The POTEnCIA Central scenario

An EU energy outlook to 2050

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The Central scenario

Context and process

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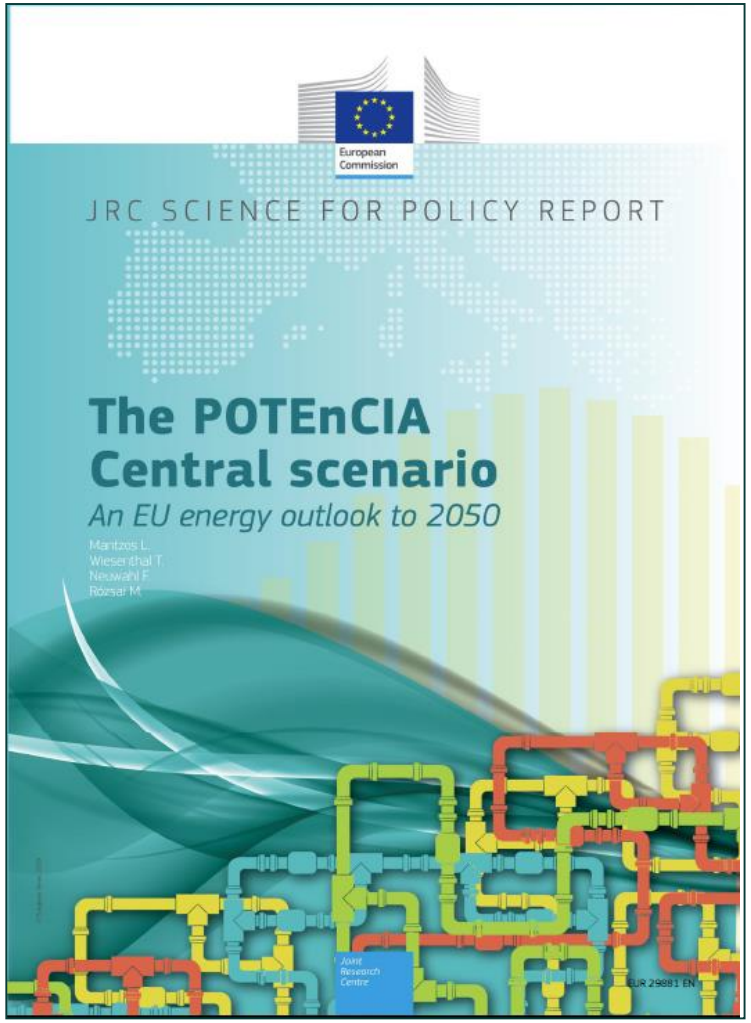
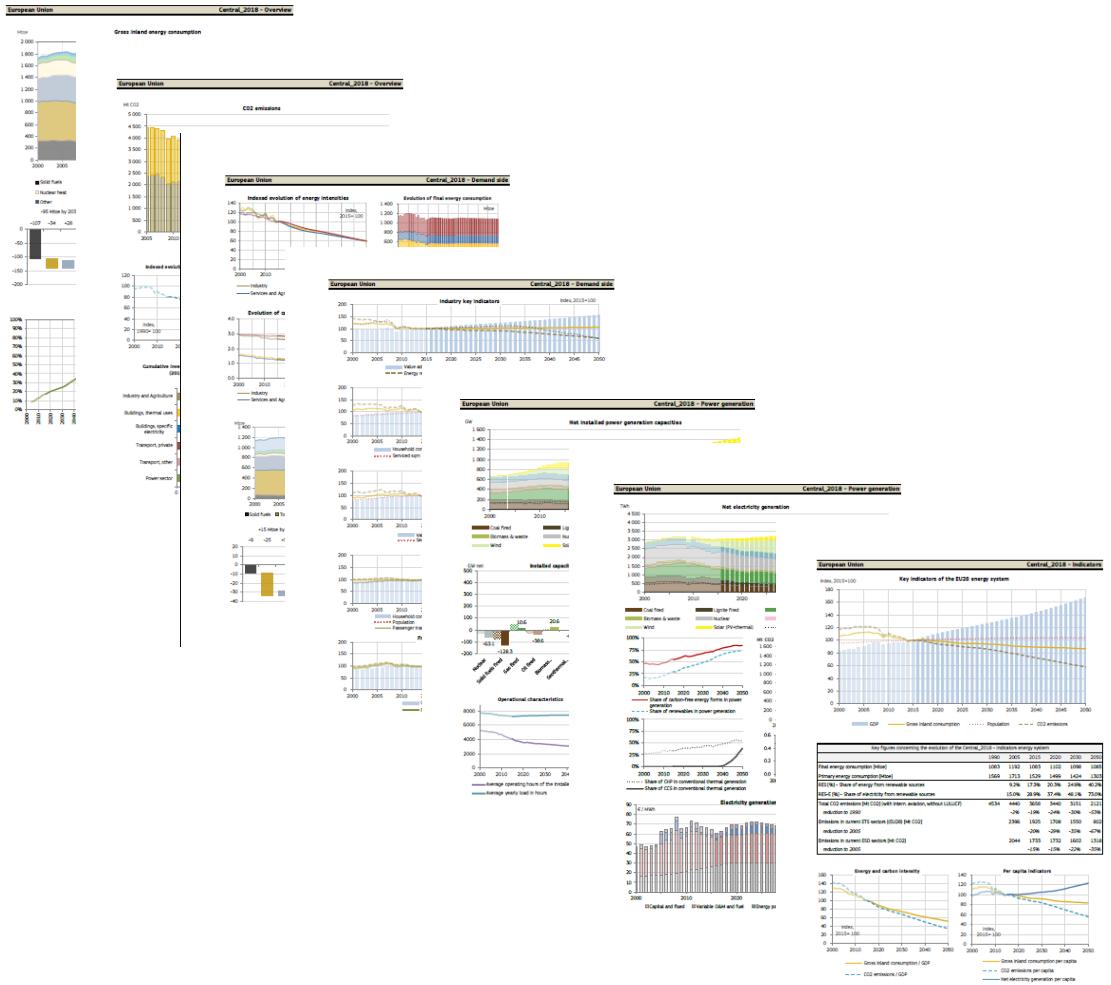
CENTRAL SCENARIO
Status quo

https://ec.europa.eu/jrc/en/potencia

https://publications.jrc.ec.europa.eu/repository/bitstream/JRC118353/potencia_central_scenario_online.pdf





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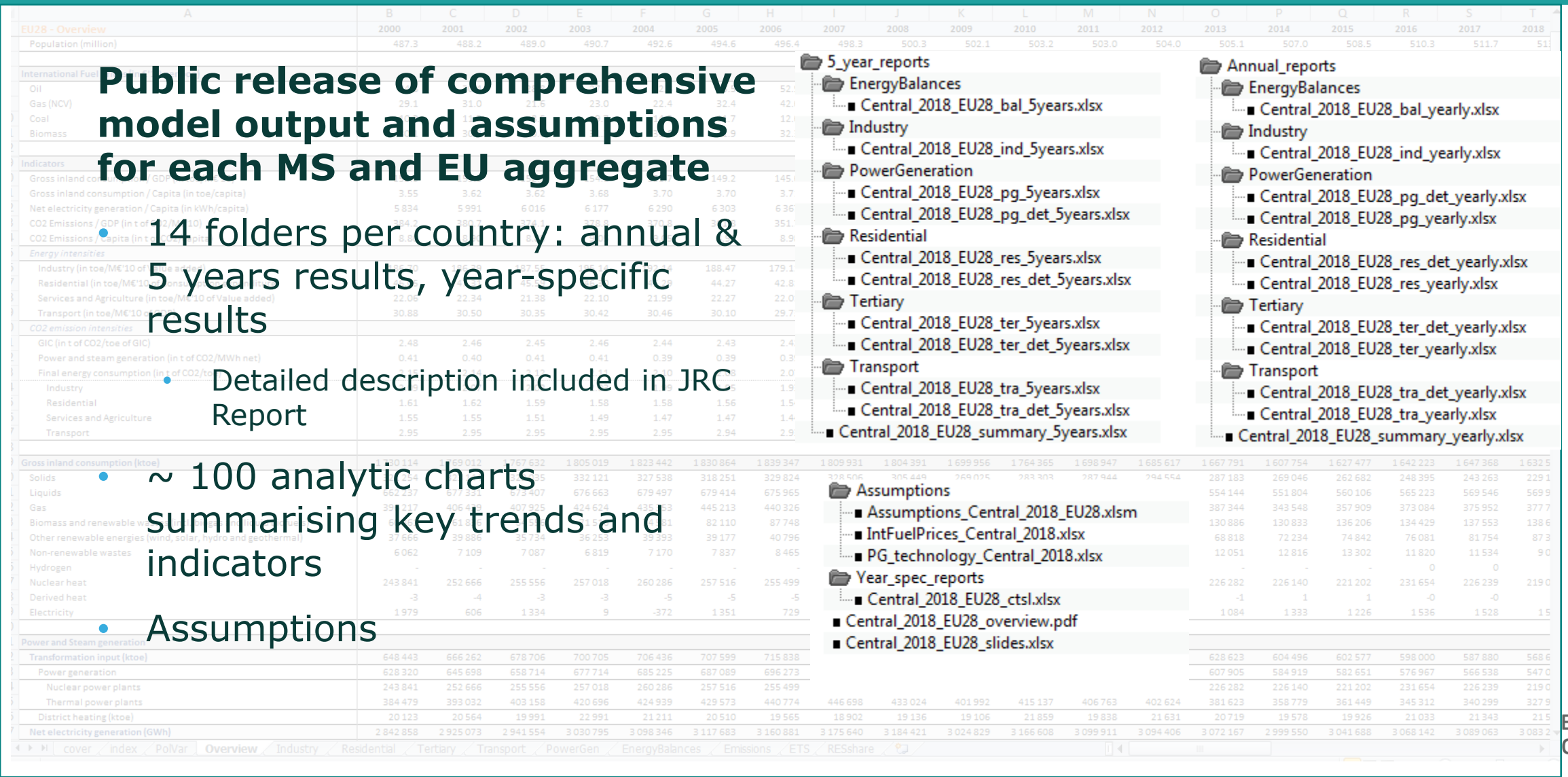
CENTRAL SCENARIO
Status quo

https://rcp.jrc.es/

Public release of comprehensive model output and assumptions for each MS and EU aggregate

- 14 folders per country: annual & 5 years results, year-specific results
  - Detailed description included in JRC Report
- ~ 100 analytic charts summarising key trends and indicators
- Assumptions

