Resource Options Engagement Wind Update

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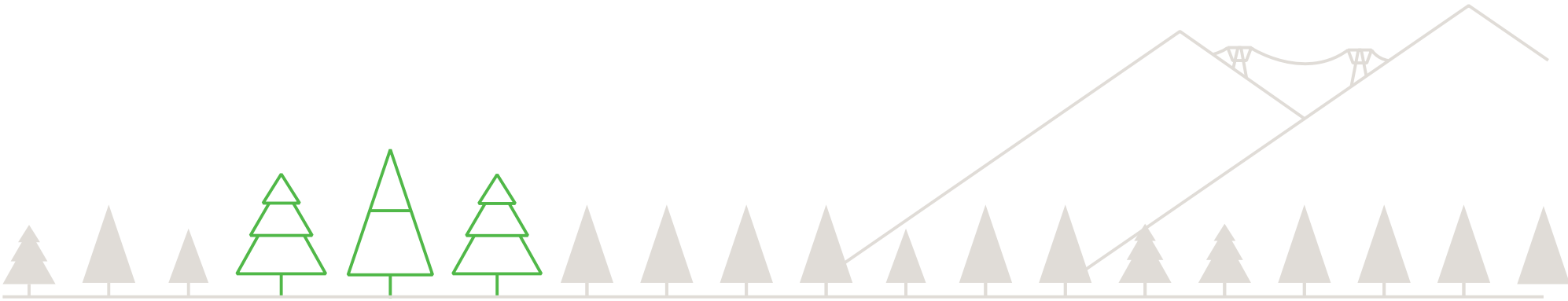

March 5, 2020

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Agenda

Purpose of the meeting is to get your feedback on assumptions

- Wind resource/project info
- Turbine characteristics
    - observed trends and assumptions being made in update
    - Impact of changes on net capacity factors
- Assumptions for capital (CAPEX) and Operations & Maintenance (O&M) costs
- Preliminary results for unit energy cost at gate

Wind Resource/Project Info

Continue to use underlying data from 2009 BC Hydro Wind Data Study and 2009 BC Hydro Wind Data Study Update

- Studies identified 130 potential wind project sites
    - Potential sites that overlap with existing wind projects have been removed
    - Installed capacity for each project unchanged
- 10 years of 10-min wind speed time series

Turbine characteristics

Turbine technology is still evolving

- Contacted 4 OEMs and received information on 9 turbine models
- Both nameplate capacity and rotor diameters have increased from 2015

	2015	2020
Nameplate Capacity (MW)	3.0 – 3.3	4.6 – 5.6
Rotor Diameter (m)	101 - 126	136 - 162

