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Evaluation of Nuclear Power as a Cost-Effective Nationally Determined Contribution to Climate Change Mitigation

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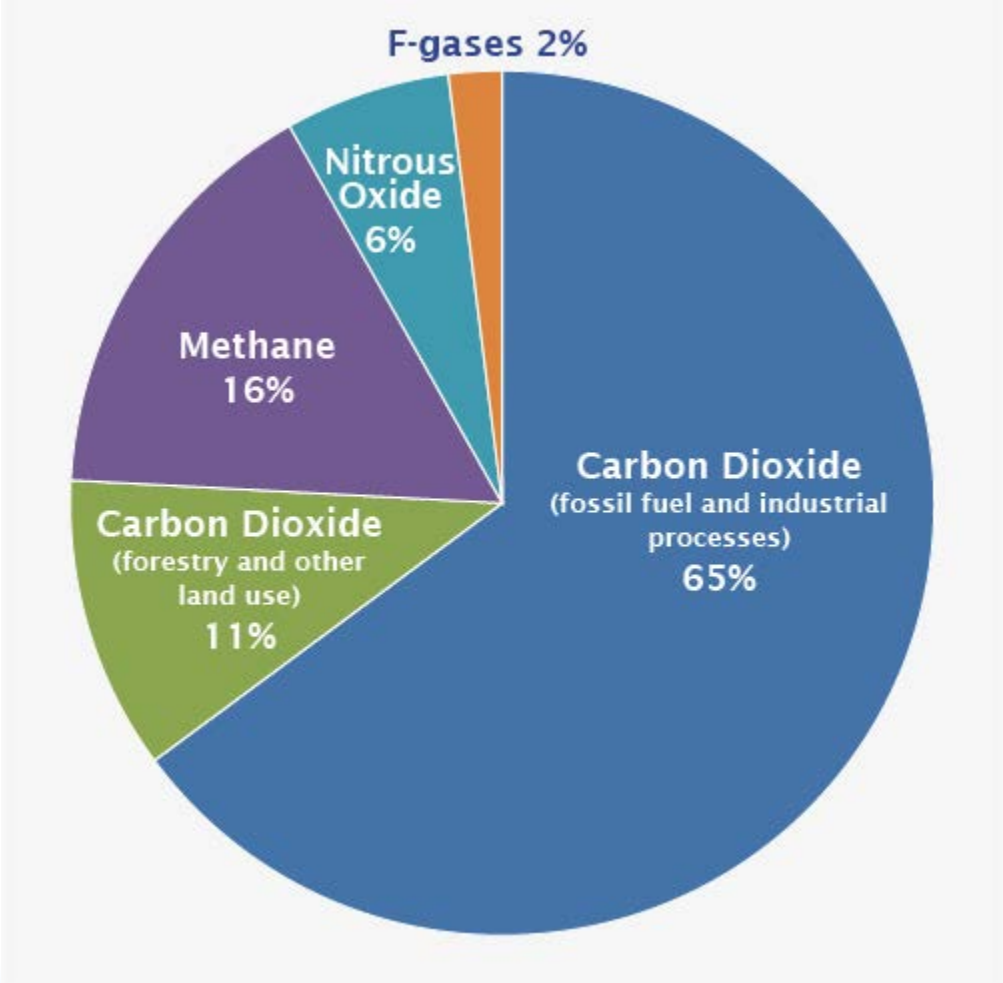
Paris Agreement – Targets & Obligations

- Aims at strengthening the global response to the threat of climate change,
  - Holding increase in global average temperature well below 2°C (preferably < 1.5°C)
  - Increasing ability to adapt to adverse impacts of climate change
  - Making finance available

- All Parties take actions to contribute to the global response (NDCs with progression over time)

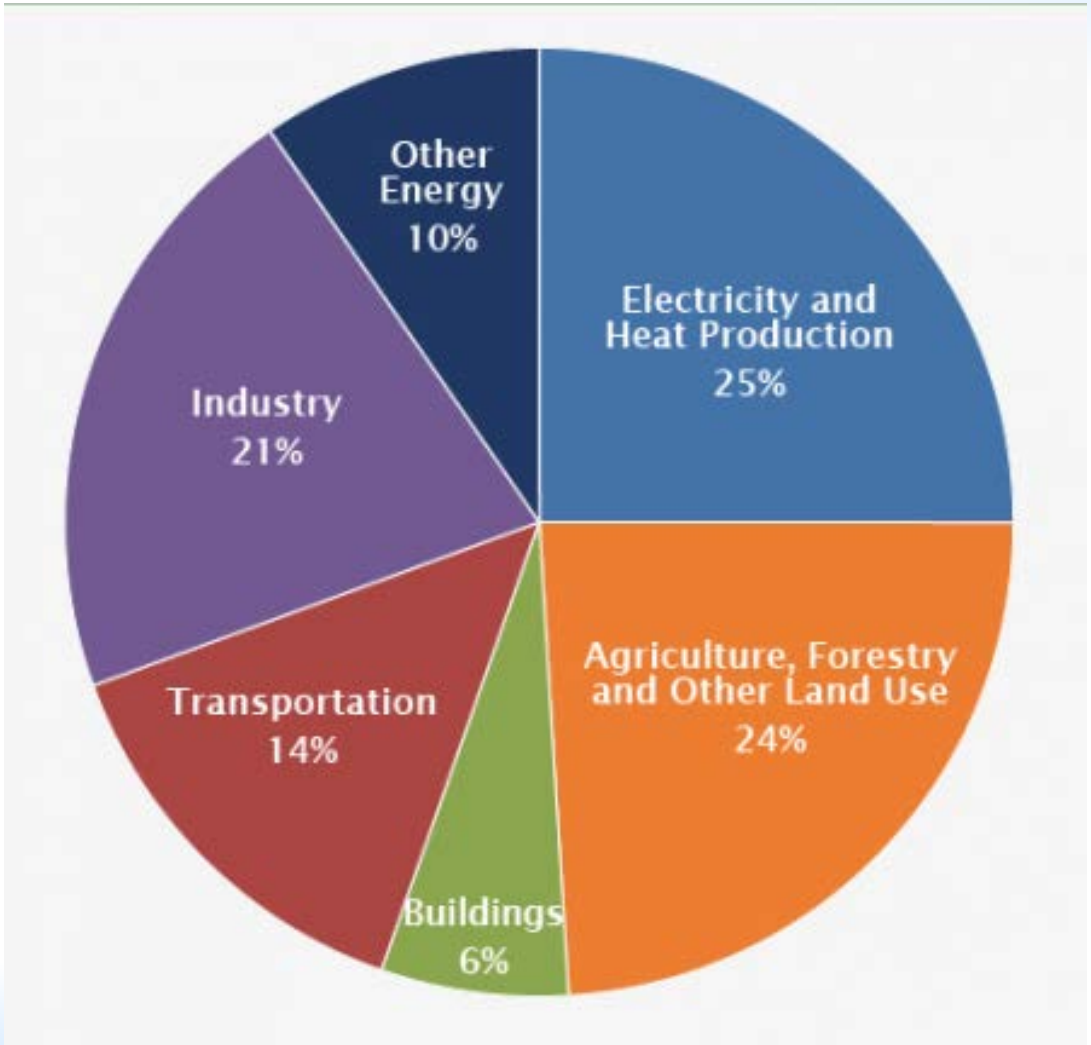
- Developed country Parties shall provide financial resources to assist developing country Parties for mitigation and adaptation (communicate this information biennially)

