A Clean Planet for all

A European strategic long term vision for a prosperous, modern, competitive and climate neutral economy

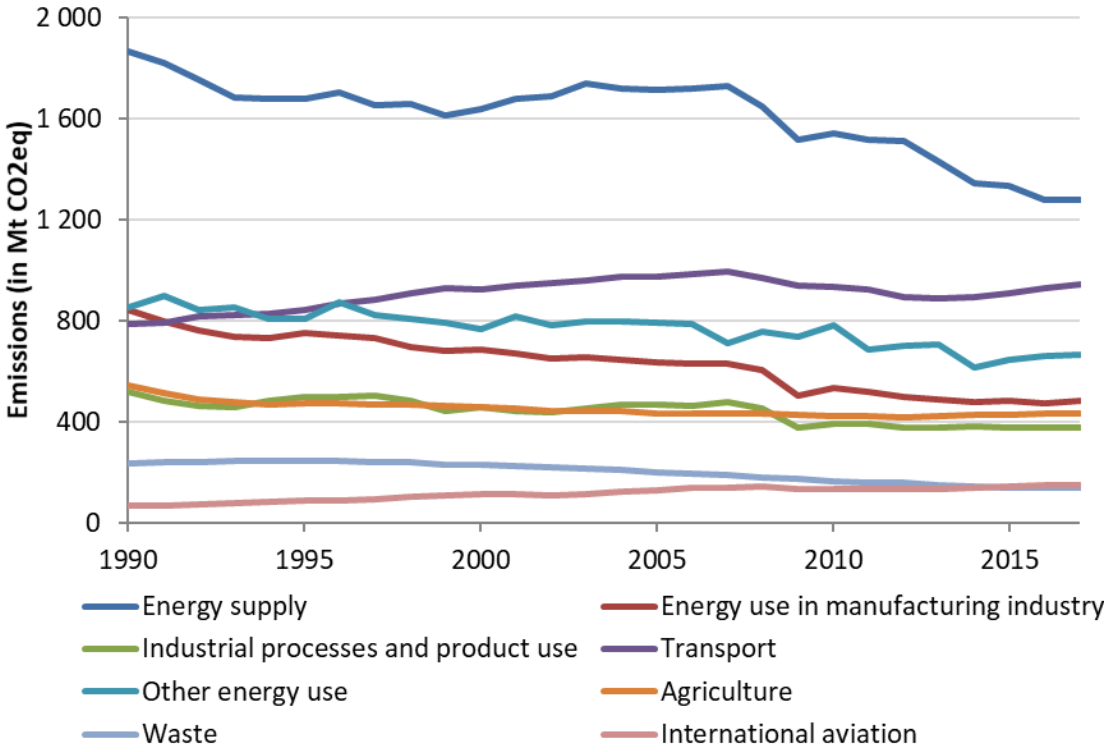
NEA Workshop, 4 September 2019, OECD Boulogne - Bilancourt

Our Vision for a Clean Planet by

- The Paris Agreement, requires to reduce GHG emissions, with the objective to hold global temperature increase to well below 2°C and to pursue efforts to limit it to 1.5°C
- The IPCC report confirms that limiting climate change to 1.5°C is necessary to avoid these worst impacts. Climate change undermines security and prosperity in the broadest sense.
- For Europe, limiting temperature increase well below 2°C means 80% emissions reduction by 2050 compared to 1990.
- For Europe to lead the world in climate action, it means achieving net-zero greenhouse gas emissions by 2050.
- The Long Term Strategy shows that transforming our economy is possible and beneficial. It also highlights the challenges of the transformation, but the status quo is not an option.

