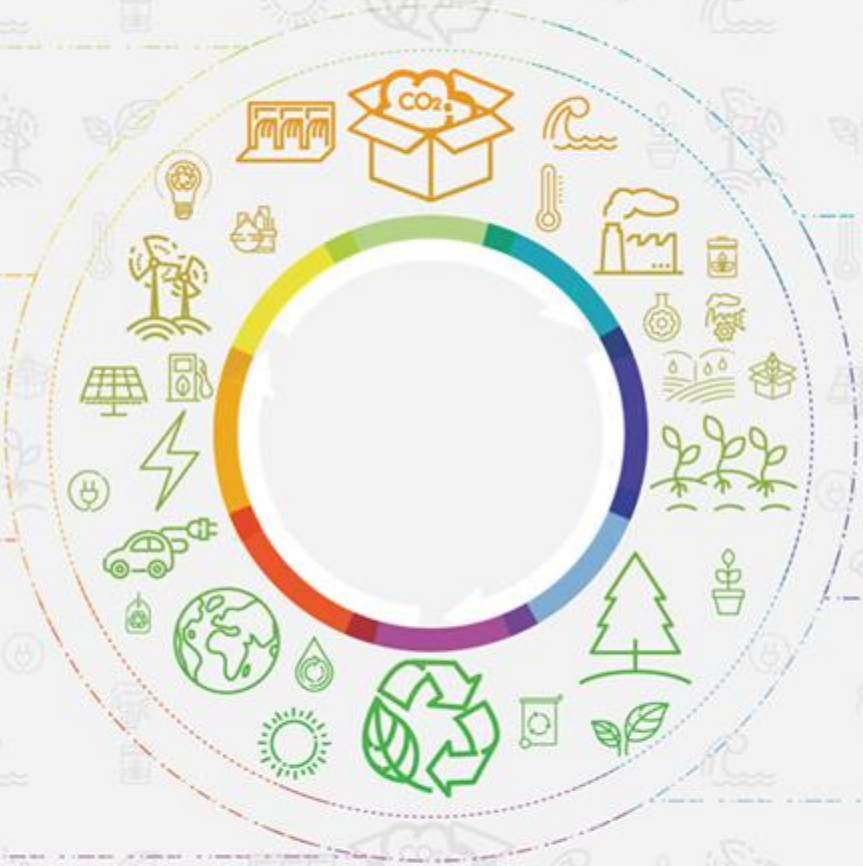
The use of modelling analysis for the EU's vision for a Long Term Strategy



IRENA Webinar_LTES_07/03/2019

Alban Kitous, DG ENER

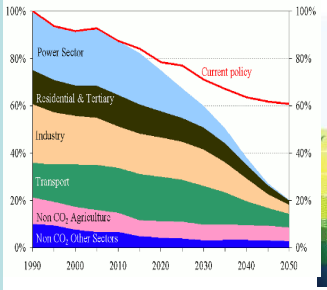
A decade of modelling for EU energy & climate policy

