

# Economic Impact Assessment:

Where We've Come From, Where We Are Now, and  
Where We Still Need to Go



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# Where We've Come From

Late 1800s to early 1900s:

Rational decision-making

Mid- to late 1900s:

Environmental economics: theory, methods...  
...let's price everything!

1960s/70s:

1. Fears of environmental deregulation
2. Environmental impact assessment: a response to cost-benefit analysis (CBA)

Economic impact analysis (EconIA) takes hold

(think input-output analysis, multipliers, indirect and induced impacts, GDP, etc.)

# Economic Benefits, Public Interest

- Economic imperative in major project development  
Somebody wants to gain
  - And \$ = votes
  - Economic benefits part of public interest definitions  
*sustainability means the ability to protect the environment, contribute to the social and economic well-being of the people of Canada and preserve their health in a manner that benefits present and future generations*  
*Impact Assessment Act, s.2*
- Assessment of economic impacts key to projects going forward

# Economic Impact Analysis (EconIA)\* Says What Proponents Want

Pipeline Project	Gross Domestic Product	Jobs (Person-years)
Energy East	\$55 billion	261,000
Enbridge Northern Gateway	\$312 billion	907,000
Kinder Morgan Trans Mountain Expansion Project	\$22 billion	123,000

EconIA = economic impact analysis, i.e., input-output analysis, multipliers, etc.

# Limits of Economic impact analysis (EconIA)

IMPACT ASSESSMENT AND PROJECT APPRAISAL  
2020, VOL. 38, NO. 5, 397-411  
<https://doi.org/10.1080/14615517.2020.1780371>



## Assessing the public interest in environmental assessment: lessons from cost-benefit analysis of an energy megaproject

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### ABSTRACT

The potential contribution of cost-benefit analysis to environmental assessment is assessed through a case study of a proposed Canadian oil project and a comparison of results with those of the method of economic impact analysis. While the latter concludes that the project would generate substantial economic benefits, the cost-benefit analysis concludes that the project would be a net loss to society and that new oil mining is uneconomic. The case study demonstrates that economic impact analysis can help inform decision-makers of projects' economic impacts, but the cost-benefit analysis with respect to the contribution of relying solely on economic impact assessment decision-making.

### ARTICLE HISTORY

Received 5 November 2019  
Accepted 2 June 2020

### KEYWORDS

Cost-benefit analysis; oil; project evaluation; environmental assessment

### Introduction

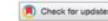
In 2011, Canadian mining company Teck submitted its proposal for a new tar sands project (known as oil sands or tar sands) for approval in the Canadian province of Alberta. The project's capital cost of \$21.5 billion (2017 forecast output of 260,000 barrels per day) would be one of the largest Canadian oil development projects. The approval from both the province of

Alberta and the federal government is governed by the *Environmental Protection and Enhancement Act*, *Responsible Energy Development Act*, *Alberta Oil Sands Conservation Act* and the Canadian federal government (pursuant to the *Canadian Environmental Assessment Act, 2012*) to determine if it would be in the 'public interest' and whether any 'significant adverse effects' of projects are justified.<sup>2</sup> The Alberta and federal governments appointed a joint review panel (JRP) to oversee the environmental assessment (EA), and after a lengthy review, the JRP concluded that the project was in the public interest and its significant adverse effects were justified because the economic benefits outweighed adverse environmental effects (JRP Frontier 2019). However, before the federal government could make a final approval decision, the proponent withdrew its application citing its concern that Canada lacked a clear framework for reconciling climate change and resource development issues (Teck

in the case of Frontier, Teck followed applicable EA law by submitting an application that identified the project's positive and negative impacts as well as mitigation measures to address the negatives (Teck 2015). A key component of the application was an estimate of economic impacts using economic impact analysis (EconIA) based on input-output modelling, a technique that has become the standard method in Canadian EA for examining projects' economic impacts.