Europe Today

- The EU is about to achieve its 2020 targets
- Targets for 2030 are agreed in EU law
- Business as usual means -45% GHG emissions in 2030 (vs. 1990)
- Without increasing ambition: -60% emissions in 2050



Scenarios for Europe in 2050

- Scenarios are used for projection about demand and supply of energy (including land use) ➔ compliant with Paris targets
- 8 scenarios analyse different technology pathways (high electrification, high energy efficiency, circular economy, etc.)
- Different levels of ambition: -80% emissions and net-zero by 2050 plus a Baseline (business as usual)

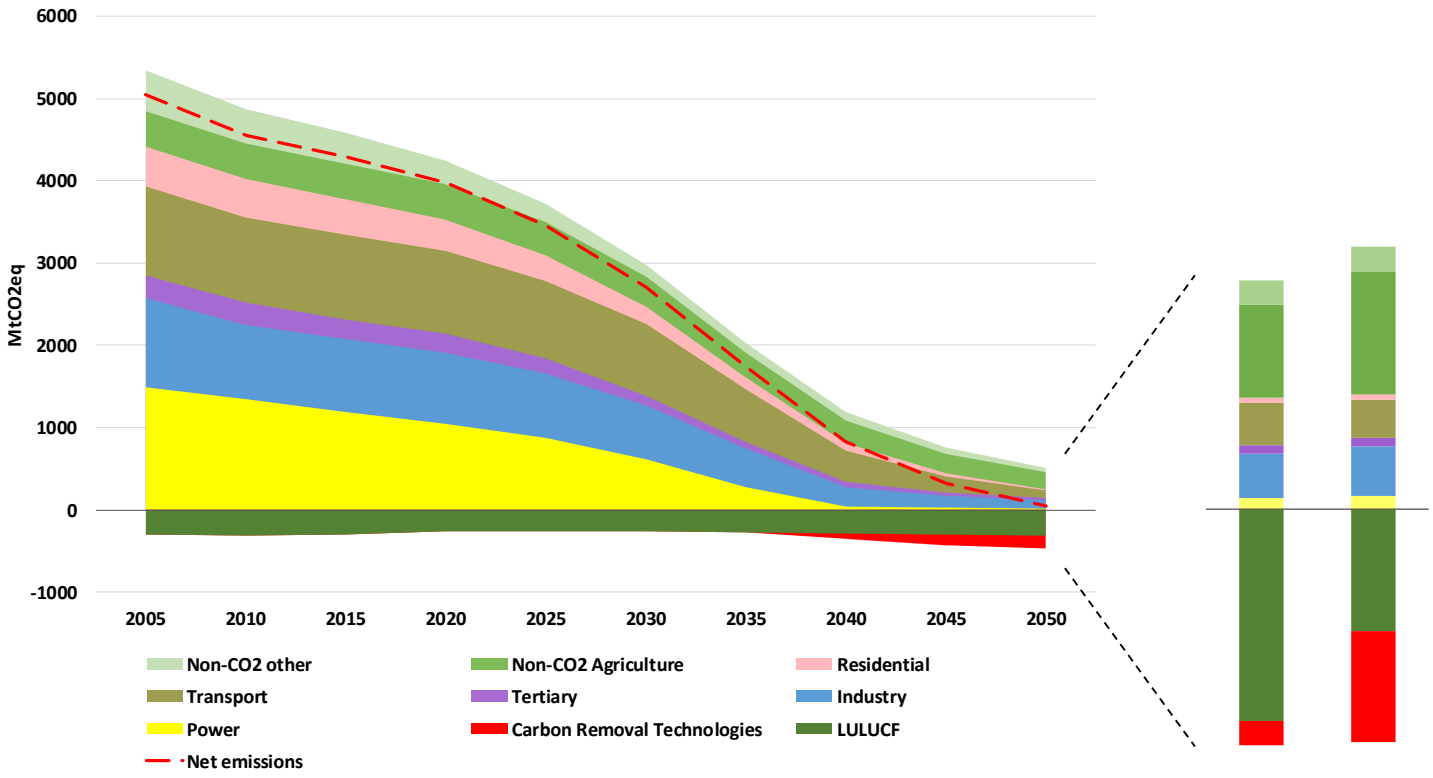
Analysed scenarios in line with Paris Agreement

