European Commission

EU-research supporting the design of decarbonisation pathways and the decarbonisation of the transport system

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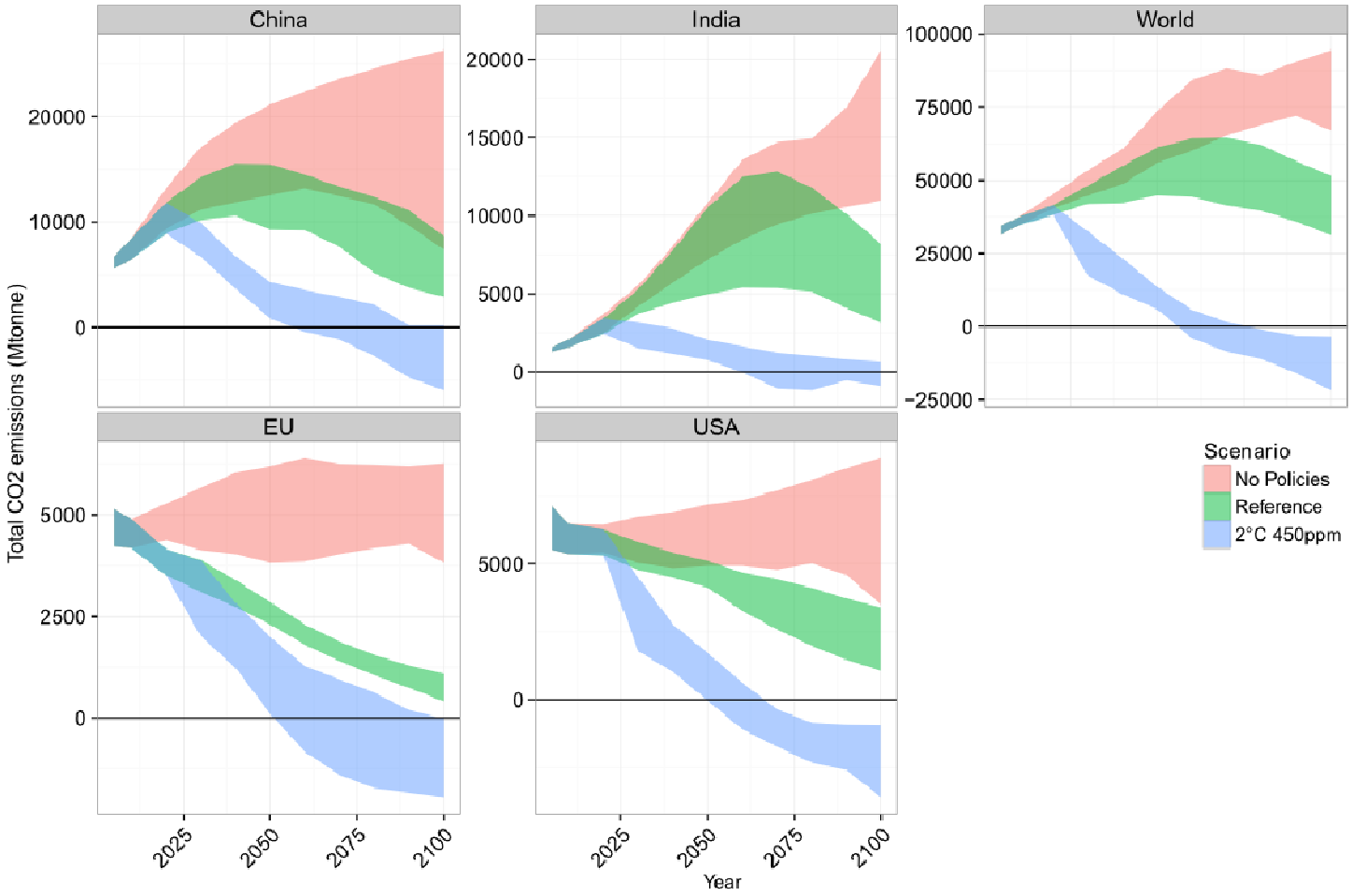
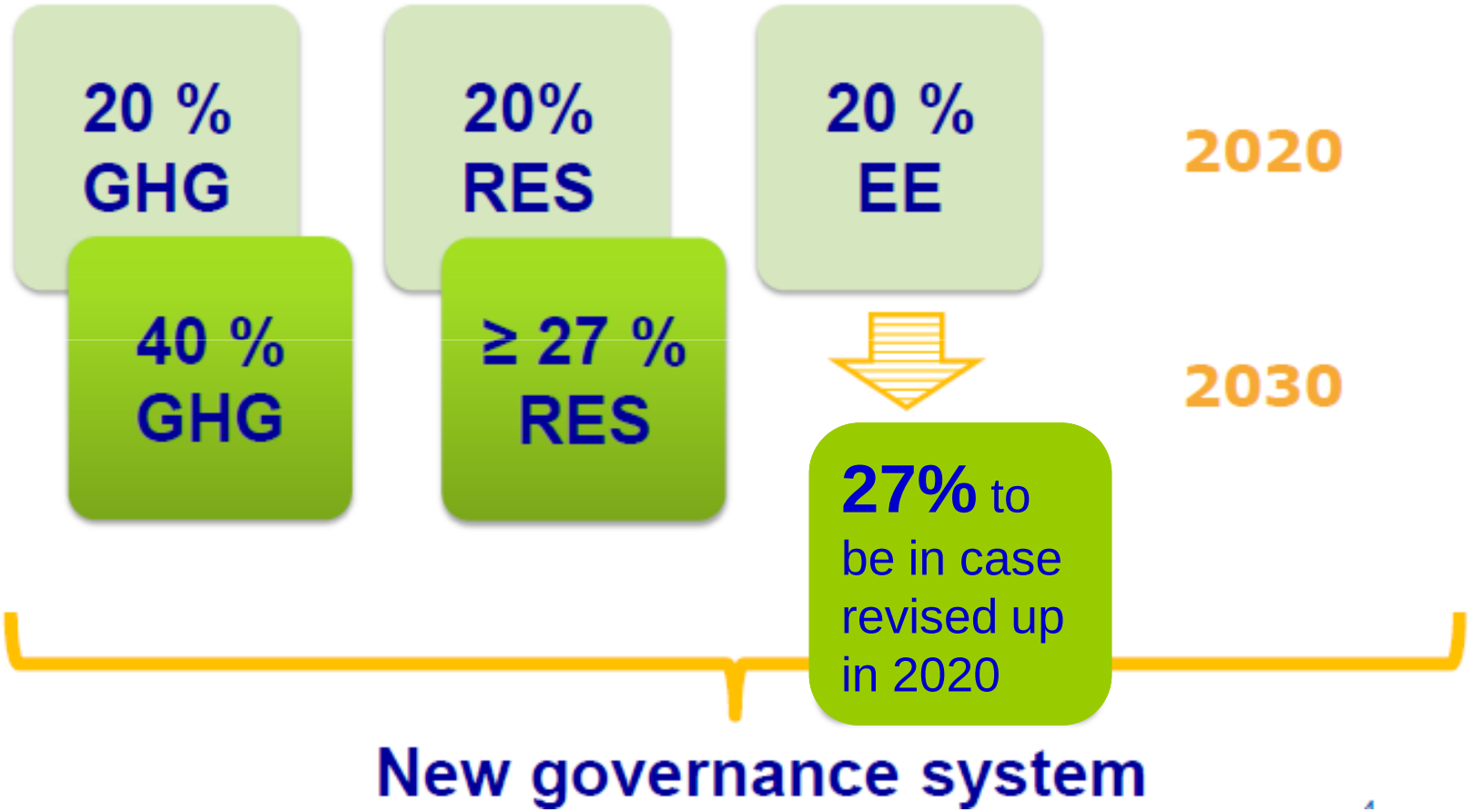
HORIZON 2020

