Greenhouse Gases in Environmental Impact Assessment

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One Team. Infinite Solutions

Stantec

Outline – GHGs in EIA

- Key question
- How to assess GHGs
- available guidance
- experiences
- thresholds
- practical guidance
- conclusion

Environmental Impact Assessment

Objectives of an EIA – in respect of a Project

- Protect the environment, health
- Assist with Planning decisions

How?

- Assess potential environmental effects
  - Use data and info from science, engineering
  - Use professional judgment, experience

Key question:

- will Project result in significant adverse environmental effects?

Specifically, consider 4 aspects:

- GHG emissions, Climate change, Mitigation, Adaptation

Available Guidance

Survey paper by Agrawala et al. 2012

- EIA is Important decision making tool
- now legal requirement in many countries
- Only 2 countries consistently applied – Canada, Australia

Netherlands (NCEA) – Kolhoff 2011 workshop

- visualization of impacts, support methods for adaptation
- Downscaling, modeling of climate and hydrology, vulnerability assessment, evaluation of adaptation options

United Kingdom – IEMA Principle Series, 2009, 2010

- 2 documents: mitigation, adaptation - in EIA
- “all new GHG emissions contribute to a significant negative environmental effect”.
- “some projects replace existing development - significance should be based on its net GHG impact”

Available Guidance

USA – CEQ Draft Guidance Memo 2011

- Advises federal agencies: reduce GHG emissions, adapt to CC
- Use scoping to set spatial, temporal boundaries
- 3 challenges: uncertainty, significance, cumulative effects

Canada – CEA Agency 2003

- Consider both GHGs and Climate change
- Concepts of low, medium, high – re GHG emissions
- Quantities, thresholds are not defined
- Re climate change, look at regulatory requirements, climate modeling, global plus local

Available Guidance

Legal Community – Canada (from Hsu and Eliot, 2009)

- Difficulty, uncertainty with regulation of GHGs in Canada
- 2 most promising policy instruments:
  - Carbon tax
  - *Canadian Environmental Assessment Act*
- No mandatory consideration of GHGs in EIA
- Joint review Panel – GSX Canada Pipeline (2003)
  - No defined criteria to measure significance
  - "emissions are small fraction of Vancouver Island and global"
  - Would not jeopardize commitment to Kyoto Protocol, and
  - Therefore, GHGs not significant
- Joint Panel – Kearl Oil Sands Project (2007)
  - Gave Alberta Env target (emissions intensity) considerable weight
  - …was in keeping with existing regulatory programs, and
  - Therefore GHGs not significant

Available Guidance

Summary

- It has been, and still is a difficult issue to address
- Historically - been a large gap between the desire to incorporate GHG and Climate change considerations in EIA, and what happens in actual practice
- The guidance is rapidly being added to, especially by countries in need
- Changes to guidance are happening quickly
- Changes to legislation, slower in coming
- In practice, most countries now quantify GHG emissions, and consider mitigation
- some consider adaptation

Experiences with GHGs in EIA

Mining EIAs, North America

- Quantify emissions, mitigation, prepare sector profile, context
- And – review climatology, down scale modeling, water balance

Hydroelectric Dam EIAs, North America

- As above, use IPCC methods Tier 1, Tier 2, Tier 3
- Added: "embodied emissions", toward Life Cycle Assessment

Petroleum Refining EIAs, North America, Middle East

- In NA, quantify "well to wheel", mitigation, prepare sector profile, place in context, high, GHG Management Plan
- In Middle East, quantify, mitigation, prepare sector profile, place in context – very difficult

Experiences with GHGs in EIA

Legal Community – Canada

- Difficulty with significance
- Do not agree with following logic:

  i) “project on its own, small fraction of global – therefore not significant”

  ii) “effects of GHGs on global climate, recognized now as significant”

  iii) So, cumulatively, when adding Project GHGs to global emissions, result is a “significant adverse environmental effect”
- This is not wanted in the EIA
- Many discussions, arguments - especially if Project emissions are “low”

We conclude there is a need:

- to get the logic right; and
- to establish a set of GHG standards for “significant adverse environmental effects”, i.e., some sort of quantity thresholds

On Thresholds of GHG Emissions

USA

- reporting - > 25,000 t CO2e/yr - US EPA CFR Part 98
- South Coast AQMD – 10,000 t CO2e/yr, significant
- California, CEQ Act, 7,000 t CO2e / yr …based on 10 million Btu/hr boiler fueled with natural gas
- Mass. – report: > 5,000 t CO2e/yr or regulated Title V; verify

Canada

- CEAA 2003 - Low, medium, high – not specifically defined
  - Low – hydroelectric, High – petroleum refinery
- Large final emitters > 100,000 t CO2e / year
- Reporting NPRI - 50,000 t CO2e / year in 2011
- Alberta - report: 50,000 t CO2e/yr verify: 100,000 t CO2e/yr
- British Columbia, Ontario, Quebec – verify: 25,000 t CO2e/yr

Practical Guidance

GHG Emissions (1,000 t CO2e per year)	What's considered re GHGs & climate change	Rating	Elements of the assessment
GHGs < 10	None	Nominal, but not 0	none
10 < GHGs < 25	Quantify	Low	Quantify, present data
25 < GHGs < 100	Quantify, Mitigate	Low	+ Possible mitigation, put in context, add elements
100 < GHGs <1,000	+effects of environment on Project	Medium	+ Prepare GHG Management Plan, embodied emissions, offsets, downscaling
GHGs > 1,000	+adaptation, vulnerability and resilience analysis	High	+ adaptation analyses, conduct one, or review existing plans

Conclusions

- increasing need is to address GHG emissions in EIA
- some countries have introduced regulations
- GHGs from large facility = significant
  - because of their incremental yet important contribution to a significant cumulative environmental effect
- Mitigation and Adaptation strategies are developing
- Consider both in the assessment of potential effects
- Proposed different thresholds and elements for EIA

Thank you!