

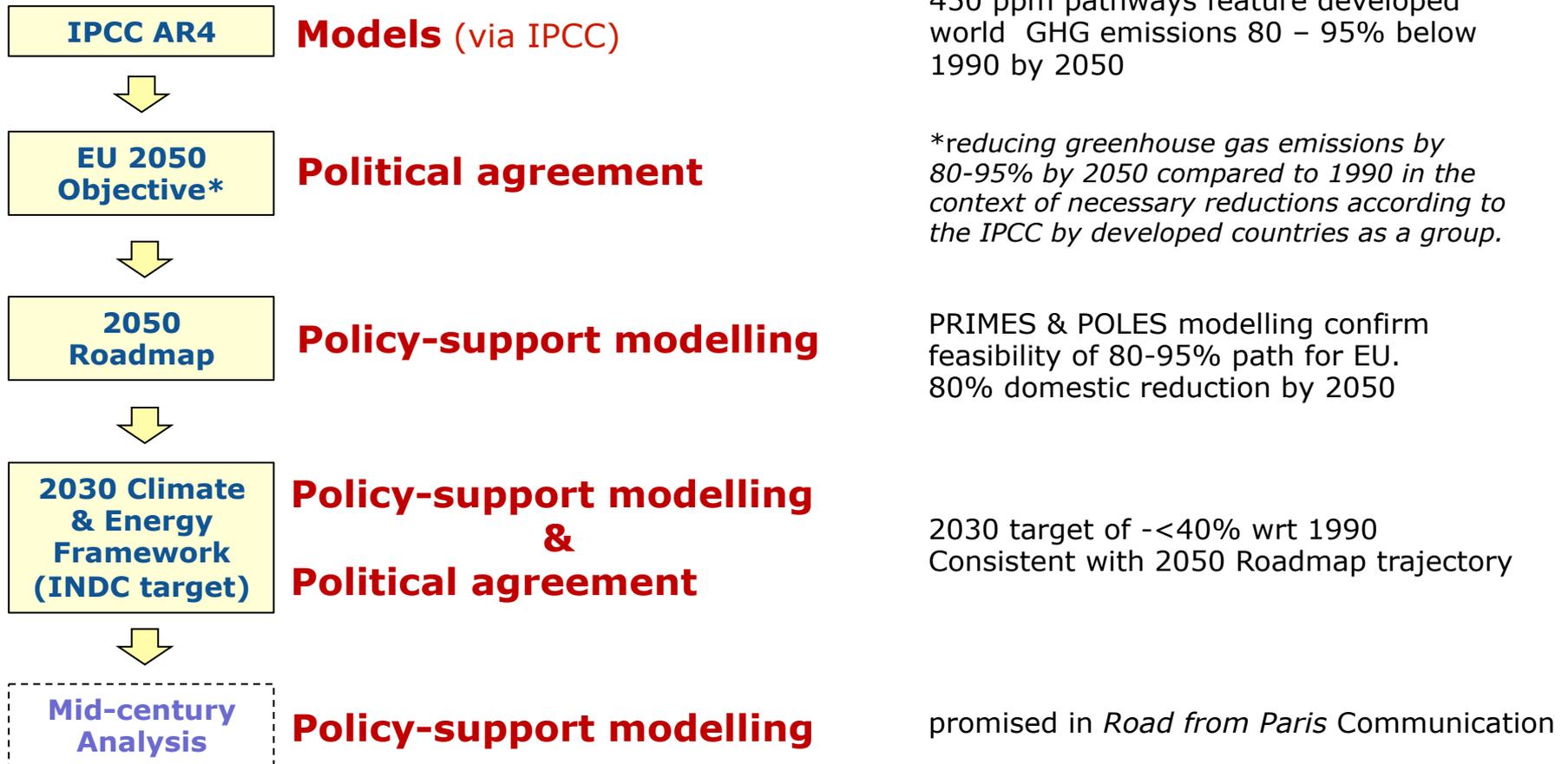


# **Scientific drivers, needs & trends: an EU perspective**

**Miles PERRY, Tom VAN IERLAND  
European Commission, DG CLIMA**

**Snowmass Workshop 2016**

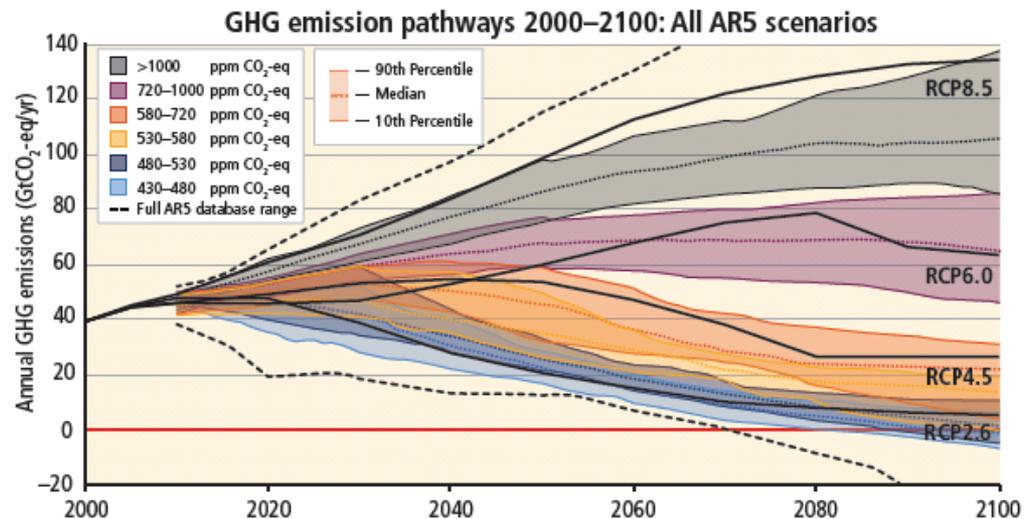