Long Term Strategy Options

	Electrification (ELEC)	Hydrogen (H2)	Power-to-X (P2X)	Energy Efficiency (EE)	Circular Economy (CIRC)	Combination (COMBO)	1.5°C Technical (1.5TECH)	1.5°C Sustainable Lifestyles (1.5LIFE)
Main Drivers	Electrification in all sectors	Hydrogen in industry, transport and buildings	E-fuels in industry, transport and buildings	Pursuing deep energy efficiency in all sectors	Increased resource and material efficiency	Cost-efficient combination of options from 2°C scenarios	Based on COMBO with more BECCS, CCS	Based on COMBO and CIRC with lifestyle changes
GHG target in 2050	-80% GHG (excluding sinks) ["well below 2°C" ambition]					-90% GHG (incl. sinks)	-100% GHG (incl. sinks) ["1.5°C" ambition]	
Major Common Assumptions	• Higher energy efficiency post 2030 • Deployment of sustainable, advanced biofuels • Moderate circular economy measures • Digitilisation					• Market coordination for infrastructure deployment • BECCS present only post-2050 in 2°C scenarios • Significant learning by doing for low carbon technologies • Significant improvements in the efficiency of the transport system.		
Power sector	Power is nearly decarbonised by 2050. Strong penetration of RES facilitated by system optimization (demand-side response, storage, interconnections, role of prosumers). Nuclear still plays a role in the power sector and CCS deployment faces limitations.							
Industry	Electrification of processes	Use of H2 in targeted applications	Use of e-gas in targeted applications	Reducing energy demand via Energy Efficiency	Higher recycling rates, material substitution, circular measures	Combination of most Cost-efficient options from "well below 2°C" scenarios with targeted application (excluding CIRC)	COMBO but stronger	CIRC+COMBO but stronger
Buildings	Increased deployment of heat pumps	Deployment of H2 for heating	Deployment of e-gas for heating	Increased renovation rates and depth	Sustainable buildings			CIRC+COMBO but stronger
Transport sector	Faster electrification for all transport modes	H2 deployment for HDVs and some for LDVs	E-fuels deployment for all modes	• Increased modal shift • Electrification as in ELEC	Mobility as a service			• CIRC+COMBO but stronger • Alternatives to air travel
Other Drivers		H2 in gas distribution grid	E-gas in gas distribution grid				Limited enhancement natural sink	• Dietary changes • Enhancement natural sink