Composition of Global GHG Emissions



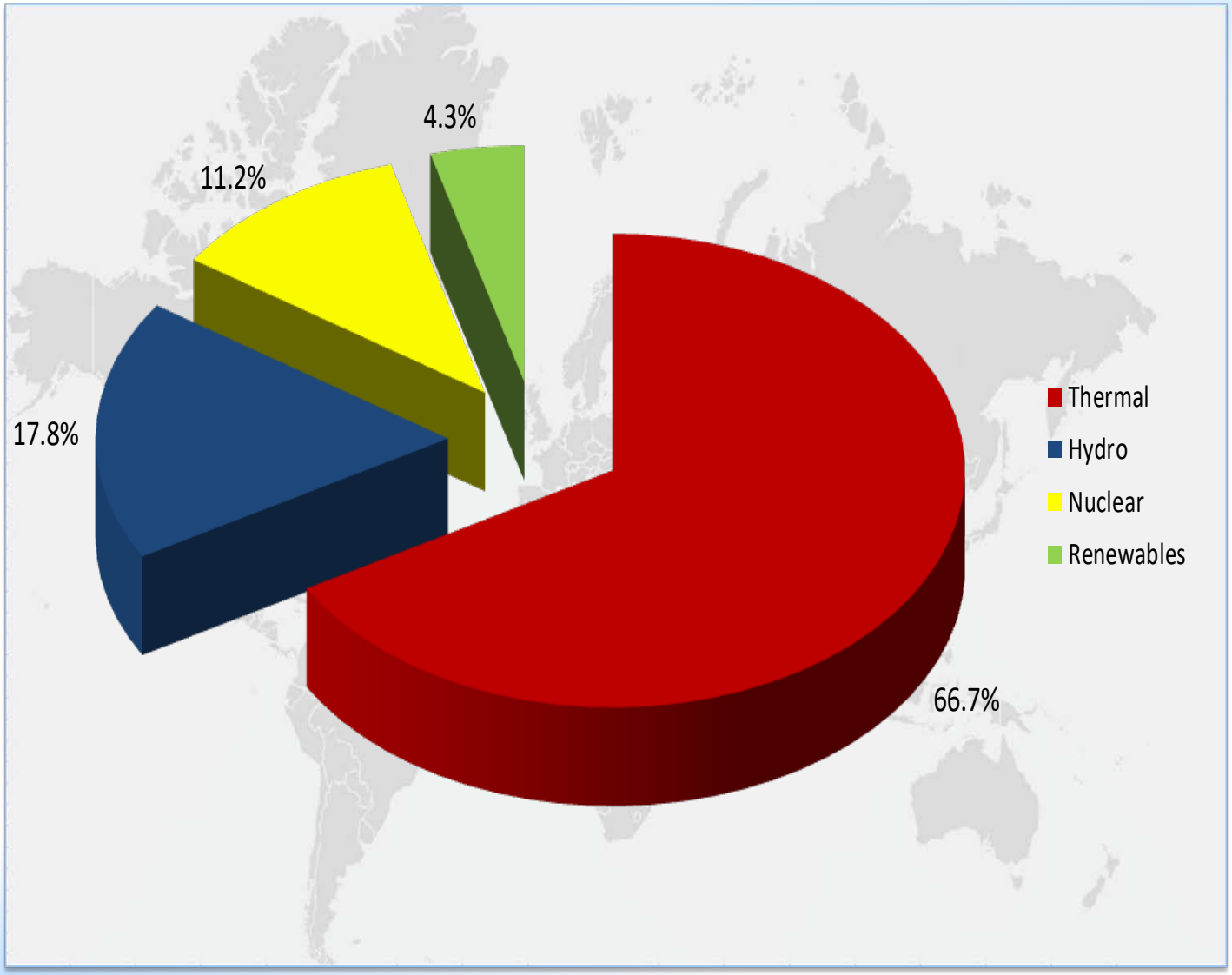
Source: IPCC 2014

Global GHG Emissions by Sectors



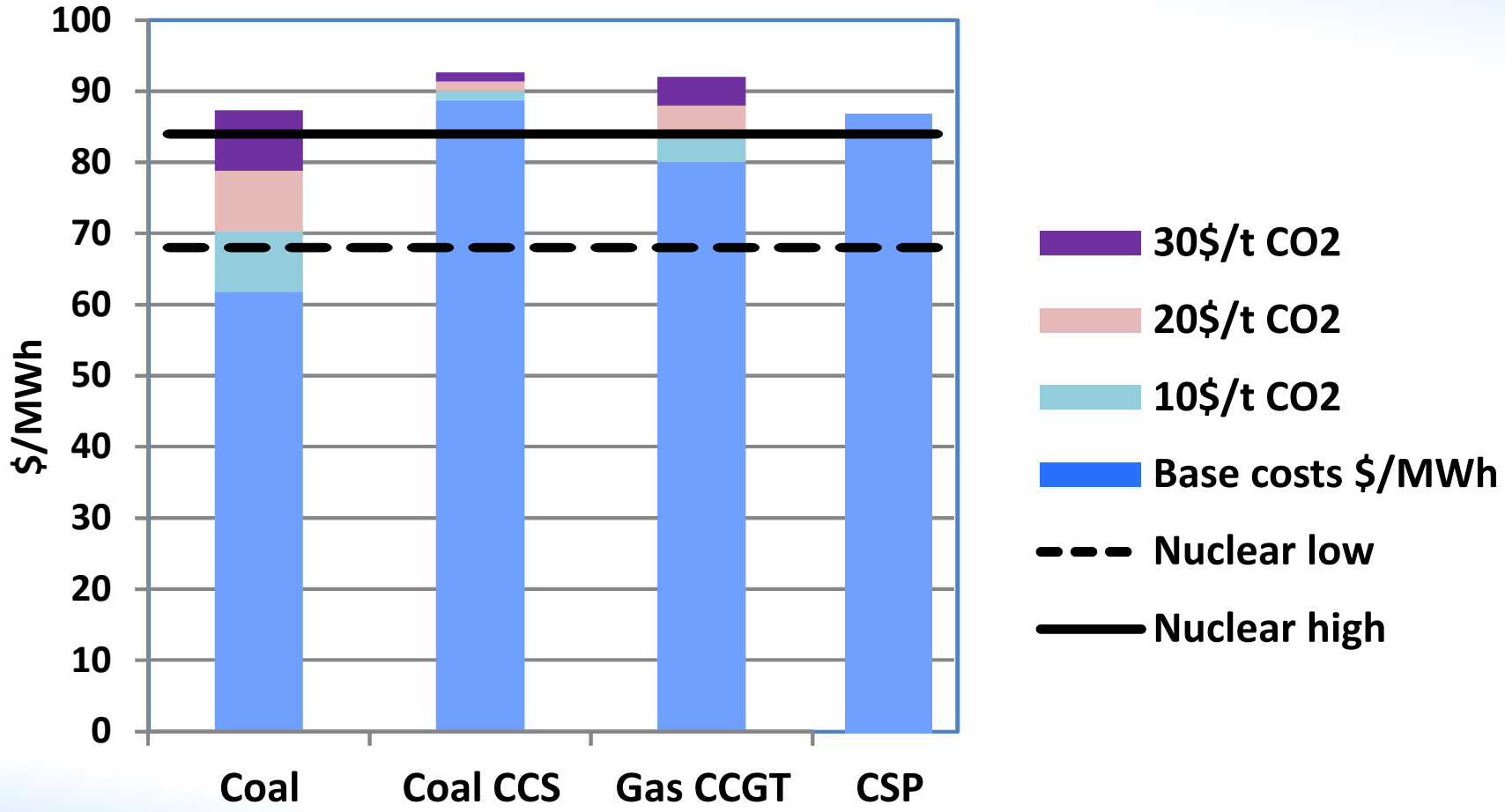
Source: IPCC 2014

World Electricity Production Mix 2015

