Global drivers of change and their implications for the EU

- Drivers of energy system change
  - Transitions to a low carbon energy system [Steve Pye, UCL]
  - Short term uncertainties: Low fossil fuel prices / Brexit [Carole Mathieu, Ifri]
  - Longer term uncertainty: Trends impacting the energy system in 2050 [Aurélie Faure-Schuyer, Ifri]

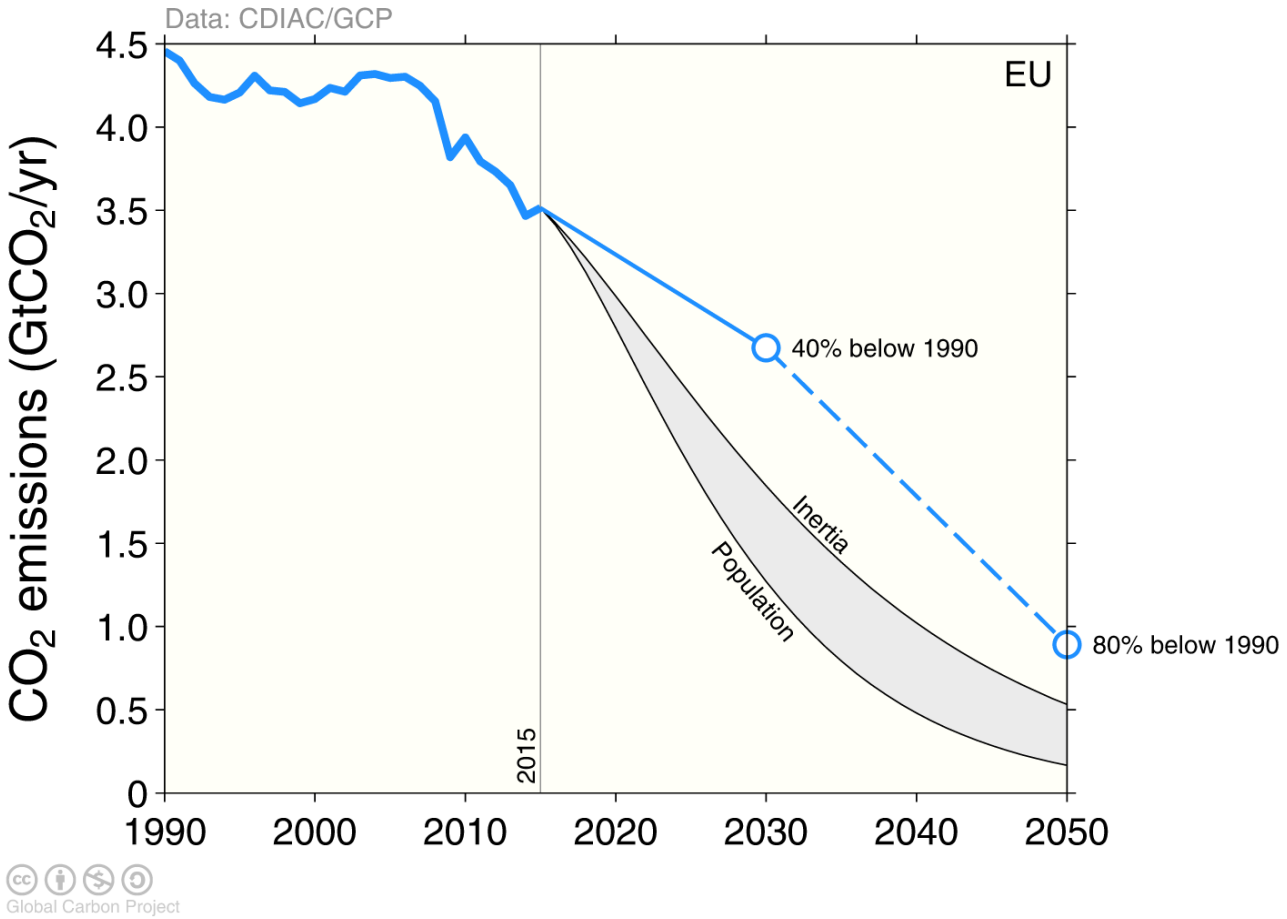
- EU responses to the challenges
  - Responses to the Paris Agreement [Carole Mathieu, Ifri]
  - Efforts to drive global sustainability goals [Mark Howells, KTH]

Transitions to a low carbon energy system

- Publication: **Unburnable fossil fuels in a 2 ^{0}C world** (Feb. 2015)
- Authors: *Christophe McGlade, Steve Pye (UCL), with Carole Mathieu (Ifri); Željko Jurić, Marko Matosović (EIHP)*

- HET based on *McGlade, C., & Ekins, P. (2015). The geographical distribution of fossil fuels unused when limiting global warming to 2 [deg] C. Nature, 517(7533), 187-190.*

The global (and EU) decarbonisation challenge



2 ^{0}C (66% probability): 800 GtCO2 global budget from 2017, or 20 years at current emissions

Source: Peters, G. P., Andrew, R. M., Solomon, S., & Friedlingstein, P. (2015). Measuring a fair and ambitious climate agreement using cumulative emissions. *Environmental Research Letters*, *10*(10), 105004.