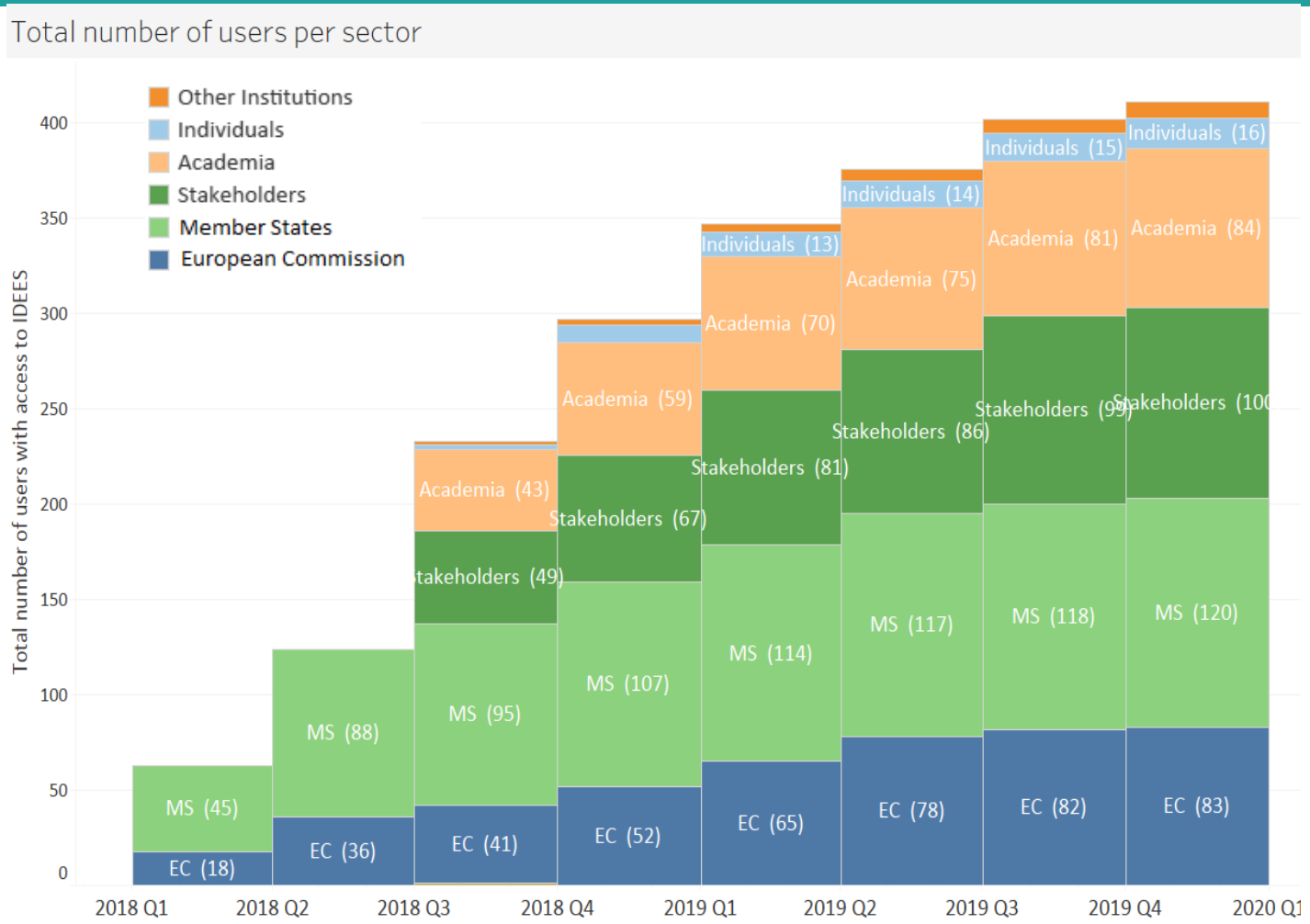


JRC-IDEES
Status quo

https://ec.europa.eu/jrc/en/potencia/jrc-idees

JRC-IDEES$_{2015}$ published 07/2018

- >400 registered users
- 27 EU Member States registered
- Interest beyond EU (Energy Community)
- Users with diverse backgrounds
  - Industry, academia, finances
  - CEN/CENELEC; EIT; EIB
- Other modelling teams



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Central scenario
Its role

First published scenario developed with the POTEnCIA model

The Central scenario

- showcases the **level of detail** the model produces
- serves to exemplarily **illustrate the POTEnCIA model features** and the methodological approach followed
- demonstrates the approach to transparency

It forms the basis for further development of policy scenarios

Structured Exchange
Key elements

Meetings

- 1st POTEnCIA ws (Feb 18)
  'Entry point' and assumptions
- 2nd JRC-IDEES ws (May 18)
  JRC-IDEES2015v0.9
- 2nd POTEnCIA ws (Nov 18)
  draft 'Central' scenario
- Energy Expert Group
- Climate Change Committee WG II

& bilateral meetings

Internet platform

- structured exchange of information
- access upon request
- exchange assumptions, draft results
- but also comments and relevant material

JRC Research Collaboration Portal
https://rcp.jrc.es

Special Groups

- on JRC-IDEES and on POTEnCIA
- a stable framework for exchanges
- … and support capacity building

… complemented by informal interaction by email, phone etc.

Jointly Developing the Central Scenario

Milestones in the iterative consultation process

Introduction to the tool

Agreeing on key assumptions

Delivering on transparency and fostering involvement

1st experts workshop (Feb 18)

Initial assump-tions

Questio nnaires

Revised assump-tions

Draft Central v1.0

2nd experts workshop (Nov 18)

Revised draft results v2.1

Member States feedback (Jan/Feb 19)

Revised scenario v3.1 (June 19)

Feedback Received
Some observations

Thank you very much for the constructive feedback provided!

It was carefully considered and incorporated to the extent possible within the general approach followed in the Central scenario:

- **Use of official EU data on GDP and population**: Eurostat; Ageing Population Report; …
- **Ensuring consistency at EU level**: matching imports/exports; divergent expectations on technology evolution; …
- **Some comments triggered revisions affecting all countries**: power generation; transport activity; …

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Key policies

- Reflection of existing policies and measures – i.e. those **in place by 31/12/2017**

  (thus not including 2030 climate and energy policies that were published in 2018)

- Historical time series already account for effect of earlier policies and measures

Key EU policies reflected in the Central scenario

EU Emissions Trading System

Energy Performance of Buildings

Energy Efficiency Directive (Art 7)

Trans-European Transport Networks

Alternative Fuels Infrastructure Directive

CO_2 standards for new cars and vans

Eco-design of energy-related products

While trying to account for national policies provided in the questionnaire to the extent possible

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In a nutshell

- Scenario with **existing policies and measures**

  … *that assumes that these policies will deliver*

- using historical data up to the year 2015

  … *including only partially more recent data*

- with international fuel prices aligned with the Reference 2016

  … *but updated with data until 2017*

- GDP growth rates in line with the 2018 Ageing Report

  … *while accounting for short-term forecasts*

What do these assumptions mean for

- buildings
- transport
- industry
- power generation

… and where do they leave us in terms of energy demand and CO_2 emissions from now until 2050?

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Key messages and sectoral insights

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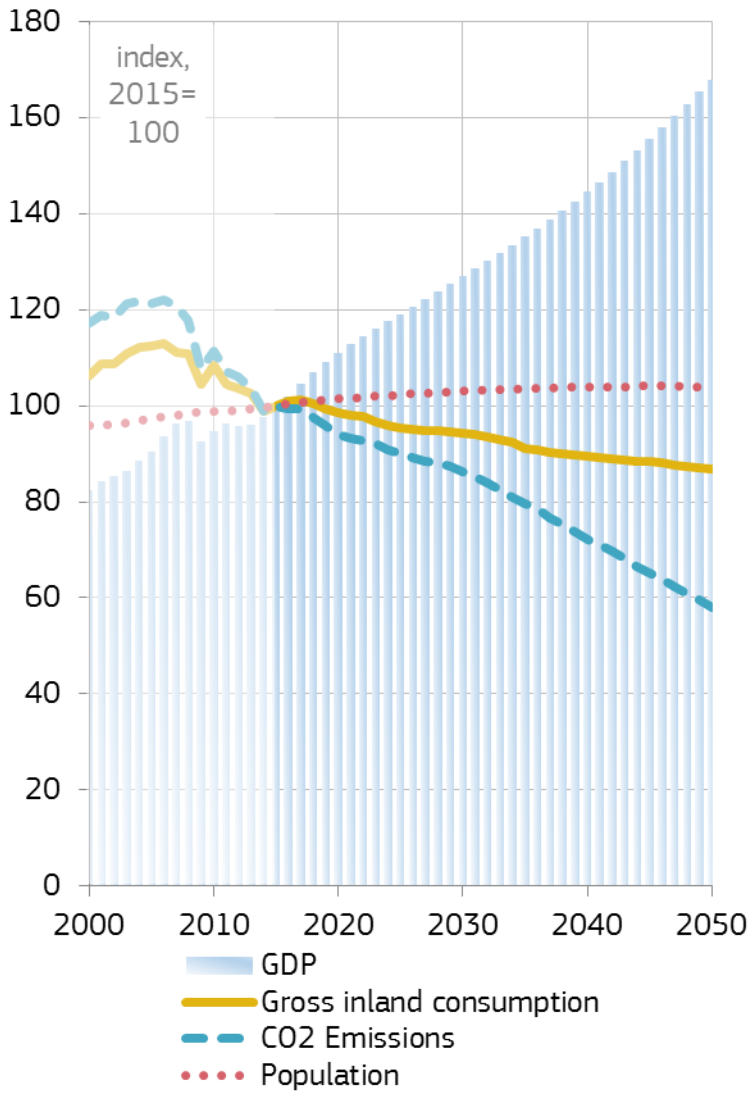
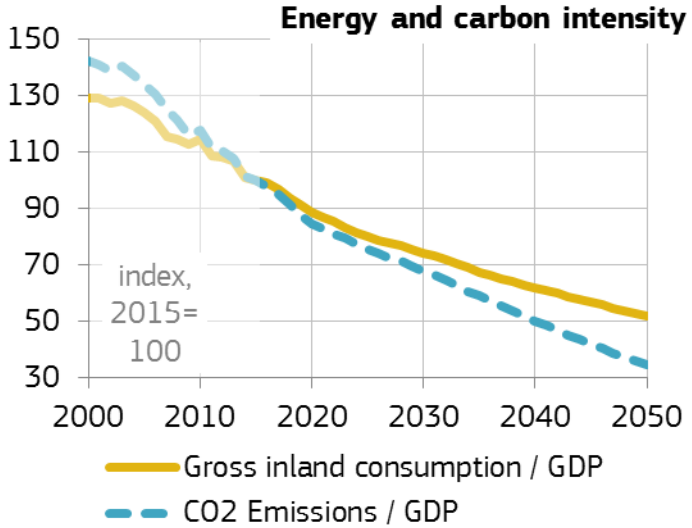
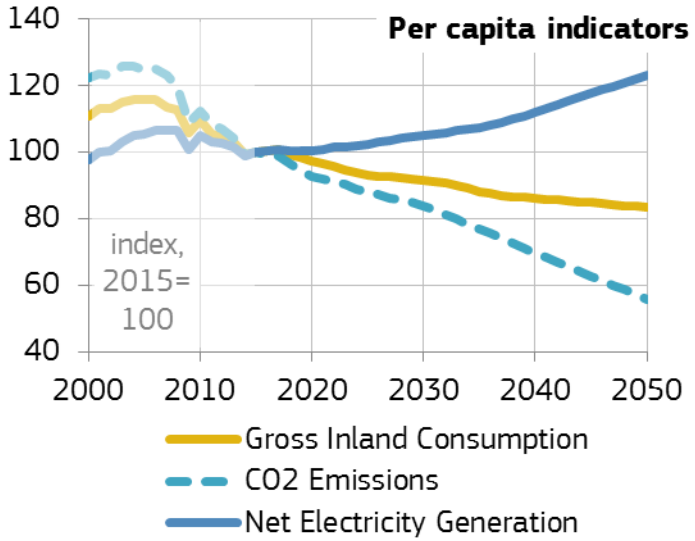
EU energy system: An overview







