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Refining Enbridge's IRP Cost-Effectiveness Test

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Agenda

- Context
  - Principles of Benefit-Cost Analyses
  - OEB Approval of DCF+
  - OEB Direction to Improve/Refine
- Proposed Improvements/Refinements to DCF+
  - Cross-cutting structure & input issues
  - Categories of impacts included in each Stage

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Context

Core Principles of Cost-Effectiveness Analysis

1. All utility system impacts should be included
2. Primary cost-effectiveness test should be aligned with the jurisdiction's policy goals
3. Symmetry – for any category of impacts, both benefits and costs must be included
4. Even hard-to-quantify impacts must be included (if relevant to policy goals)
5. Analysis must be forward-looking – incremental, marginal impacts (no sunk costs)
6. Double-counting of impacts must be avoided
7. There should be transparency in presenting assumptions, analysis and results
8. Benefit-cost analysis and rate impact analysis must be separate – 2 different things

From the 2020 National Standard Practice Manual for Benefit-Cost Analysis of Distributed Energy Resources (https://www.nationalenergyscreeningproject.org/national-standard-practice-manual/)

Enbridge's Proposed DCF+ Test

Benefit/Cost	Phase 1	Phase 2	Phase 3
Benefits			
Incremental Revenues	x		
Avoided Utility Infrastructure Costs [2]	x		
Avoided Customer Infrastructure Costs [3]		x	
Avoided Utility Commodity/Fuel Costs [4]	x		
Avoided Customer Commodity/Fuel Costs [5]		x	
Avoided Operations & Maintenance	x		
Avoided Greenhouse Gas Emissions		x	
Other External Non-Energy Benefits			x
Costs			
Incremental Capital Expenditure [1]	x		
Incremental Operations & Maintenance [1]	x		
Incremental Taxes	x		
Incremental Utility Commodity/Fuel Costs [4]	x		
Incremental Customer Commodity/Fuel Costs [5]		x	
Incremental Greenhouse Gas Emissions		x	
Incremental Customer Costs		x	
Other External Non-Energy Costs			x

OEB Ruling on Enbridge's DCF+

- Accepts construct
  - Primary focus on rate impacts (stage 1)
  - Secondary focus on broader societal impacts (stages 2 & 3)
  - Can support IRPA that is not "least cost" in Stage 1, based on Stage 2 & 3 results, but must justify
- Recognizes test can be improved
  - "…better identify and define the costs and benefits of Facility Alternatives and IRPAs"
  - "…clarify how costs/benefits should be considered within DCF+ test", including:
    - increasing carbon costs
    - Risk
    - Impact on supply costs
- Directs Enbridge & Working Group to assess, recommend, test in pilots

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Recommended Test Revisions

OVER-ARCHING TOPICS

Overarching Topic (1) – Addressing Purposes of Test

- Clarify multiple purposes of test:
  - Rate impact assessment
  - Societal benefit-cost assessment
- Clarify that Stages Cannot be "Added Together" for the second purpose
  - Mathematically inappropriate
  - Mixes apples (changes in revenue/rates) and oranges (changes in costs)
- Recommend combining stages 2 & 3 (plus elements of 1) for societal cost-effectiveness
  - Not clear what benefits are of separating stage 2 from stage 3
  - They've already been designated as "secondary" considerations by OEB

Overarching Topic (2) – Cost-Effective Relative to What?

- As proposed, DCF+ measures impacts relative to "do nothing"
- That is not a reasonable or realistic framing for IRP
  - Must do something to address reliability concern
  - Question is what approach is least cost, least risk
- Would be easier to understand if baseline is the traditional infrastructure investment project
  - Cost-effectiveness of alternatives then compared to that

Overarching Topic (3) – "Best Estimates" for Input Values

- Inputs to test should always be based on best estimates
- For GHG emissions impacts, should be best estimate of carbon taxes
  - Not just what is officially "locked in" – we would never estimate gas prices that way

Overarching Topic (4) – Discount Rate

- NPV of costs and benefits varies considerably with discount rate
- DCF+ as proposed would use utility WACC
- Not clear why that is appropriate
  - Utility WACC represents utility shareholders' perspective on time value of money
  - Not customers' or society's perspective
- Ontario policy would seem more consistent with societal discount rate