## Models & political decisions set the direction for **EU** climate action



## Models & political decisions set the direction for **global** climate action

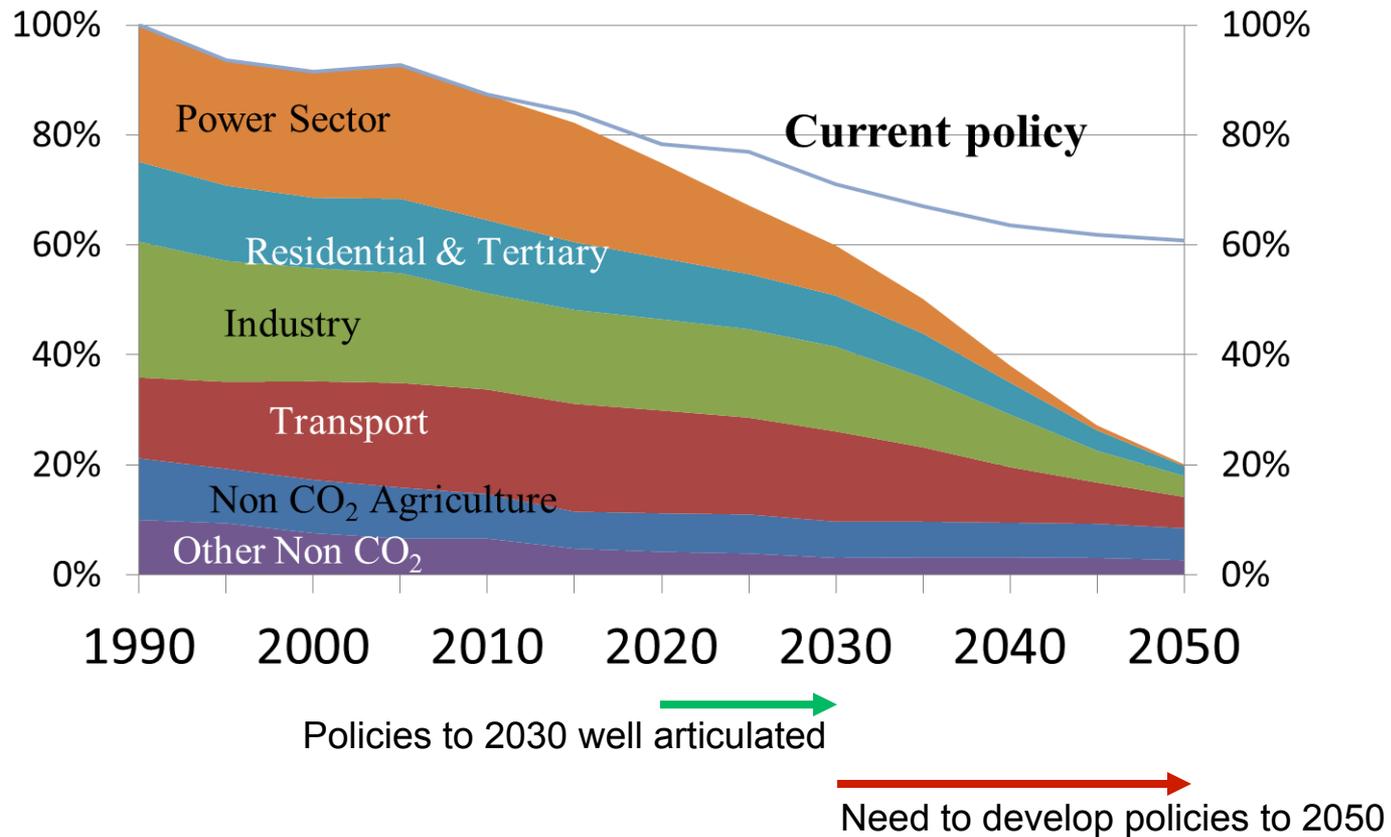
### *Paris Agreement's qualitative goals consistent with AR5:*