The proponent's EconIA concluded that the project would generate \$19.1 billion in gross domestic product (GDP) during construction and \$2.2 billion GDP annually during operations, over 278,000 person-years (PY) of total employment, and \$72.2 billion in tax and royalty payments (all in 2017 Canadian). According to the proponent, the project would 'yield substantial net benefits to residents ... Alberta and to Canada' (p.1-19) that would outweigh the adverse environmental

IMPACT ASSESSMENT AND PROJECT APPRAISAL  
<https://doi.org/10.1080/14615517.2020.1767954>



## The Role of Cost-benefit Analysis and Economic Impact Analysis in Environmental Assessment: The Case for Reform

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### ABSTRACT

Cost-benefit analysis and economic impact analysis both provide the ability to assess projects' economic impacts, but through different methodological approaches and perspectives. In Canada and elsewhere, cost-benefit analysis is often eschewed in favour of economic impact analysis in environmental assessment processes. This paper presents a criteria-based evaluation of the two methods and shows that cost-benefit analysis has numerous strengths relative

### ARTICLE HISTORY

Received 2 February 2020  
Accepted 4 May 2020

### KEYWORDS

cost-benefit analysis; economic impact analysis

1. Expenditures treated as benefits
2. Narrow scope of effects covered
3. Gross vs. net impacts

*Energy Board Act*, section 36, *Impact Assessment Act*).

Analysis of economic impacts is central to the assessment process.

A common method used in EA in Canada and elsewhere to assess economic impacts is economic impact analysis (EconIA).<sup>1</sup> EconIA relies on economic linkages and multipliers emanating from Keynesian income determination and Leontief input-output models to provide information on a project's expected economic output, employment, and tax revenue. EA journals have published a variety of case studies of EconIA, e.g., for coal mining (Robertson et al. 2017), agriculture (Piper 2003), and habitat conservation (Prato and Hamed 1999).

While EconIA is helpful for forecasting the economic impacts of projects to support community planning (Gunton 2003), EconIA is typically misused to justify projects on the basis that the economic impacts are benefits that offset adverse environmental impacts (McDonald 1990; Lockie et al. 2008; Denniss 2012). Yet EconIA has

been incapable of determining a project's net impacts. The basic steps in CBA are: (1) determine the scope of the analysis in terms of whose gains or losses will be considered, (2) predict benefits and costs over the life of a project, (3) convert any impacts not normally measured in monetary terms into such terms as feasible and appropriate, (4) discount monetized impacts, (5) compute net present value (NPV), internal rate of return, and/or benefit-cost ratio, (6) perform sensitivity analyses, and (7) interpret results (Boardman et al. 2018). Case studies in the EA literature cover energy (Shaton and Hervik 2018), water (Mohammed 2009), transport (Fischer 2006; Kolosz and Grant-Muller 2015), and waste (Manni and Runhaar 2014). CBA has a long history and holds a prominent place in project, program, and policy evaluation around the world including many developed countries by international lending institutions such as the World Bank (Hanley 2001; Rodrigo 2005; Browne and Ryan 2011; White and VanLandingham 2015).

# Myth of Major Project Economics

*decisions based on delusional optimism rather than on a rational weighting of gains, losses, and probabilities... involuntarily spinning of scenarios of success and overlooking the potential for mistakes and miscalculations*

Flyvbjerg et al. 2007

*group think growth*

Gunton 2003

Trans Mountain Expansion Project Cost Inflation (Billion \$ CAD)		
2015	\$5.4	
2017	\$7.4	37%
2018	\$9.3	72%
2020	\$12.6	133%
2022	\$21.6	300%

# Cost-benefit Analysis

- Focus on net impacts, and capability to assess many project impacts (but not all)

# Teck Frontier Oil Sands Mine: benefit and costs (base case)

Impact	NPV (2017CDN)
Revenue	+\$21.7 billion
Capital costs	-\$10.7 billion
Operational costs	-\$9 billion
Reclamation	-\$16 million
Employment benefits	No incremental benefit
Air pollution	-\$1.3 billion plus additional unmonetized costs
GHG damages	-\$4.1 billion
Impacts on water resources	Cost (unmonetized)
Impacts on ecosystem services	-\$733 million plus unmonetized cultural impacts
Additional impacts	Unmonetized impacts including: user costs; foreign investment benefits and profit leakage costs; costs of subsidies; and additional social and cultural costs
Net Present Value	-\$4.1 billion

