SASKPOWER'S PATH TO 2030

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OUR KEY CHALLENGES

- Significant growing demand for power
- Emissions regulations eliminate one of our primary **baseload** power sources: conventional coal
- Aging system requires \$ 1 B annual investment
- Adding more renewable generation
- Managing rate impacts and keeping costs low



• Fuel Supply

2018-2038 SUPPLY DEMAND GAP





GOAL TO REDUCE CO₂ EMISSIONS BY 40% BY 2030





STRATEGIC DIRECTION TOWARD 2030









STRATEGIC PRIORITY

MODERNIZE THE GRID

Where we need to be:

Reduced emissions



Increased renewables



Modernized grid





SUPPLY PLANNING TO 2030

- Load Growth
- Existing Generation & IPPs
- Generation Options
- Pipeline/Transmission Impacts
- Customer Participation
- Regional Considerations
- Emissions





SASKATCHEWAN'S POWER MIX



GENERATING CAPACITY 4,513 MW



GENERATE YOUR OWN POWER

Power Generation Partner Program

- All customers eligible
- Annual cap of 10 MW/year for renewables, 25 MW/year for carbon neutral

Net Metering

• Customers generate up to 100 kW of power, decrease bills and get credit for excess power



EQUIVALENCY AGREEMENT

- Equivalency Agreement is undergoing final Federal review
- EA enables operation of coal facilities past Federal end of life dates
- Emissions must be managed within defined regulatory limits
- Term of proposed EA expires at the end of 2029
- Without EA, Federal regulations require BD 4 & 5 to retire Dec. 31, 2019
- Plans in place to meet demand for electricity



CARBON PRICE

<u>Status</u>

• Compliance in Saskatchewan required as of January 1, 2019 (impacted customers beginning April 1, 2019)

Impact

- The amount charged is based on consumption
- Carbon tax estimated to be >\$500M for the next 4 years (2019-2022).
- Per tonne increases 250% between 2019-2022 (\$20 to \$50 per tonne)
- Uncertainty past 2022 with the per tonne price

CARBON CAPTURE UPDATE

- The International CCS Knowledge Centre contracted with Mitsubishi Heavy Industries (MHI) for a highlevel feasibility study to retrofit Shand with CCS
- Showed improvements over firstgeneration technology at BD3
- Need to manage rates and replace conventional coal with the lowest cost generation options
- Final decision required by 2024-25



NUCLEAR POWER FROM SMALL MODULAR REACTORS (SMRs)

- Evaluating the feasibility of nuclear power since the 1970s
- In 2010, SaskPower ruled out large scale nuclear power generation (>300 MW per generating unit) to focus on potential for SMRs of between 50 MW to 300 MW per generating unit
- In 2018, SaskPower joined the Govt of Canada, 3 other Provinces and 4 other Canadian utilities to participate in the development of a Canadian Roadmap for SMRs



SMR Feasibility: Conclusions to date

- could **facilitate deep GHG emission reductions** by retiring/replacing conventional coal fleet
- could **offset economic loss** from federal legal requirement to retire conventional coal generation by 2030 and the associated loss of the coal mining business

- could provide an effective hedge against gas price volatility and carbon emission penalties;
- Zero emissions alternative to natural gas generation after 2030
- could support aggressive deployment of intermittent renewables (wind/solar)



CHALLENGES TO SMR DEPLOYMENT IN CANADA

- Developing technology not commercially available today – with first commercial projects in North America expected in mid 2020s
- Regulatory/schedule/financial risks for first commercial projects in Canada
- Expectation of continuing low price of natural gas (may not be a barrier if deeper emissions cuts are required after 2030)
- Comparatively long project schedule (9-12 years) vs natural gas/wind/solar
- Public acceptance



SASKPOWER'S PLAN FOR SOLAR



SaskPower Powering the future®

PLAN FOR WIND

- Existing: 241 MW including 20 MW recently added at our Western Lily site
- In development: 387 MW
 - Riverhurst (10 MW)
 - Blue Hill (177 MW)
 - Golden South (200 MW)
- Future:
 - Next 200 MW procurement in summer 2019





PLAN FOR HYDRO

- **Existing:** 864 MW, plus 25 MW import from Manitoba Hydro
- In development: up to 315 MW imports from Manitoba Hydro
 - 100 MW starting 2021
 - Up to 215 MW starting 2022
- Future:
 - Upgrade E.B. Campbell to increase capacity
 - Explore projects and import opportunities



FIRST NATIONS DEVELOPMENT OPPORTUNITIES

- First Nations Power Authority
 - Developing 20 MW Flare Gas
 - Developing 20 MW Solar
- Cowessess Renewable Energy & Storage
 - 20 year PPA
 - Additional 340 kW solar added in October
- Meadow Lake Tribal Council
 - Potential for 8 MW biomass facility





GEOTHERMAL

- Deep Earth Energy Production
 - PPA signed
 - Proof of concept study determining the feasibility of a 5 MW project
 - \$25.6 million funding from the Government of Canada



Photo Credit: Deep Earth Energy Production



CAPITAL INVESTMENTS

Sustainment

- Transmission Wood Pole Remediation Program \$340M over next five years
- E.B. Campbell Hydroelectric Station life extension **\$300M complete in 2025**
- Distribution Wood Pole Remediation Program **\$150M over next five years**
- Rural Rebuild and Improvement Program \$100M over next five years
- B4P and PA4 Power Line Rebuild Projects **\$32M in-service 2020**
- Island Falls Hydroelectric Station Dam Rehab Project \$45M complete in 2021



CAPITAL INVESTMENTS

Growth & Compliance

- Chinook Power Station \$680M complete in 2019
- Distribution customer connects \$530M next five years
- Blue Hills Wind Energy Project **\$420M in-service in 2020-21**
- Pasqua to Swift Current Transmission Line **\$231M complete in 2019**
- Condie to Belle Plaine \$36M in-service in 2019
- Auburnton to Kennedy Transmission Line **\$58M complete in 2022**
- Queen Elizabeth transformer replacement **\$42M complete in 2020**



QUESTIONS?