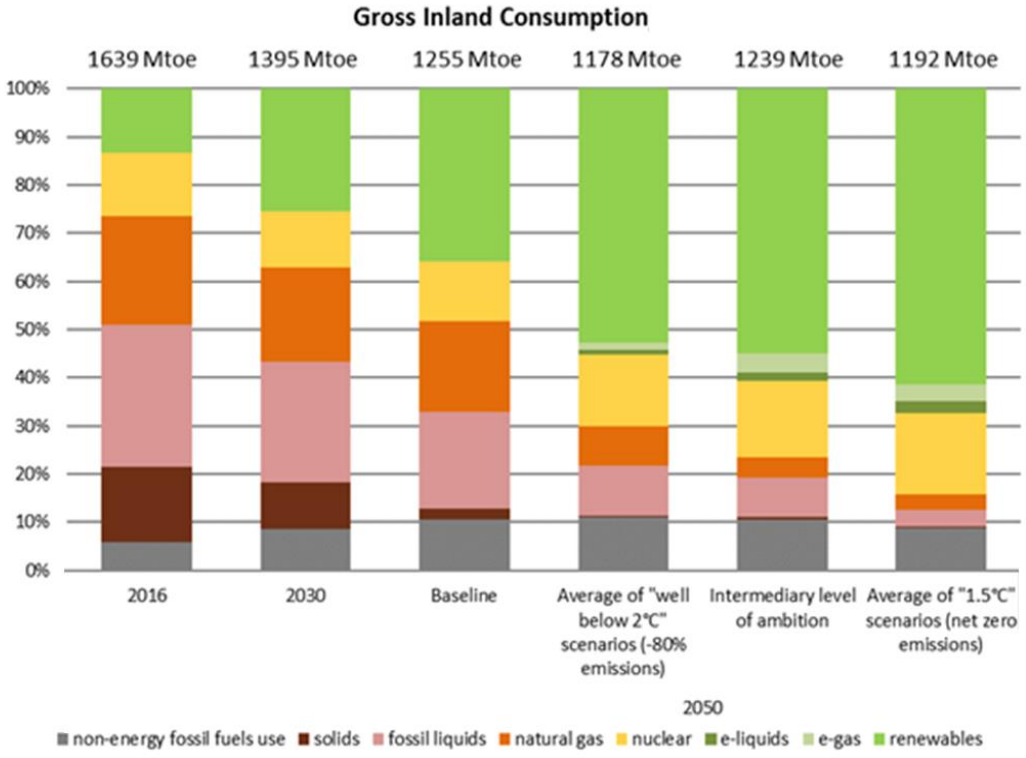
All sectors have to contribute

GHG emissions trajectory in a 1.5°C scenario



European Commission

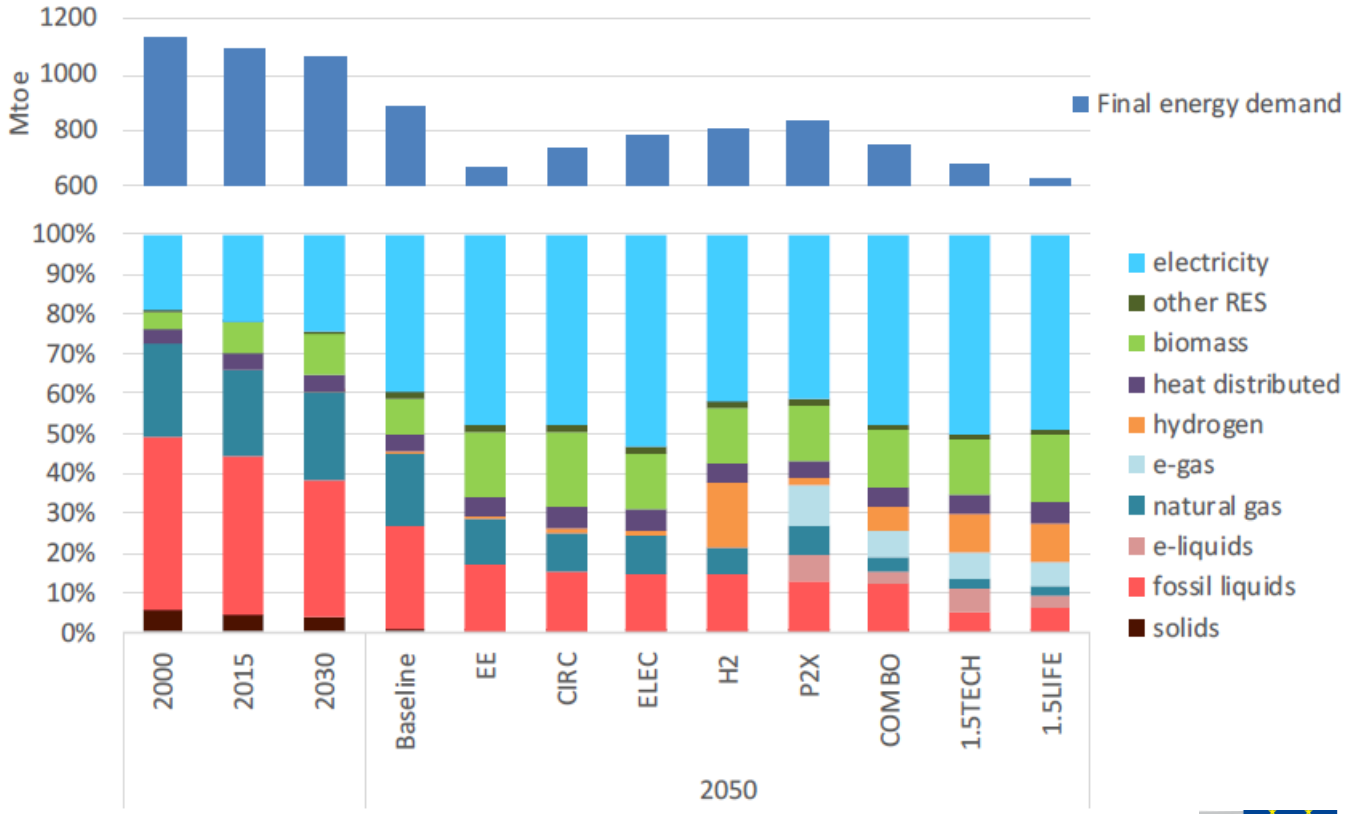