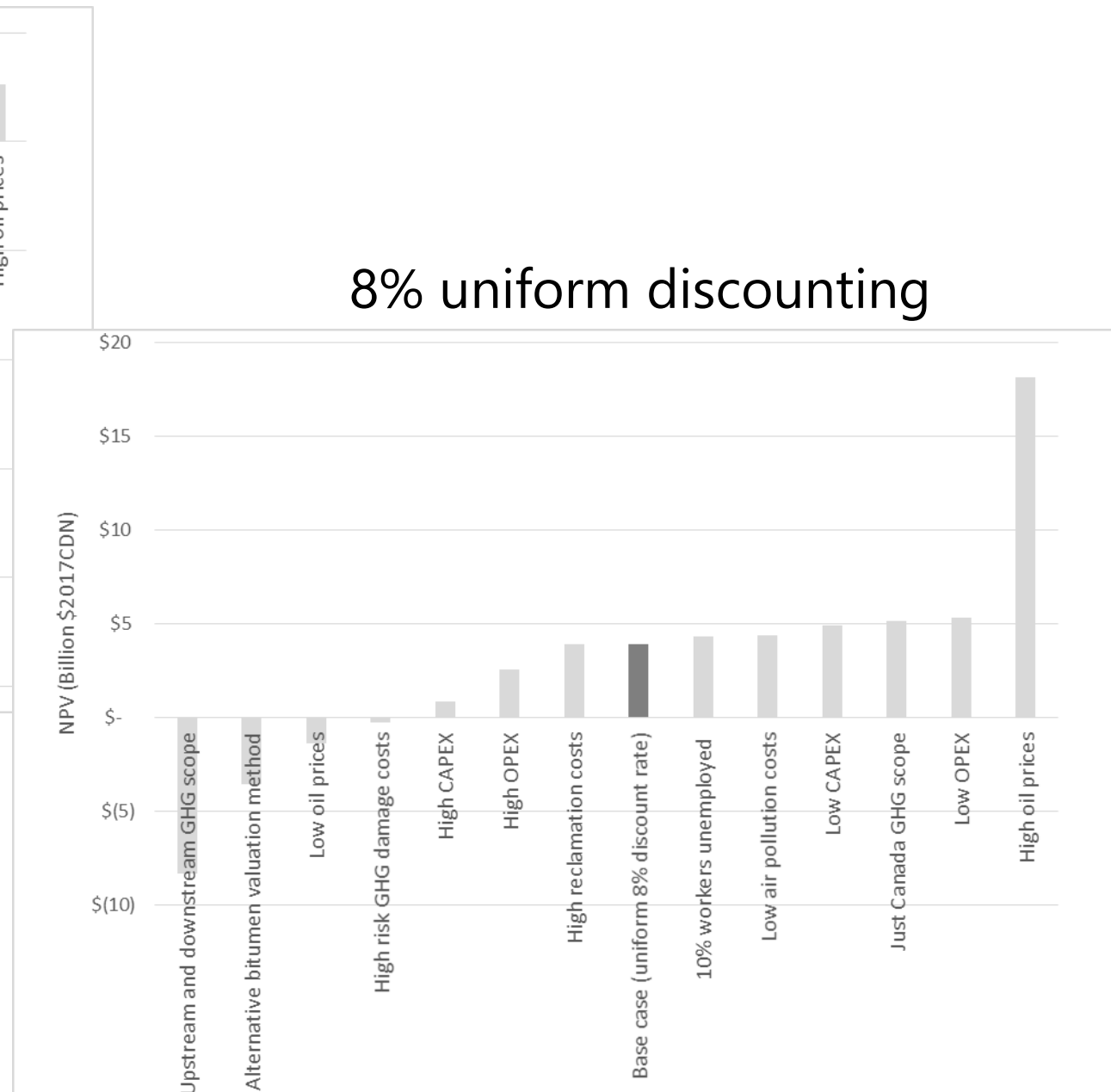


# Cost-benefit Analysis

- Focus on net impacts, and capability to assess many project impacts (but not all)
- Resolution on distribution of benefits and costs
- Reliance on individualistic preferences instead of societal preferences
- Tricky assumptions, e.g., discount rate



