Ten Years of Climate Change Research – where are we now?

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CEDR's Function

CEDR comprises 27 member states (MS) and is the Road Directors' platform for cooperation and promotion of improvements to the road system and its infrastructure, as an integral part of a sustainable transport system in Europe.

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CEDR'S Function

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Climate Change

“something that's going to happen in the future, to other people, somewhere else”

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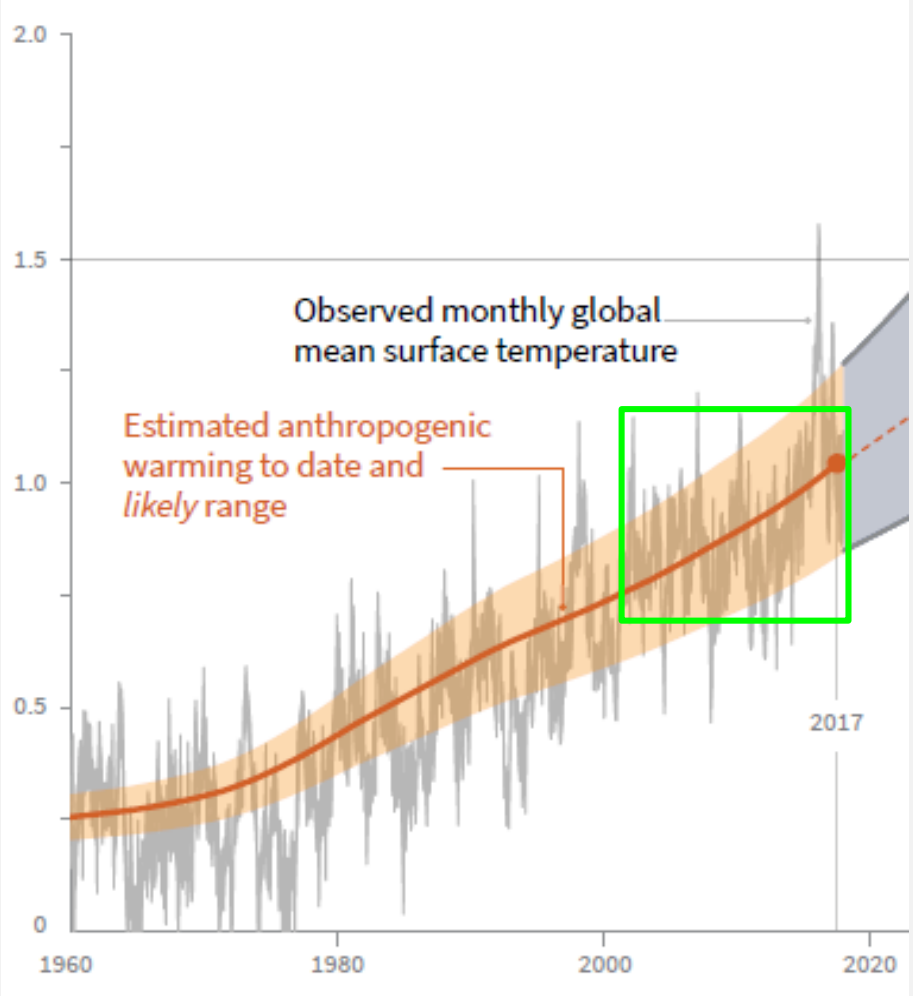
IPCC Global Warming of 1.5°C

