Societal Issues Panel (Macro Environmental and Socio-Economic Matters)

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Manitoba Hydro

Presentation Outline

- Context
- Review of macro-environmental effects and benefits
  - Air, land, water, flora and fauna
- Review of socio-economic effects and benefits
  - Training & employment
  - Business opportunities
  - Personal, family and community life
  - Infrastructure & services
  - Resource use

Context

- PDP has been dealt with in greater detail in previous presentation
- Terms of Reference – "The assessment will take the following factors into consideration:...
  - "h. The socio-economic impacts and benefits of the Plan and alternatives to northern and aboriginal communities;
  - i. The macro environmental impact of the Plan compared to alternatives"
- Presentation provides overview of macro-environmental and socio-economic effects of natural gas and wind generation, Manitoba-Minnesota and North-South Upgrade Transmission Projects, as well as DSM
- DSM has positive environmental effects. Socio-economic benefits dependent on type of program. Will be included in all development plans
- Important to note that any new generation and transmission projects will be subject to a full environmental licensing process before proceeding
- More detailed information
  - NFAT submission – Chapter 2 and appendices 2.1, 7.2 and 7.3
  - Round I and II IRs – CAC/MH I-231a, MMF/MH II-040a in particular

Air

- **Hydro** – Lowest life cycle greenhouse gas (GHG) emissions
  - Keeyask 2.5 tonnes/GW.h – Conawapa 1.4 tonnes/GW.h
- **Gas** – Life cycle GHG emissions hundreds of times larger than hydroelectric generation
  - SCGT: 764 tonnes/GW.h – CCGT: 509 tonnes/GH.h
  - NOx (oxides of Nitrogen) and particulate matter emissions
- **Wind** – Life cycle GHG emissions lower than natural gas but still larger than Hydro
  - 13 tonnes/GW.h
- **Transmission** – Minor GHG emissions based on preliminary estimates
- **DSM** – Target reduction of 1 million tonnes by 2027/28

Land

- **Hydro** – Smaller relative footprint per MW of generation capacity when compared to past hydroelectric developments in Manitoba
  - Keeyask: 290 m2 sq/GW.h – Conawapa: 16-32 m2 /GW.h
- **Gas** – Small footprint for GS. Larger impacts for upstream production and distribution
  - Negligible for GS, 650 - 1 070 m2/GW.h including upstream gas production & distribution
- **Wind** – Small direct footprint within large overall area that largely accommodates continuation of existing land uses, e.g. farming
  - Footprint: 21 m2 /GW.h Total area: 6 600 m2 /GW.h
- **Transmission** – MMTP early estimate of 12 – 15 km2 land in MB. North-South Upgrade study not yet estimated. Land affected expected to be a combination of boreal forest and agricultural land
- **DSM** – No physical footprint

Water

- **Hydro** – Sediment (total suspended solids, or TSS) during construction
  - Water quality decline in newly flooded areas, recovering over time
  - Well studied. Effective monitoring and management provisions
- **Gas** – Potential effects on water quantity and quality
  - Consumption effects on water quantity during production using hydraulic fracturing (fracking) – primarily out of province
  - Concerns also raised about the effects of 'fracking' technology on potable water quality. Extensive study underway by U.S. EPA
- **Wind** – No appreciable effects on water quantity or quality
- **Transmission** – No appreciable effects on water quantity or quality expected
- **DSM** – No appreciable effects on water quantity or quality

Flora

Hydro – Effects on wetlands

- Keeyask will affect – primarily through inundation – slightly over 80 km^2 of wetlands, or less than 1% of total wetland area in regional study area
- Conawapa field studies are ongoing. Preliminary understanding is that effect on wetlands would be minimal due to small footprint

Gas – Effects of upstream production and distribution on local ecosystems, including wetlands and boreal forest

- Adverse effects from climate change

Wind – Effects depend on land use prior to development

Transmission

- MMTP route expected to involve some wetland areas but have minor effects
- North-South Upgrade would pass through areas in northern Manitoba which are a mixture of wetlands and uplands
- Effects on wetlands for both projects would be minimized through route selection and mitigation and monitoring programs