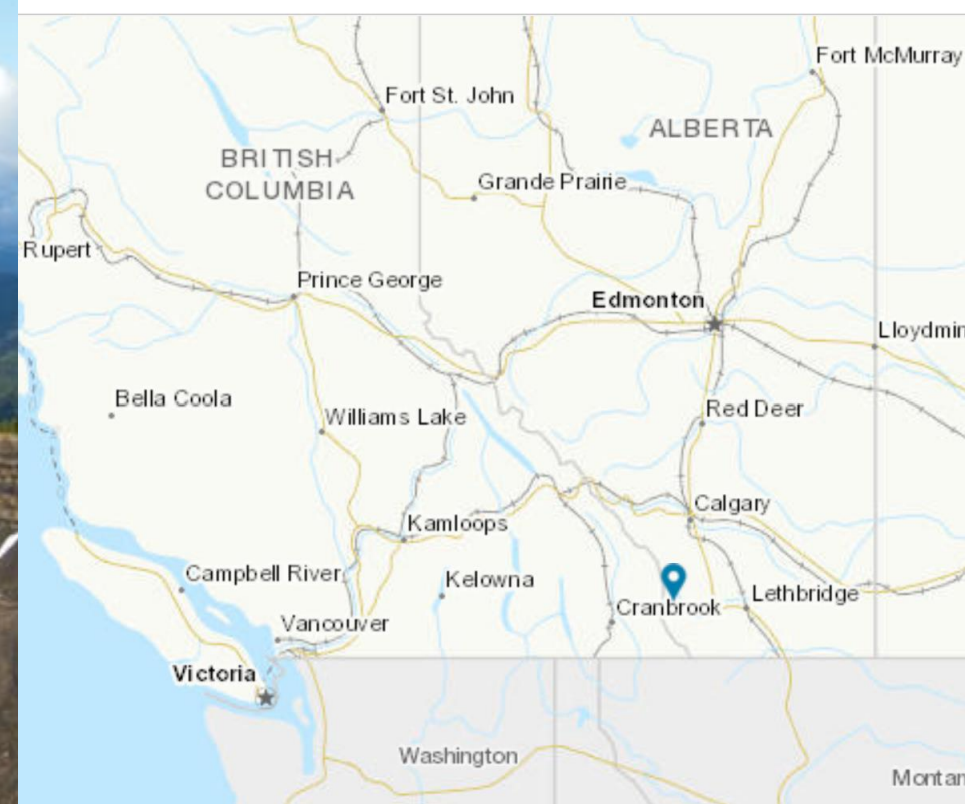
10% / 3% dual discounting



# Where We Are Now

- Questioning of EconIA, resumption of openness to CBA
  - Decision-maker attention / awareness that typical economic impact information insufficient
  - Canadian EA/IA agencies calling for more
- Starting to see real economic IA issues brought to the fore
  - Enbridge Northern Gateway review panel calling for CBA
  - Grassy Mountain review panel giving economic issues weight

# Grassy Mountain Coal Mine Proposal



# Grassy Mountain Coal Mine Proposal

*Benga did not submit key methodological details and models to support its estimates...*

*We do not have confidence in the tax estimates that Benga produced...*

*The project has the potential to impose negative impacts on other economic sectors, while other risks in Benga's estimates that were not assessed could reduce the positive economic impacts of the project...*

*We find that Benga presented an overly optimistic economic analysis...*

JRP Grassy Mountain Coal Project (2021). Report of the Joint Review Panel - Benga Mining Limited, Grassy Mountain Coal Project, Crowsnest Pass. 664 pp.



## Analyzing Health, Social and Economic Effects under the *Impact Assessment Act*

**i** This document is for informational purposes only. It is not intended to fetter decision-makers. It is not intended to suggest that the Government can regulate matters of provincial jurisdiction. It is not a substitute for the *Impact Assessment Act* (the Act) or its regulations. In the event of an inconsistency between this document and the Act or its regulations, the Act and its regulations would prevail. For the most up-to-date versions of the Act and regulations, please consult the Department of Justice website.

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# Where We Need to Get to

1. Build on the momentum
2. Guidance on how to do good economic IA
3. Economic literacy among the IA community
4. Policy development

# Where We Need to Get to: Build on the Momentum





# Where We Need to Get to: Guidance

- How to use EconIA and CBA, what to take from each, their roles
- Assumptions and judgements, e.g.,
  - discount rate and approach
  - uncertainty (e.g., project cost, output, commodity prices)
  - standing, what groups to examine for distribution questions, equity
- How much of the non-economic to economicize?
- How to blend economic IA information with rest of IA?