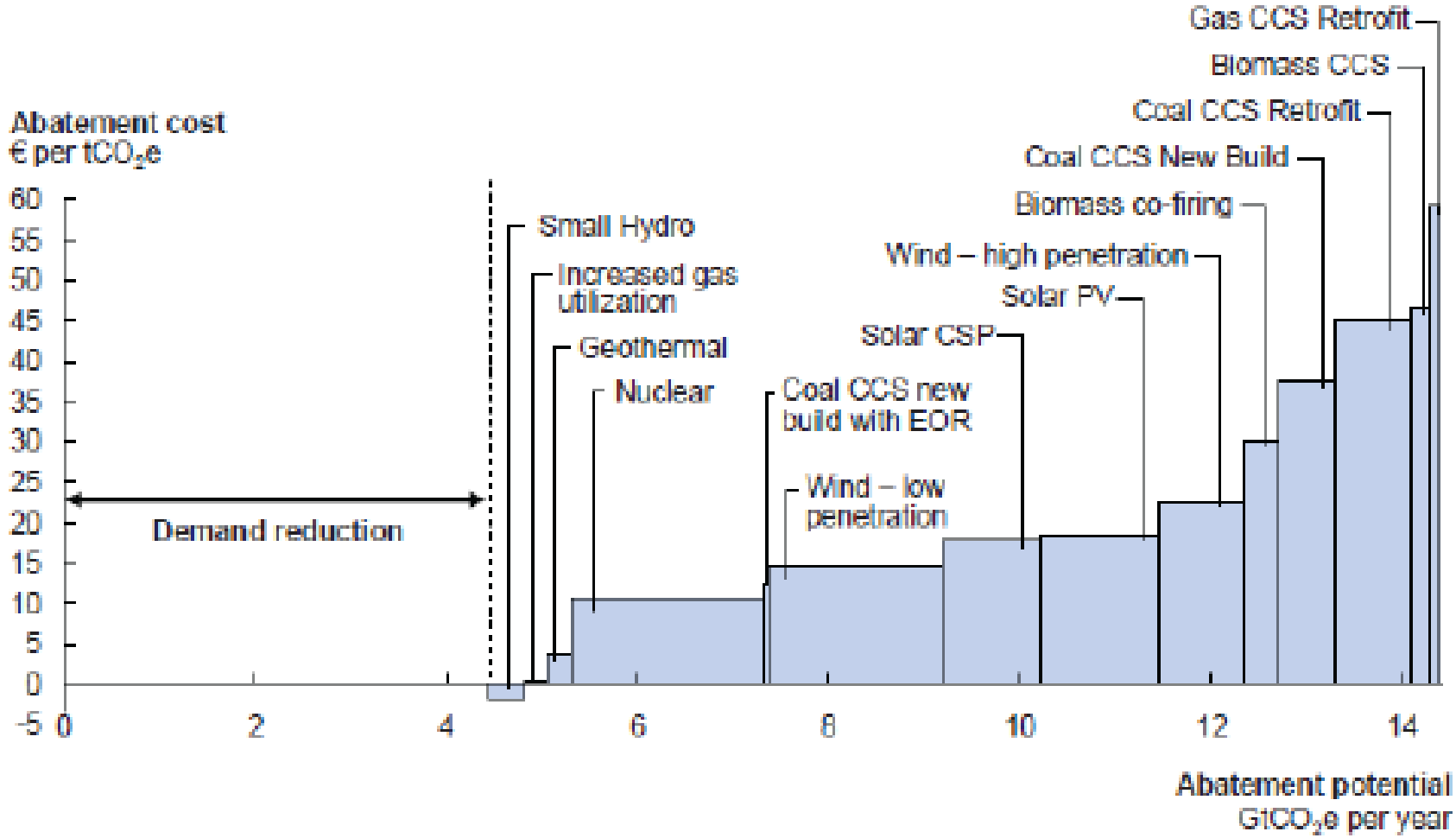


Source: RDS-1 2016

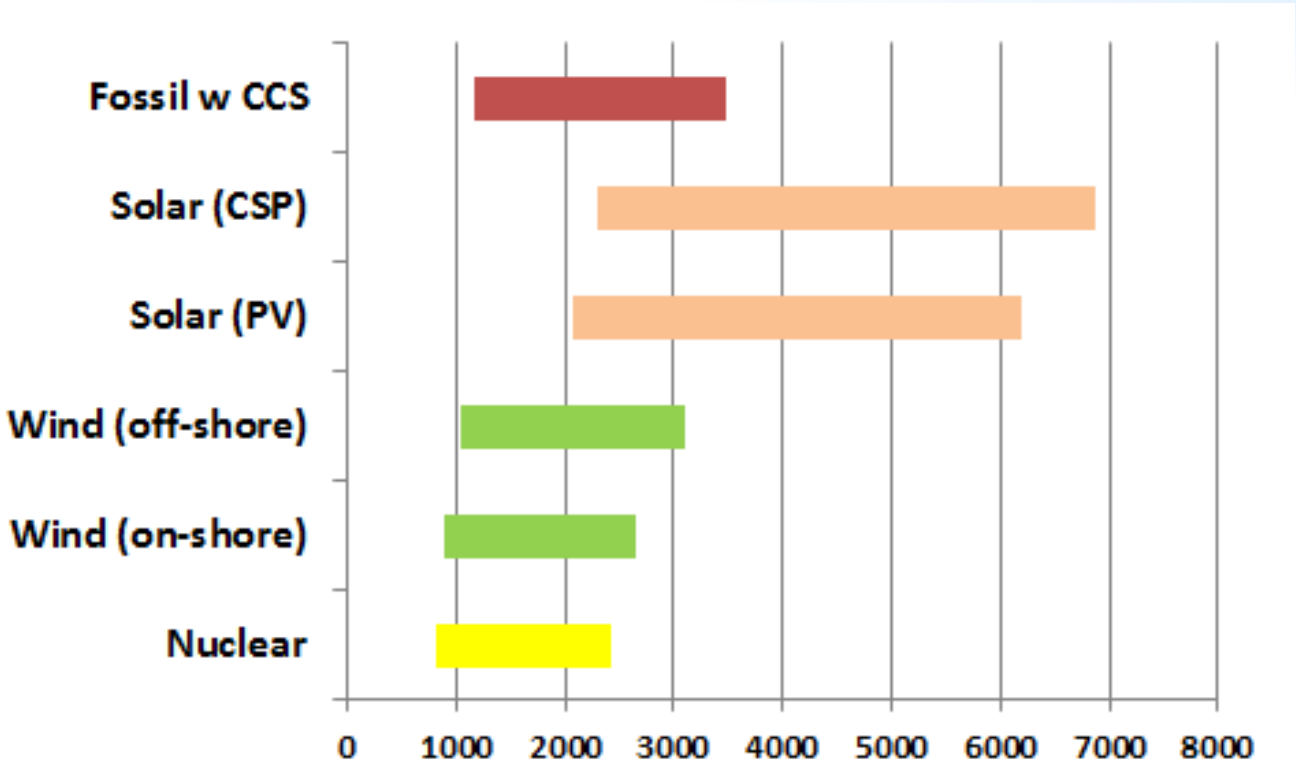
Impact of carbon prices



CO2 Avoidance Potential and Cost - Power Generation



Capital Intensity of CO2 Avoidance



$ per ton of CO2 Avoided per year.

