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Renewable Electricity Program Objectives

- Government of Alberta objectives
 - Develop a plan to bring on new renewable electricity capacity to the system by 2030
 - Utilize a competitive process, such as an auction, to keep the costs of the program as low as possible
 - The program must be managed and operated in concert with the retirement of the coal fleet
- The Government of Alberta (GoA) has indicated that at this time they have not chosen to fundamentally alter the current wholesale electricity market structure
- The AESO designed the Renewable Electricity Program (REP) to meet these objectives through a series of periodic procurements and careful consideration of the payment mechanism

Timeline

Activity	Date	Status
Climate Leadership Plan announcement	Nov 22, 2015	✓
Information gathering and analysis	Jan – May 2016	✓
REP Recommendations to Government of Alberta	May 31, 2016	✓
Government of Alberta approval expected	Q3 2016	
Stakeholder engagement / contract development	Sept – Nov 2016	
First competition opens	December 2016	
First REP projects in service	2019	

- AESO solicited input from industry and developers to inform the Renewable Electricity Program design
 - 138 questionnaire responses received in March
 - Targeted follow-up meetings held in April and May
- Summary of feedback is posted at www.aeso.ca/rep
- Key Results
 - Majority of responses came from developers/investors
 - Interest in a variety of fuel sources
 - Wind, solar, biomass, geothermal, hydro, storage
 - Strong support for the program and interest in investment opportunities, but more information and clarity is required

- We have heard concerns from developers, lenders and capital markets about:
 - Near-term low electricity market prices, low price of oil and uncertainty regarding future electricity demand
 - Longer-term electricity market price / revenue uncertainty
 - Electricity market structure and policy uncertainty
 - Lack of clarity about renewable development targets
 - Coal retirement schedule uncertainty
 - Capital intensive nature of renewable generation projects
 - Complexity and timeliness of regulatory approvals
- Addressing these uncertainties will help drive investment decisions

- All due diligence activities yielded valuable insight that helped inform and crystalize the AESO's recommendations to the GoA
 - Stakeholder questionnaire
 - Targeted stakeholder one-on-one meetings
 - Jurisdictional review of global procurement approaches
 - Best Practices
 - Payment Mechanisms
 - Significant work with external financial advisors
 - Analysis of capital market sentiments, trends and recent financing activities
 - Internal AESO assessment of market and electricity framework impacts

Common Renewable Incentive Structures

- Our due diligence and research revealed a number of incentive structures used globally to incent investment in renewables, including:
 - Renewable Energy Credits (REC)
 - Contracts for Differences
 - Capacity Payments
 - Power Purchase Agreements (PPA)
 - Feed-in-Tariffs (FIT)
 - Standing Offers
 - Renewable Portfolio Standards (RPS)
- These approaches each have pros and cons, and the GoA will need to balance consequences of the chosen approach against its objectives

Risk Allocation and Mitigation

- Risk types: commodity(price, volume); design-build-operate (DBO)
- Volume and DBO risks are well understood
- Price risk is a concern due to both macro and local factors:
 - World price of oil
 - Future electricity demand in Alberta
 - Rate of renewable integration and impact on pool price
 - Broad policy uncertainty (carbon tax, performance standards, coal emissions phase-out)
 - Electricity market structure
- Historically, investors could make assumptions within a manageable range of uncertainty
 - Unhedgeable risks allocated to developers will either deter investment or cause investors to include significant premiums in bid prices

- Two types of financing approaches:
 - Balance sheet (corporate) finance solutions
 - Project is financed based on financial strength of developer
 - Upside and downside risks to developers
 - More capable of absorbing risk / portfolio effects
 - Higher cost of capital
 - Project finance (non-recourse) solutions
 - High leverage ratio and slim equity thickness
 - Little upside benefit to lenders; higher downside exposure and risk
 - Results in lower upfront costs to Albertans (though Albertans assume more of the risks)
 - In the current interest rate environment, returns are low and there is little room to absorb losses
 - Lenders are conservative but low interest rates are favourable to borrowers (low cost of capital)

Risk Allocation – Drives Decision Making

- The AESO and GoA need to understand the benefits and consequences of each approach as recommendations are developed and evaluated
- Need to ensure a robust competition, attract the maximum number of bidders, and drive down costs to consumers
- Need to understand:
 - Risk allocation and its alignment with / impact on existing market dynamics and evolution
 - Currently all price risk lies with developers
 - The balance between risk allocation and bid prices
 - Hedgeable versus un-hedgeable risks
 - The project pipeline (and dead deal cost implications)

Key Takeaways

- The Renewable Electricity Program will bring on renewable capacity by 2030 through a competitive process to keep costs as low as possible
 - The first competition is expected to open in December 2016
- We have listened to developers and lenders and understand the risks and issues
- The AESO's role is to provide guidance and advice to the GoA about risk implications and consequences
- The AESO will design the Renewable Electricity Program to result in a robust competition and best value for Albertans

Thank you