Primary energy demand follows a continuous declining trend

- reaching -13% from 2015 levels in 2050

CO_2 emissions reduce by 42% at the same period (53.2% from 1990 levels)

Energy intensity halves whereas the carbon intensity reduction reaches 65%

Both energy use and CO_2 emissions per capita also decline (-17% and -44%)

Contrasting trend for electricity demand

- 1400 KWh more generated per capita
- +24% in 2015-2050

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Demand side: Main drivers

Structural changes in the economy

shifts across sectors; value added intensity of industrial products; saturation effects with regards to individuals' energy service needs

Actions not related to energy-consuming equipment

better-optimised operation (from an energy viewpoint) of industrial installations; improvements in the thermal insulation of building envelopes

Changes in the *structure of* energy use that can reduce energy requirements

adoption of more efficient processes, different growth patterns for energy service requirements, modal shift

Technology progress

Changes in the fuel mix

Further electrification, shift towards more efficient energy carriers, growing penetration of renewable energies, increasing role for distributed heat

plus **adoption of Carbon Capture options** in specific industrial CO_2-rich streams

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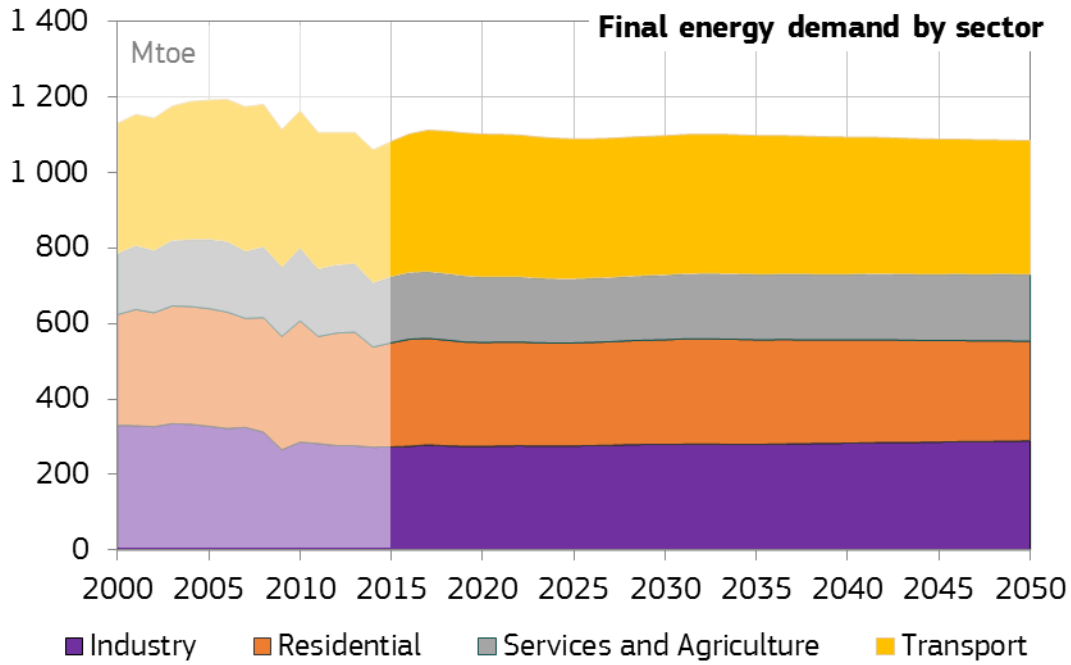
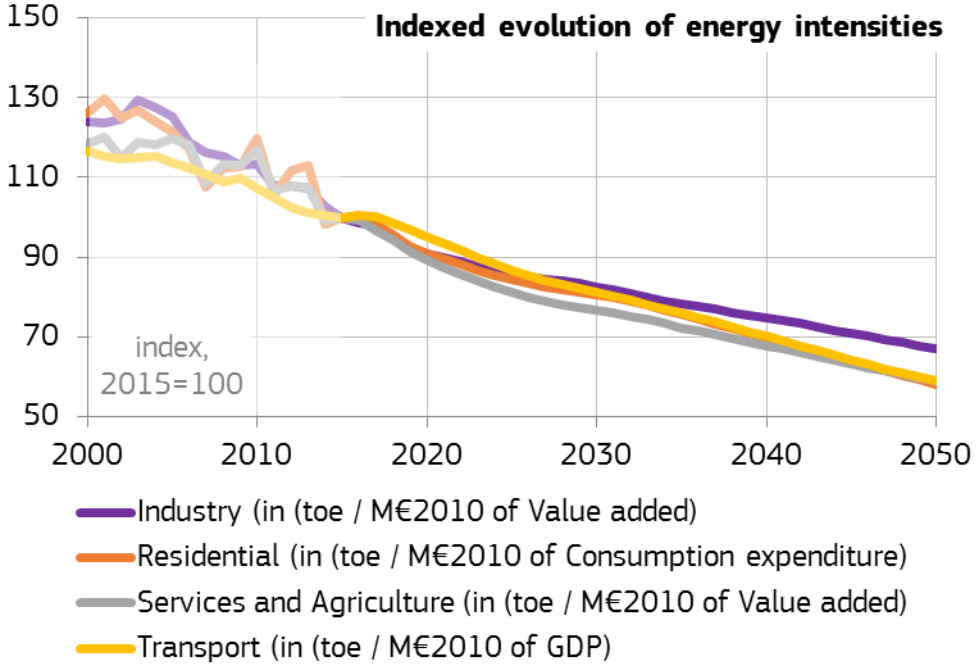
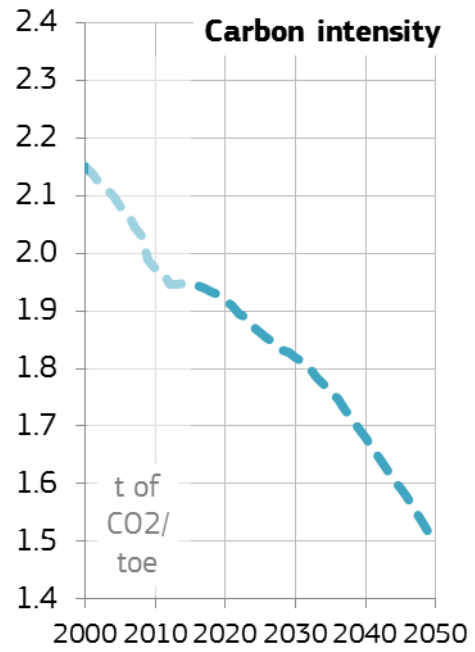
Demand side: Energy needs







Energy demand remains remarkably stable / significant improvements for energy intensities

Similar trends for residential, services and transport

- Demand declines by 1%-2%; energy intensities by -41 to -42% in 2015-2050

Slower pace projected for industry with demand increasing by 6% and energy intensity reducing by 33%

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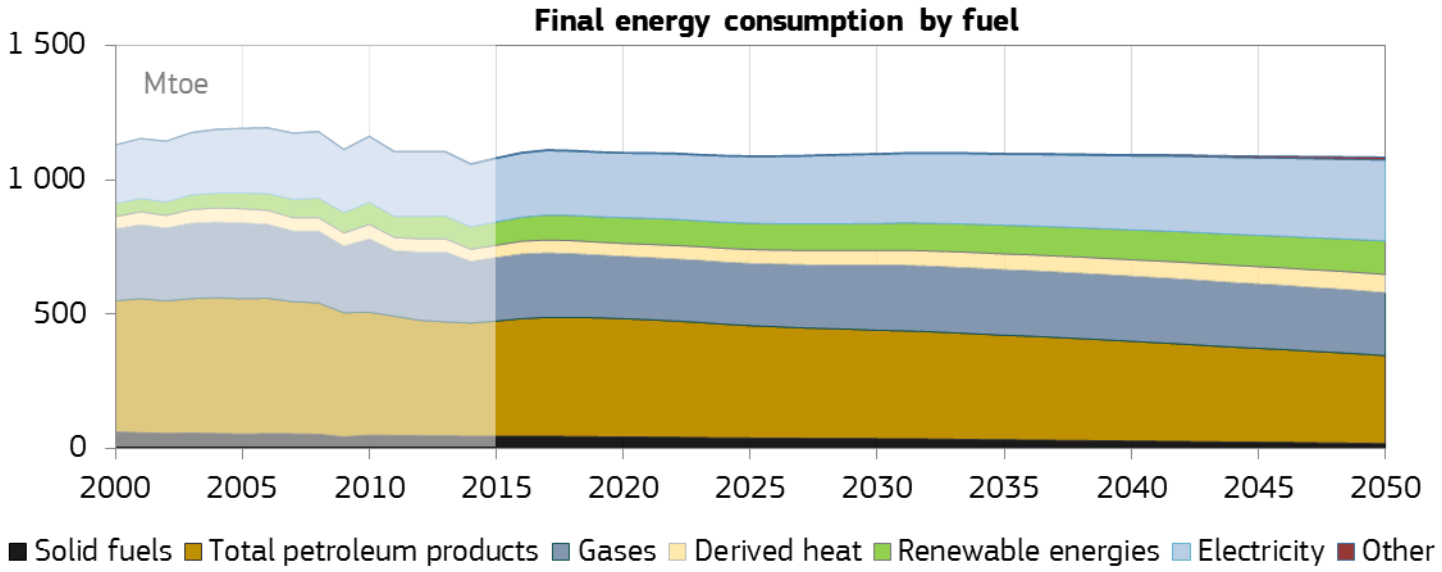
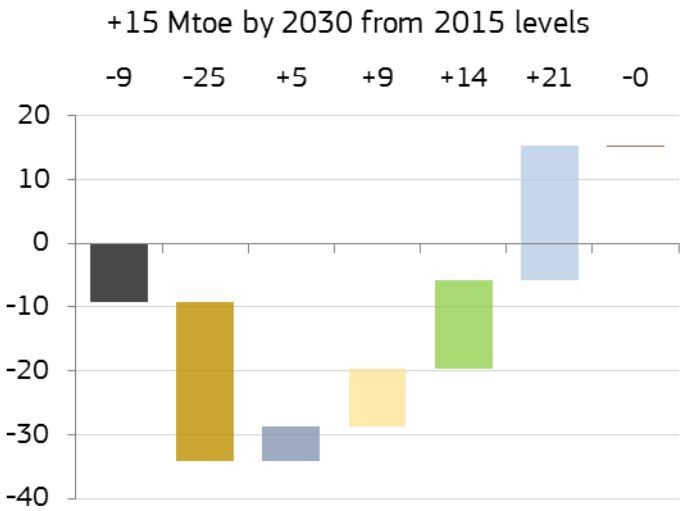
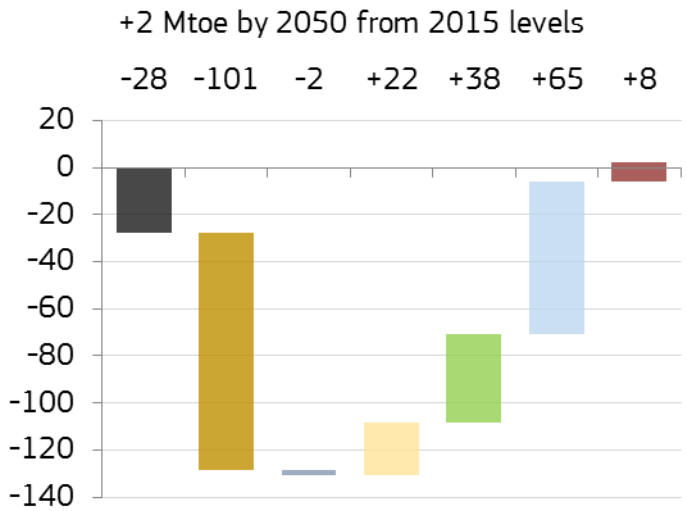
Demand side: Fuel mix