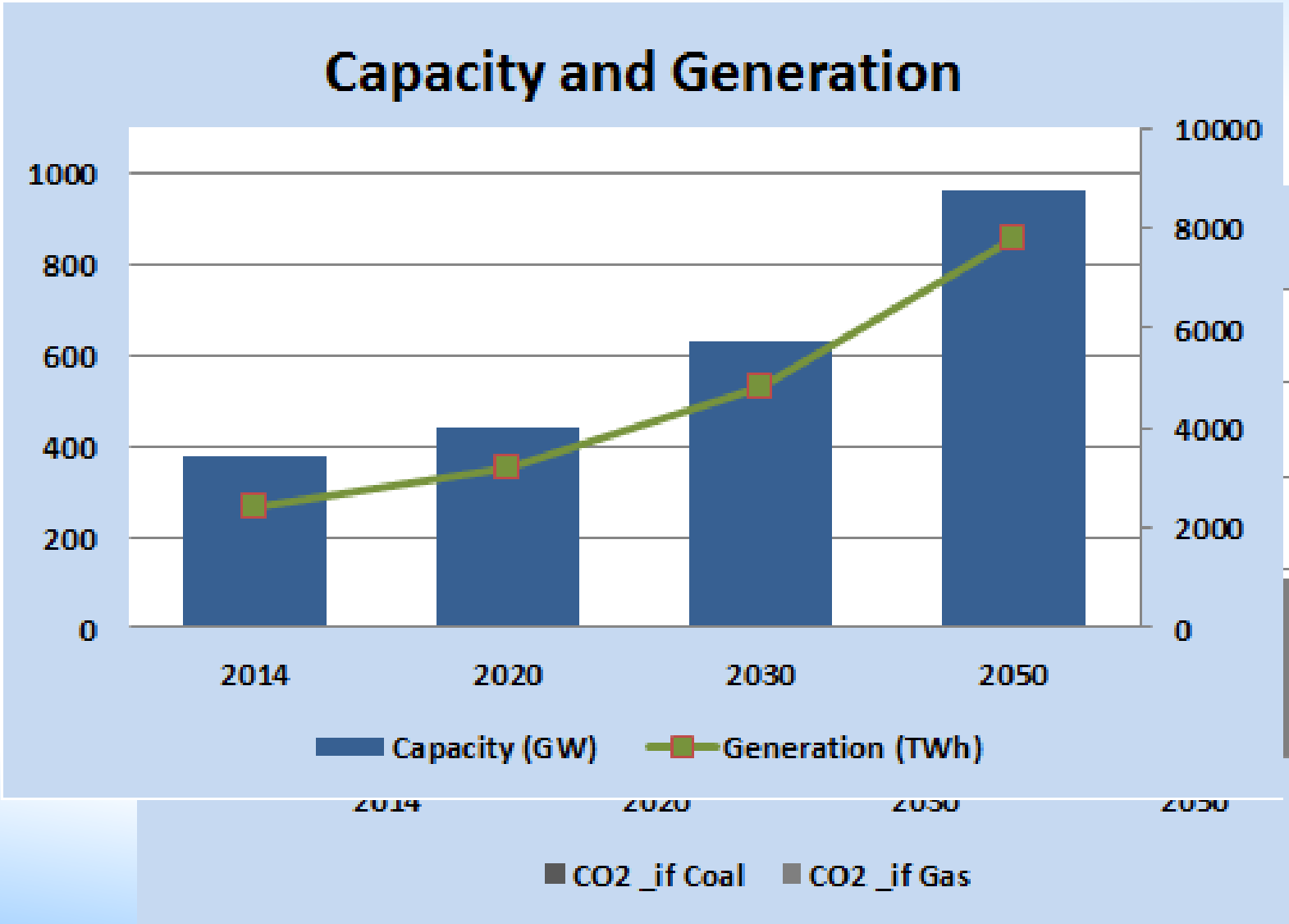
PESS Estimates

Nuclear Power Contribution to GHG Mitigation

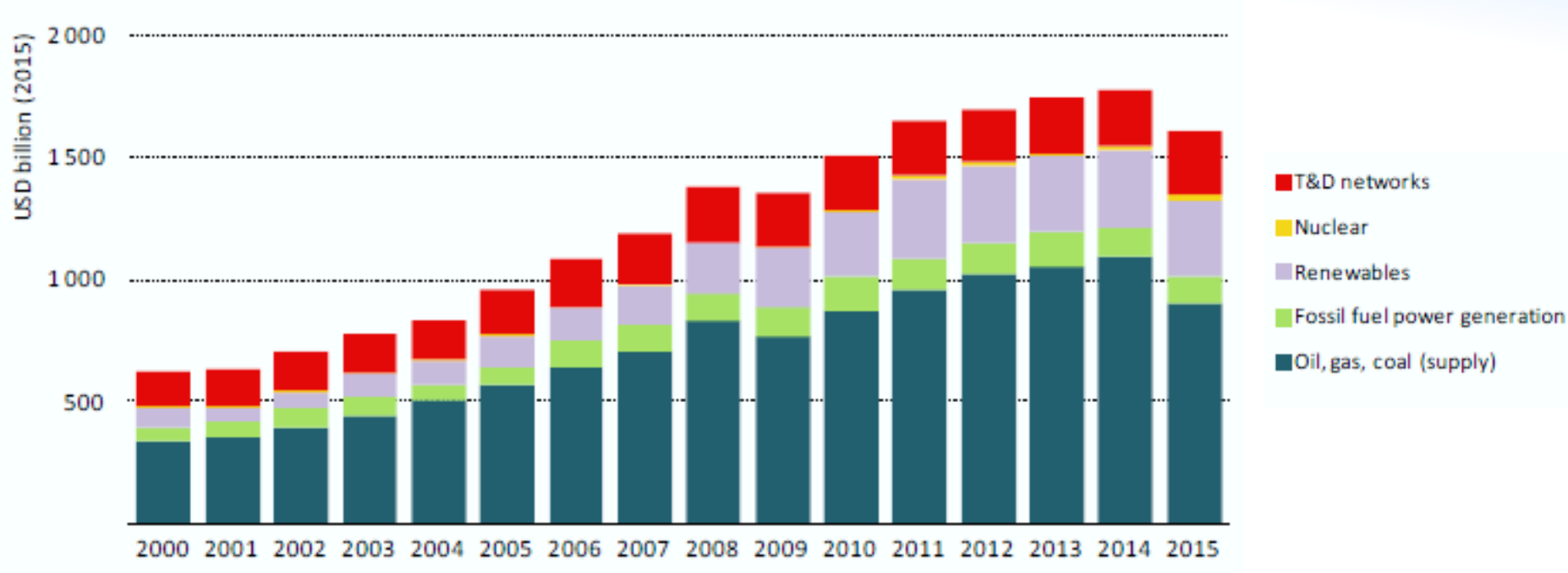
Nuclear power has avoided the release of more than 60 Giga tons of CO_2,