- hold increase in global average temperature to well below 2°C, & aim for 1.5°C
- peak global emissions a.s.a.p. with rapid reductions thereafter
- achieve climate neutrality\* in the second half of this century
- Increase ability to adapt and foster climate-resilient, low-emission development in the context of sustainable development & poverty eradication

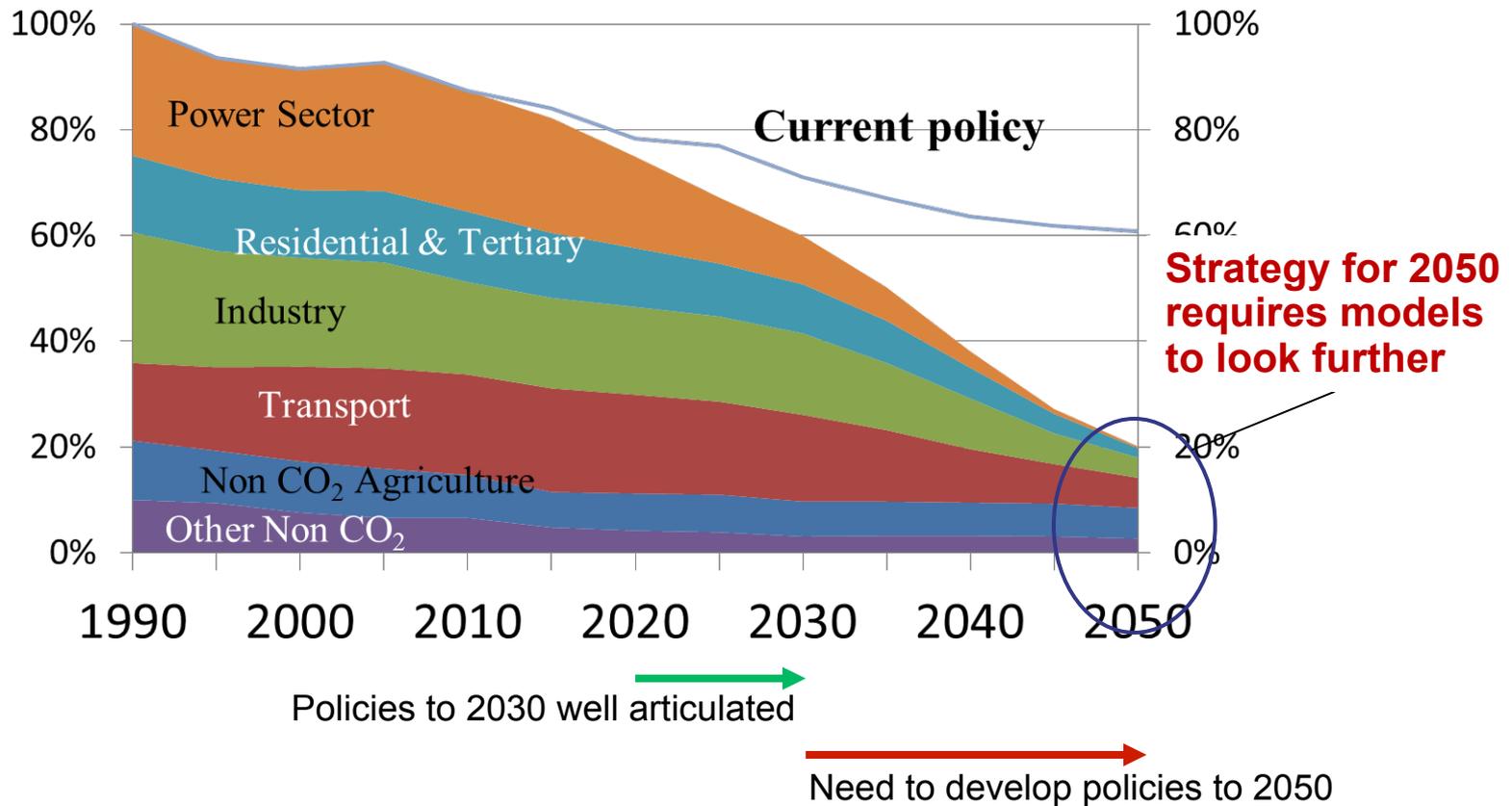


\* a balance between anthropogenic emissions by sources and removals by sinks of greenhouse gases (Art 4.1)

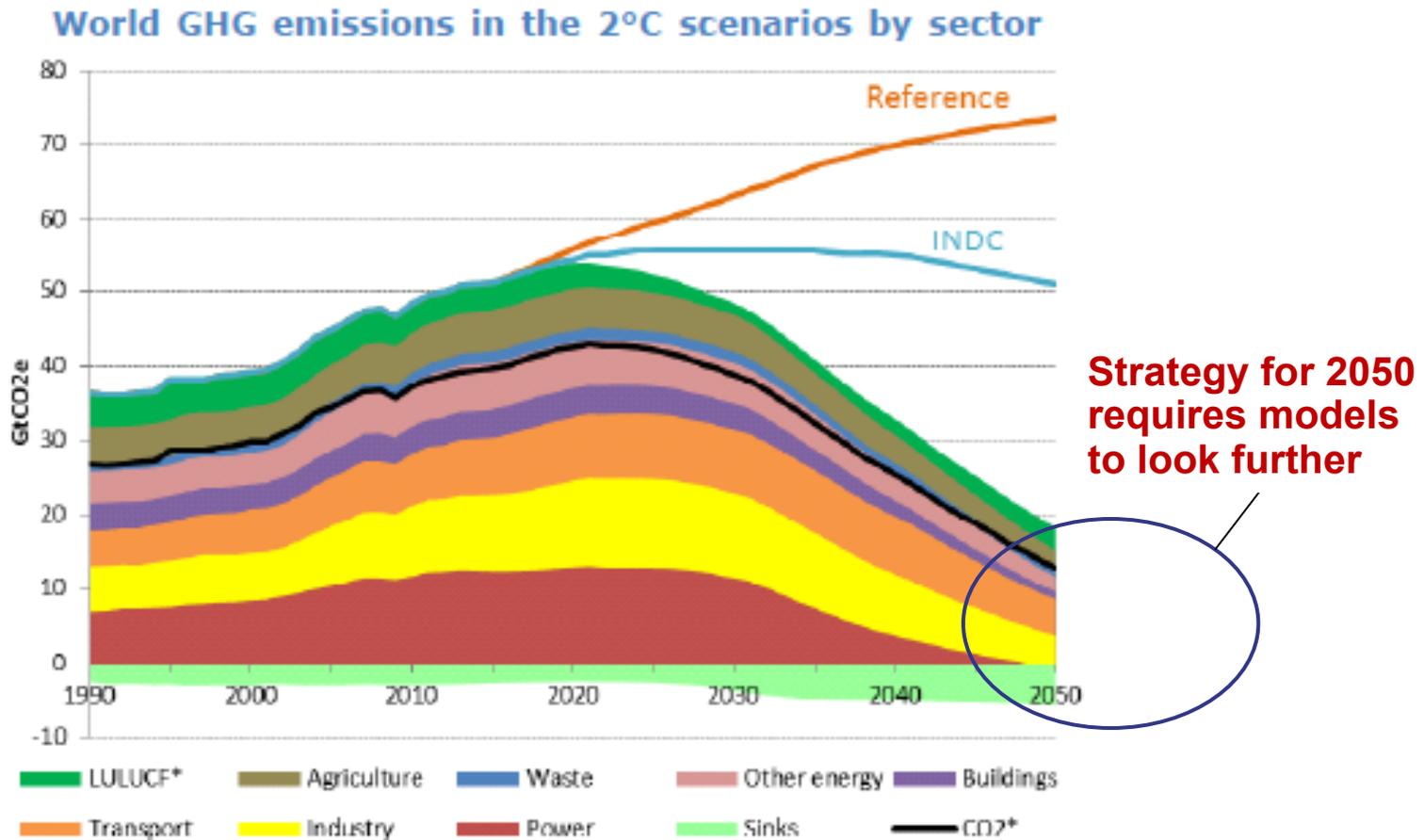
## Mid-century is not far beyond current EU policy horizon