Ref: IPCC 2018 Summary Report



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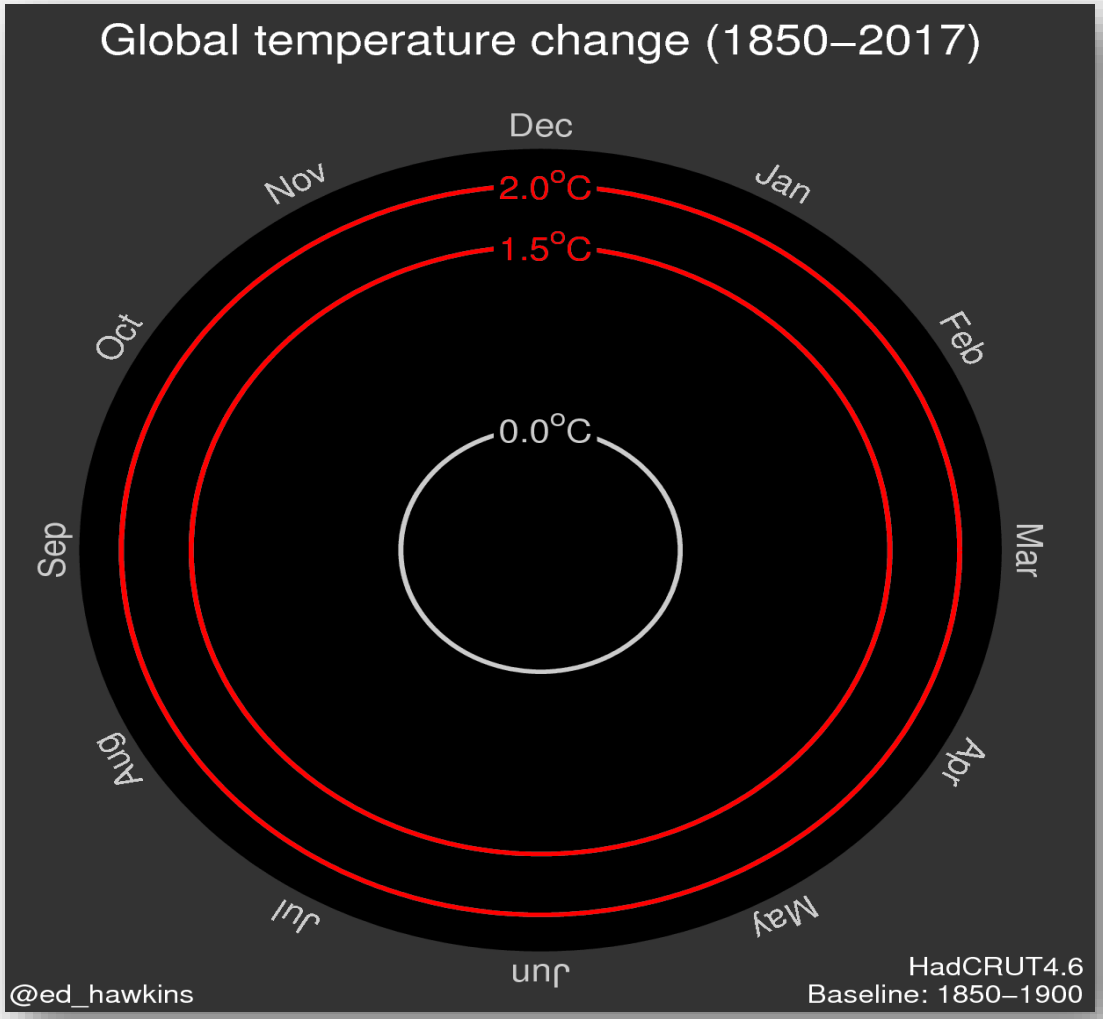
Global Temperature Change 1850–2017

climate-lab-book/files/2016/06/spiral_2017_large-1.gif



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Paris Climate Agreement

- To keep global temperatures "well below" 2.0°C (3.6°F) above pre-industrial times and "endeavour to limit" them even more, to 1.5°C
- To limit the amount of greenhouse gases emitted by human activity to the same levels that trees, soil and oceans can absorb naturally, beginning at some point between 2050 and 2100
- To review each country's contribution to cutting emissions every five years so they scale up to the challenge
- For rich countries to help poorer nations by providing "climate finance" to adapt to climate change and switch to renewable energy.