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Recommended Test Revisions

CATEGORIES OF IMPACTS IN EACH “STAGE”

Rate Impact (Stage 1) Issues

- Add effects on market clearing prices
  - Reduced load lowers prices
  - Increased load increases prices
  - Effects are modest, but consequential
- Add "hedge" value
  - Risk of over-forecasting of need and related risk of investment not needed
    - IRPAs can "buy time" to calibrate because they come in smaller increments over time
  - Avoided risk of stranded assets
  - *Big topic that requires further discussion in terms of modeling/analyzing*

Benefit/Cost	Phase 1
Benefits	
Incremental Revenues	x
Avoided Utility Infrastructure Costs [2]	x
Avoided Customer Infrastructure Costs [3]	
Avoided Utility Commodity/Fuel Costs [4]	x
Avoided Customer Commodity/Fuel Costs [5]	
Avoided Operations & Maintenance	x
Avoided Greenhouse Gas Emissions	
Other External Non-Energy Benefits	
Costs	
Incremental Capital Expenditure [1]	x
Incremental Operations & Maintenance [1]	x
Incremental Taxes	x
Incremental Utility Commodity/Fuel Costs [4]	x
Incremental Customer Commodity/Fuel Costs [5]	
Incremental Greenhouse Gas Emissions	
Incremental Customer Costs	
Other External Non-Energy Costs	

Customer/Societal Impacts Issues

- Include elements of Stage 1 except
  - revenue impacts
  - Tax impacts
- Missing some impacts:
  - Price impacts of higher/lower gas sales
  - Other fuel impacts
    - Some IRPAs increase/decrease electric costs
  - GST/HST for customers in Phase 2 (if keeping separate from societal)
  - Value of customer & societal non-energy impacts

Benefit/Cost	Phase 1	Phase 2	Phase 3
Benefits			
Incremental Revenues	x		
Avoided Utility Infrastructure Costs [2]	x		
Avoided Customer Infrastructure Costs [3]		x	
Avoided Utility Commodity/Fuel Costs [4]	x		
Avoided Customer Commodity/Fuel Costs [5]		x	
Avoided Operations & Maintenance	x		
Avoided Greenhouse Gas Emissions		x	
Other External Non-Energy Benefits			x
Costs			
Incremental Capital Expenditure [1]	x		
Incremental Operations & Maintenance [1]	x		
Incremental Taxes	x		
Incremental Utility Commodity/Fuel Costs [4]	x		
Incremental Customer Commodity/Fuel Costs [5]		x	
Incremental Greenhouse Gas Emissions		x	
Incremental Customer Costs		x	
Other External Non-Energy Costs			x

Categories of Impacts to Include

	Stage 1	Stage 2	Stage 3
	Rates	Customers	Societal
Impacts (increase or decrease)			
Utility revenue	X		
Utility capital costs	X	X	X
Utility O&M costs	X	X	X
Utility fuel costs	X	X	X
Utility Corp. tax	X		
Market price changes	X	X	X
Hedge value	X	X	X
Customer commodity costs		X	X
Carbon Taxes		X	X
Customer contribution to IRP measure costs		X	X
Other fuel impacts		X	X
GST/HST on fuel consumption		X	
Customer non-energy benefits		X	X
Societal non-energy benefits			X

Notes:

1. Format changed to include all impacts of interest from each perspective in each column – clearer than adding across columns
2. Customer and societal both shown, but suggest only use societal.
3. Red indicates what I think is change from Enbridge proposal – but not certain because not clear what some Enbridge terms include
4. Customer commodity costs are those incremental to utility fuel costs.
5. Many of these categories can be either costs or benefits – depends in part on the baseline to which an investment is being compared.
6. Customer commodity costs, other fuel costs valued using avoided costs (not retail rates)

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Summary Recommendations

Recommendations

1. Simplify to 2-stage test: (1) rate impacts; (2) societal impacts
2. Make test relative to baseline of preferred traditional, supply-side solution
3. Use best estimate of long-term GHG taxes
4. Use societal discount rate
5. Add gas price effects, hedge value to both rate impacts and societal test
    A. Hedge/risk issues require more methodological discussion
6. Clarify that revenue & corporate tax changes affect only rates
7. Various other clarifications regarding what is in customer/societal test(s)

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