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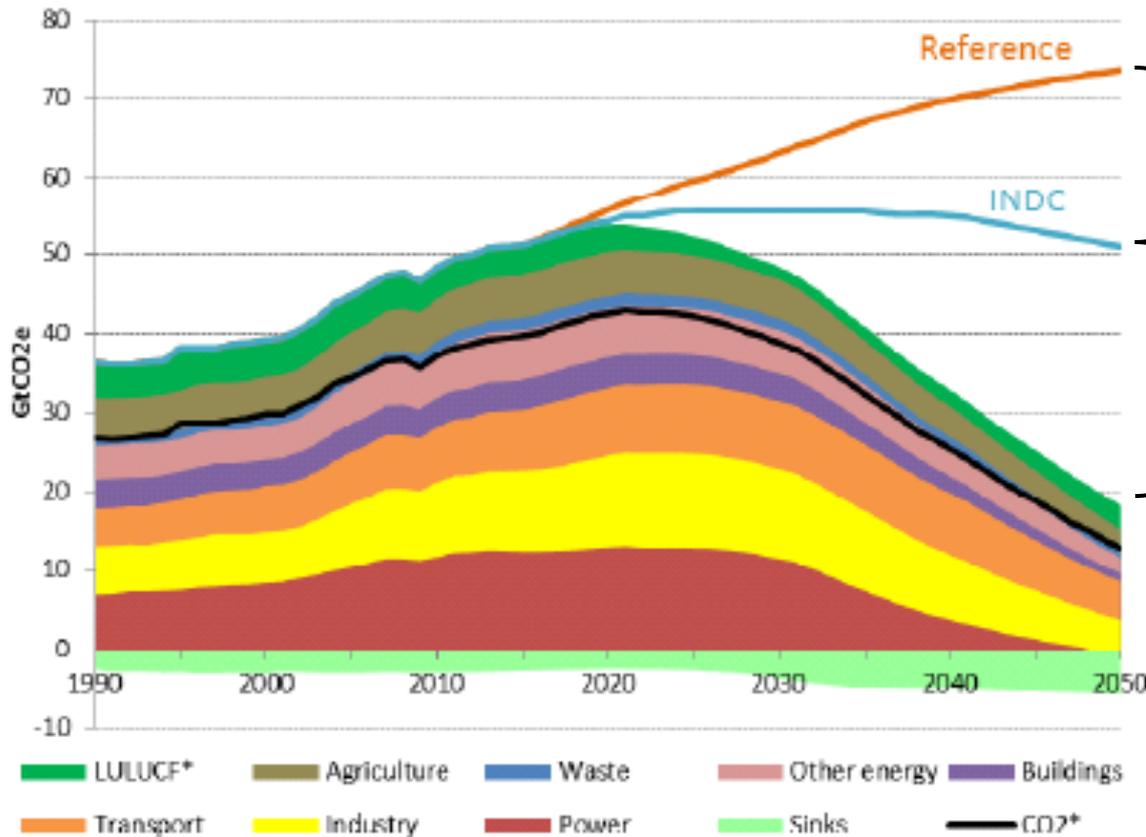


