Governance, complexity and the evolution of electricity regimes

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Outline

- Complexity and the future of electricity provision
 - Complexity and uncertainty
 - Governance: a transition perspective

Complexity and the future of electricity provision

- The vanished age of 'simplicity'
- Manifestations of complexity (internal)
 - 'diversified power mix'
 - centralised and distributed generation
 - variability: intermittency and rigidity
 - efficiency and demand management
 - grid modernization
 - enhanced interconnection

Complexity and the future of electricity provision 2

- Manifestations of complexity (external)
 - Multiple policy goals (societal objectives)
 - New actors (citizens, businesses, agencies)
 - Enhanced electrification?
 - 'Integration' :
 - Building integrated energy solutions
 - Community energy systems
 - Smart energy networks (electricity, gas, heat)
 - Regulatory 'integration'

Complexity and uncertainty

- 'Traditional' uncertainties': demand forecasts, materials prices, weather
- Novel uncertainties: climate goals, carbon price, climate impacts
- Technological trajectories: the auto sector, the future of CCS, new renewables
- Viability of 'utility model'

Governance challenge

What does governance mean in this context?

- A different conception of 'steering'
- A 'transition' framework
- A great opportunity and an exciting time to be involved with power



Managing Complexity and the Power System of the Future

Guy Bruce, VP Resource Planning, and CEO NorthPoint Energy Solutions





Electricity is a Rare Product

Produced at the Same Time it is Consumed

- SaskPower manages the power system reliably second by second, day by day, year by year
- Assets are long lived, some lasting over 50 years
- Conventional coal as a supply choice, is no longer an option
- Pace of technological change accelerating
- SaskPower must plan into the long term to meet customer objectives and have reasonable rates
- Stakeholders have strong influence





Customer of the Future

- Connected
- Controls
- Has more Influence
- Value for Money
- Environmental Leadership
- Expectation of Enhanced Product Suite





The Power System of the Future

- Variable generation enabled by design
- Pressure to build gas fired generation
- Pressure to move towards non-emitting generation sources
- Smart grid and associated control system highly sophisticated
- Technologies of the future will be competitive and available (Solar, wind, electric cars, communication and control)





Disruptive Technology (Mckinsey et al)

- 2025-16% of worlds power from solar or wind
 ..and will be competitive
- 2025- over 40% of cars will either be hybrid or electric
- Cost of storage and battery technologies will reduce and be competitive
- Community projects and thus microgrids will likely gain popularity.
- Fuel cells and the use of gas may displace some electricity use
- The Smart Grid will provide unprecedented customer control.



Challenges

- Emissions regulations and impact on current and future assets
- Market price of electricity
- Price volatility of natural gas
- Need to renew our infrastructure
- Construction cost
- Finding skilled workers





IT TAKES POWER TO GROW

Are there any questions?