

The Merits of Piping Jeanne D'arc Gas to the Avalon

***The Rationale for  
A Natural Gas Pipeline to the  
Island of Newfoundland***

*Discussion for*

*NOIA – New Technologies – New Opportunities*

*October 26<sup>th</sup> 2005*

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## **PRESENTATION CONTENTS**

- **Island Electrical Energy Options**
- **Natural Gas Development Hurdles**
- **Proposed Strategy and Approach**
- **Case Study**
  - Pipeline Specifications**
  - Economics**
  - Results, Upside**
- **Summary and Conclusions**

## **Electrical Energy Picture**

**Newfoundland has an insular grid w/ approx 2000 MW installed capacity. Approx 500 MW thermal at Holyrood, hydraulic elsewhere and small thermal plants in isolated areas.**

**Upper Churchill capacity near 5400MW and the proposed Lower Churchill capacity is around 2000MW.**

## **Energy Planning**

**Demand growth, grid stability/security and industrial marketing strategies require enhanced on-island grid capacity soon.**

**Kyoto compliance, tax benefits, supply security and cost of energy to the consumer are other key factors of immediate concern.**

## **New Electrical Capacity Options**

1. Oil-based thermal.
2. HVDC Hydro infeed from Labrador.
3. On-Island Hydro procurement.
4. Wind power.
5. Nuclear fission.
6. Natural Gas-based thermal.

## **1 - Oil-fired generation**

Oil based thermal presently provides the Island with seasonal power capacity. The primary facility at Holyrood is ageing, our dependence upon foreign oil (No. 6 fuel, 2.2% sulfur) has never been greater, the pressures to decrease greenhouse gas emissions and pollutants are increasing and the cost advantage of oil vs. other energy sources is dwindling.

## **2 - Labrador Hydro Power**

Sell Labrador hydro power at a premium as peaking power to large utilities where thermal and nuclear plants suitably provide base load supply. Resource is worth more to NL this way. Install more generating capacity at the upper Churchill plant – develop the lower Churchill to handle higher discharge rates. Isolated grid stability requires spinning backup capacity for unscheduled downtime of large sources. We are better served by smaller generation facilities distributed strategically on the grid.

### **3 – On-Island Hydro Procurement:**

Allow/promote non-utility generators to add mini, micro and small hydro capacity (say up to 25 MW) to the grid via new developments and retrofitting existing facilities. Stringent regulations should be enforced and competition promoted, general sales and permitting guidelines established.



## **4 - Wind Power**

NL should promote private wind power developments by fixing guidelines for energy sales to the distribution utilities. Wind power is best as a fossil fuel-offsetting energy supply when hydro storage is available. It is not effective as firm capacity nor does it contribute positively to grid stabilization. It is not a substitute for demand-ready capacity.

## **5 - Nuclear power**

Nuclear power re-emerging as primary clean base-load energy supply for large interconnected grids. Present design strategies do not provide for small units, facilities are measured in the 1000's of megawatts. This single source (non-distributed) generation is poorly suited to an Insular grid the size of ours where hydro accounts for almost 100% of energy needs for part of the year.

## **6 - Natural Gas Fired Generation**

*Today*, the CCG equivalent of 2600MW of power is produced in associated natural gas at Hibernia and Terra Nova - greater than the entire capacity of Island generation, greater than the prospective capacity of the lower Churchill, and much, much closer to the primary demand centre.

Even if only 60% recoverable, the natural gas resources at Hibernia, Terra Nova and Whiterose can provide fuel to run a Holyrood-equivalent combined cycle plant at full capacity 365 days a year for over 100 years.

## **6 - Natural Gas Fired Generation Cont...**

Converting Holyrood from No.6 Fuel oil to Natural Gas would reduce Provincial CO<sub>2</sub> and SO<sub>2</sub> emissions by 500,000 tonnes per year ( meeting the one-ton-challenge for every Newfoundlander – indefinitely)

Associated natural gas can be piped to NL at a significantly lower cost than a power line from Labrador and could arrive a decade earlier with all infrastructure paid for prior to the start up of a Lower Churchill river power plant, i.e., on the grid in a short enough time frame to be of use to Abitibi, INCO and other current industrial consumers.

