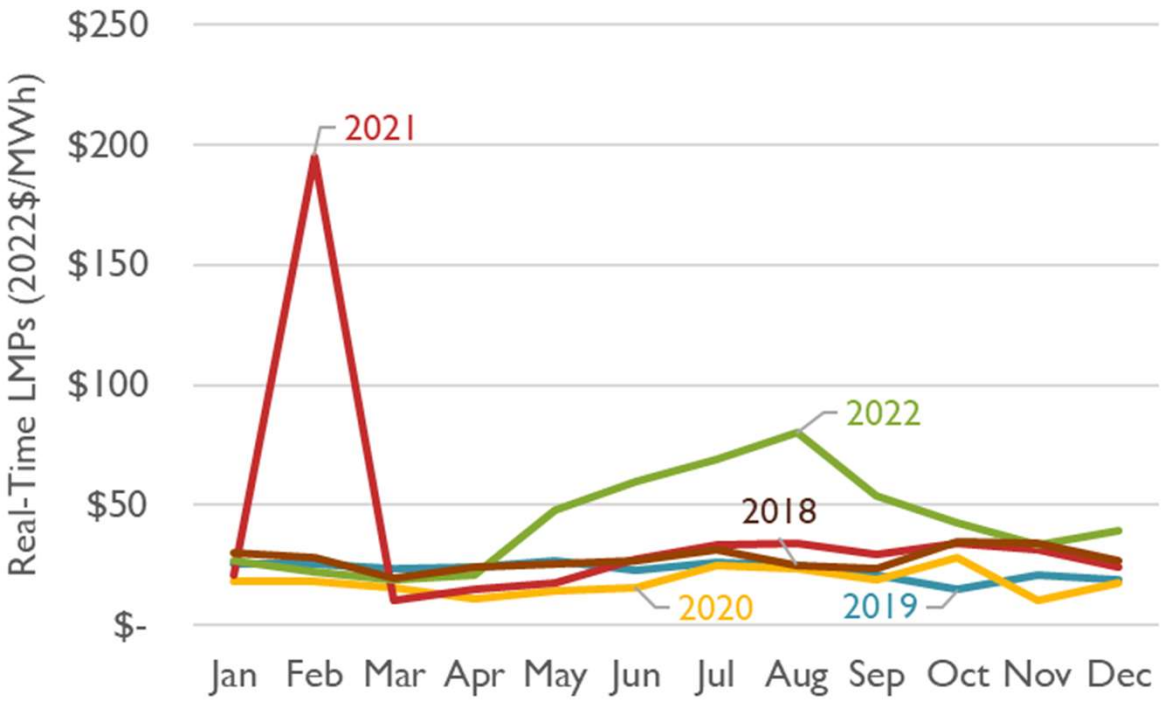
- Costs exceeded energy and capacity value in 2018 – 2020 (average net losses of $16 million per year)
- 2021 & 2022: high generation revenues



Source: BPU

2021 and 2022 are Outliers

- Very high LMPs drove high energy revenues for Nearman in 2021 and 2022
- 2021: major cold weather event in February 2021
  - Nearman made nearly as much in February 2021 as it did for the rest of the year
- 2022: high gas and energy market prices (war in Ukraine, global factors)
- Extreme weather and high fossil fuel prices usually come with risks for Nearman
- Won't always work in BPU's favor



Source: SPP

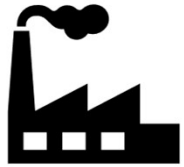
Nearman Faces Significant Risks

ENVIRONMENTAL COMPLIANCE COSTS

COAL SUPPLY, TRANSPORTATION, AND DELIVERY

COAL SUPPLY CONTRACTS

Future Environmental Regulation Will Be Costly



- Regulations increase the cost to operate coal-fired power plants (or mandate an early retirement)
- Risk of environmental regulation is a near certainty for coal
  - Carbon emissions
  - Air pollution (e.g., particulate matter)
  - Water emissions (e.g., wastewater)
  - By-products and waste (e.g., coal ash)
  - Upstream regulation (e.g., coal mining, transportation)
- Even if fully compliant now, risk of future regulations touching one or more of these inputs/outputs is very likely
- *BPU should transparently consider future environmental risks and costs in its resource planning (beyond 2027)*