# Where We Need to Get to: Economic Literacy

- Key economic concepts, and confusing terminology

**Social rate of time preference**

**Backward linkages**

**Natural rate of unemployment**

Marginal cost of supply

**Non-market valuation**

**Computable general**

In EA, also known as IA and EIA, what should we call economic impact assessment? And what acronym should we give it?

What is the difference between economic impact assessment and economic impact analysis?

Is there a difference between financial and economic impacts?

What is the difference between impacts, effects, benefits, costs?

What is the difference between net social value, net social benefits, net benefits, net present value?

# Where We Need to Get to: Economic Literacy (2)

What are some basic, good practices in science?

- Transparency
- Replicability
- Honesty
- Objectivity

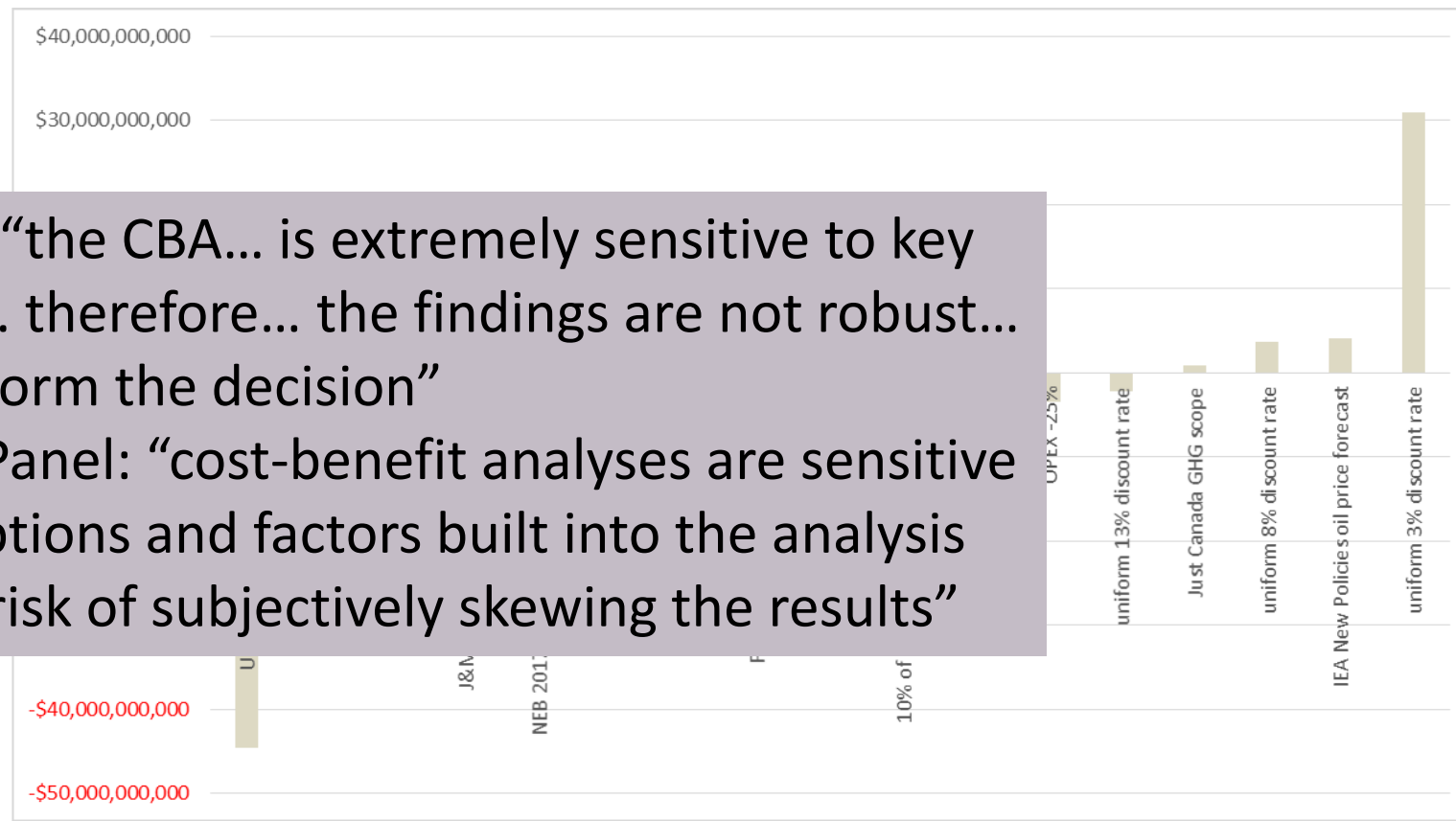
“Remove this - I think it weakens the discussion”