Decarbonisation pathways around the world

Source: LIMITS, FP7 project



EU decarbonisation plan 2020/2030



EU INDC for climate negotiations

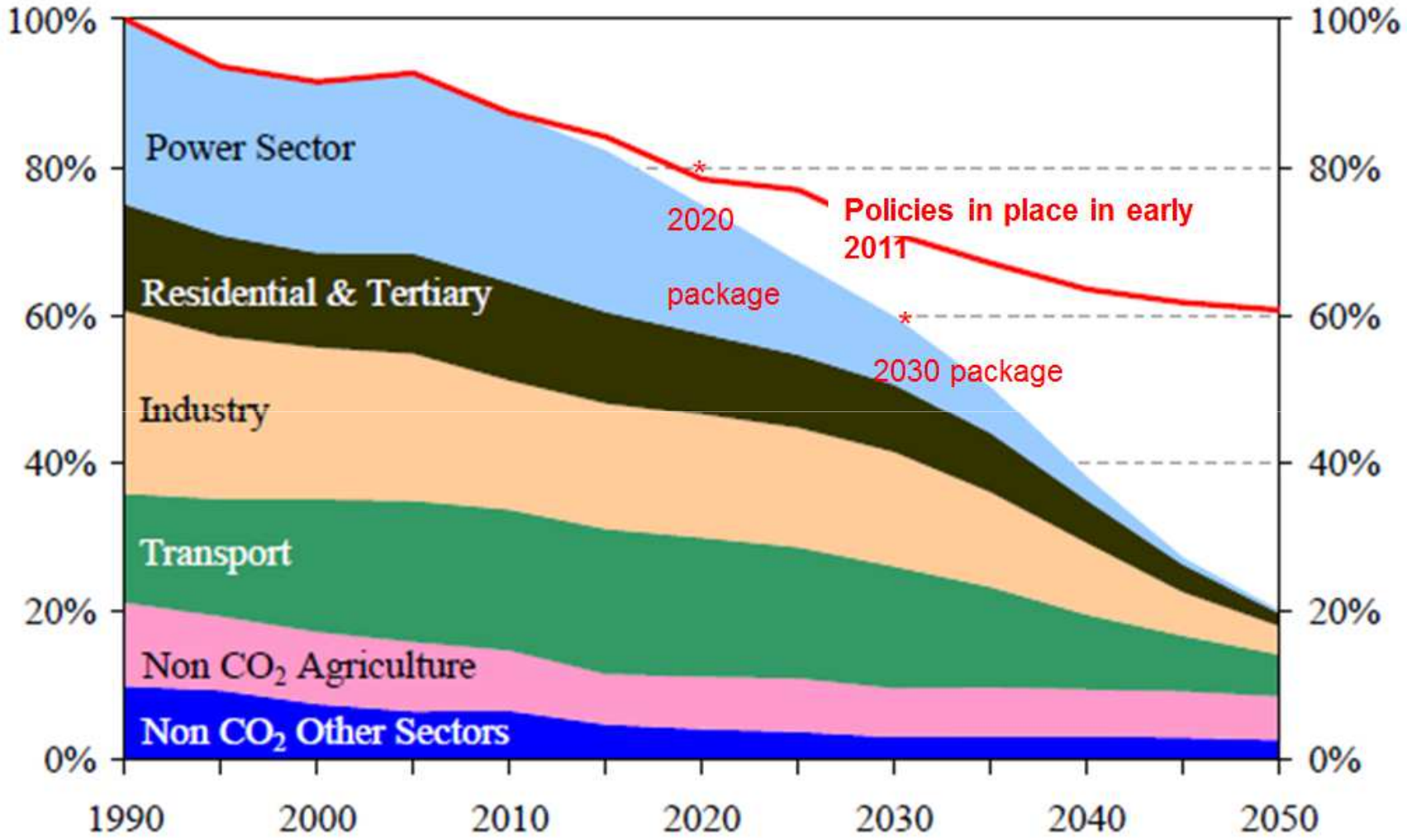
Key elements of the EU INDC	
Type	Absolute reduction from base year
Coverage	Economy wide
Scope	CO2, methane, nitrous oxide, F-gases
Base year	1990
Period	2021-2030 inclusive
Reduction level	At least 40% in 2030
Agriculture, forestry, other land uses included	Yes
% of Emissions covered	100%
Net Contribution of International Market Based Mechanisms	No contribution from international credits.
Planning process	EUCO Oct.2014; legislative proposals
Fair and ambitious	In-line with transition to a low emissions economy. Consistent with IPCC's assessment of reductions required from developed countries as a group of 80-95% by 2050. EU emissions peaked already.