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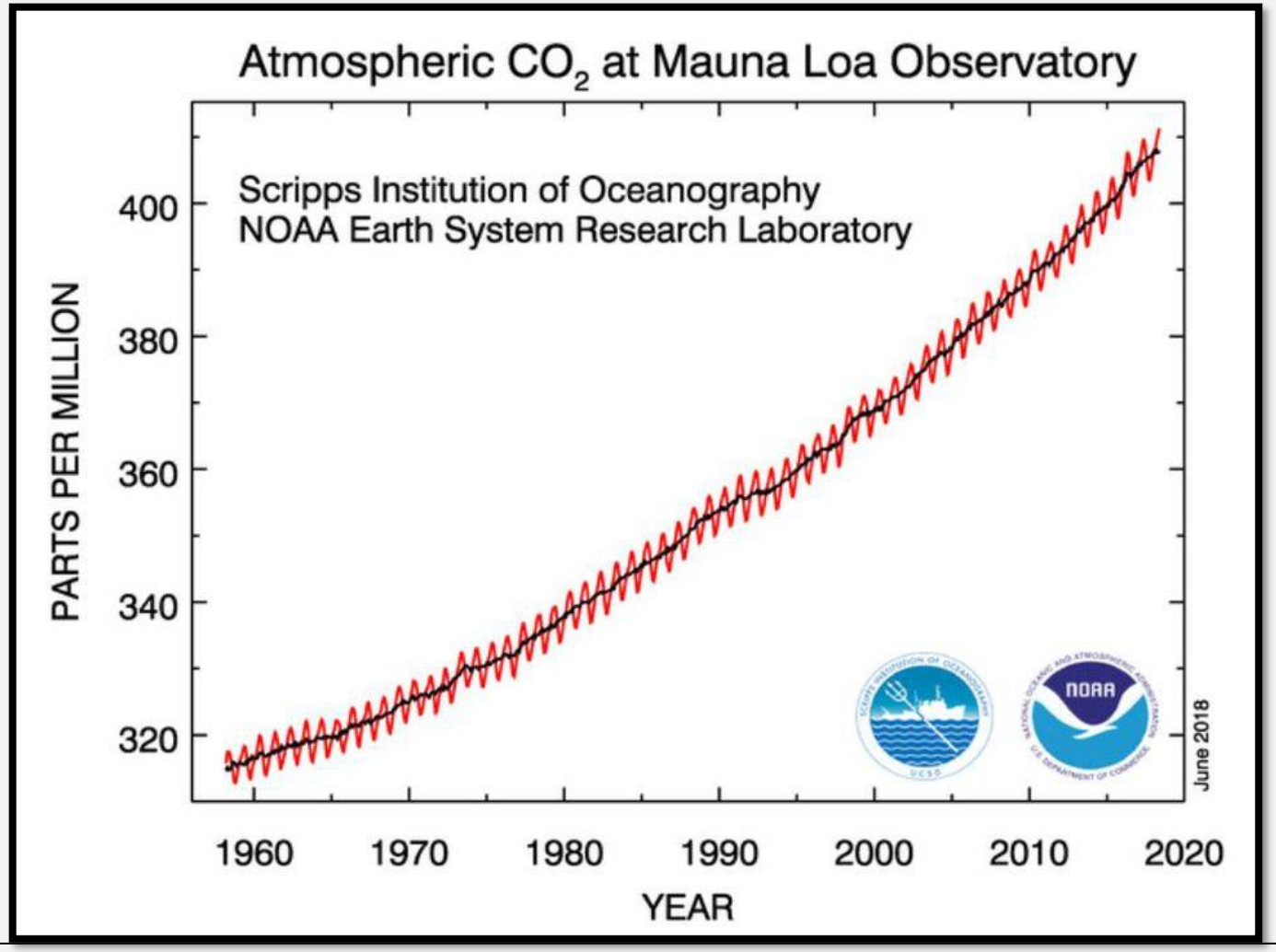
Global CO_2 Emissions