# Mid-century is not far beyond current **global** policy horizon



## Mid-century is not far beyond current **global** policy horizon

World GHG emissions in the 2°C scenarios by sector



Potential of INDCs needs to become reality

Need for greater mitigation ambition

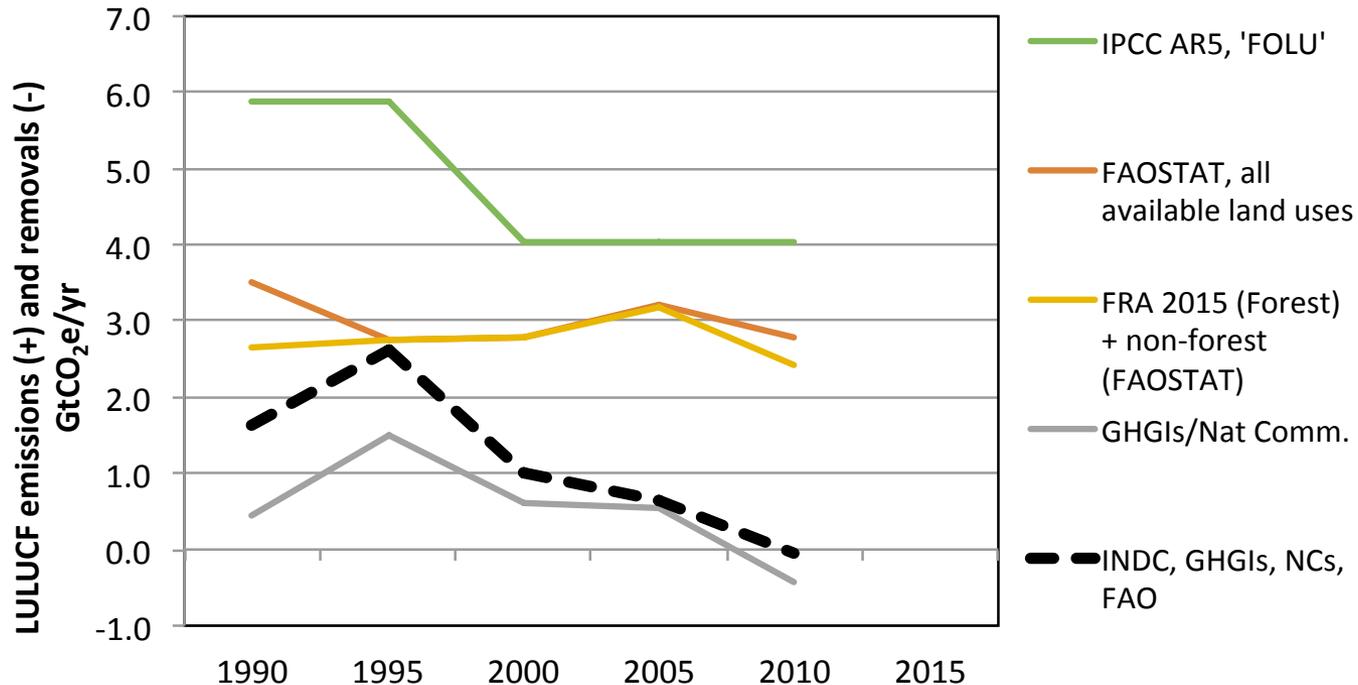
Modelling policy options consistent with <2°C: beyond 2030 & beyond 2050

## Areas for improvement (in both models & reality)

- **LULUCF** is a key part of many INDCs, but often not quantified properly
  - Of 156 INDCs submitted by 29 October, 2015:
    - 95 include LULUCF explicitly
    - but only 36 provide quantifiable details
    - and historical and projected estimates vary widely
- *Better understanding needed on how land use projections in IAM relate to the monitored and reported emissions and absorptions under the inventories used to measure policy progress.*
- *When has one achieved neutral/negative emissions in model vs. Inventory?*