EU decarbonisation vision for 2050

Energy Roadmap 2050 – COM(2011)112

- Reduction of energy sector emissions by 85% by 2050
- Energy costs rising to 2030, coming down thereafter
- 5 scenarios
  - ✓ high efficiency
  - ✓ diversified supply technologies
  - ✓ high RES
  - ✓ delayed CCS (not commercial by 2030)
  - ✓ no nuclear
- RES more than 50% of supply in all scenarios

EU CO2 reduction until 2050 by sector



How is Europe going to get there???

The low-carbon transition is an enormous challenge for:

- Energy and transport systems
- Food production and land use
- Energy-intensive industrial processes
- Businesses and investors
- Policy-makers and regulators
- International relations and trade
- Citizens and the society as a whole

Science must provide evidence-based information for climate-related decision-making at all levels!

Climate change in Horizon2020

the 2014-2020 EU framework programme

for research and innovation

The EU is committed to spend at least 35% of the overall 80 billion Euro budget of Horizon 2020 for Climate-related research and innovation actions

This includes all R&I actions having direct or indirect relation with climate action (climate research, adaptation, mitigation, low carbon technologies, etc.)

Towards a low-carbon Europe

H2020 science initiative for deep decarbonisation

H2020 will provide support within the Work Programme 2016-17 for the co-design with economic and societal actors of feasible, cost-effective decarbonisation trajectories to achieve the EU's medium and long-term climate objectives, while maximising societal benefits and economic prosperity.

Key areas to be addressed

The risks and costs of climate change for Europe

Defining and assessing complex impact chains under different climate change scenarios – from unmitigated to effectively mitigated – including macro-economic consequences

Planning and management of technology transition

Co-designing technological transition ahead of time in different sectors and with the involvement of innovators, regulators and investors, as well as for users and citizens so as to support stringent mitigation policies

Assessment of the global mitigation efforts

Analysing the adequacy of EU and global climate action in view of the long-term climate goal, as well as their impact on global industrial competitiveness, green growth, international trade, energy security, public finance and cross-border capital flows

Transport contribution to the ambitious EU climate change mitigation policy

The ***White paper 2011 - Roadmap to a Single European Transport Area*** (Towards a competitive and resource efficient transport system) will dramatically reduce Europe's dependence on imported oil and cut carbon emissions in transport by 60% by 2050

Key goals will include:

- Halve the use of 'conventionally fuelled' cars in urban transport by 2030; phase them out in cities by 2050
- Low-carbon sustainable fuels in aviation to reach 40 % by 2050; also by 2050 reduce EU CO2 emissions from maritime bunker fuels by 40 % (if feasible 50 %)
- Thirty per cent of road freight over 300 km should shift to other modes such as rail or waterborne transport by 2030, and more than 50 % by 2050

Horizon 2020

- The Transport Challenge ***'Smart, green and integrated transport'*** is aimed at achieving a European transport system that is resilient, resource-efficient, climate- and environmentally-friendly, safe and seamless for the benefit of all citizens, the economy and society
- It is structured in **four broad lines of activities** aiming at
  - *Resource efficient transport that respects the environment*: the aim is to minimise transport's systems' impact on climate and the environment (including noise and air pollution) by improving its efficiency in the use of natural resources, and by reducing its dependence on fossil fuels, e.g.:
    - Clean Sky 2
    - European Green Vehicle Initiative
  - *Better mobility, less congestion, more safety and security*
  - *Global leadership for the European transport industry*
  - *Socio-economic and behavioural research and forward looking activities for policy making*

