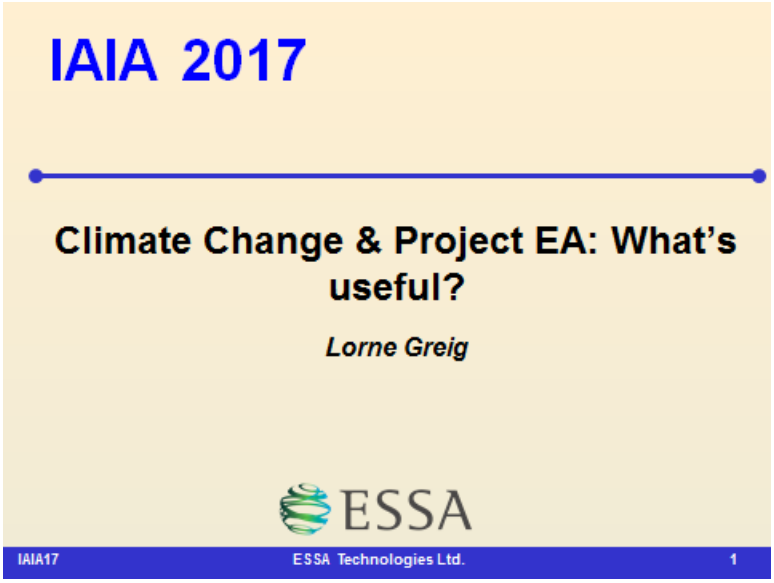
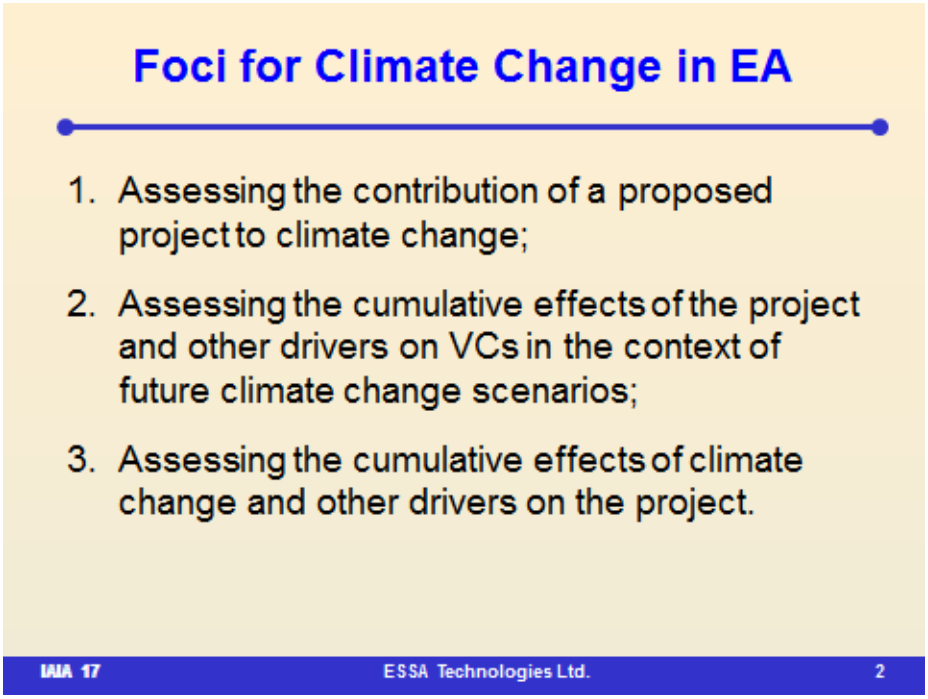


In 1986, when the then Canadian International Development Agency (CIDA) committed to do environmental assessment for its development projects, I led a small team of environmental analysts and agency staff in integrating EA within the agency's project planning cycle. Shortly after that my colleague Pille Bunell and I were engaged in training agency staff in the fundamentals of EA. As part of those sessions they were briefed on climate change and advised it would be their greatest challenge in developing environmentally sustainable projects.

They made it clear, based on their experience at the time, that most thought we were crazy. Today the reality of that challenge is clear, as is the urgent need for EA to face this challenge head on.



There are at least three foci for EA in relation to climate change, all of them are matters of cumulative effects assessment.

A critical element of the scenario analyses of the latter two foci is exploring not just a singly “most likely scenario” but employing contrasting scenarios to explore effects of uncertainties. The interesting impacts of any development lie at the extremes of variation and estimating where these may be in a changing climate is critical to envisioning and designing effective climate adaptation strategies for a proposed project.

The importance of these two foci in project level EA seems obvious. In part because they are consistent with typical scales for EA.