Coal Supply Constraints Could Threaten Reliability

- Growing issue across coal and power generation industries
- April – June 2022, BPU experienced coal delivery issue
  - Coal car maintenance delays, Union Pacific labor disputes; coal supplier not able to delivery contracted amount of coal
  - 45-60 kilotons per month to 27 kilotons
  - Resulted in a derate
  - Cost ratepayers $960,000 in replacement power costs
- US coal heavily dependent on rail and barge transportation
  - Rail labor shortages in 2022 hindered coal movement across country
  - Droughts hindered coal deliveries on Mississippi

Delivery and supply issues can result in expensive replacements or put reliability at risk

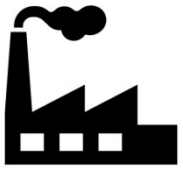
40% of BPU energy from coal: vulnerable to fuel supply/delivery issues

Coal Contracts Limit Ability to Respond to Changing Market

- BPU purchases coal through Western Fuels Association (which contracts with coal producers and railroads)
- WFA contract: BPU must pay penalty of $5 per ton if unable to accept shipments
  - ***Either***: BPU pays exorbitant fees if it can't accept coal delivery
  - ***Or***: BPU self-commits Nearman to burn coal unnecessarily and wastefully
  - Added costs and/or inability to respond to price signals
- Long-term contracts are also risky, especially if Nearman retires early (BPU economic retirement decision or environmental regulation)
- *Coal contracts could make it harder to respond to market signals*
- *BPU should consider future risks and costs in future resource planning (beyond 2027)*

BPU Must Determine its Economic Retirement Date

- Current 2040 date does not consider forward-going economics
- BPU has not conducted any recent analyses of Nearman's retirement (including cost impact, replacement resources, etc.)
- **Aim of BPU: minimize costs and risks for ratepayers**
- Retirement decisions should be based on the economics and risk factors of the generator, relative to the economics and risk factors of alternatives
- **Recommendation: conduct an assessment to determine the most economic retirement date for Nearman**



Technical and Robust Modeling is Essential

- How do we do this type of analysis?
  - Industry best practice: capacity expansion and production cost modeling
- Determines:
  - Economic retirement date
  - Set of replacement resources
  - Most economic path forward for BPU and its ratepayers
- Critical components:
  - Environmental regulations
  - Energy prices
  - Risk of weather impacts, other risks, etc.

Capacity Expansion & Production Cost Modeling

- Capacity Expansion Modeling
  - Economic optimization of new and existing capacity and generation: What mix of generators should we build to meet load?
  - Simulate electricity system, given assumptions about future electricity demand, fuel prices, technology cost and performance, and policy and regulation
  - Outputs: generation and transmission capacity builds/retirements, fuel consumption, electricity prices
- Production Cost Modeling
  - Economic optimization of generator operation and dispatch: What is the least cost dispatch of generators to reliably meet load in every hour of the day?
  - Analyze impact of changes to the system (retirements, new resources), assess transmission congestion, energy prices, etc.
- Run multiple scenarios and sensitivities to assess fuel price volatility, environmental regulations, extreme weather, etc.

Stakeholder Engagement is a Key Step in IRP Process

- Reasonable inputs and assumptions are crucial
- Requires meaningful stakeholder engagement and transparent assumptions

Recommendation for Board:

- Order staff to conduct technical modeling as part of the next IRP
- Require stakeholder input in process
- Ensure inputs and assumptions are transparent and clear
- Enable stakeholder review and feedback on modeling inputs and assumptions

Recommendation #2

Proactively procure replacement resources

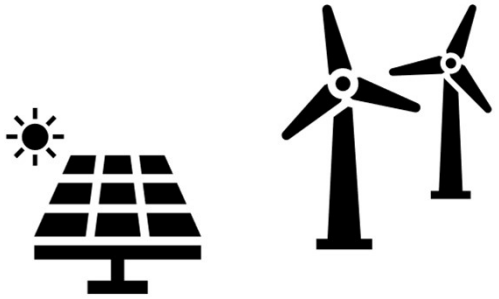
More Economic, Lower Risk Alternatives Exist