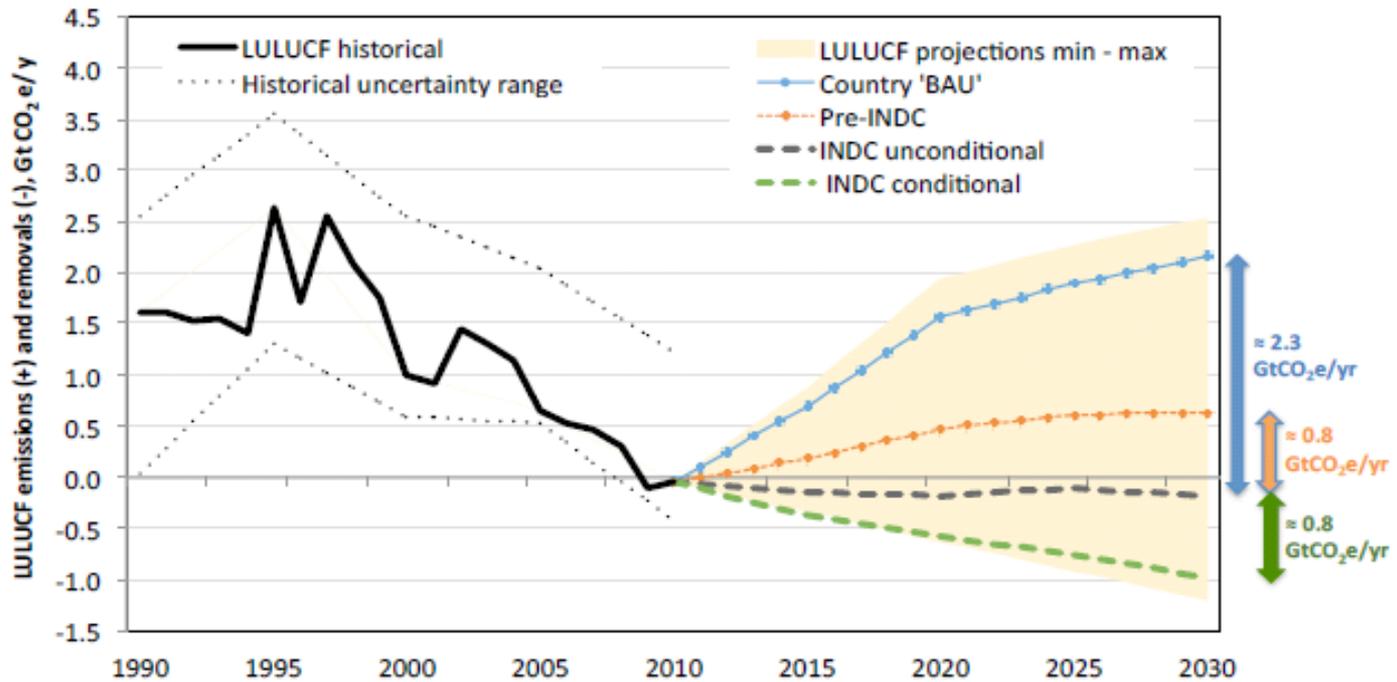
# Land use, Land Use Change and Forestry