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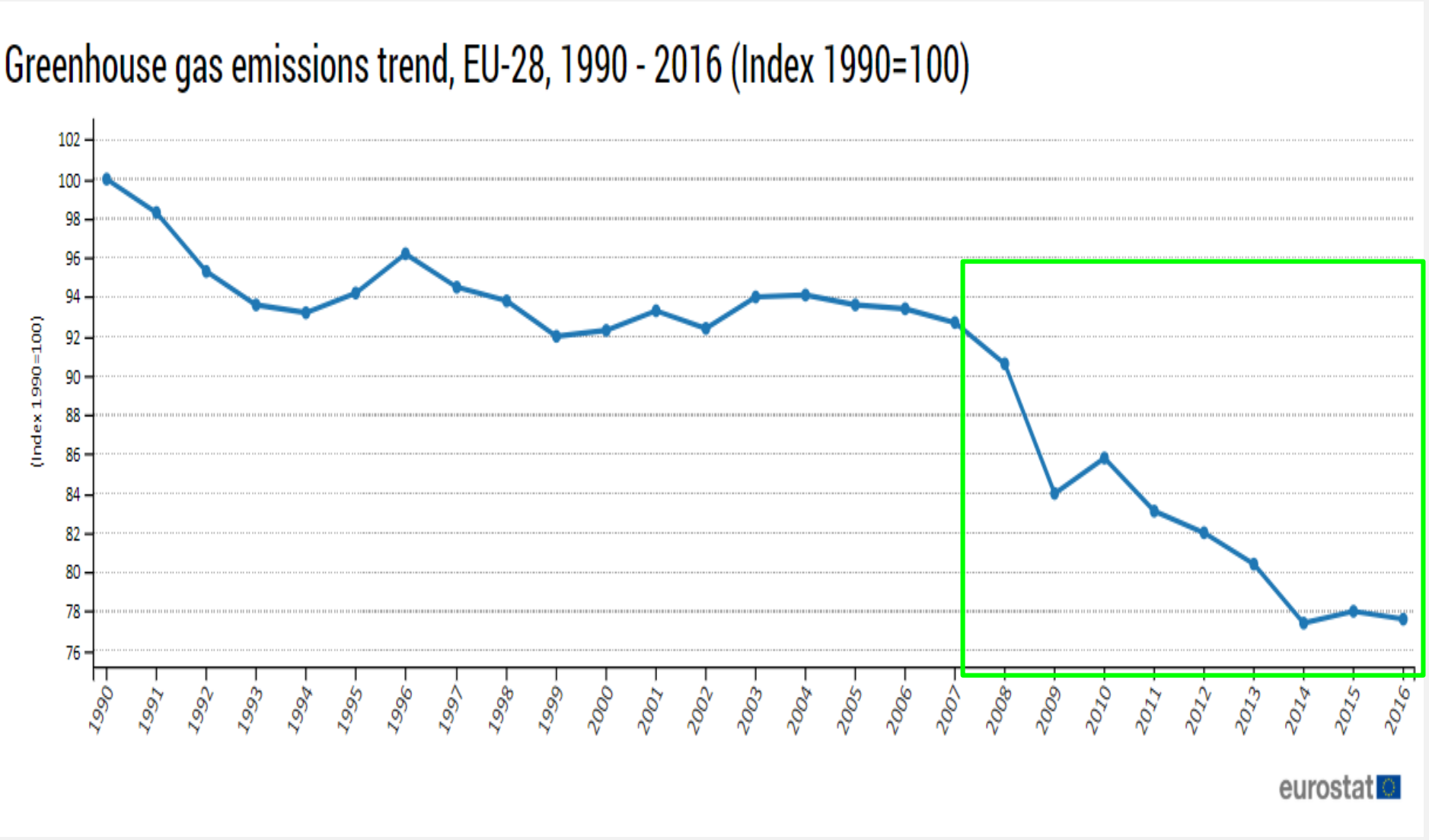
EU28 Greenhouse Gas Emissions Trends