Energy supply in 2050



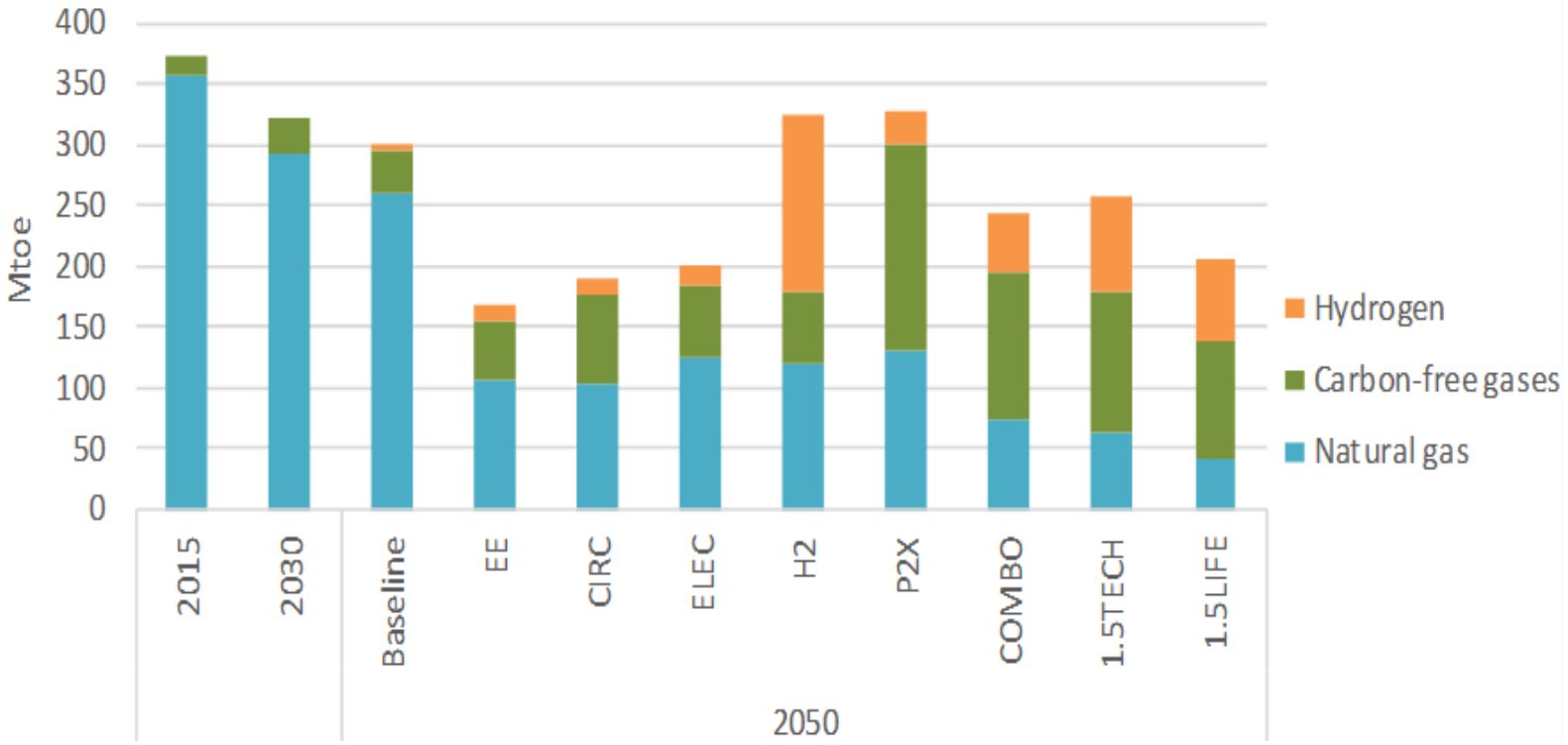
European Commission

Electrification of demand

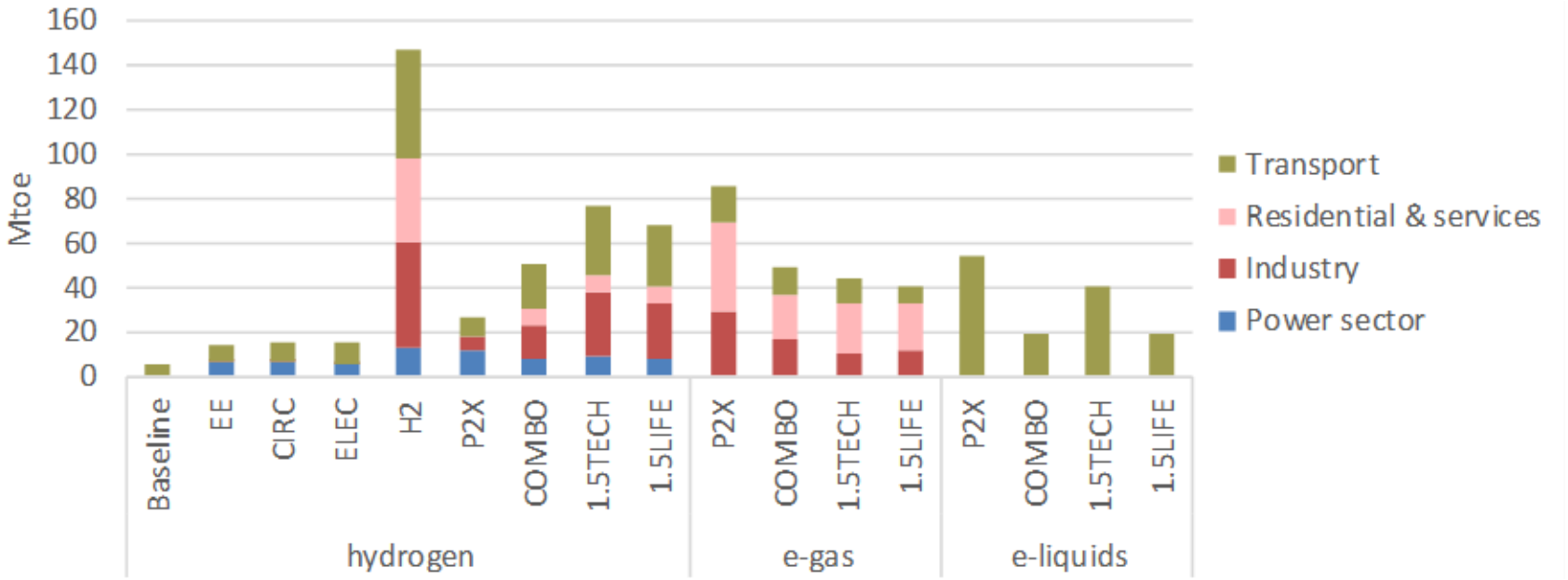
Evolution of final energy use by fuel



Consumption of gaseous fuels



Consumption of new fuels by sector in 2050



Network infrastructure

Integrated and interconnected smart infrastructure, spurring sectoral integration.