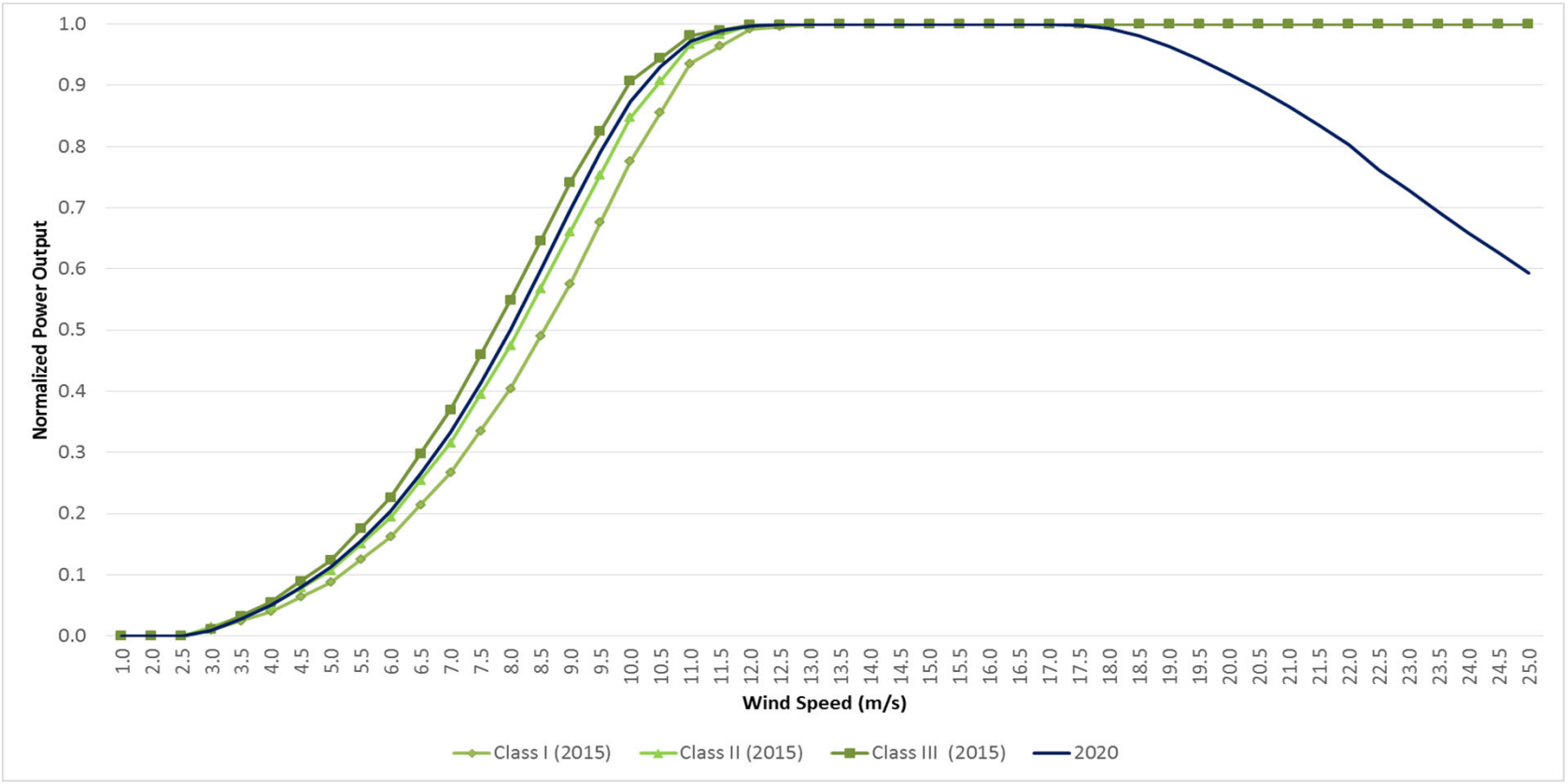
- Trends in hub heights less clear
- Emergence of IEC Class “S” turbines – designed to be used across all IEC wind classes

Proposed changes to turbine characteristics

- Increase hub height from 100 m to 110 m
- Use uniform turbine size of 5 MW (no impact)
- Assume 12.75% loss factor (same as 2015)
- Blended power curve based on information provided by OEMs

Power curve update

Use one power curve for all sites.