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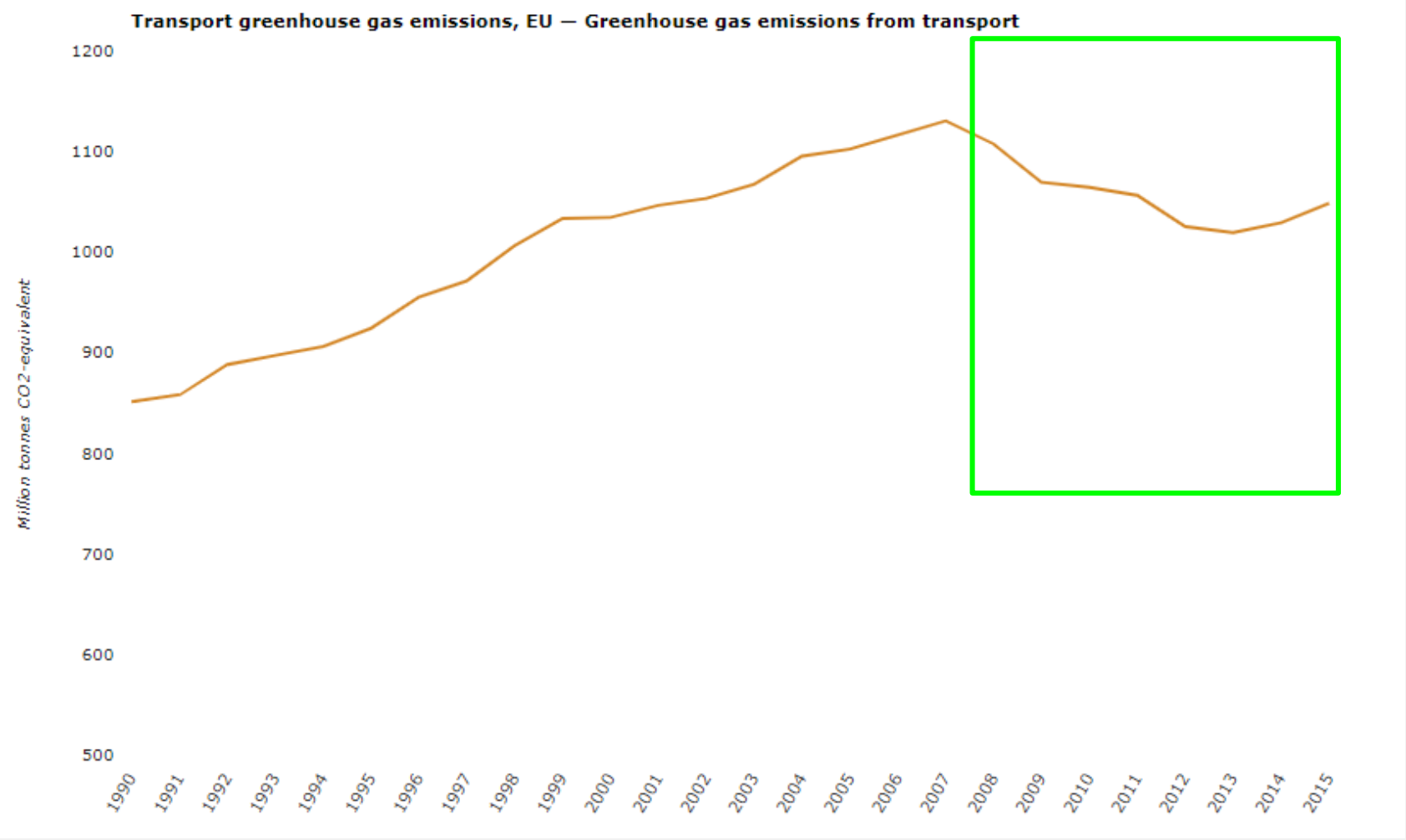
Greenhouse Gas Emissions from EU Transport



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Future Challenges for NRAs

- Car ownership in the EU-28 area increased considerably between 2000 and 2015, growing from 411 to 500 cars per 1,000 inhabitants
- Population growth in Europe has gone from 485 million to 515 million; an approximate growth of 2 million per year
- Does this mean we are adding 1 million additional cars to our roads every year?

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Future Challenges for NRAs

- How will NRAs continue to manage their networks to accommodate all the additional growth in vehicular traffic?
- Building resilience into an existing network where we are unsure about the impacts of climate change
- Over the past 10 years, CEDR has undertaken research and has dedicated working groups addressing climate change mitigation and adaptation

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2008 – Road Owners Getting to Grips with Climate Change

First cross-border funded joint research programme in ERA-NET ROAD.

- **IRWIN** focused on developing an improved winter road index using historical observations from the Road Weather Information System (RWIS) networks in Sweden and Finland

- **P2R2C2** looked at the impacts of climate change across Europe on the moisture (water)/ice condition in the pavement/subgrade. It also estimated the likely consequences for pavement and subgrade material behaviour and for whole pavement needs

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2008 – Road Owners Getting to Grips with Climate Change

- **RIMAROCC** was all about developing a common method for risk analysis and risk management with regards to climate change. The purpose was to support decision making concerning adaptation measures in the road infrastructure
- **SWAMP** focused on flooding and mainly involved developing a methodology for identifying sections of road networks that are most vulnerable to flooding using GIS. This brought drainage inspections and maintenance under the spotlight for NRAs