2008

2020 EU Climate and Energy Package

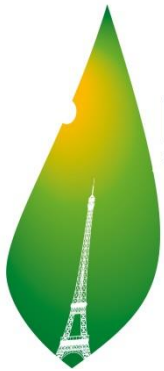
2011

2050 Energy & Low Carbon Roadmaps



2014

2015

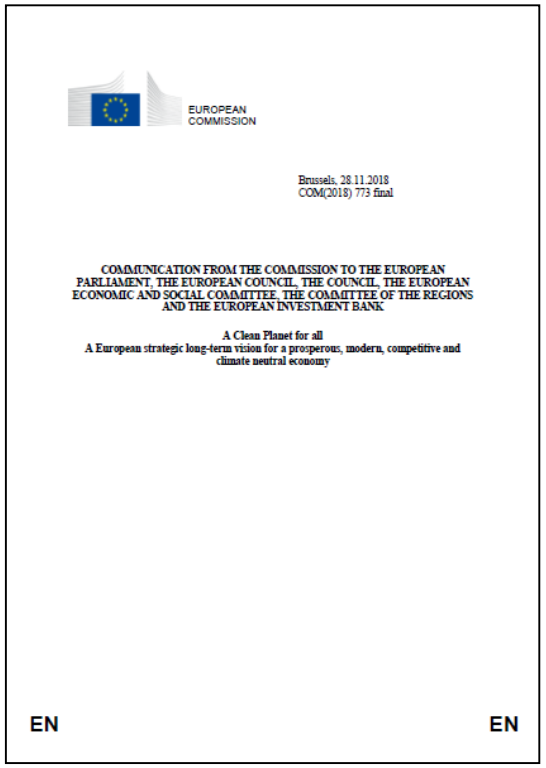


2016-2017

Clean Energy Package

- Effort Sharing Decision
- LULUCF
- Energy Efficiency
- Transport Decarbonisation
- Renewable Energy
- Market Design
- Governance

2018


EUROPEAN COMMISSION

Brussels, 28.11.2018
COM(2018) 773 final

COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE EUROPEAN COUNCIL, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE, THE COMMITTEE OF THE REGIONS AND THE EUROPEAN INVESTMENT BANK

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

EN EN

Communication on the proposed Long Term Strategy, 25 pages

https://ec.europa.eu/clima/sites/clima/files/docs/pages/com_2018_733_en.pdf


EUROPEAN COMMISSION

Brussels, 28 November 2018

IN-DEPTH ANALYSIS IN SUPPORT OF THE COMMISSION COMMUNICATION COM(2018) 773

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

In depth analysis supporting the Communication, Long Term Strategy, 393 pages

https://ec.europa.eu/clima/sites/clima/files/docs/pages/com_2018_733_analysis_in_support_en_0.pdf

To accompany our modelling

- **Stakeholder consultation on technologies**

- **Broad literature review** throughout the LTS in-depth analysis:
  - IPCC Special Report on 1.5°C
  - Results of (scientific) studies and modelling exercises
  - Inputs from a variety of stakeholders such as industry roadmaps, position papers, studies
  - Inputs from all European Commission services