equivalent to twice the total annual emissions globally

Nuclear Power
Potential for the Future

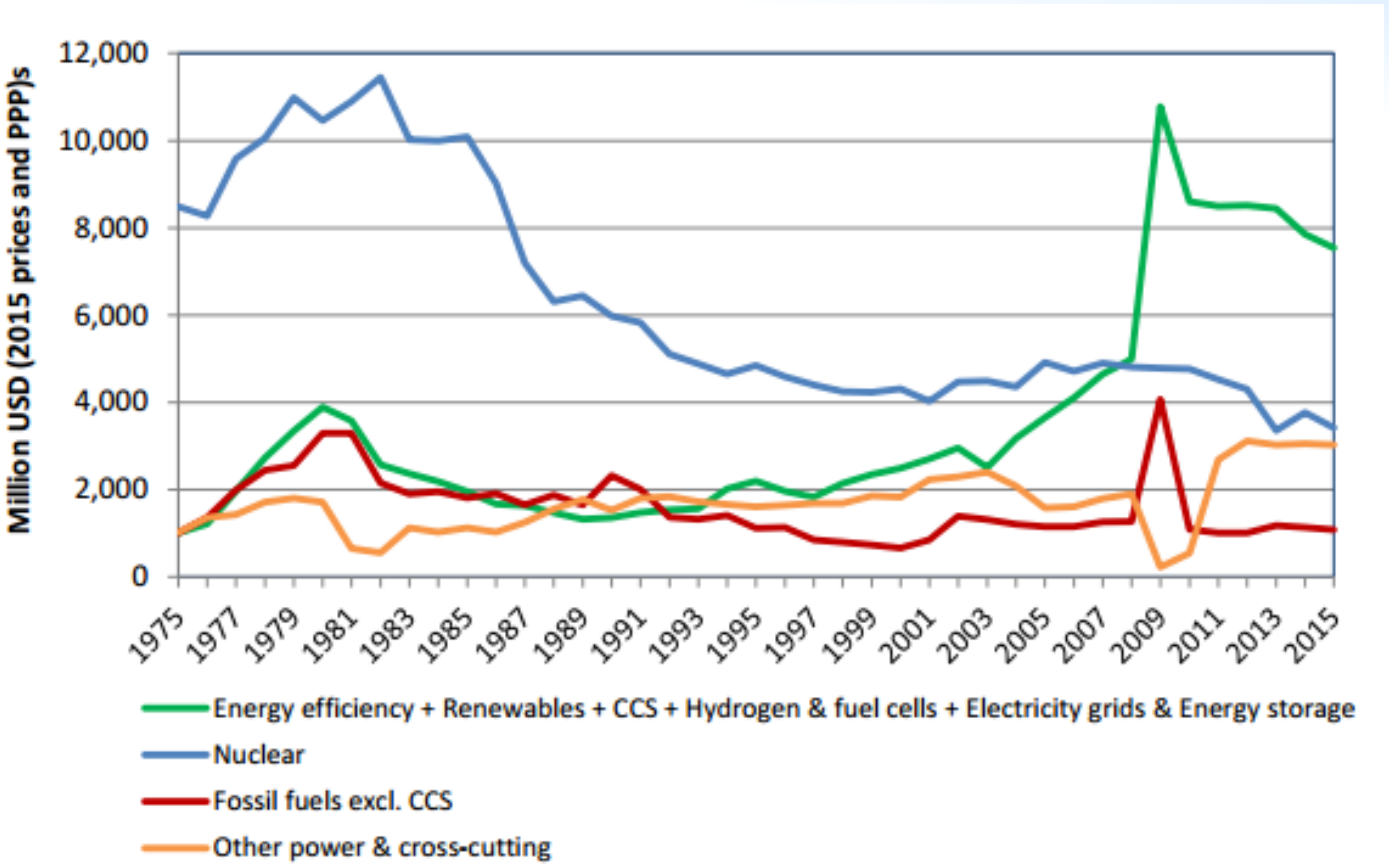


Global Energy Investments



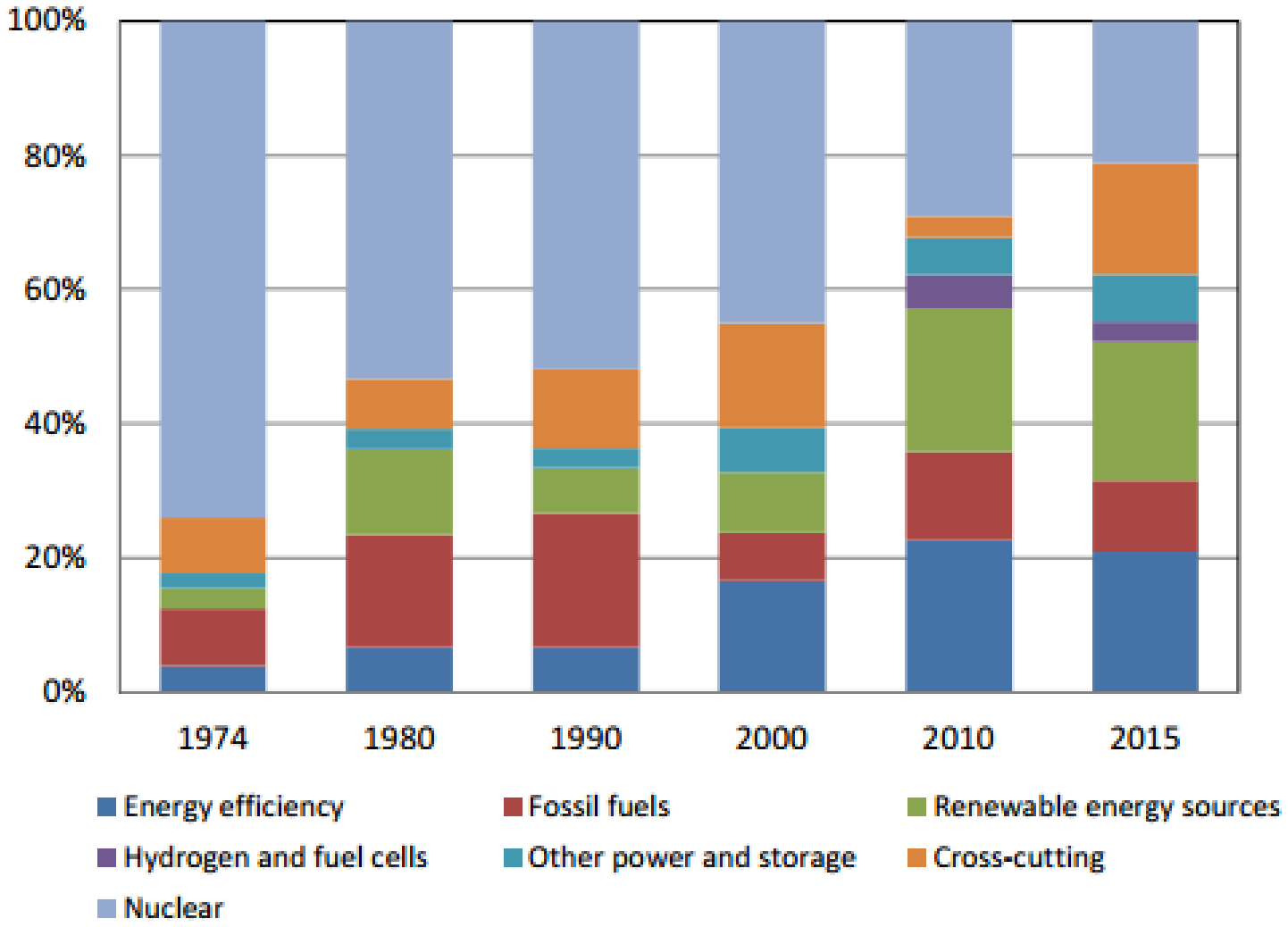
Source: Energy Investments, IEA 2016

Energy R&D Investments



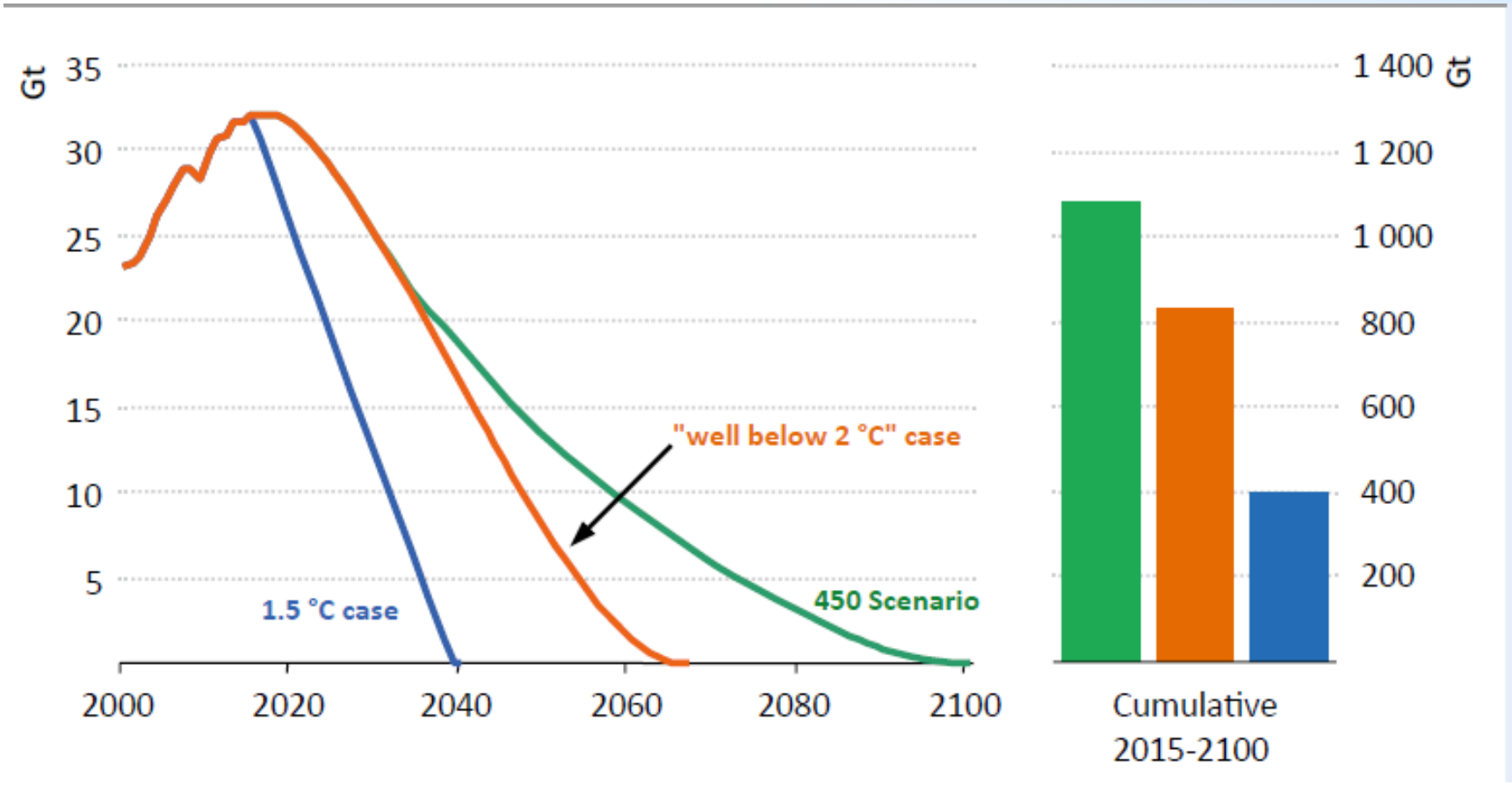