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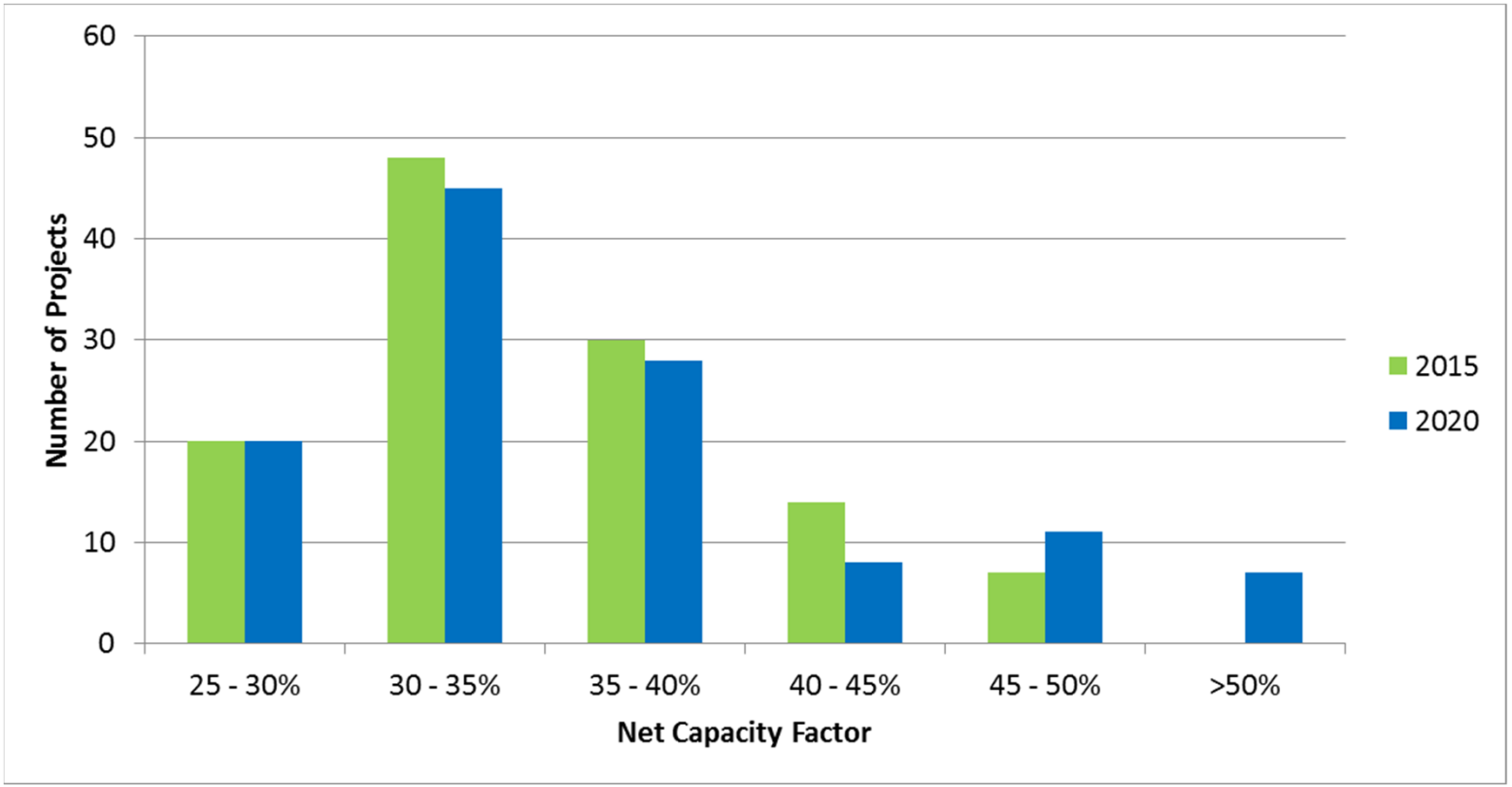
Impact of changes in turbine assumptions on net capacity factor



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Cost Updates

In 2018, Hatch provided an update to its 2015 cost analysis.

7-10% decrease in turbine prices

No changes in O&M or BoP costs

Factors, trends not captured in cost analysis

- Turbine design life increasing from 20-25 years to 30 years
- Increased OEM competition, leading to favourable turbine supply agreement terms for the wind developer
- Exchange rate fluctuations can significantly affect project viability
- Increased emphasis on condition monitoring and performance assessment
- Improved turbine technology leading to less O&M

CAPEX assumptions

- Use 2015 Hatch report, with a 15% decrease in turbine cost
- No change in BoP costs
- Assume CAPEX remains same for all regions in BC
- CAPEX scaled with project size
- Assume 20% increase in CAPEX for more complex sites
- Assume 25 year project life