DSM – No effects on flora

Fauna

Hydro

- **Keeyask** – Residual effects of Keeyask on **Lake Sturgeon** predicted to benefit populations, supported by monitoring and adaptive management
- **Keeyask** – overall adverse effects to **caribou** but regionally acceptable due to regionally small habitat loss and intactness decrease and predation not expected to change
- **Keeyask** – construction be adverse, but regionally acceptable, levels of disturbance to **birds**, decrease habitat and potential increase harvest
- **Conawapa** – Environmental assessment ongoing. Effects on **Lake Sturgeon**, **caribou** and **birds** will have similar pathways as for Keeyask, although specific effects depend on the unique characteristics of the project and local area. MB Hydro would take a similarly proactive approach to avoiding, minimizing and mitigating adverse effects

Gas – Effects of upstream production and distribution, for example ongoing degradation of wildlife habitat in Alberta, including SARA protected boreal woodland caribou

- Adverse effects from climate change

Wind – Turbines have effects on birds and bats

Transmission – No effects on Lake Sturgeon. No caribou in MMTP area. North-South Upgrade would traverse caribou habitat areas and monitoring and mitigation would be fully implemented. Bird habitat would be considered in route selection for both projects and mitigation and monitoring would be fully implemented

DSM – No effects on fauna

Training & Employment (Construction & Ops)

Hydro – Highest level of construction and operation employment

- Keeyask estimated direct construction employment in Manitoba of 4 300 person years, including 500 - 1 700 person years of employment for Northern/Aboriginal workers. Conawapa estimated at 5 000 person years of direct construction employment for Manitoba, Northern/Aboriginal to be estimated
- Employment preferences in BNA and pre-project and on-the-job training

Gas – Far less employment overall, and for Northern MB in particular

- SCGT: little expected for Northern/Aboriginal, 116 estimated for construction in MB. CCGT: little expected for Northern/Aboriginal, 320 estimated for construction MB, many specialized positions
- Likely insufficient to warrant dedicated training

Wind – Low employment overall, and for Northern MB in particular

- Little expected for Northern/Aboriginal, 50 - 120 estimated for construction MB, many specialized positions
- Insufficient to warrant dedicated training for construction. Some opportunities for operations

Transmission – Not yet estimated. Will involve short-term construction employment in the local areas traversed by the projects. Some training opportunities associated with construction

DSM – Not estimated, expect fewer opportunities in Northern Manitoba due to smaller markets

Local Business Opportunities

Hydro – Highest level of local business opportunities, in this case in Northern MB

- Over $200 million total value of directly negotiated contracts with Keeyask Cree Nation – similar approach will be taken for Conawapa
- In addition to DNCs, sub contracting opportunities for Northern and Aboriginal businesses

Gas – Significantly smaller level of local business opportunities. Would be focused in Southern MB

Wind – No material business opportunities for Northern MB

- Limited local southern opportunities, including landowners and potentially southern Aboriginal businesses. (Not yet formally estimated but expected to be highly specialized and much smaller in scope than Keeyask)

Transmission – Construction typically takes place over 2 years. Clearing contracts for local Aboriginal businesses employing local people during first winter. Limited local employment with general contractor during second phase when towers erected and lines strung

DSM – Not estimated, will depend on type of programs. Existing Power Smart programs are supported by over 2 300 Power Smart registered contractors

Personal, Family and Community Life

Hydro

- Worker interaction and methyl mercury effects with extensive mitigation and monitoring for Keeyask and similar approach for Conawapa

Gas – Several potential effects in areas where natural gas production occurs, including effects on infrastructure, services, water quality and quantity and concerns about worker interaction

Wind – Turbine noise and potential health effects

Transmission – Environmental assessments are in preliminary stages. Potential for worker interaction with short-term construction employment workforces will be evaluated as part of those assessments