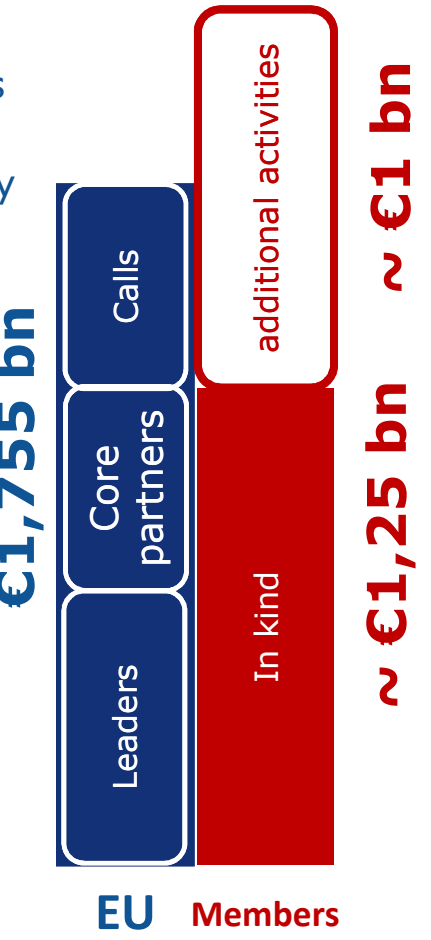
Clean Sky 2: objectives & budget

- **Objectives**
  - **To integrate, demonstrate and validate most promising technologies capable of:**
    - increasing aircraft fuel efficiency and reducing CO2 emissions by 20 to 30%
    - reducing aircraft NOx emissions and noise emissions levels by 20 to 30%

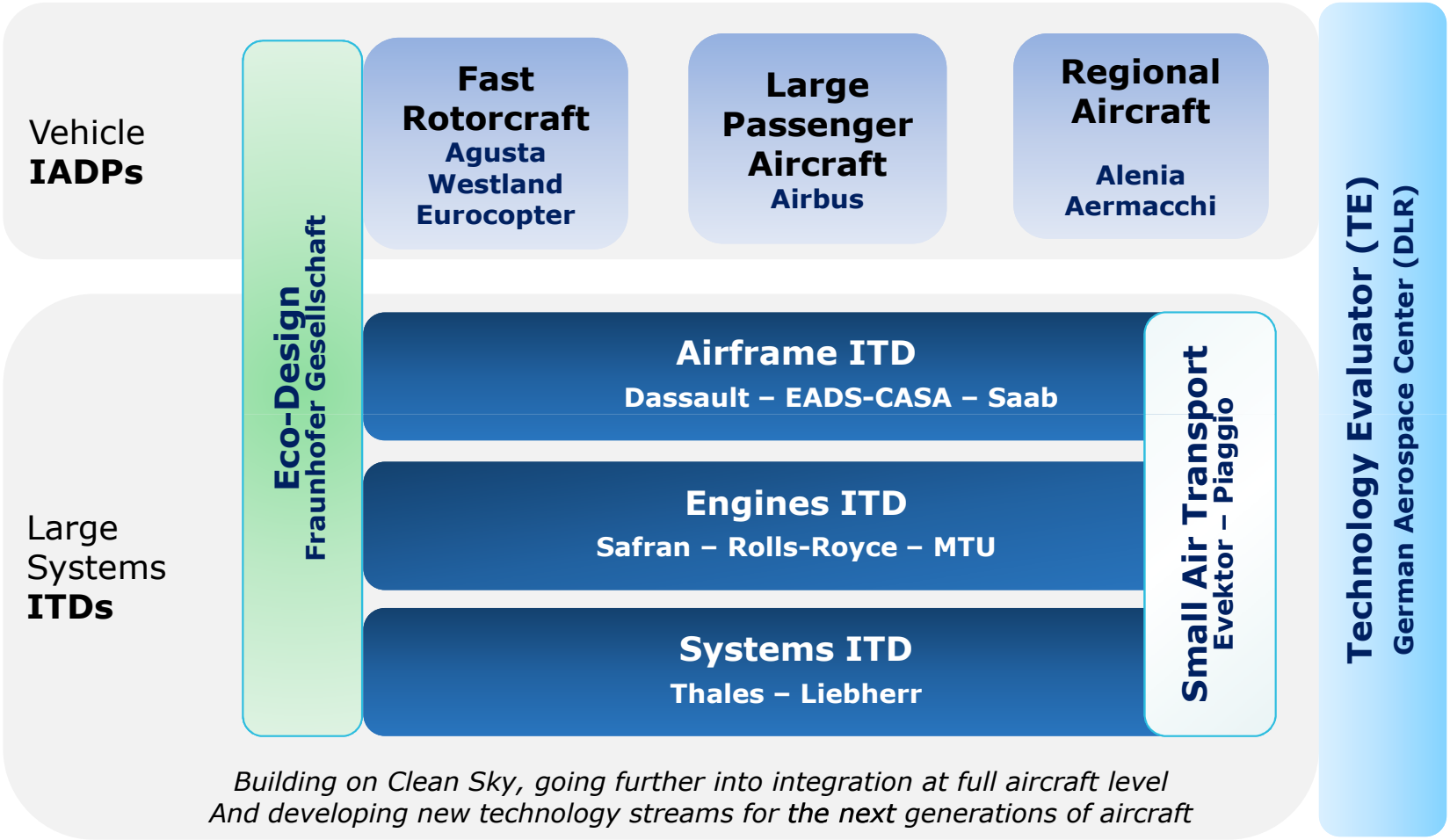
New baseline: targets compared to "State-of-the-art" aircraft entering into service as from 2014