Important changes in the fuel mix, driving down the carbon intensity

Further electrification

- Transport through uptake of EVs
- Industry
- In buildings, increase in thermal uses outweigh lower specific electricity uses

Rise in the use of derived heat

Important uptake of renewable fuels

- Solar in buildings
- Biomass in industry
- Biofuels in transport

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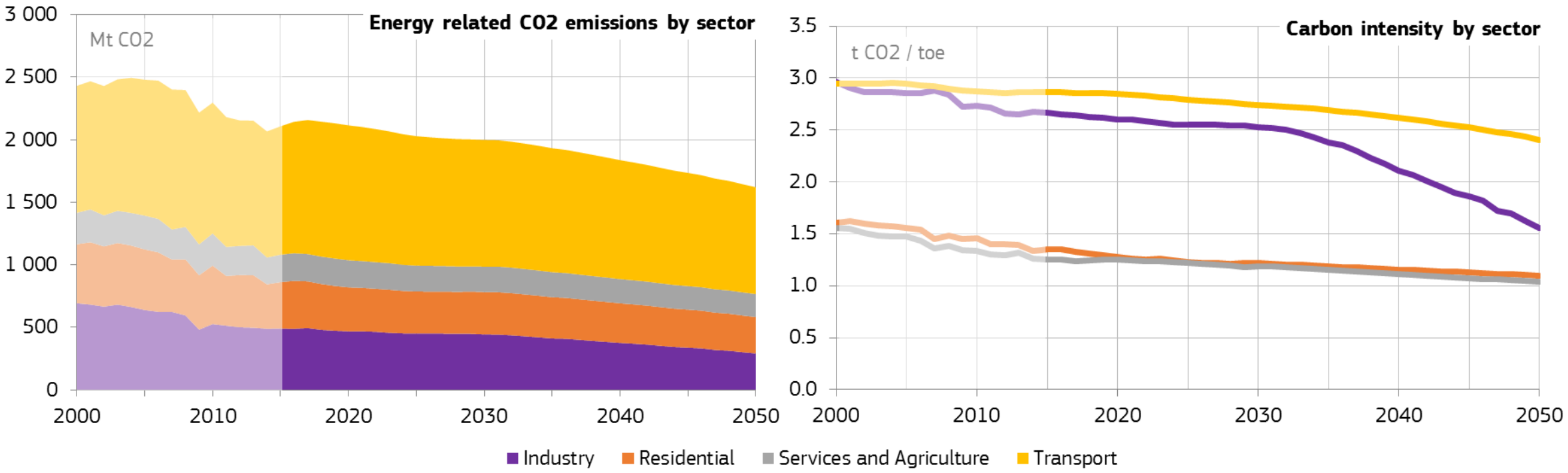
Demand side: CO_2 emissions



Demand side CO_2 emissions decline by 24%

- Significant decline of carbon intensity in industrial sectors beyond 2035, also through carbon capture
- In the transport sector energy consumption gradually delinks from CO_2 emissions
- Pronounced improvements for domestic sectors

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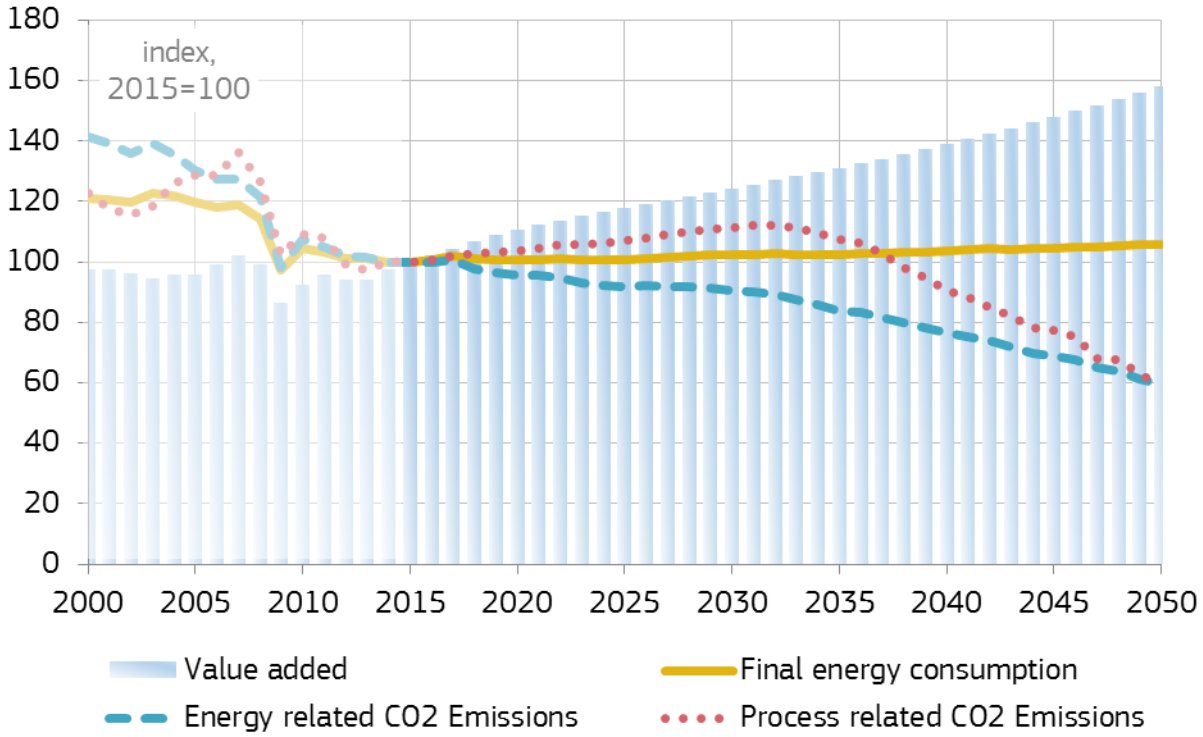
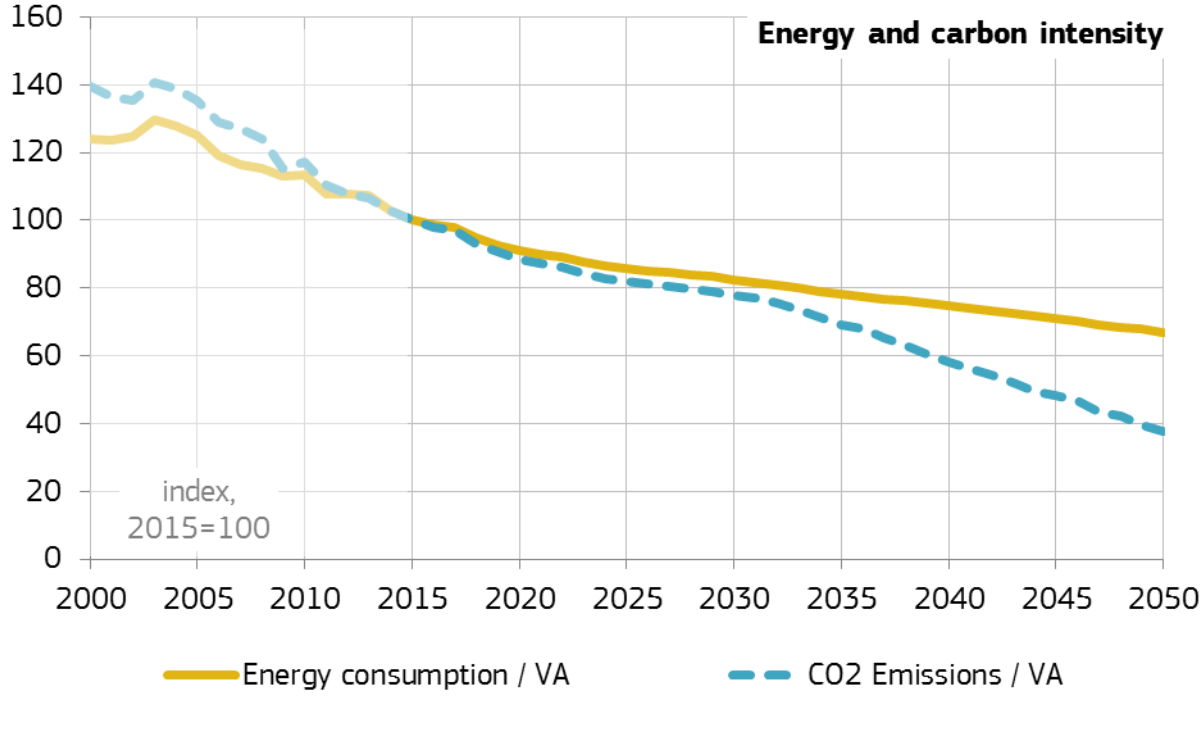
Industry: An overview





Continued decoupling of energy and CO_2 emissions from economic growth

- VA from manufacturing grows by almost 60%
- Energy consumption increases by 6%
- CO_2 emissions contract by 40% driven by carbon capture from 2035 onwards