Modelling suite for the EU Long Term Strategy

Economics

Energy

Land use & agriculture

Non-CO_2 GHG
Air pollution

Modelling suite for the EU Long Term Strategy

Economics

Framework conditions: Population & GDP

Economic impacts of policies: GEM-E3, E3ME

Economic impacts: QUEST

Energy

Global system: POLES-JRC

EU system: PRIMES

Industry: FORECAST

Land use & agriculture

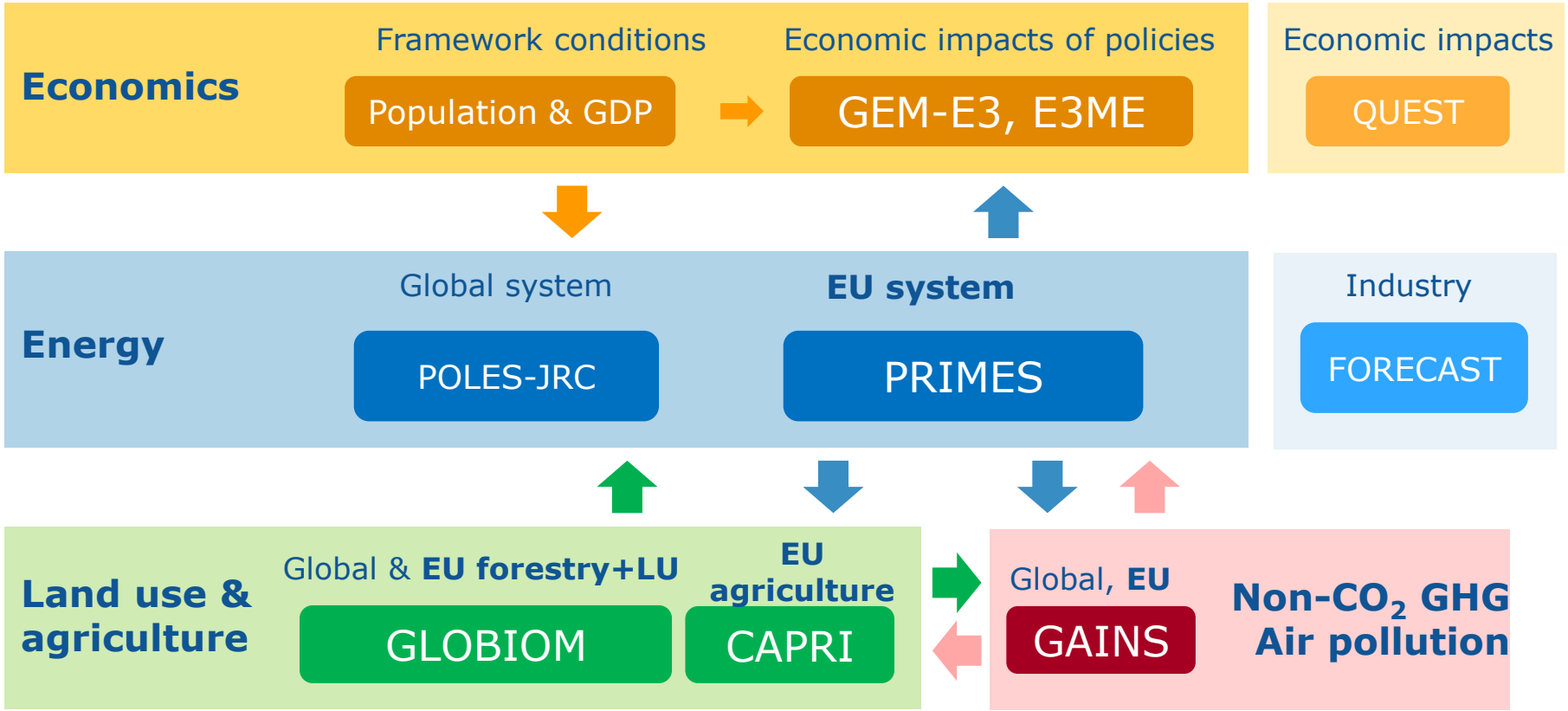
Global & **EU forestry+LU**: GLOBIOM

EU agriculture: CAPRI

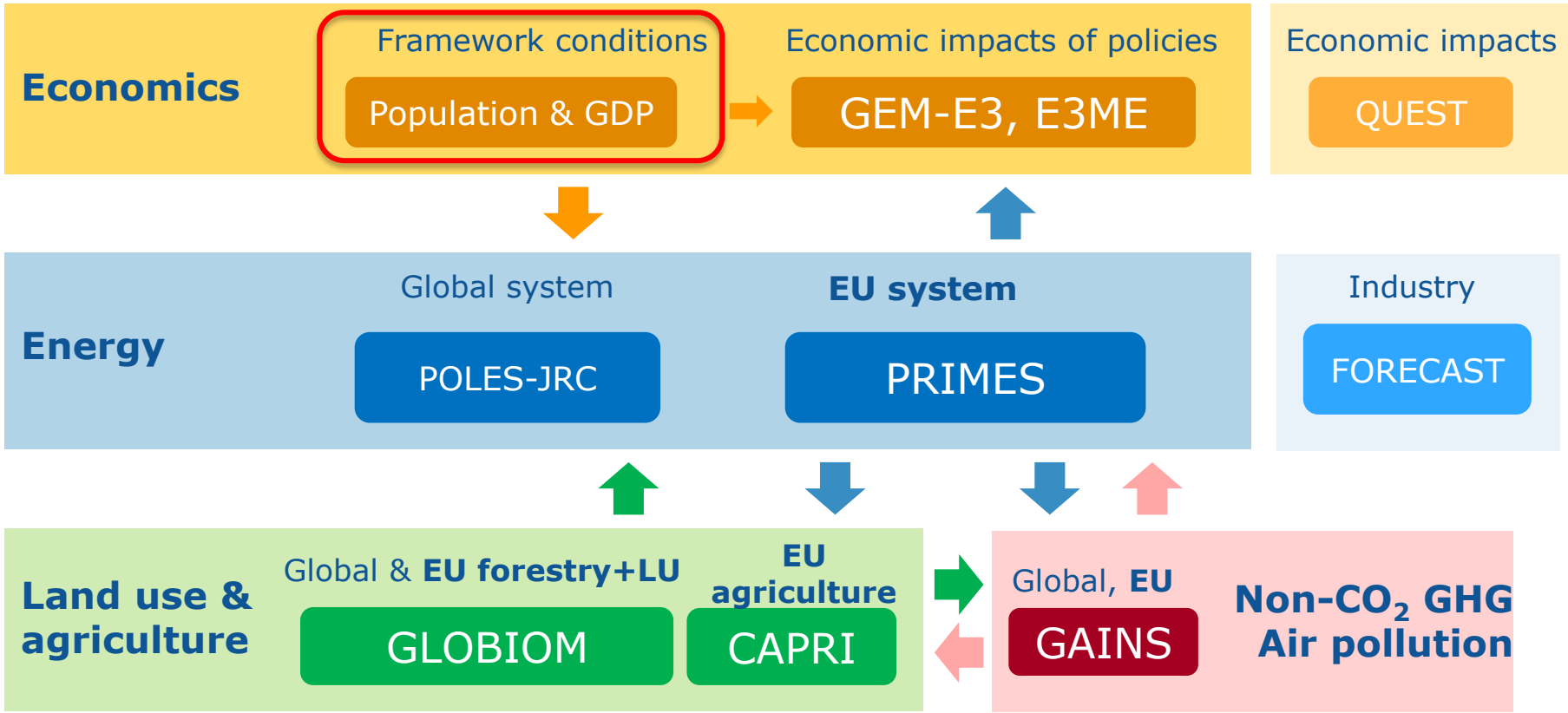
Global, **EU**: GAINS

Non-CO_2 GHG Air pollution

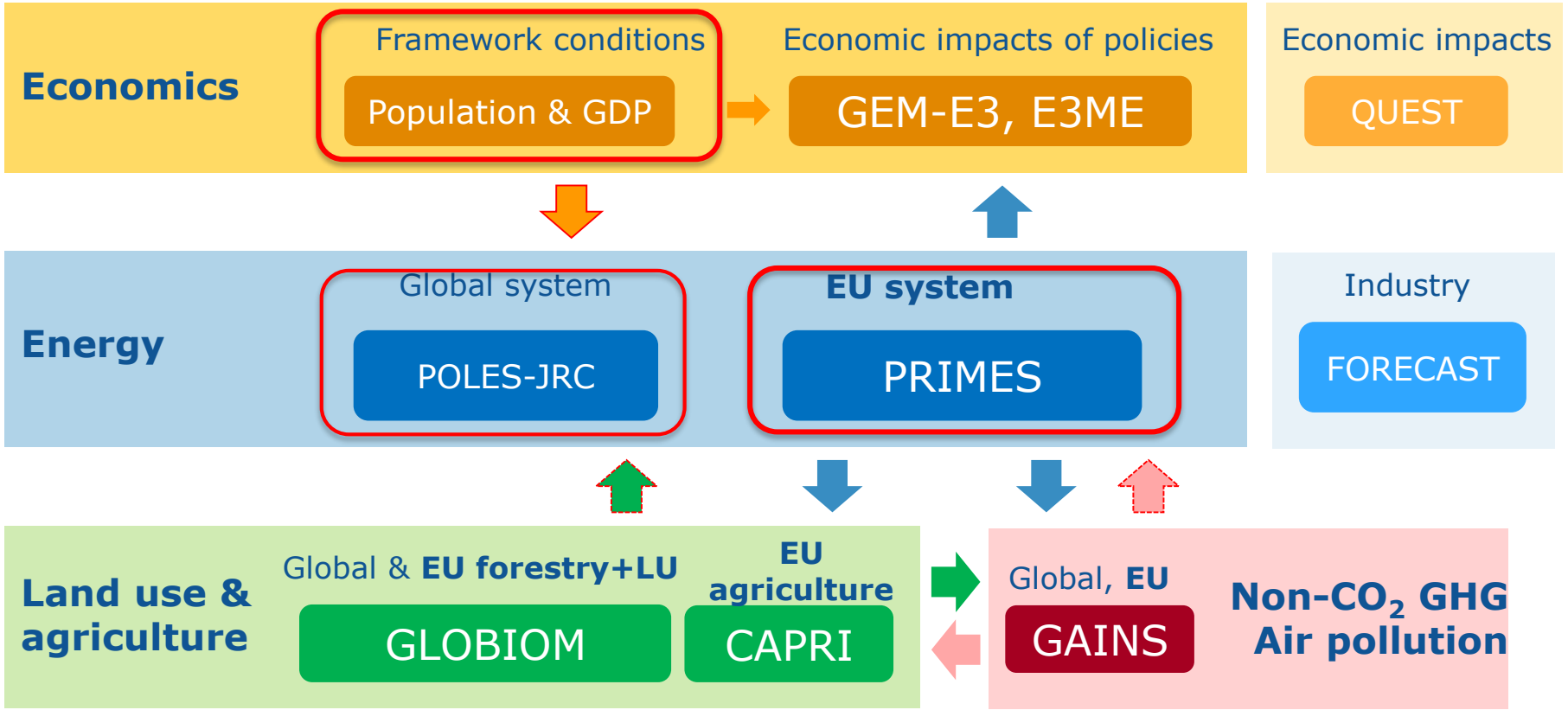
Modelling suite for the EU Long Term Strategy