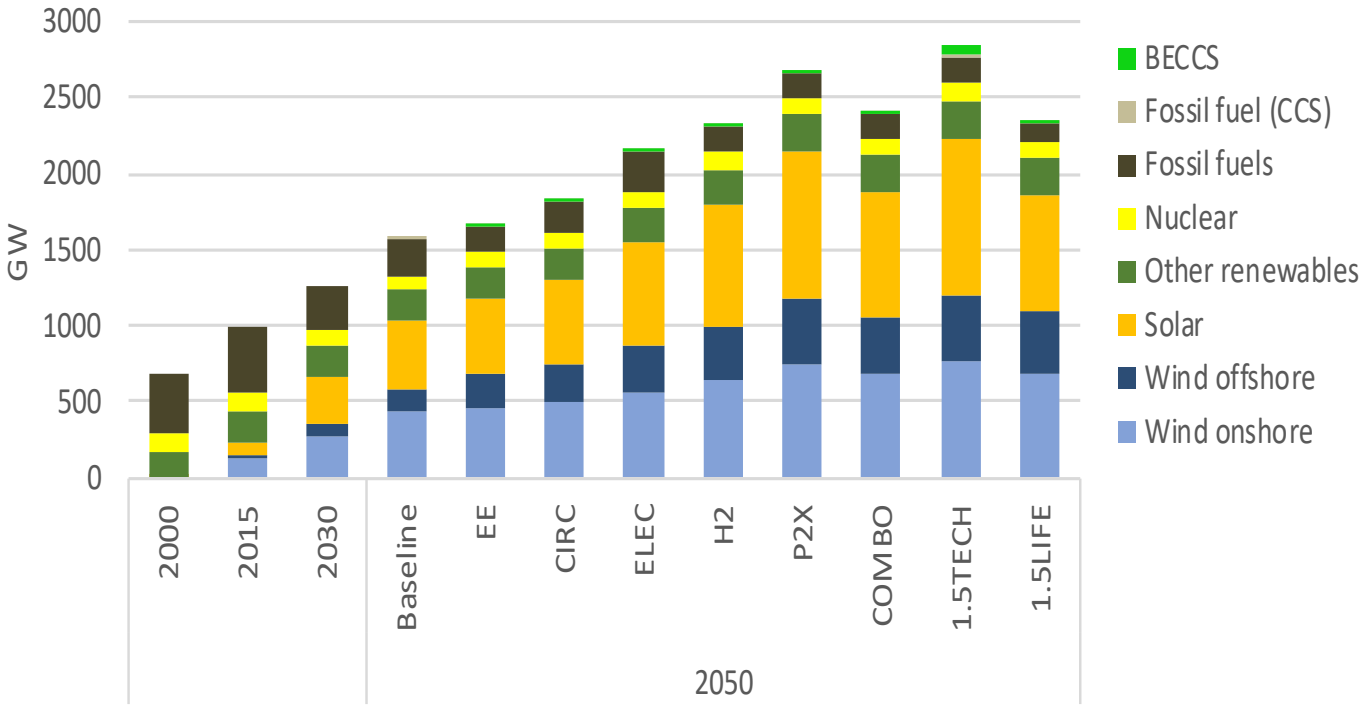
Completion of the Trans-European Energy and Transport Networks.

Smart electricity and data/information grids, hydrogen pipelines.

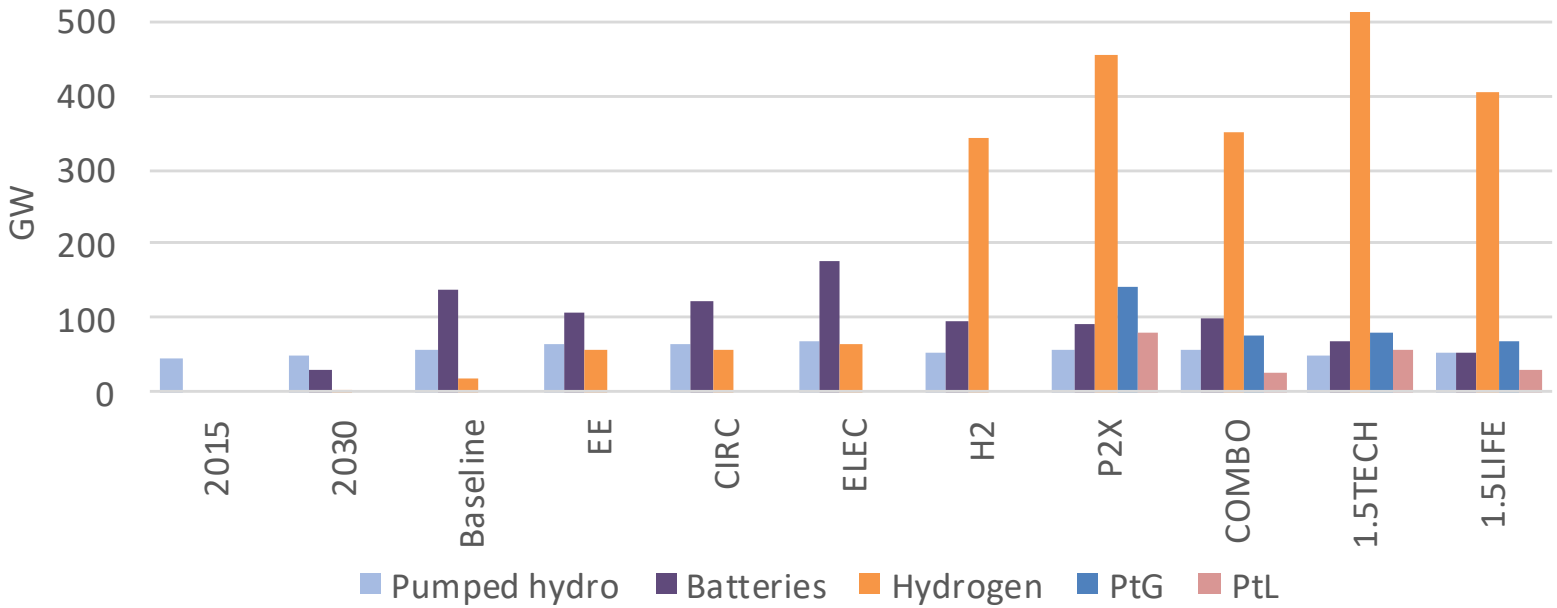
Smart charging or refuelling stations for transport. Increased synergy between transport and energy systems.