- **Budget**
  - **Union financial contribution : €1,755 bn**
    - Up to 40% allocated to Leaders
    - At least 60% allocated following open and competitive calls:
      - Up to 30% allocated to Core Partners
      - At least 30% allocated to external partners
  - **Contributions of members other than the Union**
    - Around € 1,25 billion in kind
    - Around € 1 billion for additional activities

      e.g. activities related to investments (infrastructures, tools, etc.) contributing to execute CS2 programme



Clean Sky 2: operational activities



IADP - Innovative Aircraft Demonstrator Platform

ITD - Integrated Technology Demonstrators

Horizon 2020 and the EGVI

- **The European Green Vehicles Initiative (EGVI):**

  A new cPPP with € 750 million EC funding

  - To support the competitiveness of the automotive industry (CARS 2020 strategy)
  - Help to reach the ambitious targets set by the EU transport, energy and climate protection policies:
    - the 20/20/20 targets on renewable energy use,
    - the CO2 emissions regulation,
    - the Euro emissions standards for road vehicles

- **Calls on Green Vehicles are an essential component of road and urban transport R&I, funding:**

  - Improvement of energy efficiency of a wider range of road transport vehicles
  - Use of new types of non-conventional energies in road transport, such as electricity, CNG and LNG, bio-based fuels

Decarbonisation in the EGVI

- **For light duty vehicles**
  - Vehicle electrification and integration, for both full electric (battery electric and plug-in hybrid) and hybrid vehicles
  - Development of advanced electric components (batteries, motors, power electronics, auxiliaries)
  - Interfaces with the electric infrastructure to facilitate the integration of renewables
  - Natural gas vehicles integration, engines and components
- **For heavy duty vehicles:**
  - Improvement of energy efficiency of combustion engines
  - Use of new types of non-conventional energies in road transport, such as electricity, CNG and LNG, bio-based fuels
  - Vehicle electrification and integration, for both full electric (battery electric and plug-in hybrid) and hybrid vehicles

Thank you for your attention!

HORIZON 2020 Participant Portal
http://ec.europa.eu/research/participants/portal/desktop/en/home.html

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