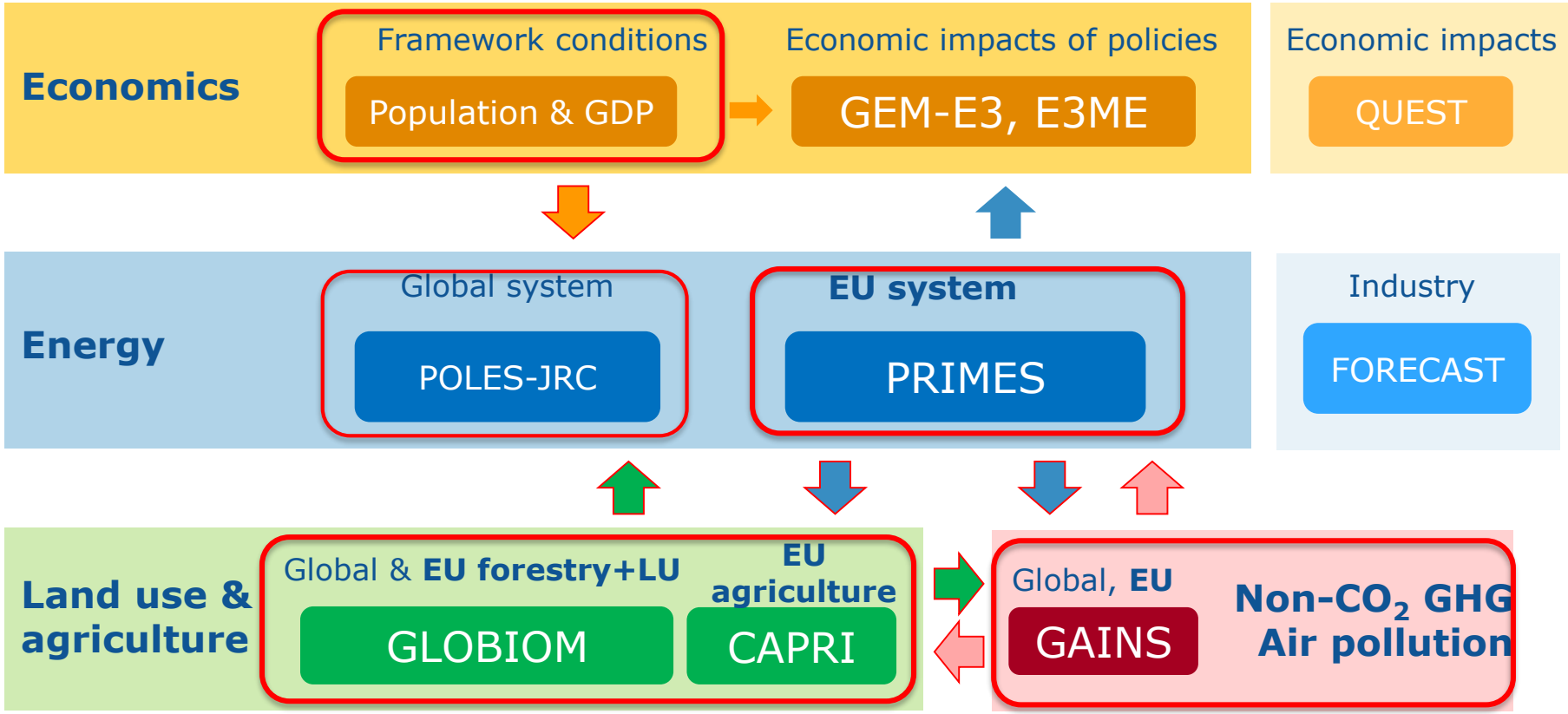
How does that work? 1st step: boundary conditions..