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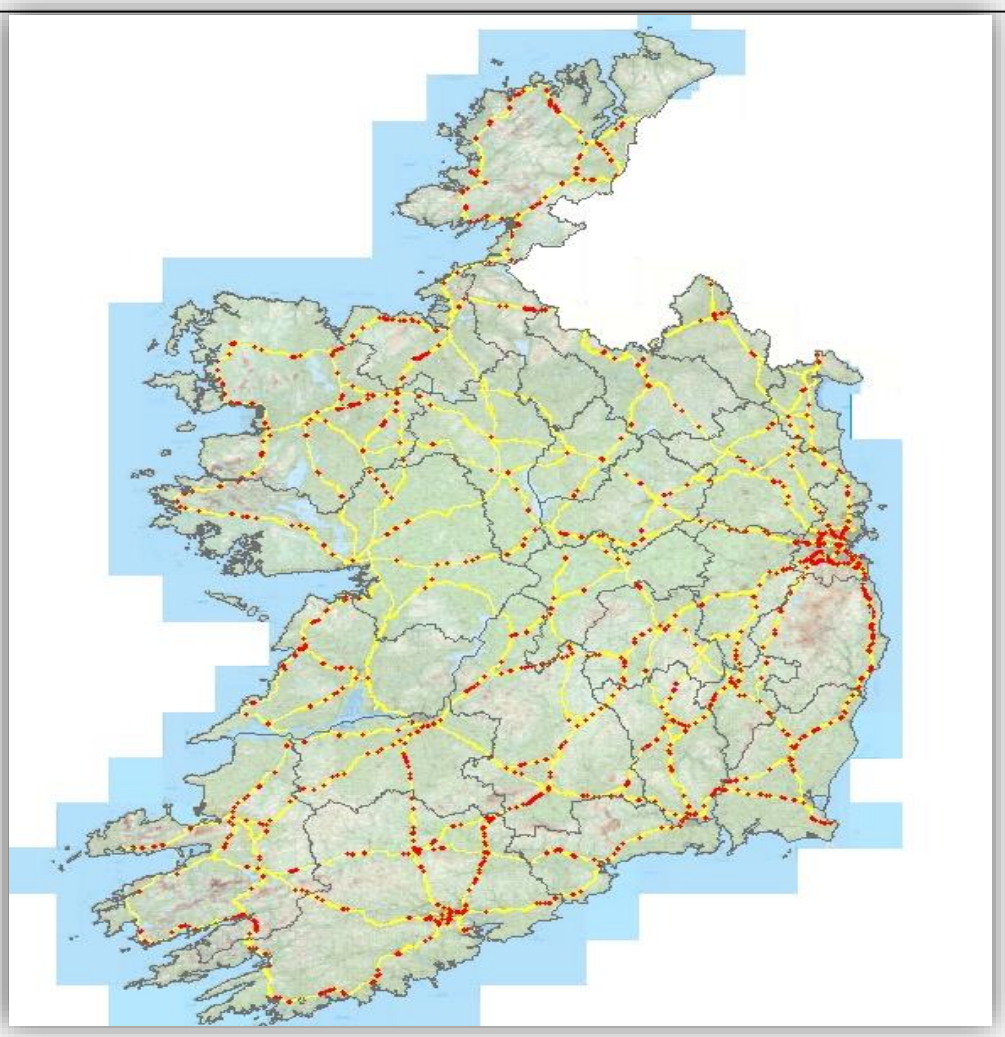
Example of Implementation in Ireland



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2012 – Road Owners Adapting to Climate Change

This call aimed to provide road owners with adaptation technologies and the models and tools to support decision-making, concerning adaptation measures for road infrastructure.