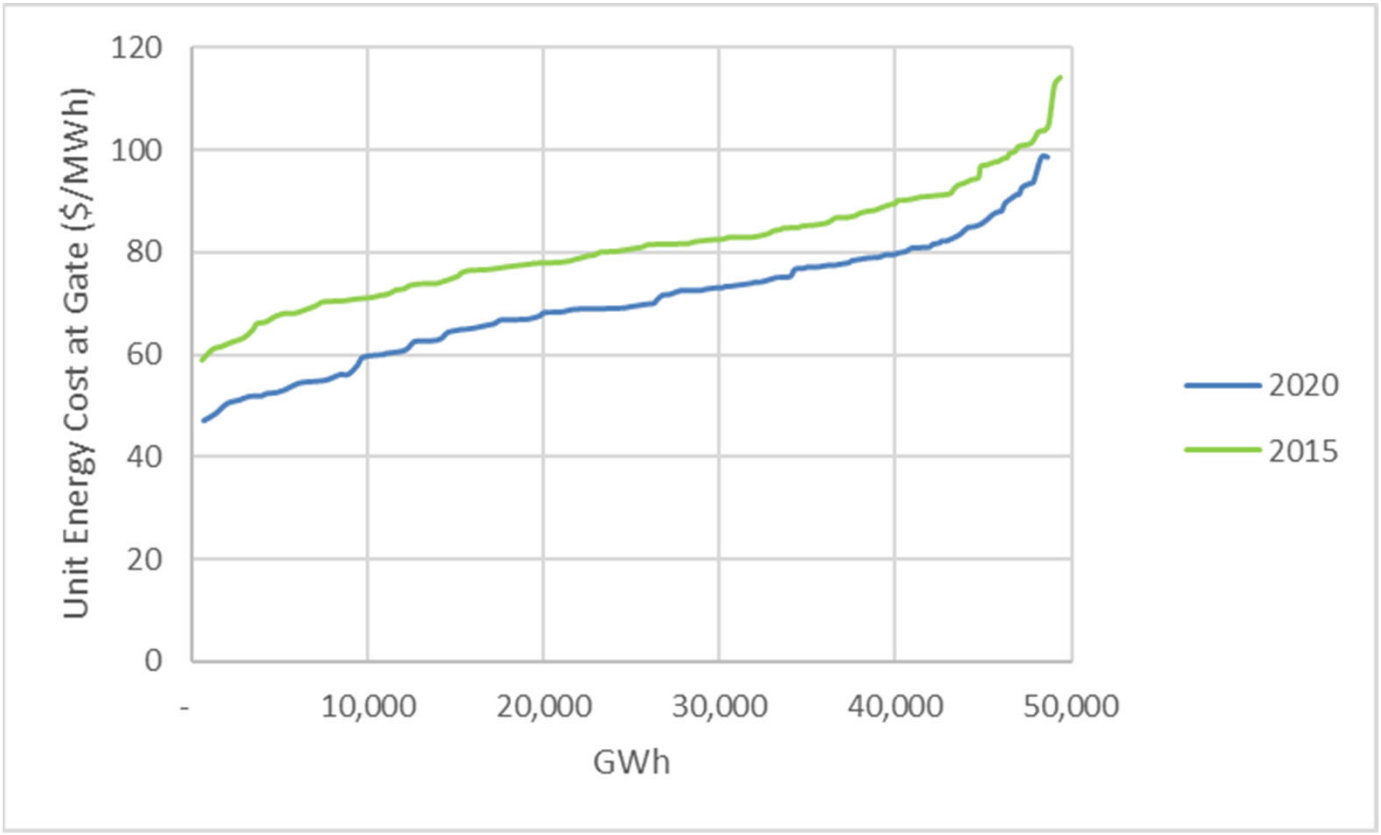
→ Capex cost for 200 MW project in easy terrain = $1,990/kW

→ Capex cost for 200 MW project in complex terrain = $2,390/kW

O&M Assumptions

- O&M assumed to include turbine O&M, personnel costs and other costs (taxes, leases, rents)
- Assume $60/kW-yr, based on 2018 Wind Technologies Market Report and collaborated with actual O&M cost for a wind project in BC

Unit Energy Cost at Gate (preliminary)



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Thank you for your feedback!

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