## Historical Global LULUCF Estimates



# Land use, Land Use Change and Forestry

## What's in a BAU?

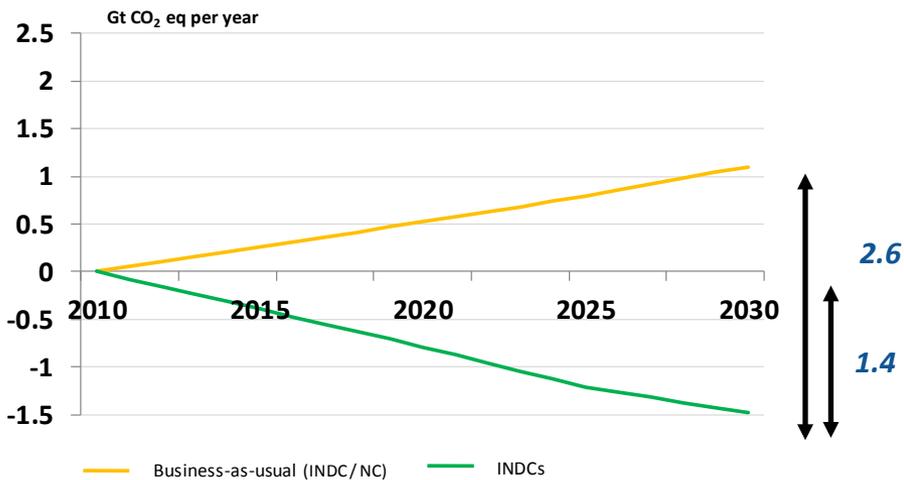


**Figure 1.** Global LULUCF trend of emissions and removals, and future scenarios analyzed.

# Land use, Land Use Change and Forestry

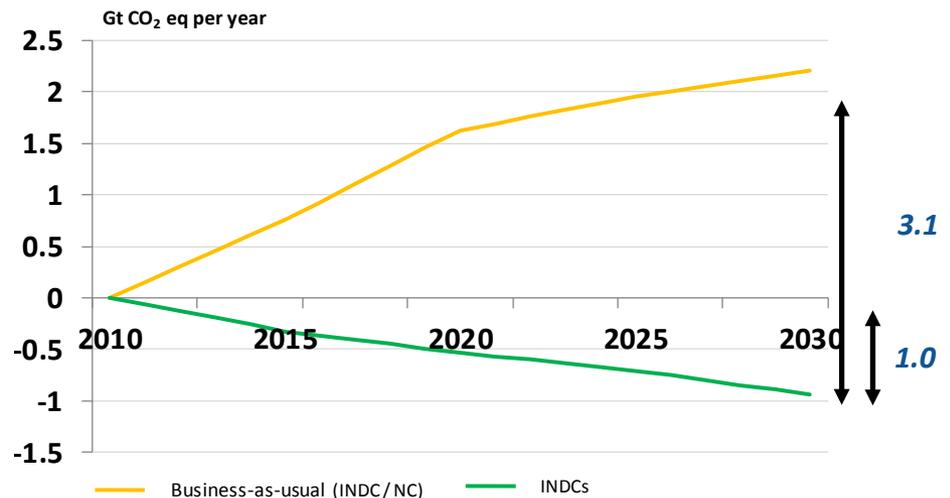
**Two estimates based on INDCs & NCs where possible**

**IIASA/PBL - Global LULUCF net emissions**



*Admiraal et al. Assessing Intended Nationally Determined Contributions to the Paris climate agreement. PBL Policy report*

**JRC - Global LULUCF net emissions**



*Grassi et al. Quantifying the contribution of the Land use sector to the Paris Climate Agreement. JRC Science and Policy report*

## Bioenergy, low-emission scenarios & LULUCF

*Most low emission scenarios rely in one way or another on heavy biomass use.*

*This can be for energy production (including BECCS) or in the form of afforestation.*

*On the other hand Biomass (and certainly many biofuels) are under critique of emitting (a lot of) CO<sub>2</sub> themselves.*



## Bioenergy, low-emission scenarios & LULUCF

*Can the modelling tools give insight in what sustainable biomass/biofuels means in the 'real policy world?'*

*To what extent do models account for emissions related to biomass production?*

*Important to convince stakeholders at large about what the plausible and sustainable pathways are.*

*Important to link this to monitoring, reporting and accounting methods.*



## Is there enough land?

*The use of land for biomass for mitigation (energy, BECCS or increased sink) is large in low emission scenarios.*

*How large? Let's become more concrete what this means.*

*How does this impact other uses of land:*

- Agriculture (food, bio-economy)
- Biodiversity

*Impacts on the larger development agenda, including regional opportunities and challenges.*

## The role of agriculture?

- How can it contribute to mitigation (efficiency improvements, technology, behavioral change)?
- What about agriculture as a source of biomass and what about agriculture as a source for the bio-economy? What does this mean for LULUCF and agriculture emissions.
- What does this mean for agriculture production (intensification, marginal lands, water use, other environmental impacts, etc)?
- How can its contributions be measured, e.g. can all technologies or land use practices included in modelling projections be captured by inventories?

## The role of consumption?

- Models tend to limit themselves to baseline economic growth projections and the consequent consumption patterns (and associated elasticities if impact of prices are included).
- Can/should models go beyond? Role of behavioural change in possibly different ways:
  - Food
  - Demand for mobility including aviation
  - Type of buildings, e.g. building materials, surface, comfort levels (higher in passive houses)
  - Etc.

## Impact of climate change

*To what extent does modelling need to take into account climate change itself:*

- The energy system (heating or cooling needs, water use)
- The agriculture system, including the potential to be a large source of biomass and food production
- The forestry system

*On what time scales does this become relevant, for which emission/temperature profiles should models start taking into account changes in the climate/environment?*