- Nearman has a forward-going levelized cost of energy (LCOE) of **$54/MWh**
- More expensive than some alternatives
- Supply chain issues, inflation, federal incentives

Resource Type	BPU Internal Estimates	NREL and EIA Estimates
Wind	$24 - $30	$17 - $67
Solar	$48 - $58	$19 - $33
Solar + Battery		$55
Combined Cycle Natural Gas		$37

Source: BPU, NREL (ATB), 2022 and EIA, 2022

IRP modeling can determine the lowest-cost, and lowest-risk resources for BPU and its ratepayers



Proactively Procure Resources

- Proactive planning is essential
- Nearman could have to retire early
- Procurement takes time (owned assets and PPAs)
  - Finding sites
  - Interconnecting into SPP
  - Supplying equipment
  - Contracting and approvals, etc.

Inflation Reduction Act Benefits Available Now

Tax benefits for Solar, Wind and Batteries	
Investment Tax Credit (ITC)	Utility-scale solar, wind, and battery storage eligible for 30% ITC (through 2032)
Production Tax Credit (PTC)	Increased to $26/MWh for wind and solar (through 2032)
Direct Pay Option	Direct pay for governments and tax-exempt entities
Energy Community Adder	10% adder on ITC and PTC for energy communities
Funding for Refinancing Undepreciated Assets and Reinvesting in Renewables	
Sec. 50141. Funding for DOE Loan Programs Office	Loans to retool, repower, repurpose, or replace energy infrastructure that has retired ($40 billion of authority through FY2026)
Sec. 50144. Energy Infrastructure Reinvestment Financing	Loans to retool, repower, repurpose, or replace energy infrastructure no longer in operation or enable operating energy infrastructure to avoid greenhouse gas emissions ($5 billion to guarantee up to $250 billion in loans through FY2026)
Sec. 60103. Greenhouse Gas Reduction Fund	Financial assistance for projects that reduce greenhouse gas emissions or deploy zero-emission technology ($27 billion available through FY2024)
Transmission Development	
Sec. 50151. Transmission facility financing	Loans supporting the construction and modification of national interest electric transmission facilities ($2 billion through FY 2030)
Sec 50152. Grants to Facilitate the Siting of Interstate Electricity Transmission Lines	Grants to study impacts of transmission projects, hosting negotiations, participating in regulatory proceedings and economic development for communities affected by construction and operation ($760 million)

