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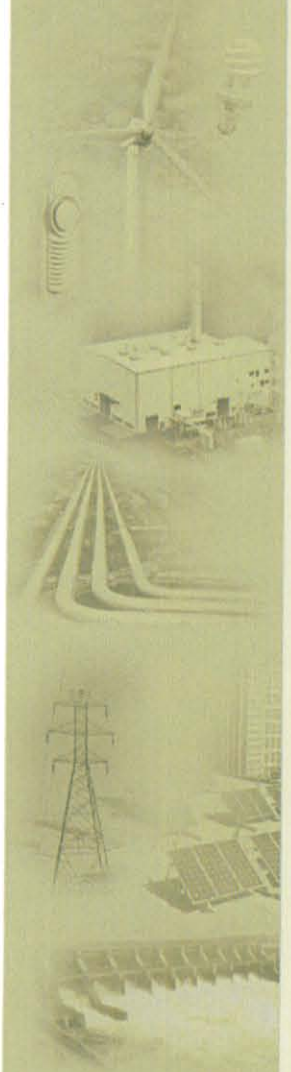

Comments on the Muskrat Falls Reference

Presentation to the Public Utilities Board of Newfoundland and Labrador

Philip Raphals
For Grand Riverkeeper Labrador Inc.

February 23, 2012

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Optimality

- « How did you ensure that … you were dealing with the optimal scenario under each one? »
  - > Technical optimization vs. planning processes
  - > Iterative process seeking robust solutions
  - > Real time (evolutive) versus planning exercise
  - > Avoiding irrevocable choices that would turn out badly in certain possible futures
  - > Scenario versus plan

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PPA payment options

- "Does the 2035 ratepayer have to pay more so that the 2017 ratepayer can pay less?"
  - > Nominal LUECs vs. escalating prices
  - > Same present value, but different reality
  - > Consumers unlikely to prefer escalating prices

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PPA vs COS

- Simulate annual costs for Muskrat Falls under COS
  - > Higher than PPA in early years
  - > Drastically lower in later years
- Prices post 2067
  - > PPA: maintaining 2067 price levels ($400/MWh) ⇒ windfall profits
  - > COS: continue to decline (< $20/MWh)

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CDM

- MHI
  - > model CDM like generation
  - > End-use modelling
- Nalcor's approach
  - > Integrate into load forecast through technological change variable
  - > No mesure-by-mesure or program-by-program analysis
- Objectives to date not met
- Sensitivities
  - > Far less than Marbek scenarios
  - > At low demand (= high CDM) scenarios, CPW preference for Muskrat drastically reduced

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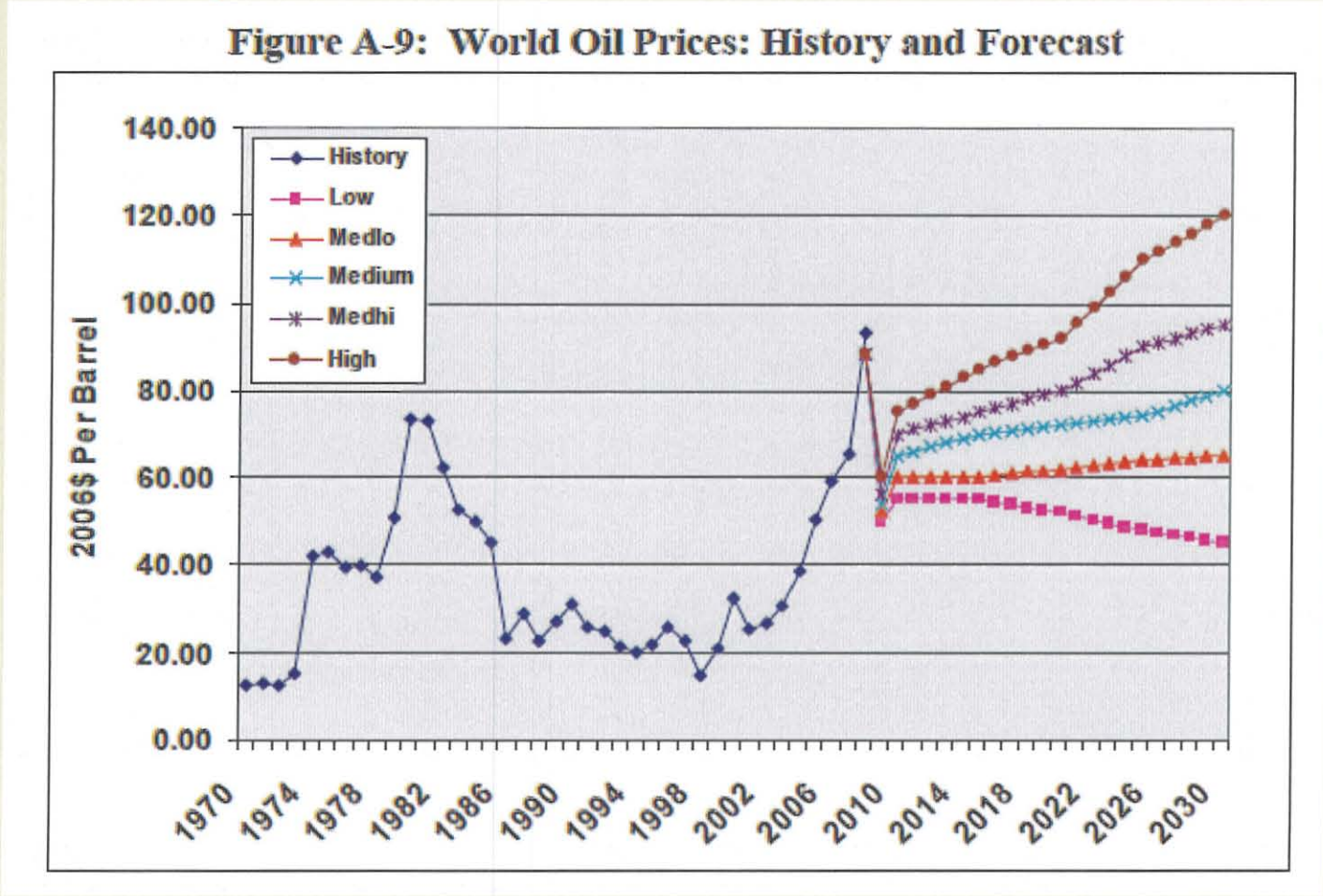
Fuel price forecasts