## **Natural Gas Development Hurdles**

Rules, regulations, taxation . . Framework needs to be in place, clear and enforceable to attract investment and encourage timely development.

Oil and gas operators need to be in competition with each other, they don't always work well together.

Operators have limited time horizon – long term planning strategy is often vague, giving way to shorter term shareholder demands. They do not like to interfere with profitable operations.

## **Development Hurdles Continued. . .**

Labrador gas, tanker-based production/transport are distracting decision-makers, regulators, academics and the public from developing Grand Banks gas resources now.

Reinjection issues. Reinjection of gas is not essential for reservoir maintenance – and retrieval is not guaranteed (permanent losses may be anywhere between 10 and 50%).

Gas will ultimately be produced commercially on the Grand Banks but Newfoundland may be bypassed.

## **Natural Gas Development Criteria**

- Market driven, not concept driven.
- Proven recoverable resource-based
- Lowest technological risk
- Lowest cost, highest present value and long term
- Highest benefit to NL

***Equals a pipeline now. . .***

## **Proposed Strategy**

1 - Crown buys in to a plan to build a gas pipeline from the Jeanne D'arc Basin to Bay Bulls or Holyrood for power generation, thus, puts the regs in place to allow it to happen.

2 - Crown prepares RFPs for a pipeline and for gas supply to the pipeline in the range of 50 to 100 mmscf/d. Operators may bid either or both elements (broken out) and may bid in partnership or solo for gas supply. All figures to be justified in terms of the present value of alternative development plans for stranded gas. Non-producers encouraged to bid/own and operate the pipeline.

3 - New gas-fired generation on Island to be strategically constructed, in one or more locations. Gas distribution may follow if customers request it – MUN steam for instance.



## **Sample Gas Dev Pipeline Specification:**

- 12" diameter pipeline 350km
- 1/2" wall thickness
- 3000psi inlet pressure
- 90 mmscf/d (= 600MW new Siemens CCG)  
Pulled through existing J-Tube at Hibernia,  
trenched, bermed, reeled or laid, coated, anodes,  
labour, engineering, contingencies etc etc  
2005 cost = \$300 mmUSD

## **Sample Gas Dev Economic Case Study:**

CAPEX and OPEX conservatively estimated as follows:

***All in millions of USD***

- Platform preps = 100, Operating = 5
- Offshore Pipeline = 300, Operating = 10
- On-Shore Pipeline = 12.5, Operating = 2
- Power generation = 400, Operating = 15 + Fuel

## **Sample Economic Case Study RESULTS:**

Utility-like IRR of 12% for each element independently, with a netback to producers of 2.0 USD per mscf/d results in:

***less than 5 cents per KWh at Holyrood gate.***

Less than any other prospective energy source for Newfoundland!

## **Upside**

- Proven operation of gas pipeline will quickly promote looping for enhanced deliveries for other end uses including on-Island LNG production. Looping provides additional supply security, and opens up other marginal developments on the Grand Banks.
- When gas throughput volumes increase, the IRR for the platform and the onshore infrastructure climbs providing flexibility for improved netback to producers and better electricity prices for consumers.

## Summary

- Resource base is easily in place today for Island requirements - major export pipeline gas quantities are not yet proven.
- Proposal uses gas from existing oil developments.
- Eliminates gas reinjection wastage and realizes higher present value of salvaged gas.
- Initially, gas remains stranded in Province for use/processing unlike a large grid-connecting pipeline with “postage stamp” tariff structure, i.e., the price of stranded gas would be lower than the grid price

## **CONCLUSION**

***Associated gas transferred to the Island via pipeline is economical and is a wise choice for Newfoundland and Labrador energy strategy. It will result in lower electricity prices, improved environmental stewardship, will attract major industry including LNG export opportunities, and, is economical to begin IMMEDIATELY.***

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**End of Presentation**

**QUESTIONS**

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