The first focus however, assessing the projects contribution to global climate change, is equally important but the different scales of project EA and global climate change pose questions about how this is best done and what the contribution of project EA might be.

An important factor here is the past challenges in executing comprehensive CEA in an EA context. The calls for improvement in CEA practice are well documented in the literature so I won’t dwell on them here. If we are to include assessment of climate effects in the project EA process, CEA practice needs to be elevated to a much more robust analytical practice than has been the norm.

Related to this is what I think is a critical perspective about how we think about the impact significance of individual projects – especially in a world where undesirable cumulative effects will be a dominant driver of our future wellbeing. I’ll exemplify this with an example – the Mackenzie Gas Project (MGP), in the Canadian Northwest Territories, but first I want to present a simple conceptual frame for thinking about it.

Recall the scenario in Garrett Hardin’s 1968 paper in Science, *The Tragedy of the Commons*. Without ever using the term cumulative effects Hardin describes a simple cumulative effects problem in which a population of herders use common pasture land. For a single herder there is an innate drive to maximize returns and it makes sense to add just one more animal to their herd as the financial benefit can be significant while the perceived environmental cost is not. This same logic applies through time stimulating further additions and the logic

applies equally to all. As they proceed to increase their herds the cumulative environmental degradation negatively affects them all.

The point argued by Hardin is that those individual decisions to maximize individual wellbeing are rational economic decisions AND that natural selection favours psychological denial of cumulative effects. To quote Harden, “The individual benefits individually from his ability to deny the truth, even though society as a whole, of which he is a part, suffers.”

In other words, as long as there is no immediate unacceptable cumulative effect the relatively small effects of individual projects are perceived as insignificant.

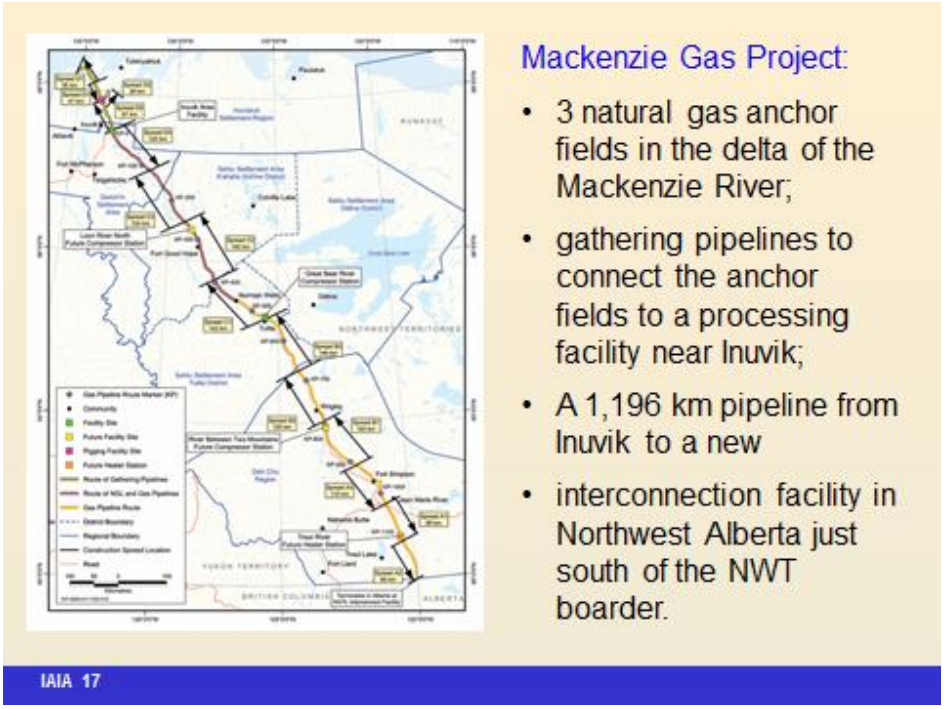
The corollary to this is that once an ecological threshold is passed causing unacceptable cumulative effects – especially those that threaten our wellbeing – then all the existing effects are collectively significant. So are any further additions regardless of their size. In this condition there is simply no such thing as insignificance.

Today climate change is the poster child for this scenario. When you look at how we came to be here it’s the outcome of billions of individual decisions to emit individually “insignificant” emissions that have brought us to a crisis point. And denial and avoidance of responsibility to fix it, while not universal, continues to be rampant.

So, can a project’s impacts be both insignificant and significant at the same time? Yes they can – it’s a matter of how you look at it.

Making a good decision is about understanding the full implications of the cumulative impacts rather than focusing on the size of individual contributions. The assessment of the Mackenzie Gas Project provides an informative example.