Europe's low carbon transition

- Europe's targets: a 40% reduction in GHGs by 2030, with an ambition of 80-95% by 2050
- Question concerning whether 2030 is 'in line' with Paris Agreement – and provides a pathway to deliver longer term objectives
- A recent multiple country analysis (IDDRI, 2016) estimates -
  - rate of decarbonisation to slow
  - changes based on cyclical effects, not structural decarbonisation
  - policies for 2030 not preparing for the change needed in long term

IDDRI (2016). State of the Low-Carbon Energy Union: Assessing the EU's progress towards its 2030 and 2050 climate objectives. http://www.iddri.org/Publications/State-of-the-Low-Carbon-Energy-Union-Assessing-the-EU-s-progress-towards-its-2030-and-2050-climate-objectives

The need for reducing fossil fuel use

- A long term perspective, with requisite short term policy action, is needed to significantly reduce fossil fuels
- INSIGHT_E paper focused on prospects for fossil fuels to 2050 in a scenario that stayed within a 2 °C warming threshold
- The analysis showed that unabated combustion of current estimates of fossil fuels reserves are more than three times this estimated carbon budget
- To stay below the 2 °C threshold, the majority of existing fossil fuels reserves must therefore not be produced, and are termed 'unburnable fossil fuels'.

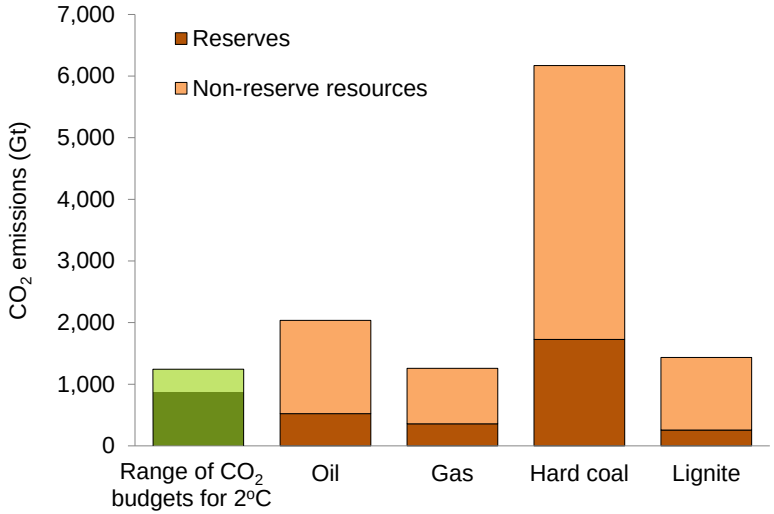


Figure 1: Aggregate CO_2 emissions from unburnable resources.

Distribution of unburnable fossil fuel reserves

- Under the 2 °C case, 80% of current coal reserves, 50% of gas reserves, and 33% of oil reserves globally should be classified as unburnable.

- Unburnable reserves are distributed unevenly (as per resource supply economics).
  - Majority of very large coal reserves in China, Russia and the United States.
  - 60% of gas reserves in Middle East.
  - Oil reserves in the Arctic region.

	Oil		Gas		Coal	
	Gb	%	Tcm	%	Gt	%
Africa	23	21%	4.4	33%	28	85%
Canada	39	74%	0.3	24%	5.0	75%
China & India	9	25%	2.9	63%	180	66%
CSA	58	39%	4.8	53%	8	51%
Europe	5.0	20%	0.6	11%	65	78%
FSU	27	18%	31	50%	203	94%
MEA	263	38%	46	61%	3.4	99%
OECD Pacific	2.1	37%	2.2	56%	83	93%
ODA	2.0	9%	2.2	24%	10	34%
USA	2.8	6%	0.3	4%	235	92%
Global	431	33%	95	49%	819	82%

Table 1: Distribution of reserves unburnable before 2050 under a 2 °C scenario with CCS

Implications for Member States

- Policy now and to 2030 needs to recognise this future reduction while cognisant of timing of the transition
- Less than 20% existing oil and gas reserves in Europe unburnable in this scenario, overwhelmingly concentrated in the North Sea.
- Still raises some issues around extractive policies in a 2 ^{o}C world that seek to maximise resource take
- There is also a need to consider exploitation of new fossil resources, and role of European-based multinationals.
- There is also a question of continued use of unburnable fossil fuels e.g. (unabated) coal power generation.

Implications for European energy industries & financial markets

- Within carbon budget, potential for companies to hold 'stranded assets'. Implications for investors in fossil fuels, with possible future liabilities set against carbon-intensive assets.

- Estimated exposure to firms holding fossil fuel reserves and to commodities is around 5% of total assets for EU pension funds, 4% for EU insurance companies and 1.4% for EU banks.

- Question around the speed of climate policy, and ability of companies to respond / adjust.

- New investments may also be perceived as risky in the longer term, based on potential liabilities. Also moral case being made by divestment movement.

- May need to be increased transparency of assets held in the future. This is being taken forward by the Task Force on Climate-related Financial Disclosures, for example.