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2012 – Road Owners Adapting to Climate Change

- CliPDaR (Design guideline for a transnational database of downscaled climate projection data for road impact models) addressed the need for review, analysis and assessment of existing (regional) Climate Change projections regarding the TEN-T network
- ROADAPT (Roads for today, Adapted for tomorrow) built on the RIMAROCC project and targeted the need for a risk-based approach, addressing causes, effects and consequences of weather-related events to identify the major risks that demand mitigating measures from road authorities

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2015 – From Desk to Road

- The aim was to build on the outcomes of the 2008 and 2012 calls and provide research on integrating Climate Change into decision-making processes
- A: Economic costs associated with integrating climate change into decision making
- B: Embedding climate change into practice and procurement
- C: Developing a transnational approach to water management in the face of climate change
- D: Driver behaviour: Diagnosing driver decision making (in a changing climate)

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2015 – From Desk to Road

- **DeTECToR – Decision support tools for embedding climate change thinking on roads** aims to address the economic costs associated with integrating climate change into decision making and the issues surrounding embedding climate change into practice and procurement for NRAs
- **WATCH – Water management for road authorities in the face of climate change** addresses the requirement for a transnational approach to water management in the face of climate change. In addition, the project aims to provide guidance on how to carry out a cost-benefit analysis as a prerequisite for implementation of the results

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2015 – From Desk to Road

- **MoDBeaR – Mobility Management and Driver Behaviour Research** considers issues relating to mobility management in the context of climate change