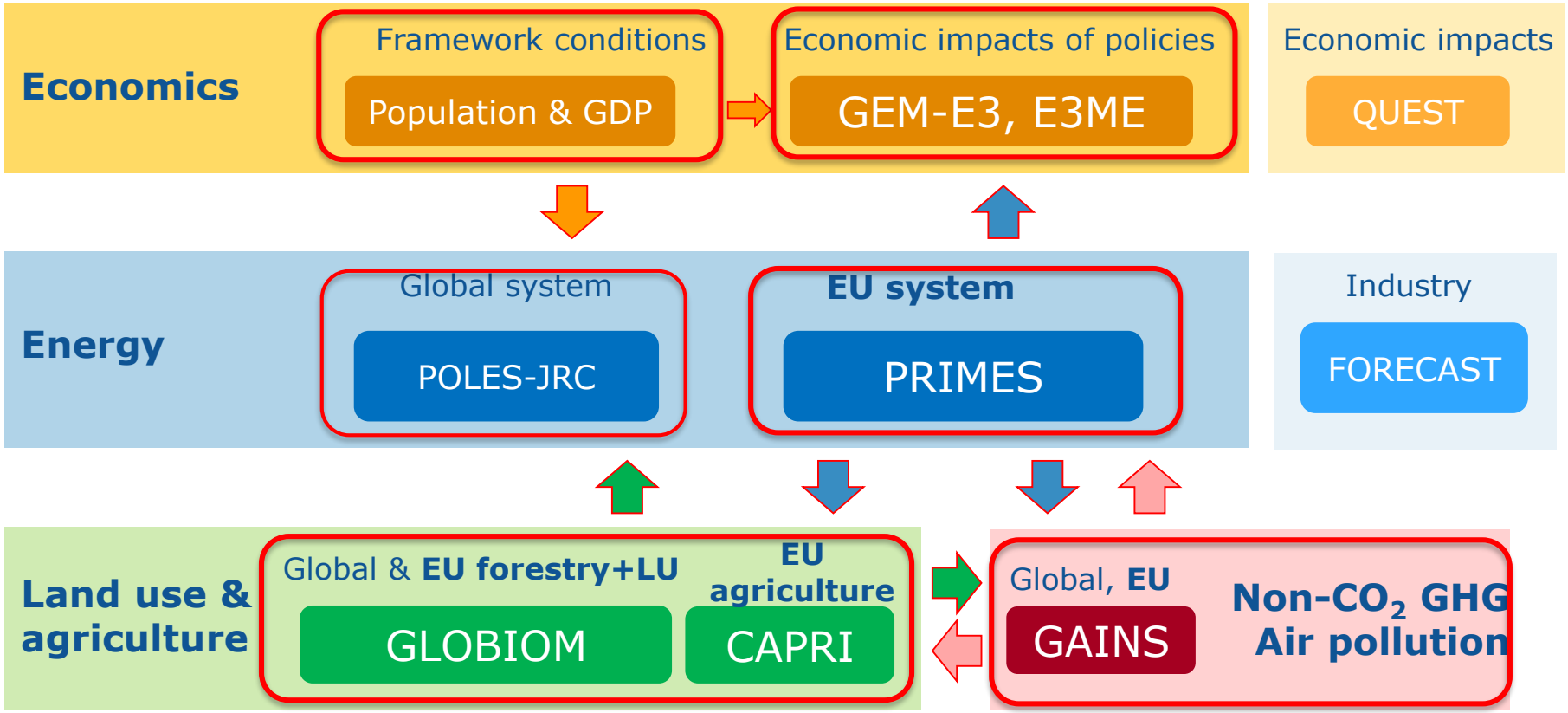
.. feeding the energy system models, which include « reduced forms » of land and non-CO2 models