Retrofitting existing infrastructure and assets and timely replacement of ageing infrastructure compatible with the deep decarbonisation objective.

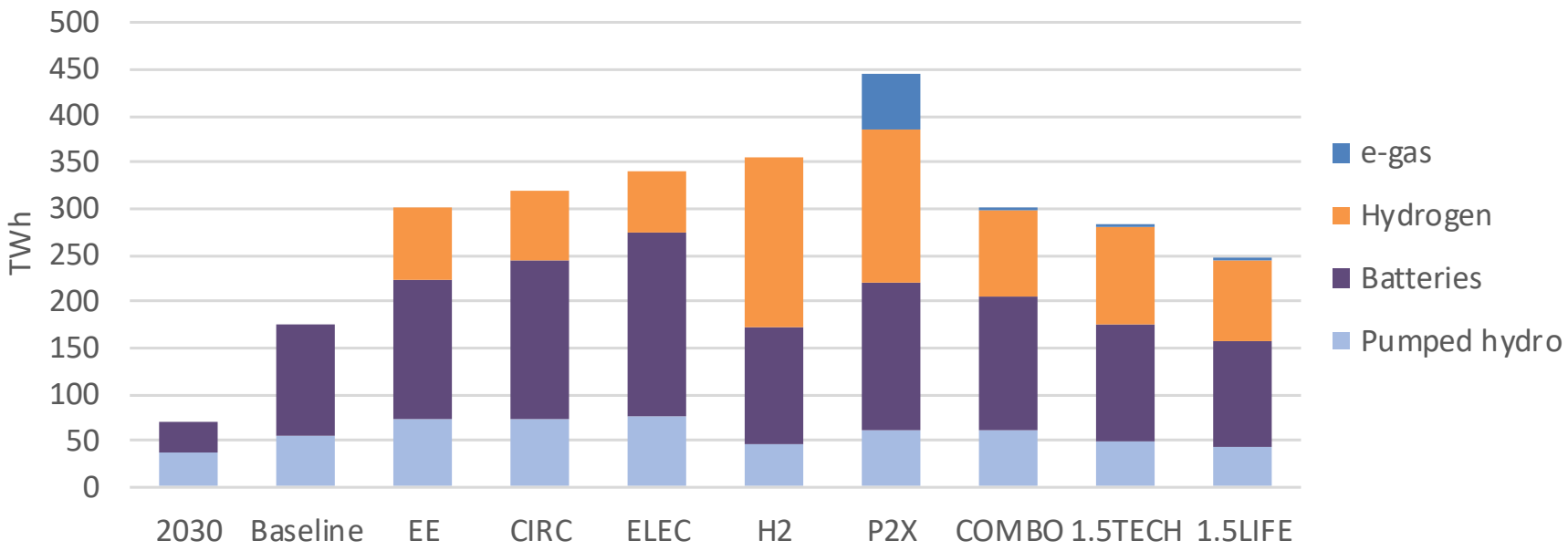
Power generation capacity in 2050



Storage capacity in 2050



Electricity stored in 2050



Thank you