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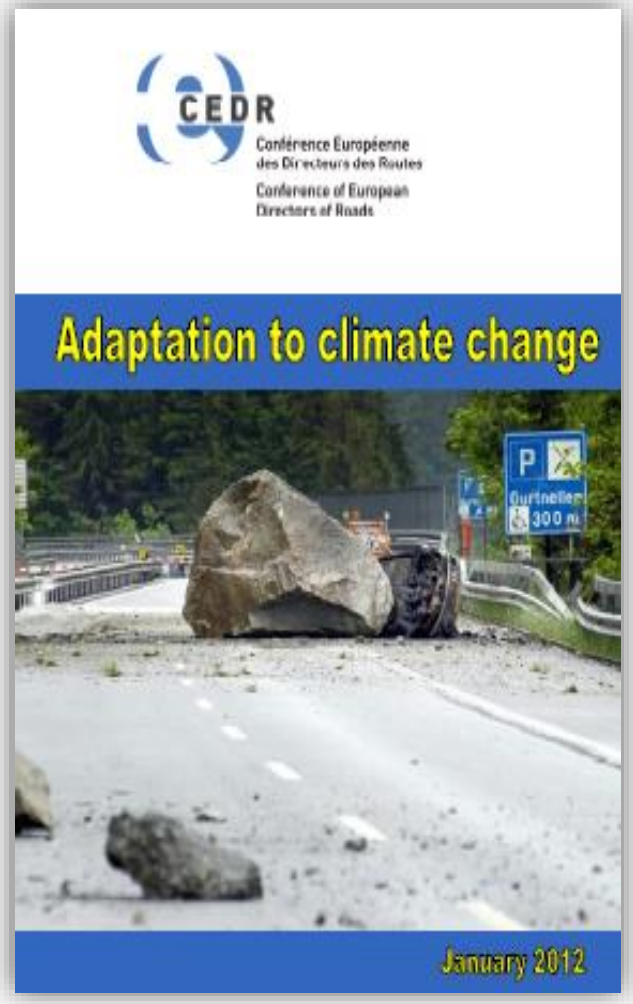
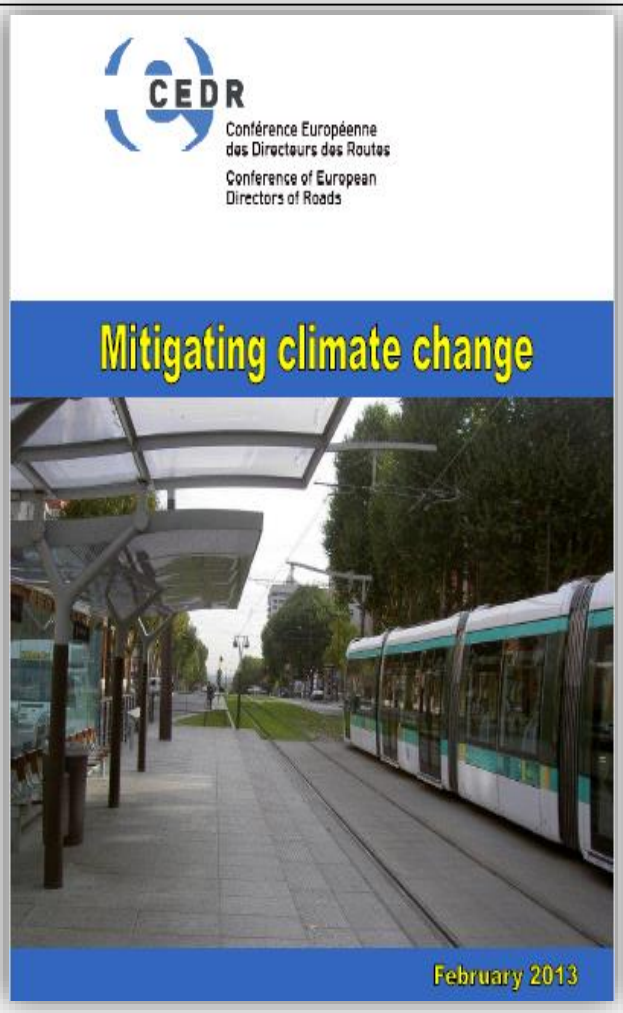
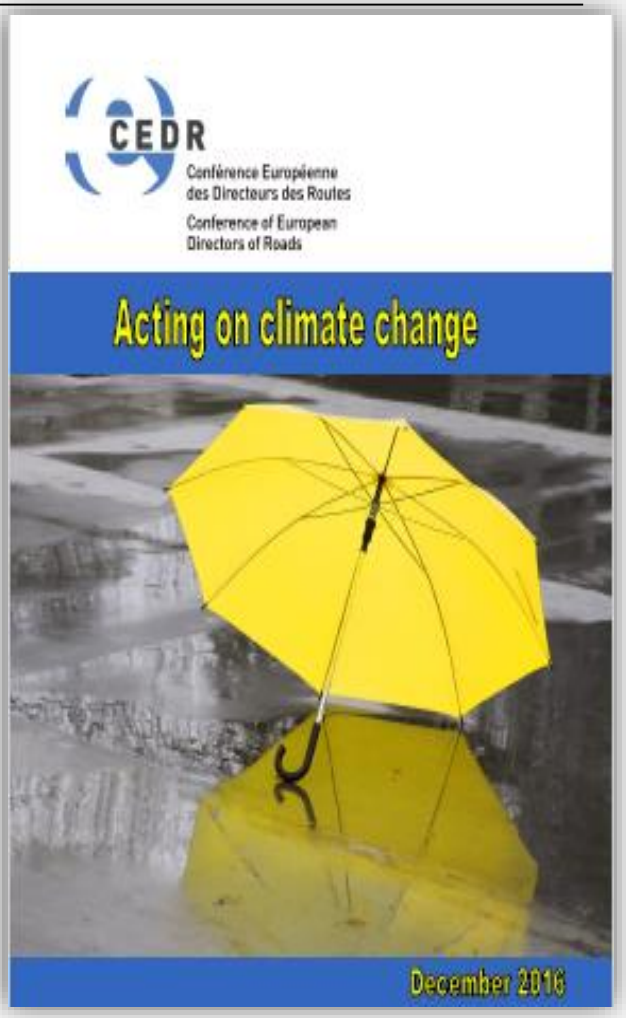
CEDR Working Groups







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What have we achieved to date?

- Most countries still plan infrastructure on the basis of BAU-based forecasts. Climate change objectives have to be considered for future transport planning
- Despite the array of new approaches, methodologies and tools, implementation of climate change adaptation still appears to be limited across most NRAs
- Appears to be a lack of awareness across NRAs, particularly at the higher levels of the organisation
- Need for organisational wide strategies on climate change implementation

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Where from here?

- For the next two days, we will have the opportunity to discuss the outcomes from the 2015 programme, keeping in mind the 2008 and 2012 research programmes
- We need your active participation during the workshops to identify potential transnational implementation actions that can be communicated to the higher levels in our NRAs
- Also, if there is a specific action/actions that you feel needs to be acted on in your own NRA, that will also be a positive outcome from the discussions

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Where from here?

- The outcome of our discussions will be compiled into a final end-of-programme report which will be made available to all, once approved by the PEB

- The current climate PEB will continue for another year as a project implementation board to assess the recommendations emerging from our discussions over the next two days