- Fixed technological coefficients
- Linear relationships between industries
- No constraints on supply
- Impacts are assumed to occur instantaneously
- Externalities are ignored

# Where We Need to Get to: Economic Literacy (3)

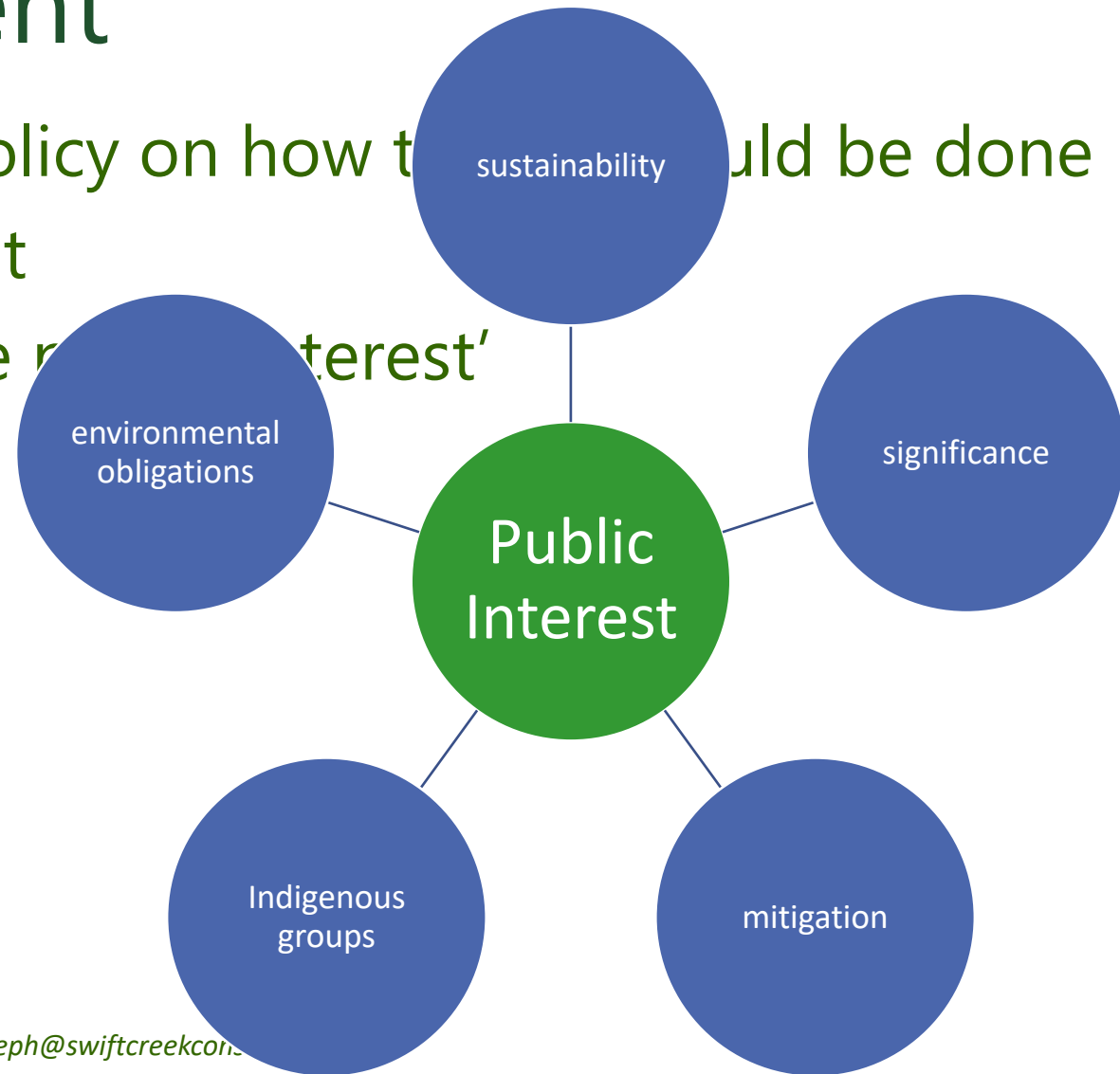
- What is good practice when forecasting the future?
  - Explore uncertain parameters and their effect on results