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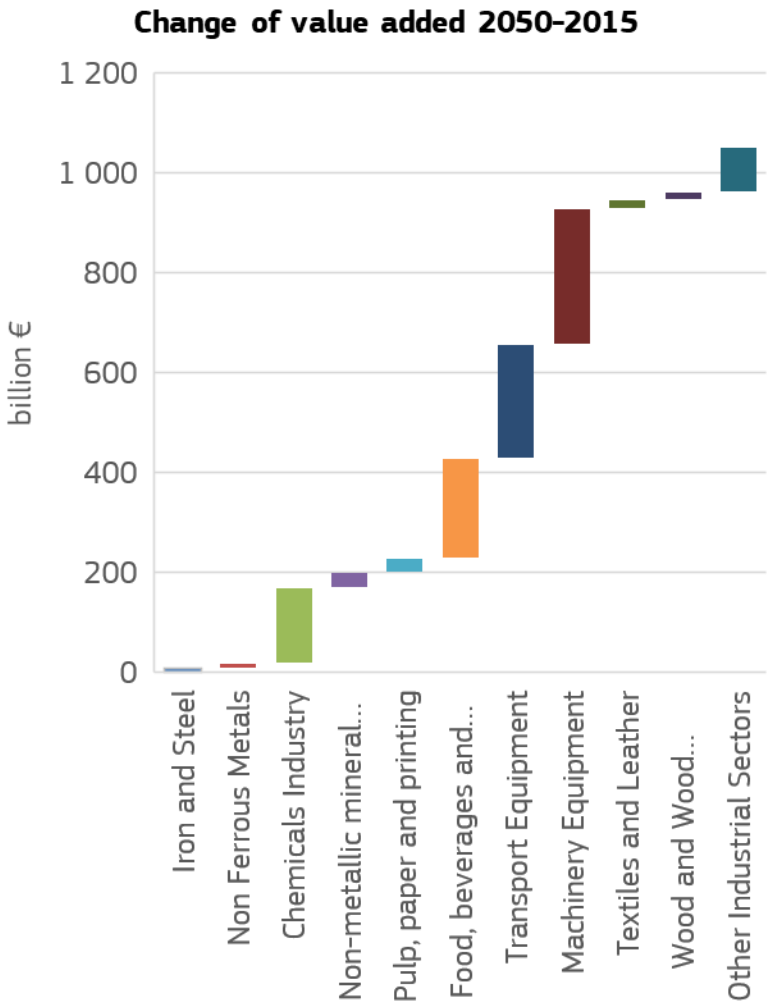
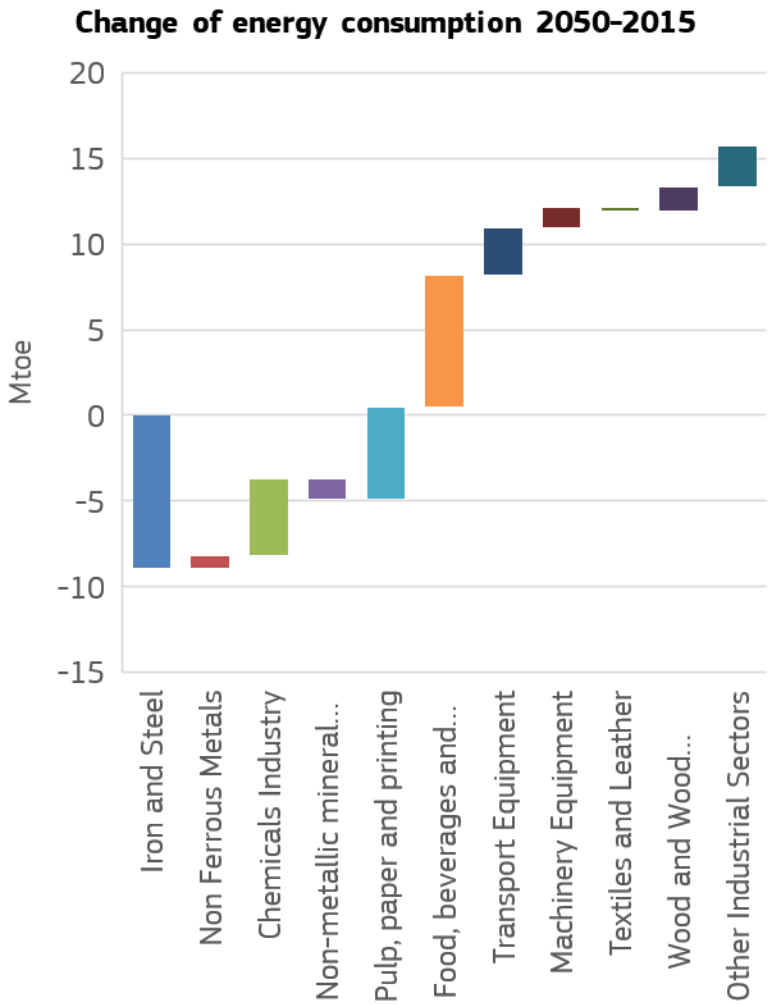
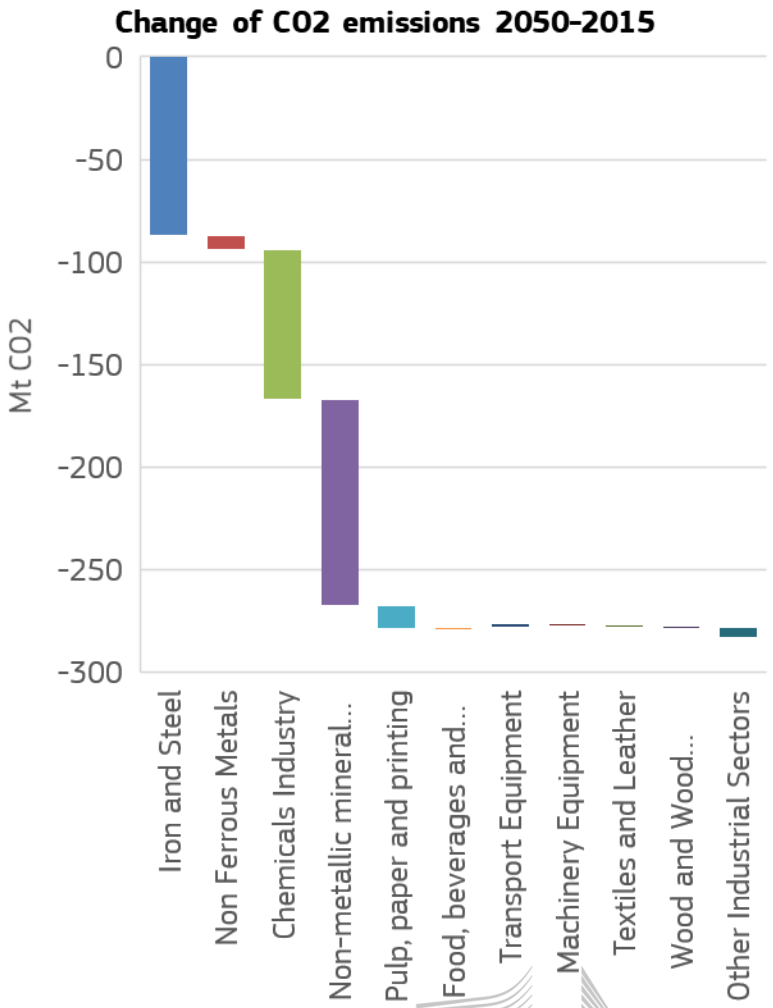
Industry: Sectoral trends







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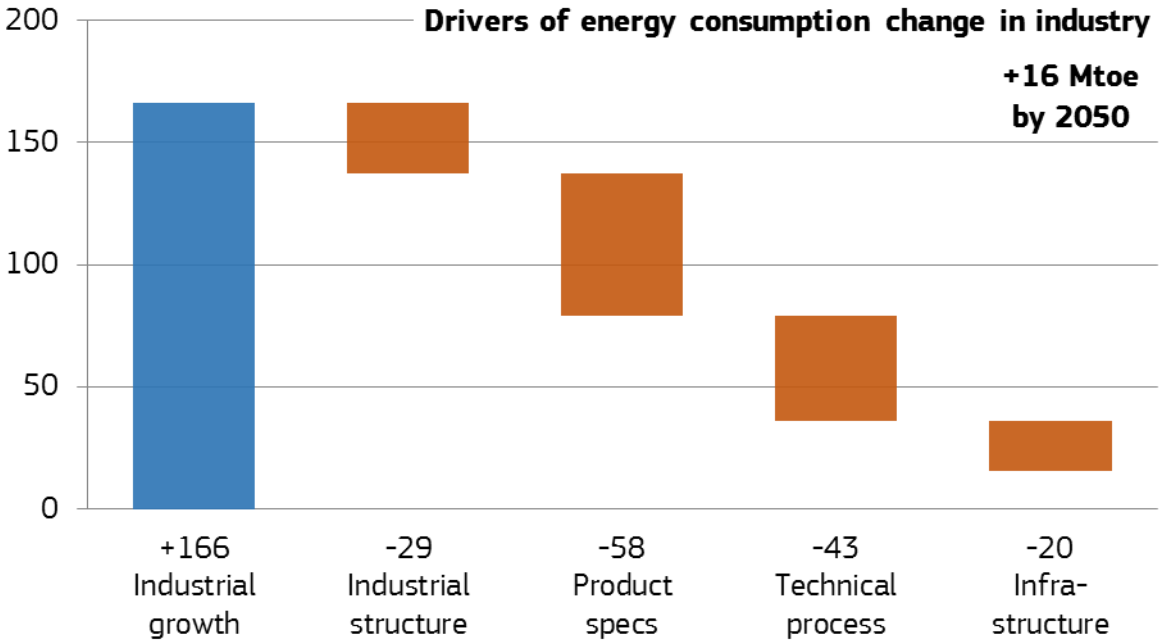
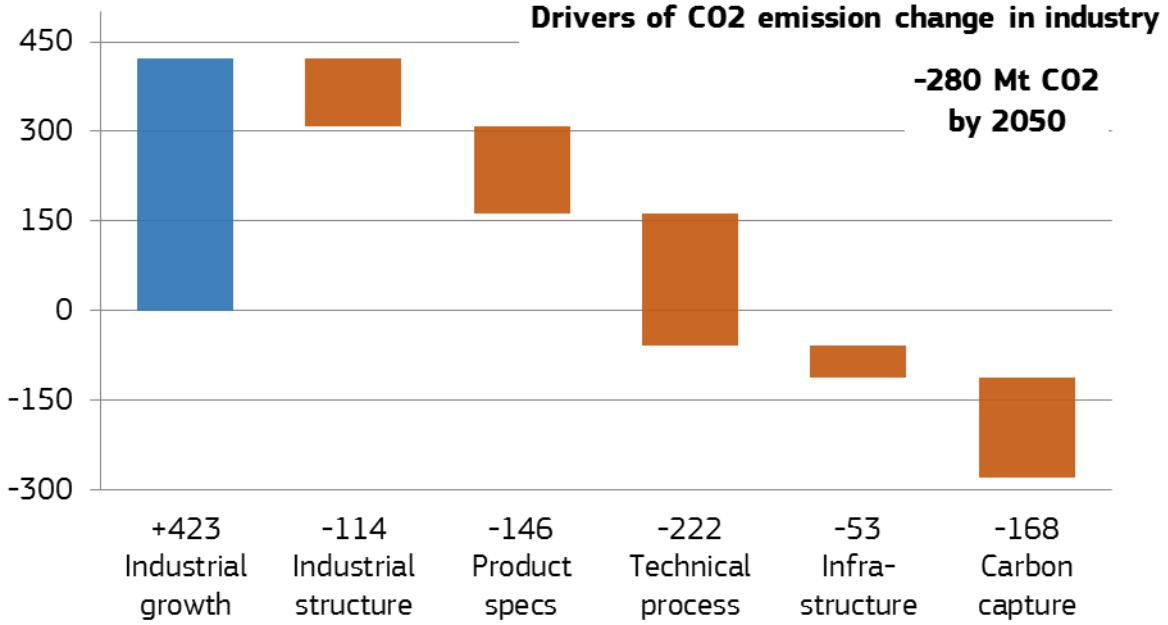
Industry: Quantifying the role of different drivers





Decoupling of energy use and CO_2 emissions from economic growth is driven by

- Changes in the industrial structure and products characteristics
- Technical process changes
- Non-energy equipment related improvements
- Carbon capture