The Mackenzie Gas Project (MGP) proposed to develop:



The consortium of proponents filed the project for review by the Joint Review Panel as the 3 anchor fields, and the pipeline, with one compressor station, along the route at a throughput capacity of 0.8 Bcf/d. However the pipeline was designed for expansion to 1.2, Bcf/d and later on to 1.8 Bcf/d to accommodate additional resource developments anticipated by the basin opening nature of the project. Additional information supplied to the panel by intervenors from the oil and gas industry indicated future development potential could justify further expansion to a 3.2 Bcf/d throughput.

Having filed the application for 0.8 Bcf/d the proponents argued that all future developments were “hypothetical” and that only the project “as filed” be the basis of the panels review. However the 1.2 Bcf/d expansion scenario was designed to accommodate gas from an additional field developed by an Aboriginal pipeline group. Shared revenues flowing to the aboriginal community was a significant selling point for the project but revenue sharing was conditional on this additional development being done in a short time period.

The proponents assessment of GHG emissions naturally focused on emissions from the project. A fear of non-governmental interveners was that once the gas

reached the Alberta terminus it would be utilized in operating Alberta Oil Sands projects, significantly increasing downstream emissions.

In this context the panel undertook to explore GHG additions from: project operations (upstream contributions); from potential future additions; and from potential end use of the gas (downstream contributions). Considerations about the significance of the project contributions included:

- Upstream emissions would double NWT emissions, but would add less than 1% to Canada's total emissions – viewed as insignificant;
- Once in the Alberta pipeline (in the Market) the destination and fate of project gas could not be controlled.
- Emissions from end use of the gas would be much larger than the upstream emissions (calculated with an average factor provided by Environment Canada).

- The Pembina Institute estimated that over 2006 – 2053 with 1.2 Bcf/d flow and 10 M m^3 (0.35 Bcf/d) utilized in oil sands operations – combined upstream and downstream emissions would be 30 x higher than upstream emissions alone – viewed as significant.

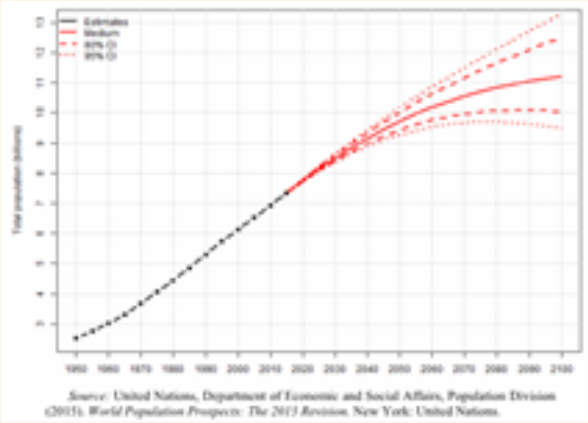
So depending on the perspective taken significance could be judged as both insignificant and significant. The Panel however did not approach this as a matter of significance determination. Their decision-making was based on a sustainability test.

A major consideration in the sustainability test was that the low GHG intensity of the gas meant that if its use displaced the use of "almost any other form of carbon based energy" it would actually help to reduce global emissions. If it didn't – it wouldn't!

The panel noted that only government regulation could address this concern, it could not be addressed at the project level. Given where we are and where we appear to be going this seems the crucial test – further projects should serve to reduce not add to emissions.

Where we are

World Population



- 200,000 y > 1 B (1804)
- 213 y > 7.5 B (now)
- 83 y > ~ 11.2 B (2100) : ^ 50%

Climate Change

- < 200 y : 280 > 400 ppm ....CO_2 : + 1 °C
- Paris → ~ + 3.6 – 4 °C future commitments for lower emissions & temp
- 2 °C "safe" – ? uncertain
- Scenarios → 2 °C need new tech to remove CO_2

↑ Population ↓ Emissions

(Lots of development)

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At the same time the prospects for adding half again as many people by the end of the century means we will need considerably more development than we already have. Our challenge then is to carefully tread this path to sustainable outcomes with our eyes firmly fixed on the cumulative effects picture – not just a project effects lens.

Quantifying emissions is of course critically important and needs to be comprehensive. The information needs to be in a format consistent with input to national carbon accounting . In developing countries where carbon accounting is not well developed EA might be an important source of this information.

The main focus needs not to be arguing how insignificant emissions might be, but designing projects to minimize and preferably eliminate GHG emissions. As

observed by the Mackenzie Gas Panel, the effects of GHG emissions could not be managed at the project level and this focus needs to be elevated to a broader context that is capable of dealing with such expansive cumulative effects.