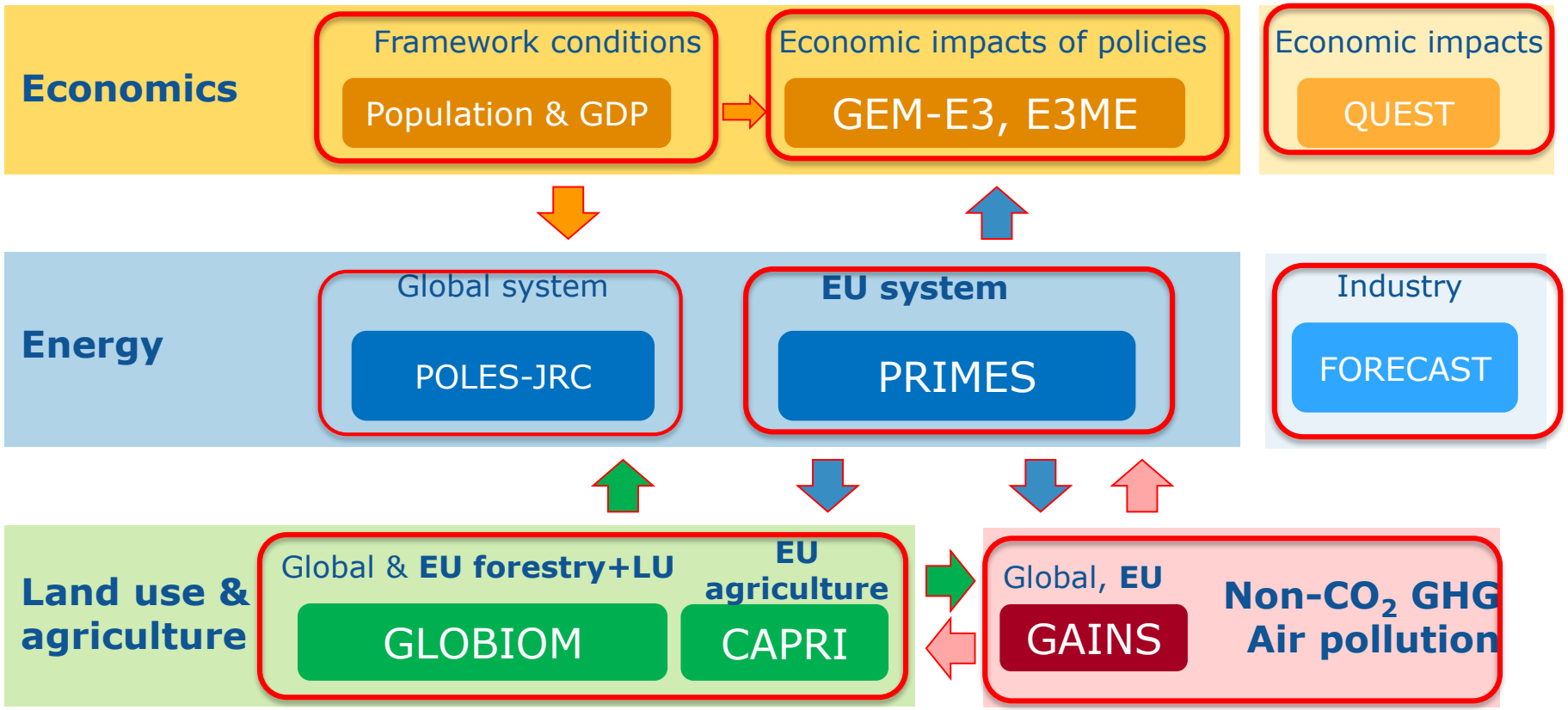
Then the land use and air pollution models are run for further details