NWPPC fuel forecast 2009

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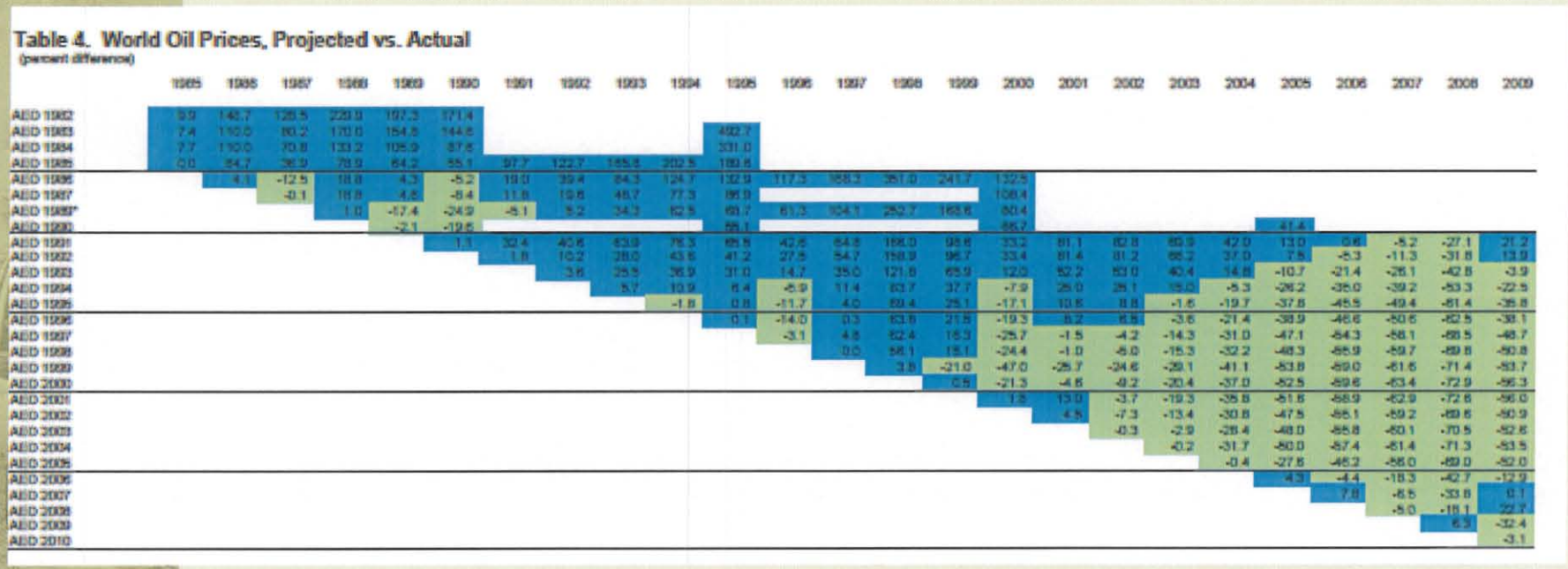
EIA Retrospective Review

Table 4. World Oil Prices, Projected vs. Actual
(percent difference)



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Wind power assessment

- 2004 NLH study
  - > Sole source for Strategist inputs
  - > 80 MW limits primarily economic
    - Based on minimizing spill
    - Fails to take into account cost of wind, net of curtailment or spills
  - > « preliminary »
  - > Government RFP shows that higher penetration remains an objective

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Conclusions

- Reference question
  - > Verify that the costs attributed to each scenario are correct?
  - > Verify that each scenario makes sense?
- Analyses of MHI and others
  - > Results highly dependent on assumptions
  - > Great uncertainties
  - > Little confidence that the Isolated Island scenario would play out as defined
- If Muskrat Falls does not go forward
  - > planning process will continue
  - > May lead to solutions very different from IIS
- Thus Reference Question largely academic

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