Exhibit to Agenda Item #1

Provide the Board with informational external and internal presentations and discussion about the **Prospects of Nuclear Energy for Deep Decarbonization**.
[Mark Gake, Black & Veatch]

Board Energy Resources & Customer Services Committee and Special SMUD Board of Directors Meeting

Wednesday, October 15, 2025, scheduled to begin at 6:00 p.m.

Auditorium, SMUD Headquarters Building

New Nuclear Momentum Building

Large plant growth didn't happen in early 2000's

DOE NP-2010 Program only resulted in one new U.S. power station

Small Modular Reactor (SMR) interest in 2012-2015 stalled due to low natural gas prices

New momentum building

- Decarbonization – nuclear needed for deep decarbonization
- Energy Security – firm reliable power needed for energy security
- More Owners/Developers – New-to-Nuclear Utilities and Industrial Users
- AI/ML Data Centers driving latest demand – larger energy growth

Government support

- DOE (Technology Awards, ARDP Demonstration Projects)
- Infrastructure Bill (2021) and Inflation Reduction Act (2022)
- Four New Executive Orders in 2025
- Other Countries Also Funding Growth

Where We See Nuclear Growth Today

Canada's SMR Roadmap – OPG DNNP, SaskPower, others

American Clients – both existing and new nuclear utilities and industrial clients/developers

- TVA, Energy Northwest, Duke, Dominion, DOW, and others
- U.S. utilities updating IRPs and looking at potential of SMRs (e.g. Duke ZELFR)
- Several U.S. utilities doing SMR siting and technology studies, Early Site Permits, and Construction Permit Applications (CPAs)

Europe – decarbonization and energy security driving both Large Light Water Reactors (LLWRs) and Small Modular Reactors (SMRs)

Asia – emerging nuclear interest in new countries but government agreements and policy work needed now to support nuclear future

Market Dynamics Impede Reliable Grid Power

Increase In Data Center Load

- AI processing 10x traditional Google search[1]
- New data center size increasing >=1 GW
- Annual load growth projected to increase from 1% pre-2023 annual to 3-15% annually through 2030[1]

Changing Grid Characteristics

- Intermittent resources increased from 5.3% in 2014 to 16% in 2023[2]
- Estimated retirement of 24 -58 GW of dispatchable resources by 2030 in PJM[3]

Challenge Building New Grid Infrastructure

- New transmission can take over 10 years to build
- Emerging political challenges for approval of new infrastructure for data centers[4]

[1]EPRI, "Power Intelligence – Analyzing Artificial Intelligence and Data Center Consumption", 2024
[2]Energy Information Administration
[3]Monitoring Analytics, "2023 Year in Review", 2024
[4]Statement by Texas Lt. Governor Dan Patrick

Why SMRs and Why Now?

New Nuclear – Two Paths Forward

Small and Micro Reactors

- Provides flexibility to incrementally add capacity
- Plant and component sizes more like combined cycle fleet
- SMRs not fully modular
- Gen III+ & Gen IV SMR options
- Micro-reactors will support distributed generation
- $/kW higher due to lower output
- 6-10 years for SMRs (3-4 years after CP); less for micro-reactors

Large Reactors

- Hyperscaler demand has resulted in large plants being considered again
- No one is building a single SMR on a site
- More efficient to address large load demand increases
- Large initial capital investment but 80+ year asset
- $/kW more attractive
- 8-15 years for large plants (6-8 years after CP/COLA)

New Nuclear Projects Underway

OPG Darlington New Nuclear Project (BWRX-300) – Unit 1 in construction – 2029/2030 COD, Units 2-4 in design

PacifiCorp (TerraPower Natrium) – Kemmerer, Wyoming (ARDP) 2032 COD (CPA review stage)

DOW Project Long Mott (Xe-100) – 2032 COD (CPA review stage)

TVA – Clinch River Nuclear (BWRX-300) 2034 COD SMR (CPA review stage)

Energy Northwest New Nuclear (Xe-100) – 2033-2034 COD for Unit 1 (PLM fast follower)

Kairos Power – Hermes 1/2 – 2028/2029 COD (construction permits issued)

Fermi America (AP1000) – COLA review stage – planning for 2035 COD for first unit

Owner/Developer Near-Term Planning

Early-Stage Planning

- Site Selection/Evaluation Services
- Technology Selection
- Site Layout Work
- Geotech Evaluation/Soil Borings
- Environmental Review/Permitting
- Licensing Support/Analysis
- Heat Rejection Optimization
- Site/BOP System Design
- Early Site Permits
- License Applications (CPA or COLA)

Later-Stage Planning

- Integrated Project Schedules
- Construction Execution Plans
- EPC Capital Cost Estimates
- Contract Development
- Procurement Strategy
- Commissioning/Startup Planning
- Operational Planning
- Maintenance/Warranty Support
- Fleet Coordination

Future is Promising

- Early projects need to be successful
- Nuclear will not be cheap, but is firm green energy
- Contracting requires an open collaborative approach with reactor vendor and EPC/builder
- Risk mitigation needs careful consideration
- Sharing of lessons learned across projects extremely important