Source: IEA RDD Factsheet 2016

Energy R&D Investments – OECD Countries

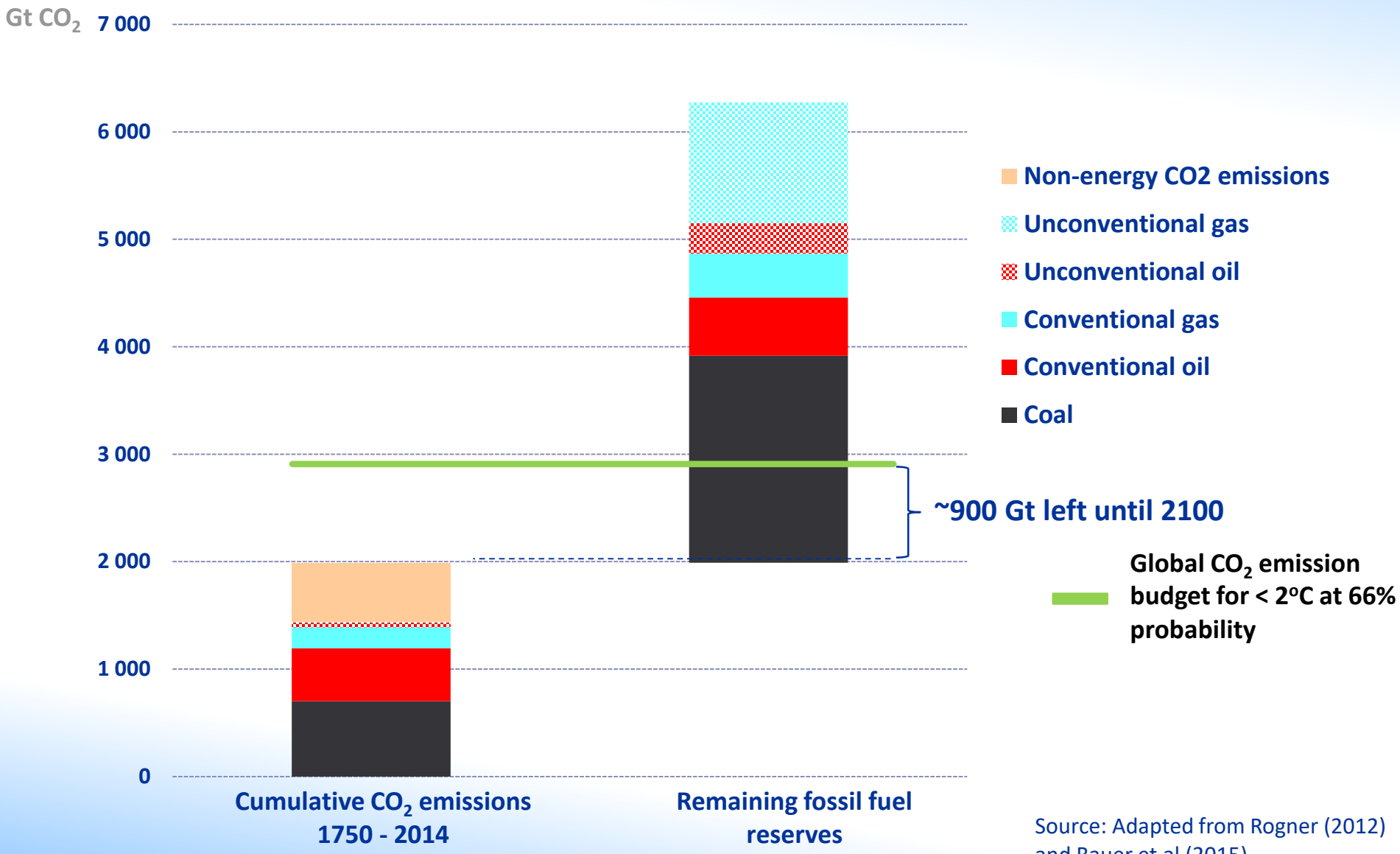


Source: IEA RDD Factsheet 2016

CO2 Emission from Energy Sector

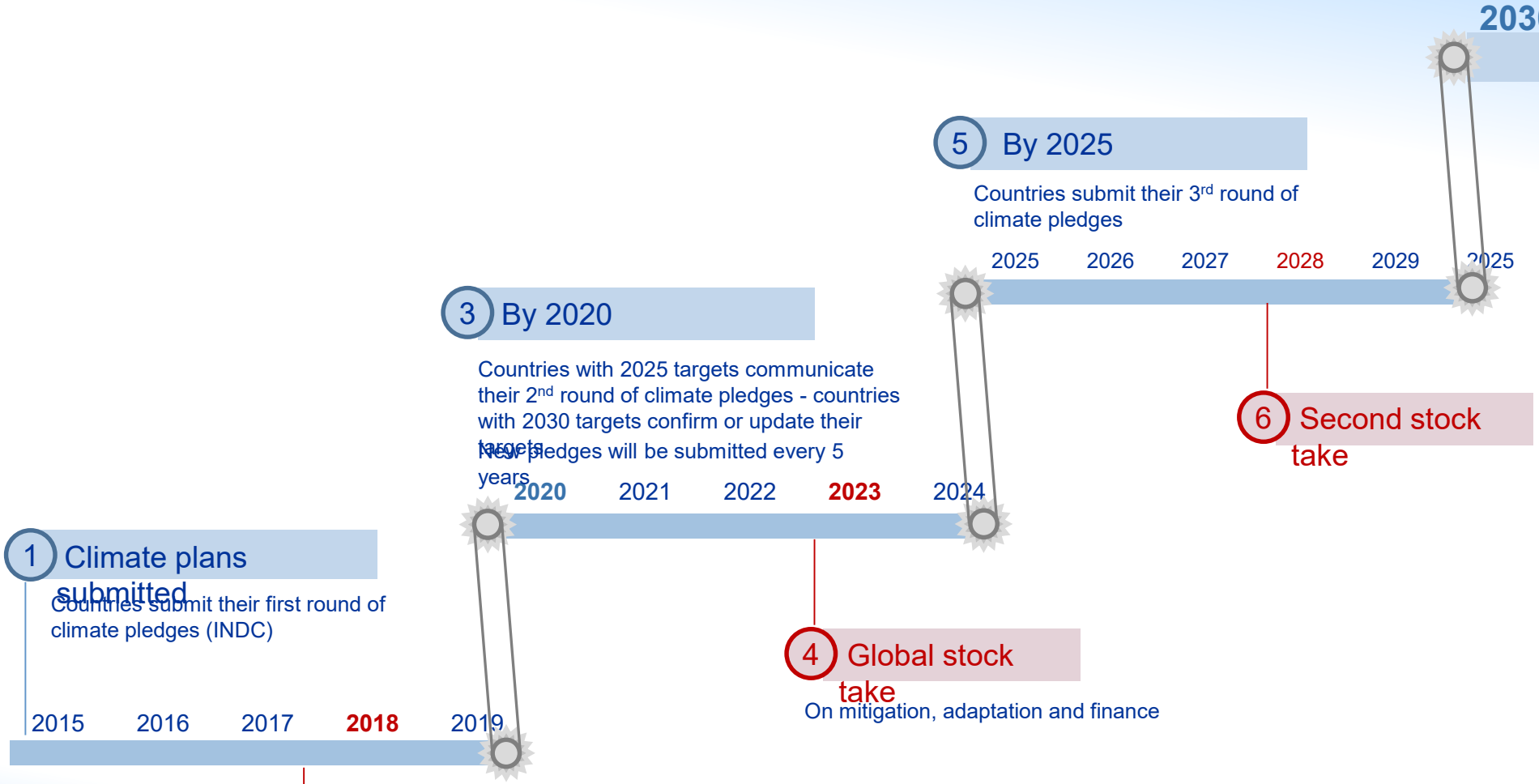


Carbon Budget and Fossil Fuel Reserves



Source: Adapted from Rogner (2012) and Bauer et.al (2015)

