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# **Assessing Impacts of Climate Change and Infrastructure - an Introduction**

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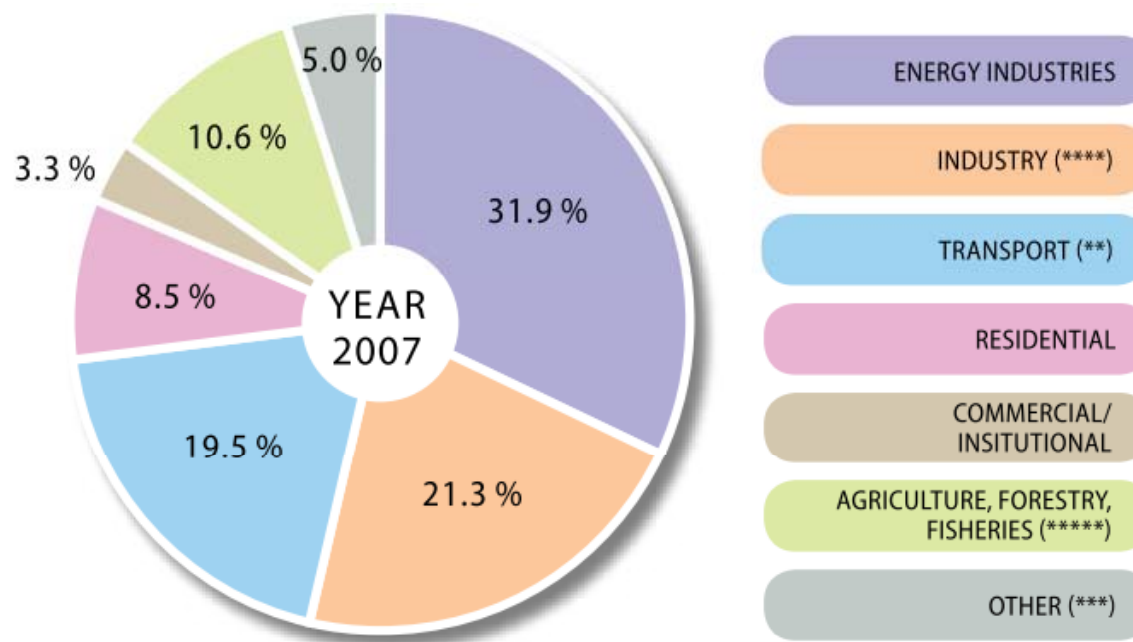
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# Background

Transportation is one of the mains sources of CO<sub>2</sub> emissions (or more broadly defined GHG emissions)



GHG Emissions by sector – EU-27 (million tonnes CO<sub>2</sub> Equivalent) Source: European Commission, 2010



# Climate change needs to be discussed from two separate perspectives

## A. Mitigation

Main question: How can we limit CO<sub>2</sub> emissions (stemming from an increase of infrastructure, and car mobility)?

Answer: reduction of energy use, reduction of other sources of CO<sub>2</sub> 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

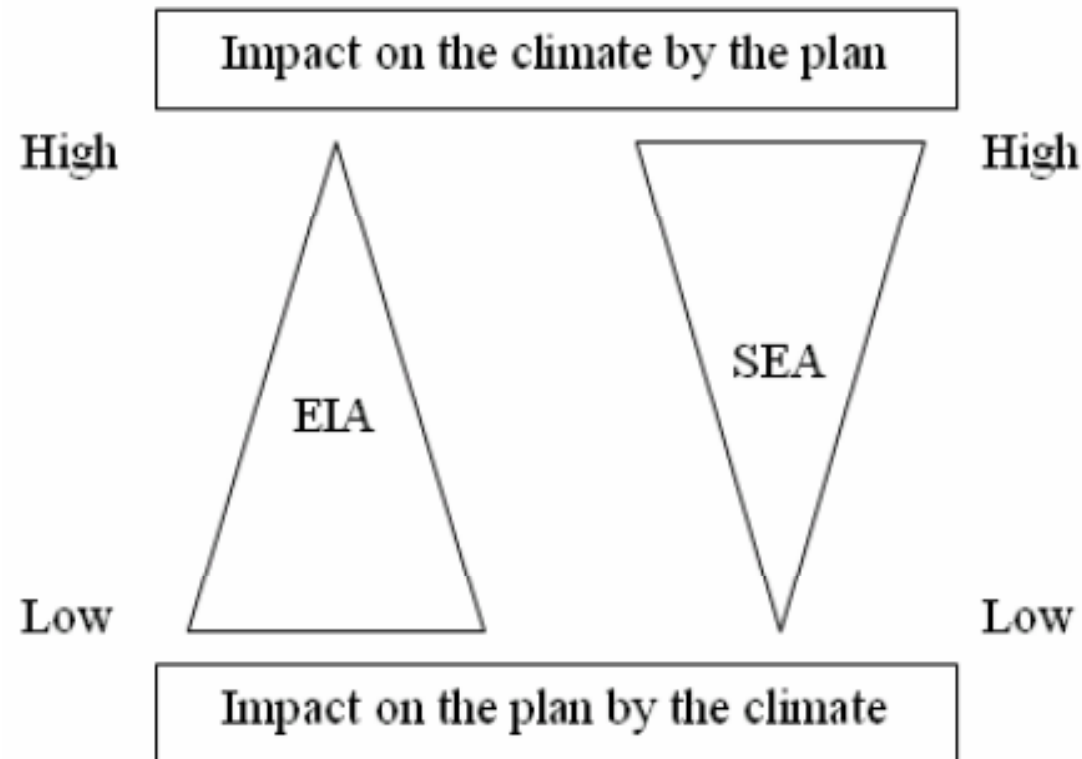
1. Infra development  $\Rightarrow$   $\Delta$  climate change (designing for less emissions)
2. Climate change  $\Rightarrow$   $\Delta$  infra developed (designing for CC)

$\Rightarrow$  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*

# 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 to adaptation (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