Recommendation #3

Avoid long-term coal contracts and contracts with must-take clauses

Coal Contracts Limit Ability to Respond to Changing Market

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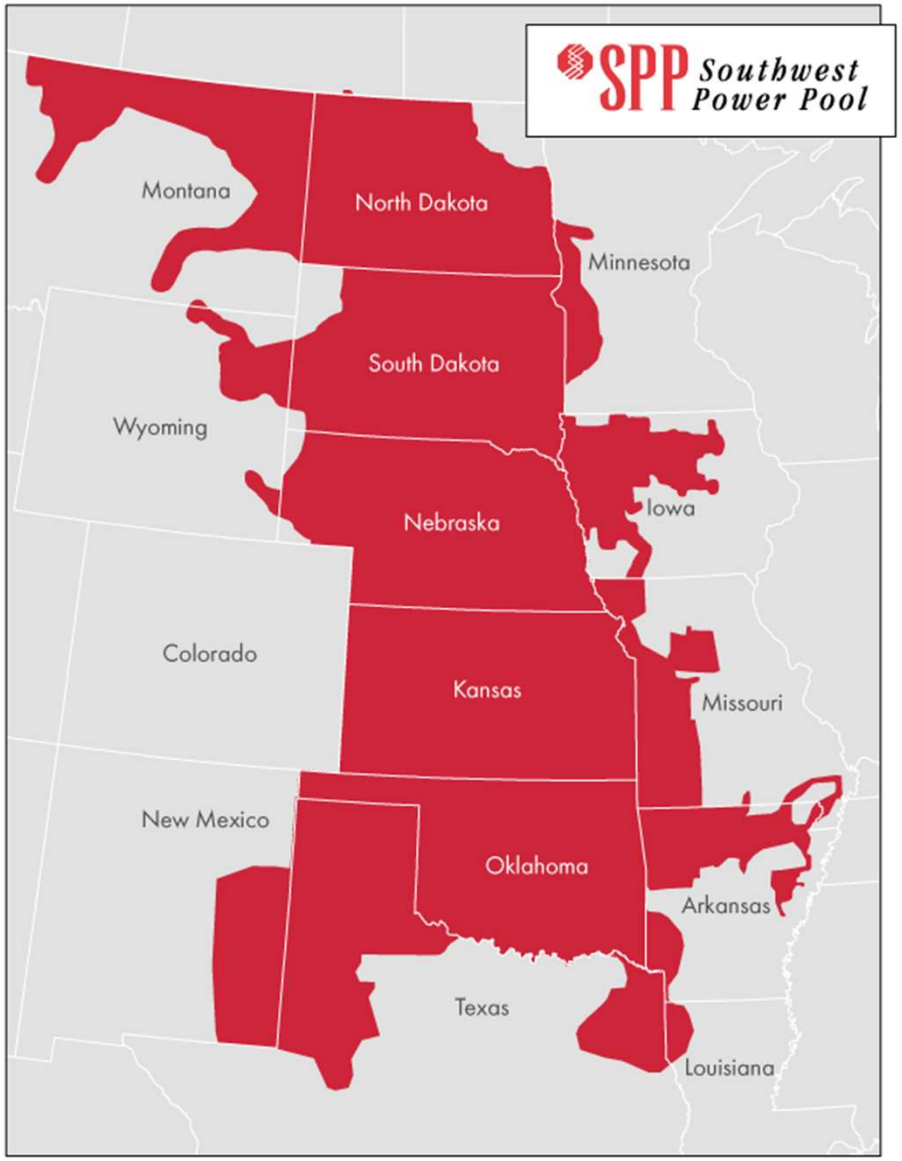
- Long-term contracts are also risky, especially if Nearman retires early (BPU economic retirement decision or environmental regulation)
- *Coal contracts could make it harder to respond to market signals*
- *Contracts hedging against price volatility but now need flexibility*

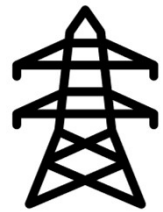
Recommendation #4

BPU should avoid self-commitment into the SPP energy market as much as possible

SPP Participation Options



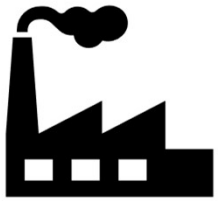
- BPU participates in SPP Energy Market
- Nearman generates energy revenue when it is dispatched into SPP energy market
- 5 options for participation:
  1. Market-commitment
  2. Self-commitment
  3. Reliability
  4. Outage
  5. Not participating



Market Commitment Mitigates Market Risks

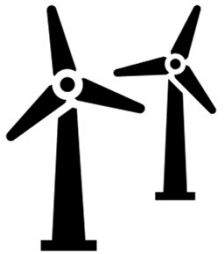
Market Commitment

- A resource is offered into the market at price that covers its marginal cost
- SPP schedules the resource if its offer price is equal to, or less than, other resources selected to meet demand
- Resource is paid for its generation at the market clearing price
- Eligible for SPP make-whole payments
- *Insulates a resource from energy-market risk*



Self Commitment

- A resource generates regardless of whether clearing price will cover marginal costs
- *Exposes a resource to energy-market risk*



Avoiding Self-Commitment Minimizes Losses

- BPU prefers to market-commit Nearman; plans to do so as much as possible in future
- BPU's seasons for self-commitment:
  - Environmental and performance testing
  - Managing its Air Quality Control System ("AQCS")
  - Coal silo management
  - Managing coal inventories (avoid $5 per ton supplier penalty)

Year	% Self Committed
2018	54%
2019	73%
2020	71%
2021	4%
2022	5%

Summary

- **Recommendation 1:** Determine the most economic retirement date for Nearman
  - Nearman's costs exceed its value to ratepayers
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Questions?