A dynamic agreement and its ratchet mechanism



Source: Adapted from CarbonBrief, 2016

Periodic Stock-Take

Review and Assess Adequacy of

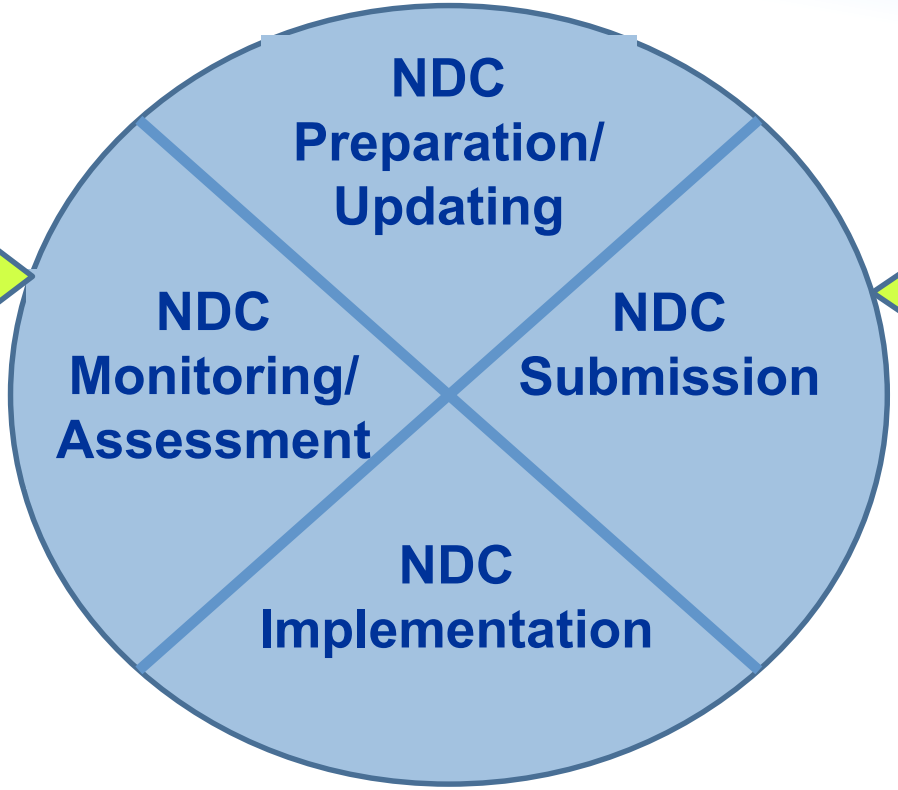
- Mitigation Efforts
- Support for Adaptation
- Climate Finance
- Technology Development and Transfer

Ad Hoc Working Group on the Paris Agreement is preparing the “Entry into Force”.

NDC Process & Assessment Tools

Forward-looking
Modelling tools

Ex-post
evaluation of
projects/policies
Indicators/Metrics
for Impacts



Sectoral
Consolidation,
National
Consensus

Concrete Actions/Policies,
Investments/Taxes,
Regulations, etc.

Modelling tools for NDC evaluation

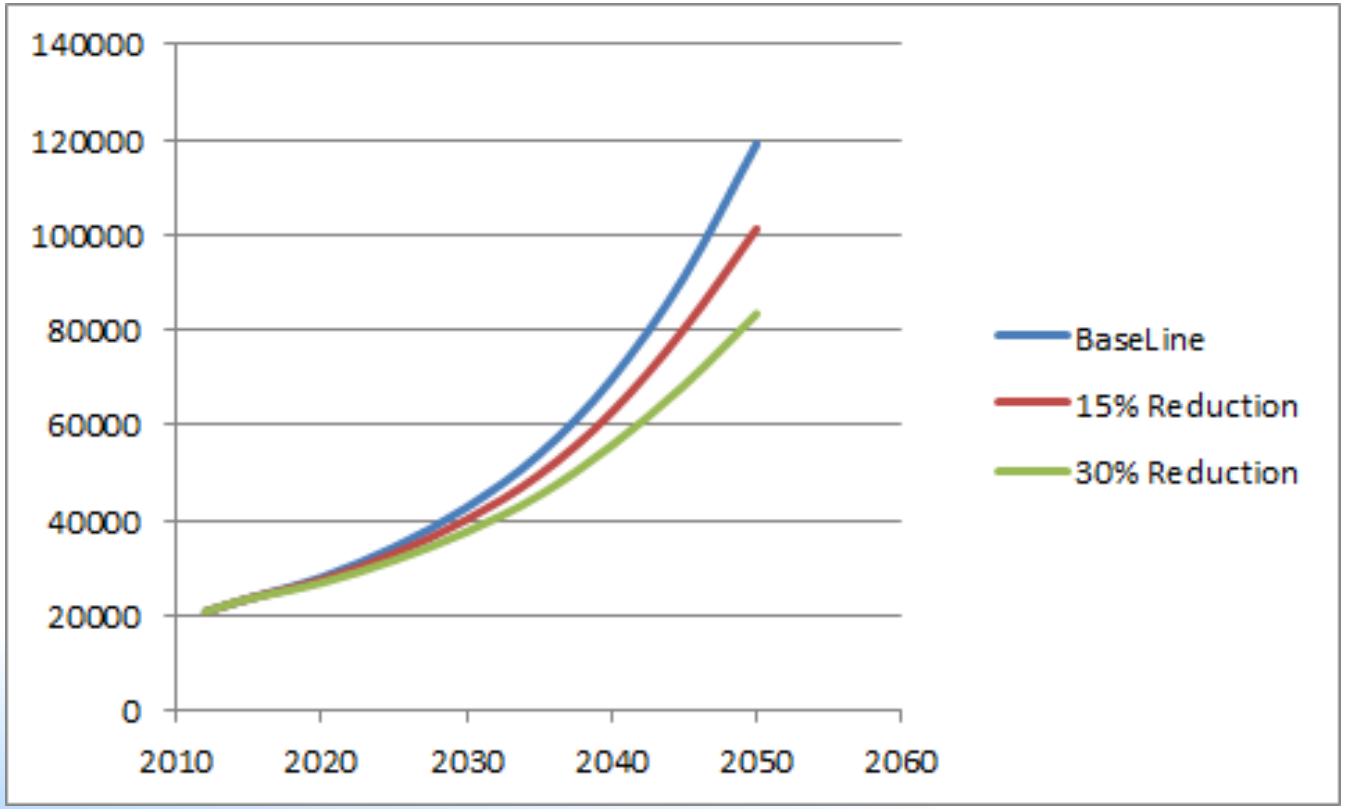
- Models included here are for mitigation and/or carbon pricing policies primarily in energy-related sectors, for ex-ante analysis and projection (excluding visualization/communication tools, and software)