DSM – No effects are expected

Infrastructure and Services

Hydro

- **Keeyask** – Full service camps for construction workforce provided, including recreation facilities and on-site health care and counseling services. Similar approach would be followed for Conawapa
- Gillam Redevelopment and Expansion Program expanding infrastructure and services for growing workforce there
- Potential for improved infrastructure in Partner communities as a result of revenue stream from income opportunities associated with Keeyask, and expected for Conawapa

Gas, Wind, Transmission – Much smaller workforces than for generation projects and would be expected to be met through existing service providers in local communities

- Increased demand for hotel rooms and temporary accommodations, and other services during construction period, which is much shorter than for hydroelectric generation

DSM – Power Smart programs improve energy efficiency of housing stock, including in Aboriginal and other communities in Northern Manitoba

Resource Use

Hydro – Effects on domestic resource use (hunting, fishing & gathering) and commercial resource use (fishing, trapping, outfitting) through construction of GS, dykes, roads and inundation of lands for reservoir

- Keeyask: extensive mitigation as well as Adverse Effects Agreements for domestic resource use
- Conawapa: environmental assessment not complete. Similar approach would be used

Gas – Effects on domestic, and potentially commercial, resource use in regions of upstream production and distribution

- Adverse effects from climate change

Wind – Some effects on agricultural (commercial) activities including:

- Crop area loss (around 2%) that can impact ease of harvest and the potential loss of aerial crop dusting services
- Agricultural effects offset by land rental agreements

Transmission – Potential effects on traditional plants, access to moose and other game by resource users and predators, domestic and commercial trapping harvest and agricultural operations. Effects will be minimized through route selection process and consultation with users as well as mitigation and monitoring programs

DSM – No effects on resource are expected

Summary - DSM

- DSM is very attractive from a macro-environmental perspective
- Socio-economic benefits not estimated – depend on type of programs. Programs are market driven and benefits in Northern Manitoba may be fewer due to smaller markets
- Is part of all MB Hydro development plans

Summary – Natural Gas

Plans with Gas :

- Natural gas thermal generating station(s) would be located close to load in southern Manitoba
- Would have limited, or negligible, employment and other socio-economic benefits to Northern and Northern Aboriginal communities
- Emit large quantities of GHG emissions, which contribute to climate change and the associated adverse effects on flora, fauna and resource use
- Result in direct adverse environmental effects to land, water, flora and fauna in areas of upstream production and distribution

Summary – Transmission

Plans that include MMTP and/or North-South Upgrade Transmission Project:

- Environmental effects will be minimized through the route selection process and through consultation with users
- Mitigation and associated monitoring programs will also be implemented
- MMTP enables reductions in regional GHG emissions through exports of hydroelectric power
- Are expected to have business and employment opportunities for local and Aboriginal workers in the vicinity of the project

Summary – Wind

Plans that include Wind:

- Have low life cycle GHG emissions
- Have adverse effects on birds and bats and potential human health effects related to turbine noise
- Would be built in southern Manitoba, and would have limited, or negligible, employment and other socio-economic benefits to Northern and Northern Aboriginal communities in Manitoba

Summary - Hydro

Plans that include Hydro:

- Each new hydro project has been redesigned to dramatically reduce its environmental impact. Adverse environmental effects on land, water, flora and fauna, which are avoided, minimized and mitigated as much as possible
- Adverse Effects Agreements have been negotiated with the KCN for Keeyask and a similar approach would be taken for Conawapa
- Have monitoring and adaptive management measures to ensure that mitigation is effective and provide a mechanism for any necessary adjustments
- Promote economic development and capacity building in Northern and Aboriginal communities, which have historically faced socio-economic challenges
- Construction of new hydro power will create more jobs and more new business activity for Manitoba than natural gas fired imports or local gas generation
- New hydro will emit far fewer GHGs than natural gas over its lifetime and result in large regional reductions in GHG emissions, which assists in combating climate change
- Are concluded to be the best source of electricity generation from macro-environmental and socio-economic perspectives

Thank You

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