Assessing Impacts of Climate Change and Infrastructure - an Introduction

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Background

Transportation is one of the main sources of CO₂ emissions (or more broadly defined GHG emissions)

GHG Emissions by sector – EU-27 (million tonnes CO₂ Equivalent) Source: European Commission, 2010
Background (continued)

- Population growth (the EU population is projected to rise by 5% between 2008 and 2030)
- Expansion of regions and markets (larger labour markets etc)
- Increased mobility

There will be a continued increase in transportation

Climate Change is an important environmental aspect in the planning of transportation infrastructure
Climate change needs to be discussed from two separate perspectives

A. Mitigation

Main question: How can we limit CO₂ emissions (stemming from an increase of infrastructure, and car mobility)?
Answer: reduction of energy use, reduction of other sources of CO₂ emissions (e.g. construction, concrete)

B. Adaptation:

Main question: How shall we adapt to changing weather and geophysical conditions as a result of CC?
Answer: more robust plans/designs (↔ sea level rise, storm surges, draughts etc.)
Issues to consider in IA in relation to Climate change

IA in planning of infrastructure need to deal with the impacts of Climate change. Issues to consider:

• Temporal scale issues: short- ↔ long-term; life-cycle perspective
• Spatial scale issues: local ↔ global; accumulation of many small projects
• Causality issues

⇒ How to take CC into consideration throughout the life-cycle of infra development?
The relationship is two-sided

1. Infra development $\Rightarrow$ $\Delta$ climate change (designing for less emissions)

2. Climate change $\Rightarrow$ $\Delta$ infra developed (designing for CC)

$\Rightarrow$ What is the role of IA?
$\Rightarrow$ What is in it for IA professionals?
Impact on climate by plans/projects vice versa

Fig. 8. Impact on the climate caused by plans and vice versa as seen by the respondents

From Sjöholm, 2009
Issues identified with regard to mitigation

• CO2 footprint – how to calculate?
• What are relevant standards, criteria, policy objectives etc?
• How to translate policy objectives/ambitions to individual projects
• Differences construction (infrastructure) ⇔ operation (traffic),
• Differences in responsibilities (governments)
• Modal shift:
  differences in transportation via road, rail, water, air
  as well as differences in private versus public transportation
• Relevance of mobility management (information technology) and
  better spatial planning (eg reducing mobility by compact city planning)
Issues identified with regard to adaptation

- How to take into account CC consequences for infra development through a sound SEA/EIA process? (issues of improved designing, life-cycle management)
- **Sea level rise:** sea level + changes in river flows (amount of rise, time frame)
- **Changing weather patterns:** floodings, draughts, intensity of precipitation. Issue: downscaling of weather predictions to the local level is difficult.
- **Tools:** e.g. scenarios for weather, sea level rise, river floodings. Concept of a climate atlas (a GIS like tool indicating sensitive areas)
Issues identified with regard tonadaptation (2)

• **Risk standards**: which standard should be applied regarding the context? (e.g. 100 % availability of the infrastructure network or otherwise?)
• **Long-term issues**, how to deal with these uncertainties? (context dependency)
• **Modal shift**: e.g. change of modal split in freight traffic, from (inland) shipping toward trucking due to changing river/sea levels and therefore less reliability of shipping in logistics,
• **Impact mitigation**: how nature mitigation in a changing climate (e.g. Natura 2000 requirements vs autonomous development)
• **Design issues**: how to make robust designs for climate change (robustness, adaptiveness, resilience in design)
Session Program

• Session 1 – Views from current practice of IA of CC in infra planning
  – Assessing Impacts of CC & Infra - Introduction
  – Towards a climate resilient society - tools for IA of infra and urban development
  – Integration of CC in the SEA of the Swedish National Transportation Plan

• Session 2 – Lessons from practice
  – Integration of climate aspects in the Stockholm Bypass project
  – Challenges in addressing the CC issues within IA practice of transport projects in Estonia.
  – Challenges in addressing climate change in IA of modal shift projects

• Session 3 – Ways to move forward
  – Scope for Cost-Benefit Analysis in a Changing Environment of CC and Infra
  – Assessing Climate Change Effects for Infra Projects: What, How and When
  – Discussion