Possible Options for NDCs

Base Line emissions

Unconditional Reductions

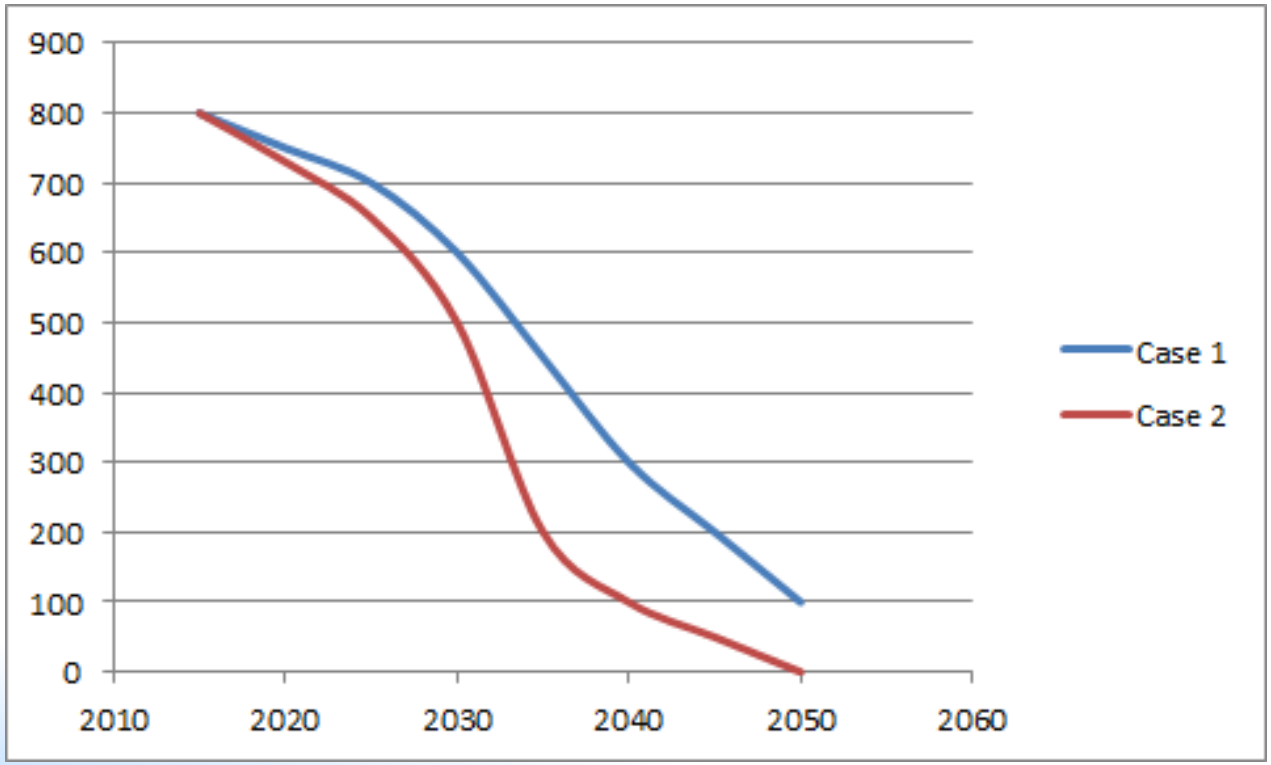
Conditional Reductions



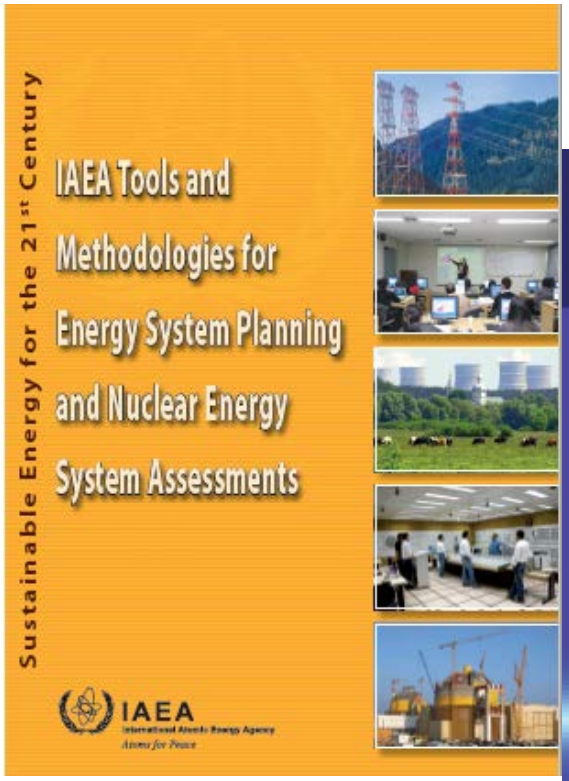
Possible Options for NDCs

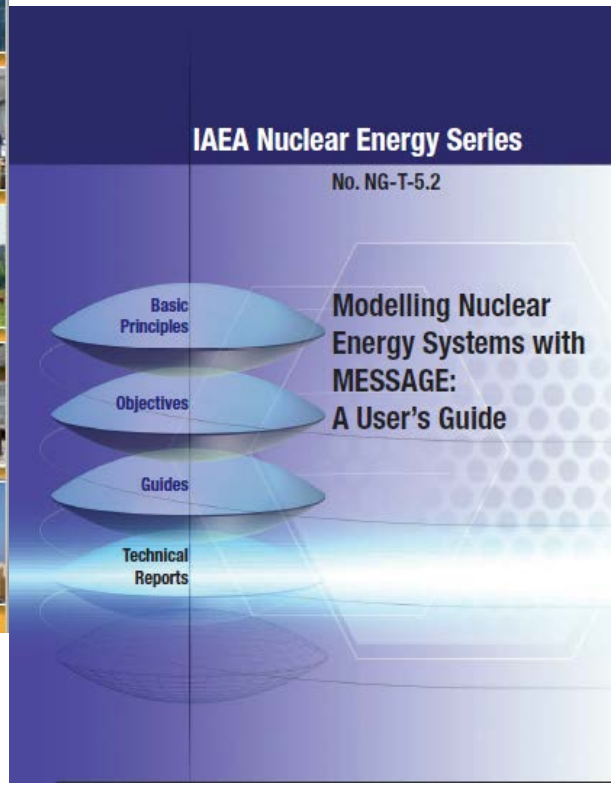
Intensity Targets

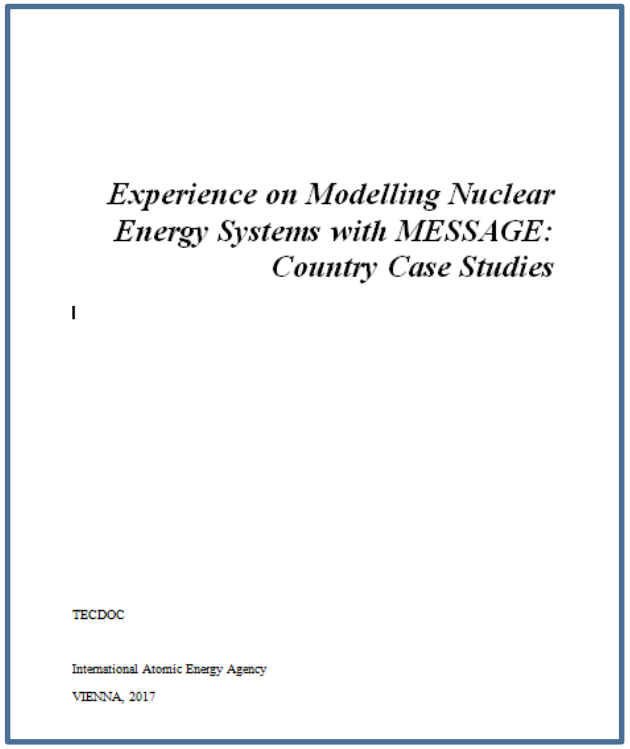
Reduction in GHG per unit of electricity generation



INPRO Studies and MESSAGE Modelling Framework







Technology Development & Transfer Needs

- What Nuclear Energy Technologies would be needed
- When different technologies should be available
- What RD&D efforts/investments are needed

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Thank you!