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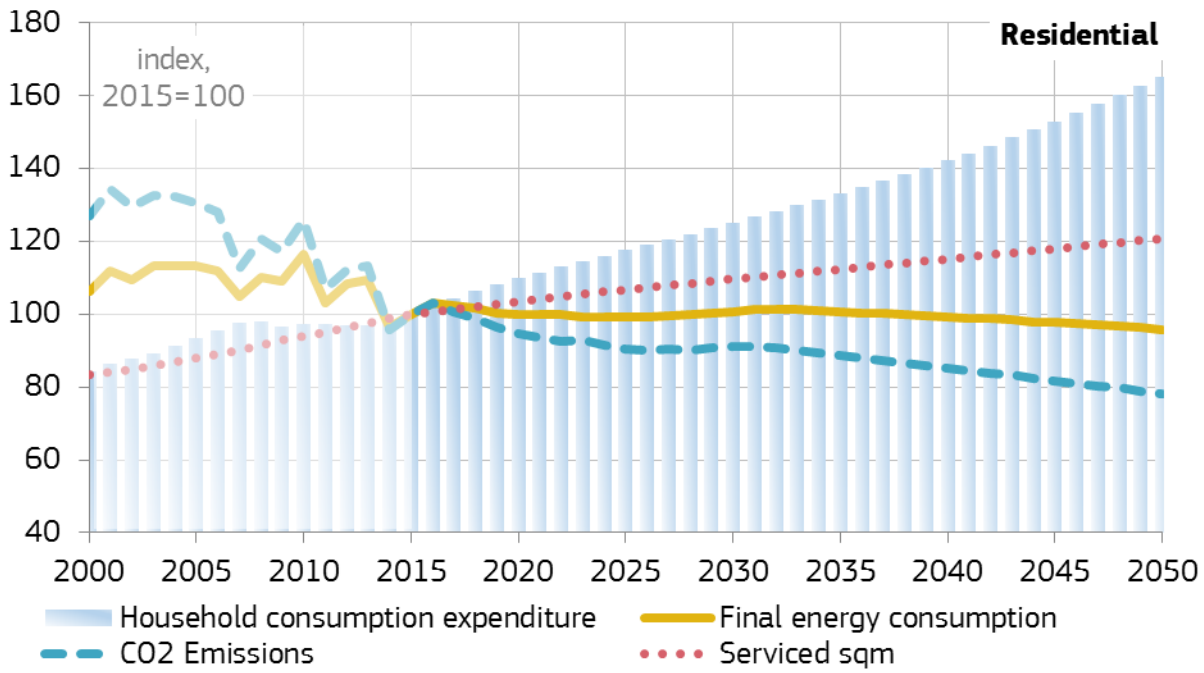
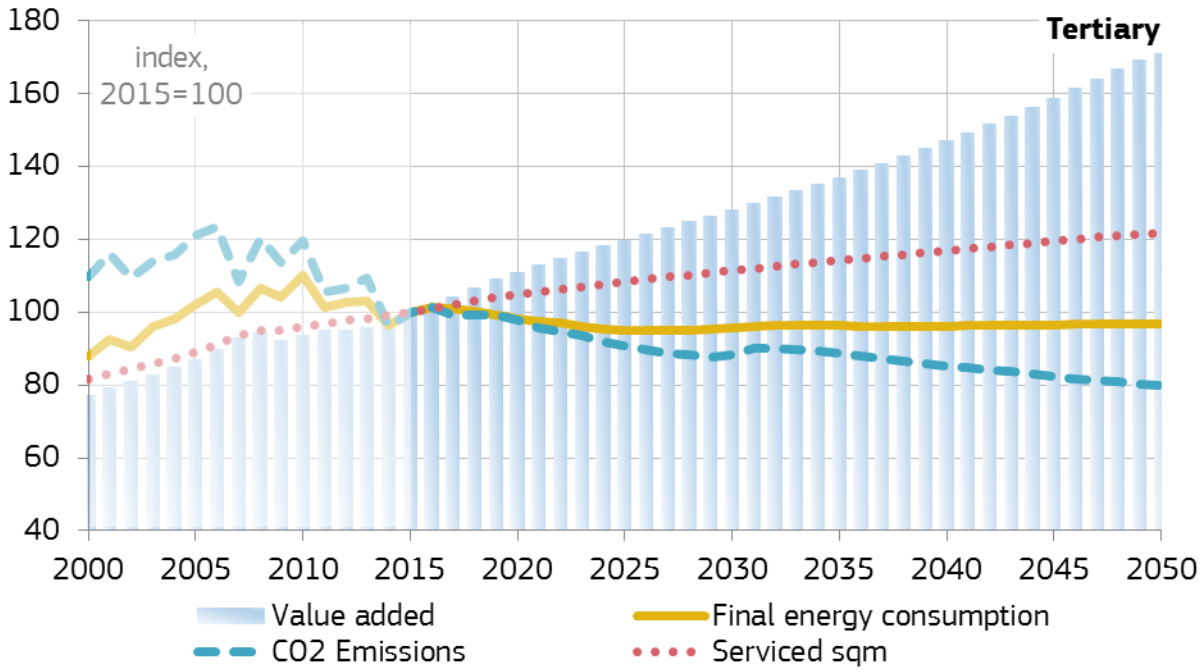
Buildings: An overview





Similar trends for residential and services sectors

- Delinking occurs not only relative to the economic drivers but also as regards the serviced surface area
- Energy needs remain rather stable over the projection period
- CO_2 emissions decline steadily with temporary upsurge around 2030

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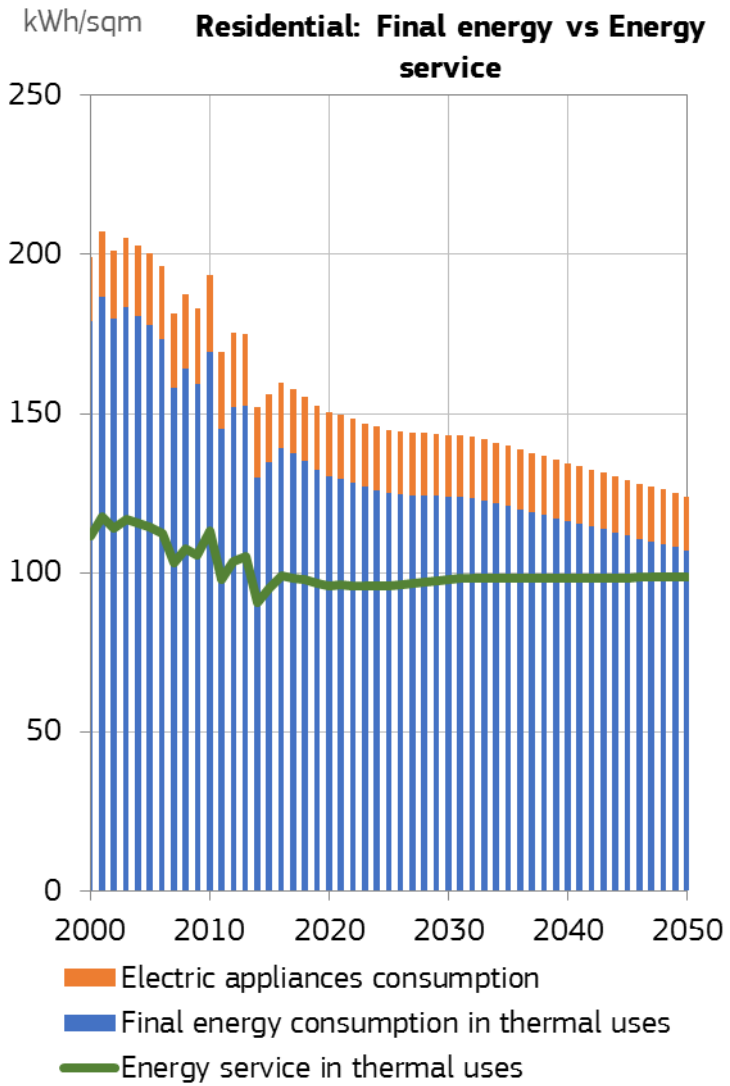
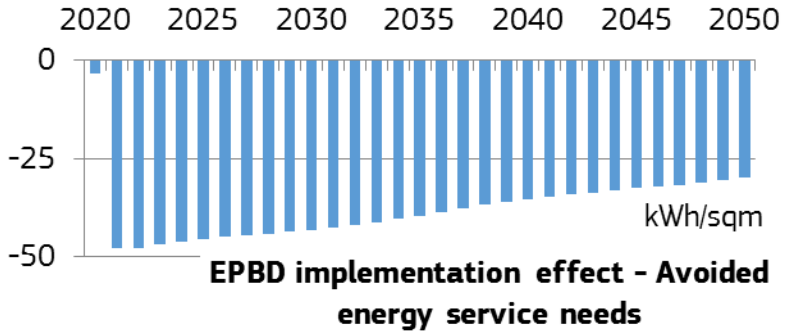
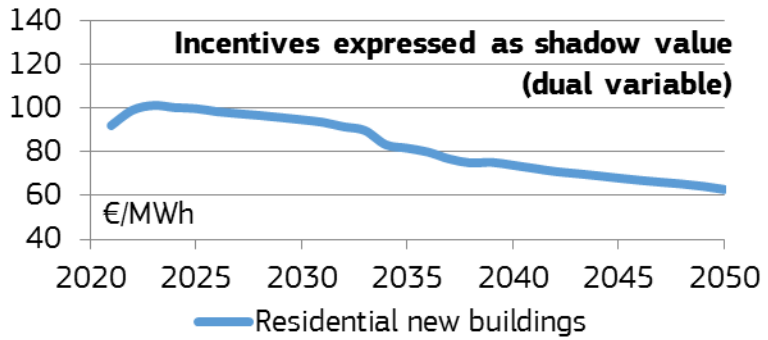
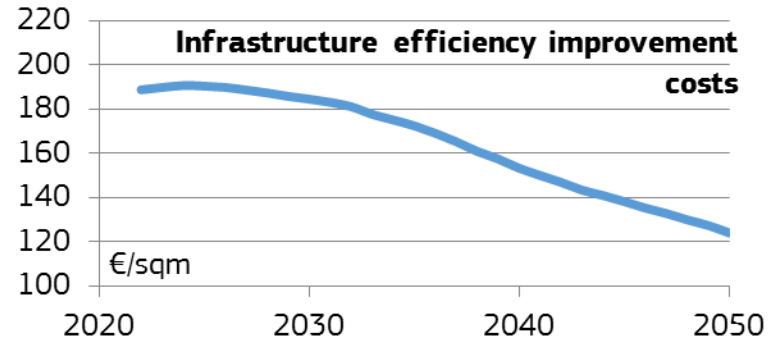
Residential: The role of EPBD









Near stabilisation of energy service needs in thermal uses

- in early years, investments in building insulations are the dominant options
- over time reductions result **also** from the deployment of very efficient equipment and embedded renewables