Finally the information is sent to macro models for the economic analysis



The analysis is completed by other models having run similar scenarios



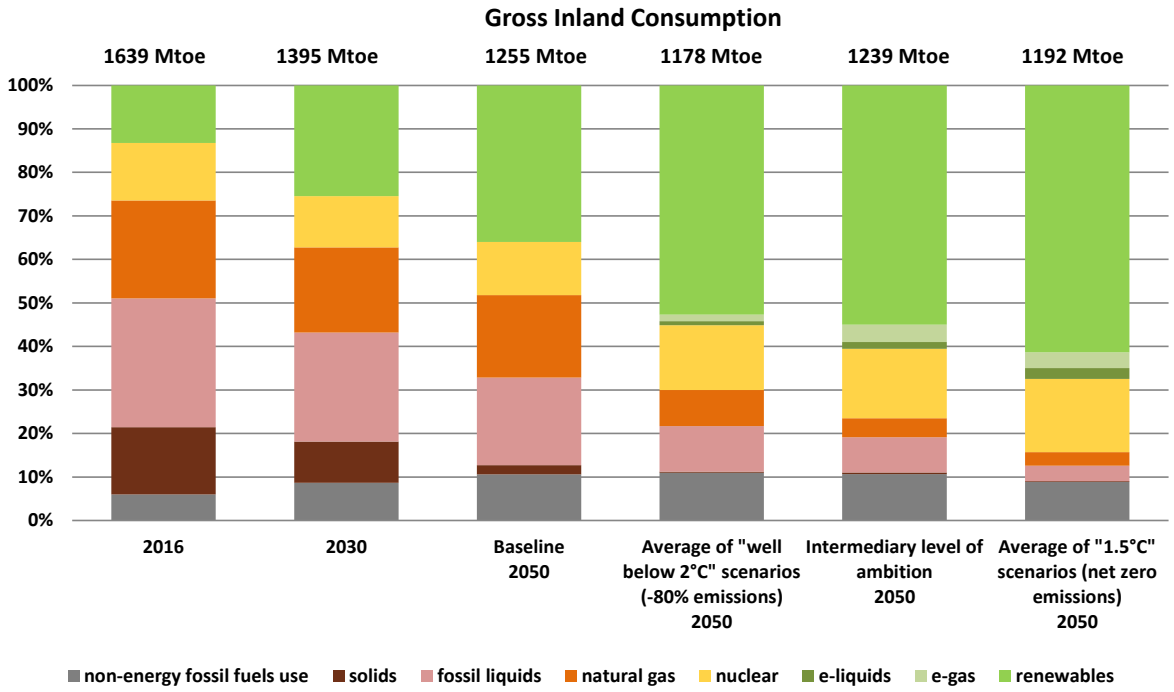
Detailed assessment supported by scenario analysis

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	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

Evolution of gross inland consumption

Primary energy in 2050 largely coming from renewable sources



Thank you for your attention!