- Teck critique: “the CBA... is extremely sensitive to key assumptions... therefore... the findings are not robust... should not inform the decision”
- Joint Review Panel: “cost-benefit analyses are sensitive to the assumptions and factors built into the analysis and results... risk of subjectively skewing the results”

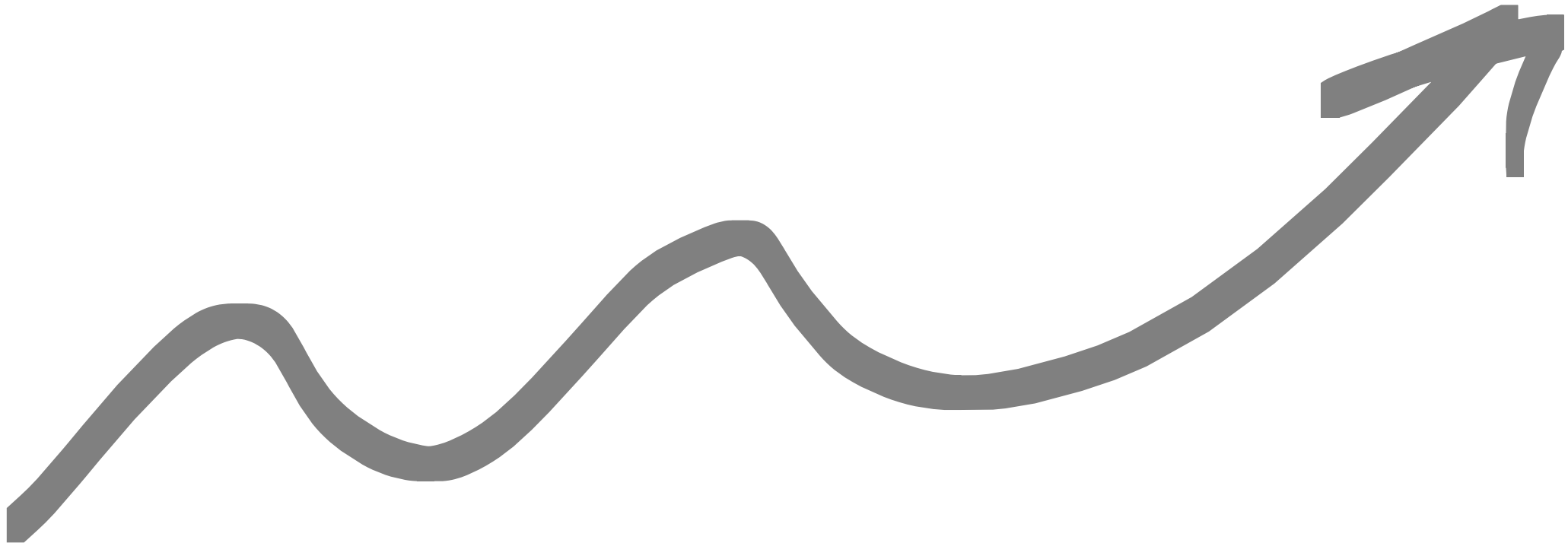


# Where We Need to Get to: Policy Development

- Underlay guidance with policy on how things should be done
- Defining the public interest
- Methods for assessing 'the public interest'



# From there to here to forwards



# Thanks

- Colleagues
- Funding
- Clients

# Let's continue the conversation!

Post questions and comments via chat in the IAIA22 platform.



**#iaia22**