Related costs in building insulations follow a declining trend

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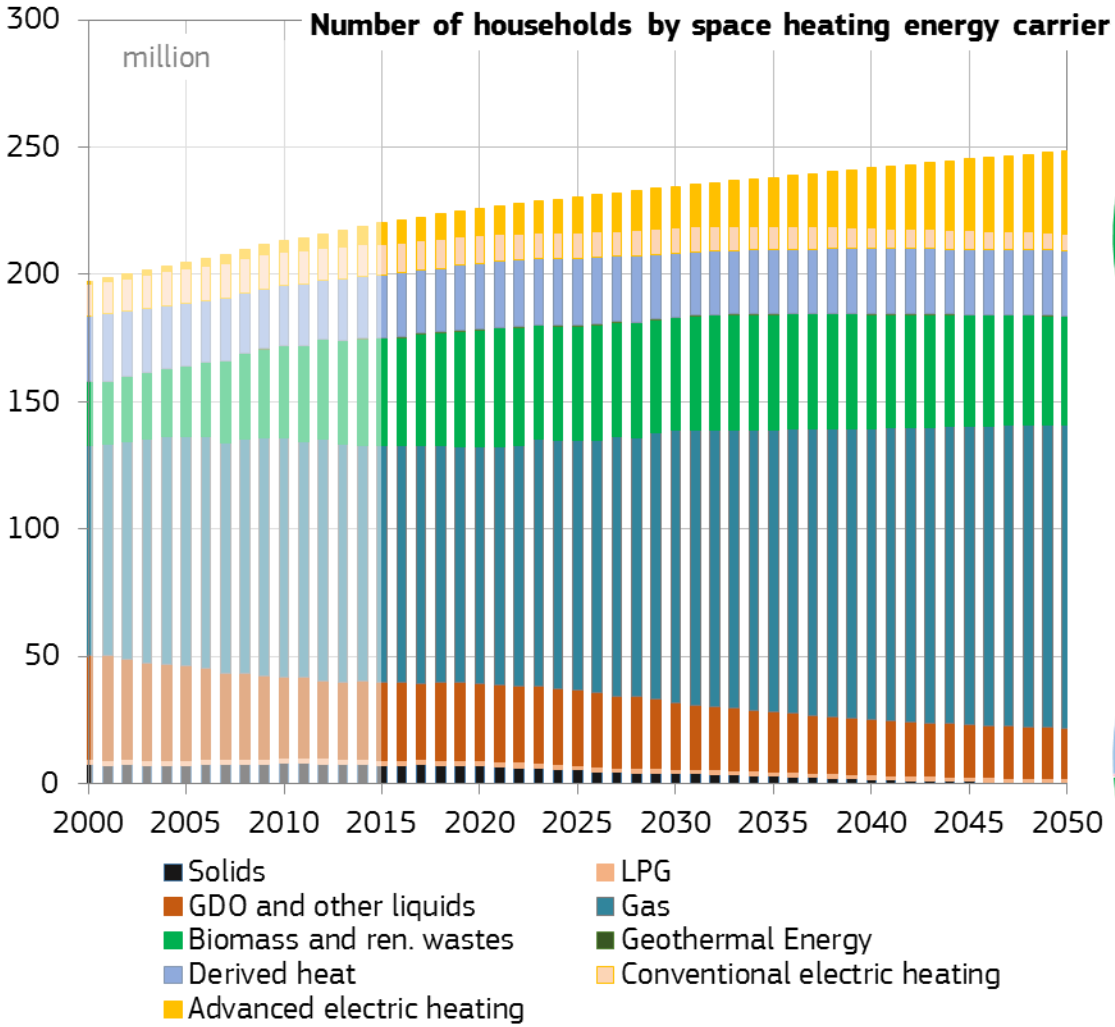
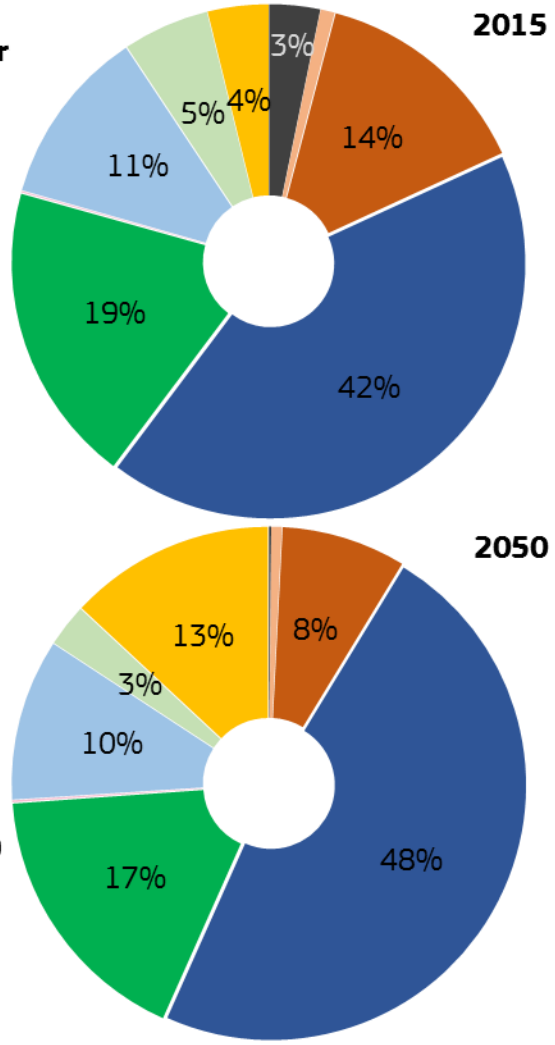
Residential: Building stock





Strong shift towards more efficient household types

- Solids become an obsolete option
- Liquids are faced with strong downward trends
- Efficiency issues make biomass space heating less attractive
- The same for conventional electric

Two clear winners:

- Natural gas and
- Advanced electric (heat pumps)

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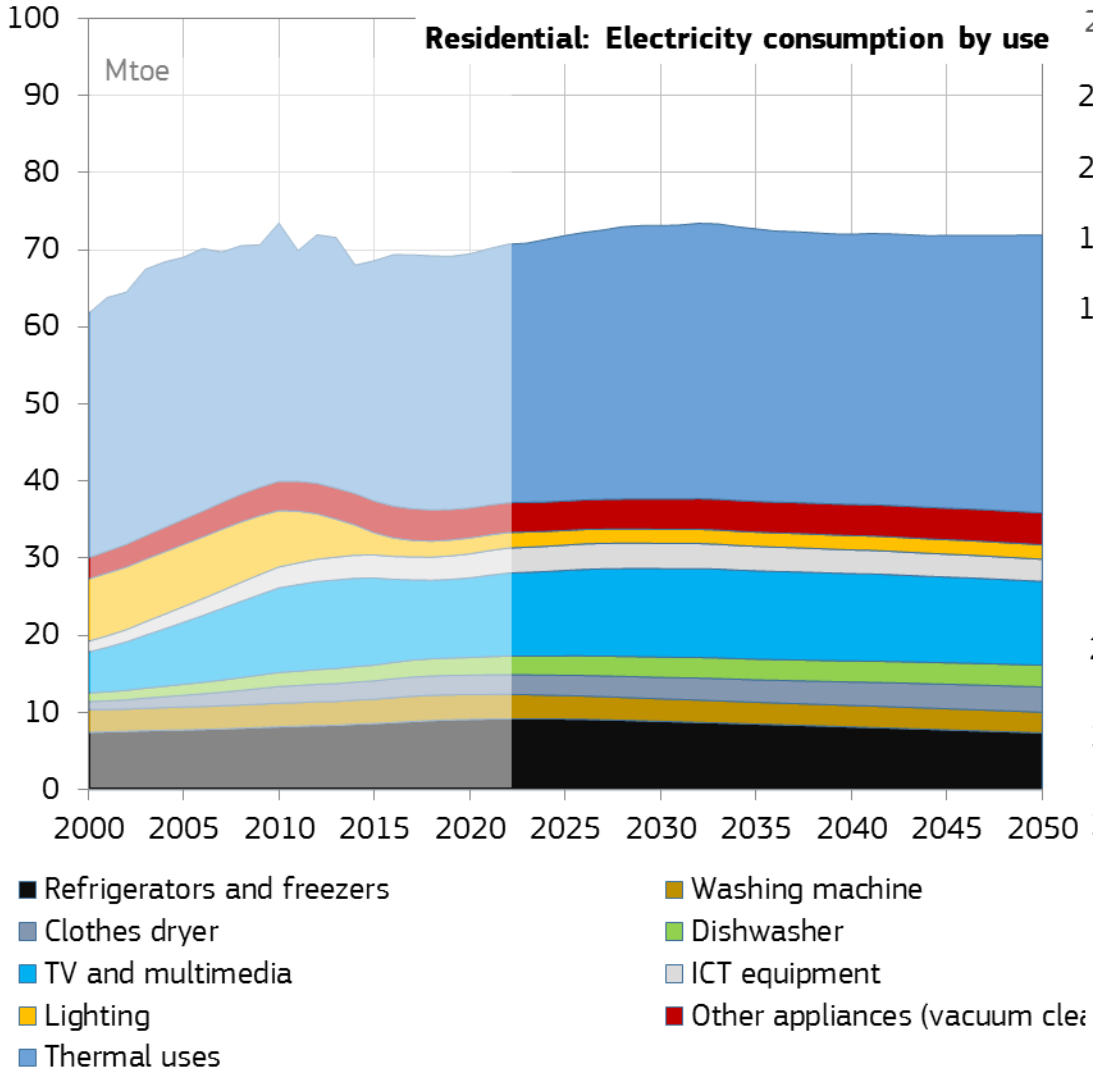
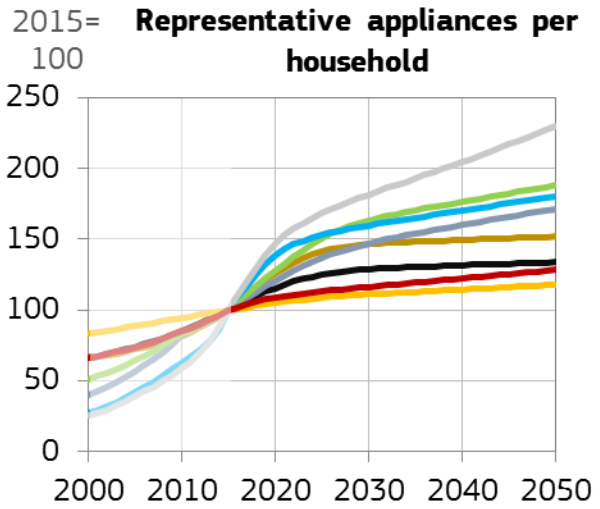
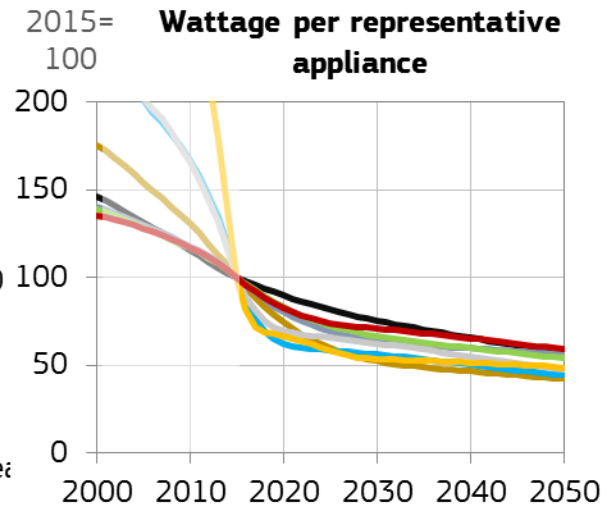
Residential: Electricity demand







- Demand of specific electricity uses slightly declines
  - Evidence of some saturation effects
  - Technology progress continues though at a slower pace
- Overall increase driven by heating and cooling uses
  - Large increase of heat pumps equipped households
  - Strong penetration of air conditioning
  - Counterbalancing factors: conventional electric households, solar water heating

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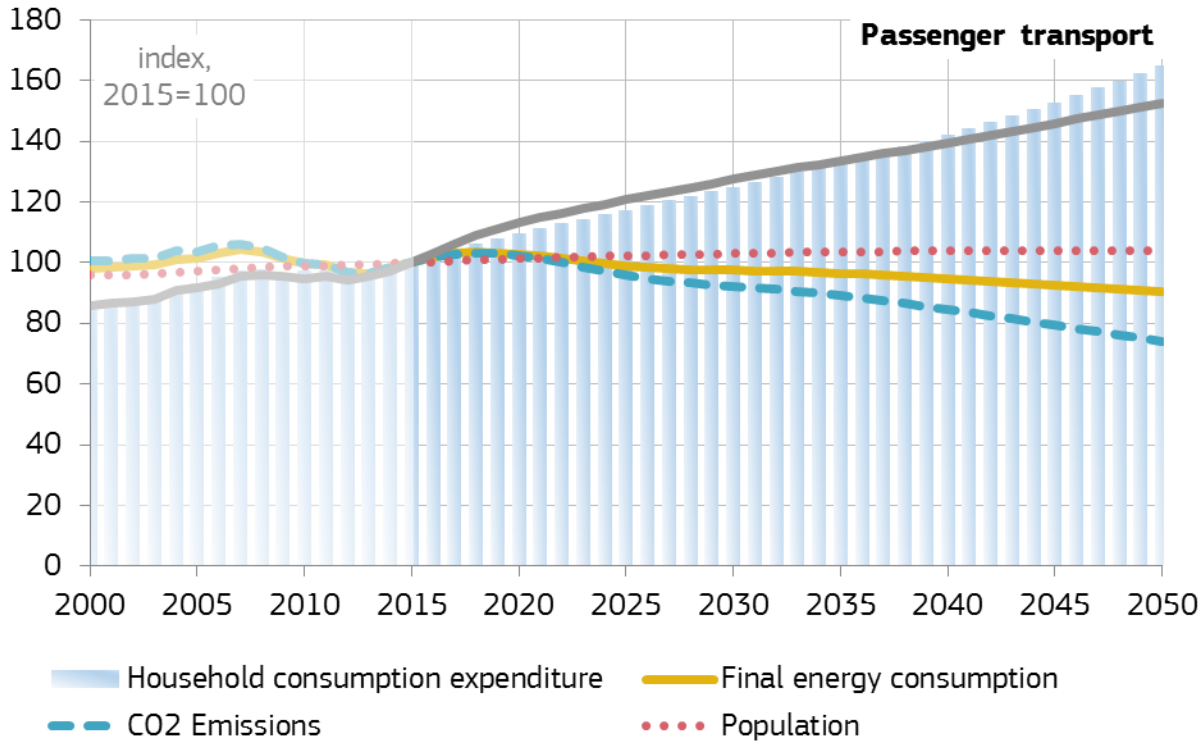
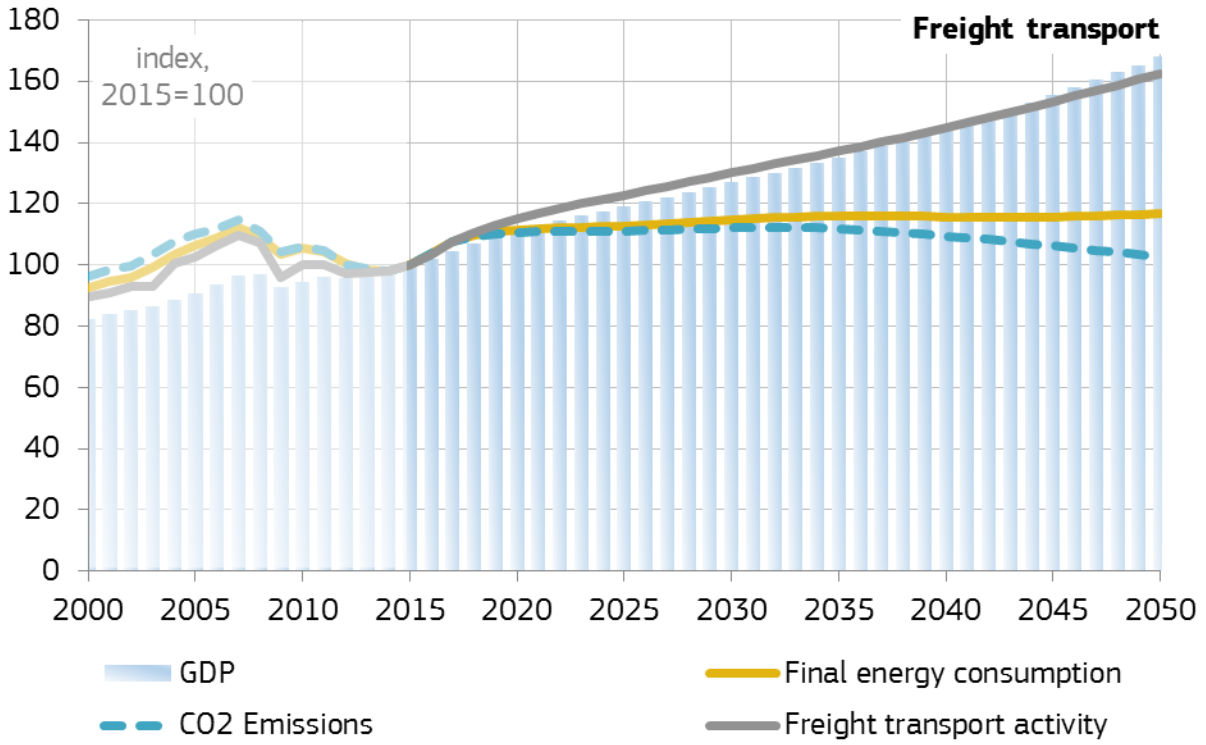
Transport: An overview





Limited delinking of activity from economic growth

Passenger transport exhibit significant improvements both for energy and CO_2 emissions

Freight transport demand grows but CO_2 emissions decline beyond 2030

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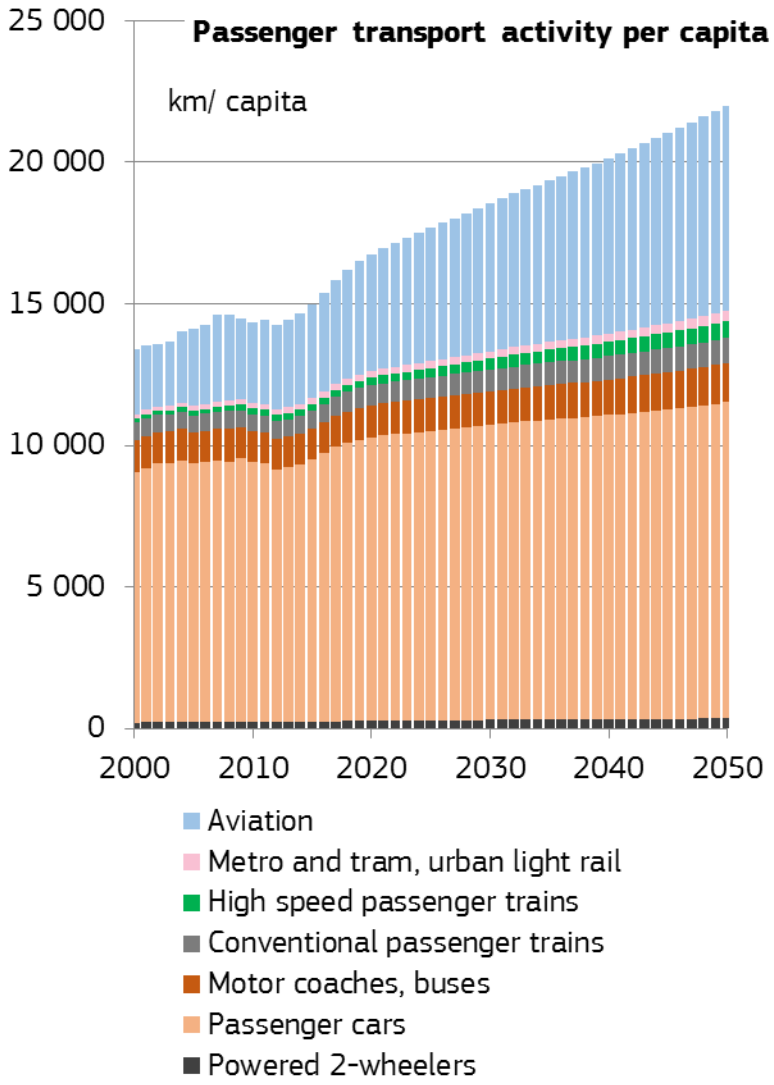
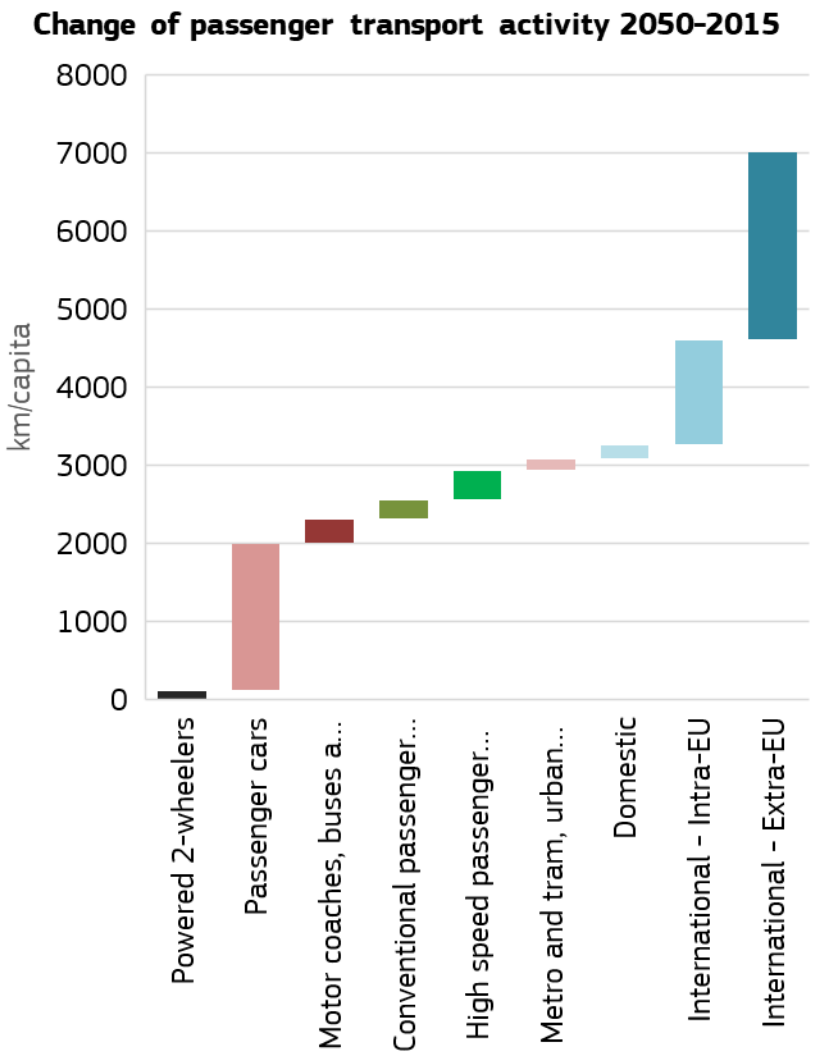
Transport: Passenger transport





Activity per capita increases by 7000 km pa

More than 55% coming from aviation:

- +1500 km pa intra EU
- +2400 km pa extra EU

Private cars activity increases by 1900 km pa

In percentage terms the highest growth is projected for high speed rail

- Almost tripling but still accounting for below 3% of total activity

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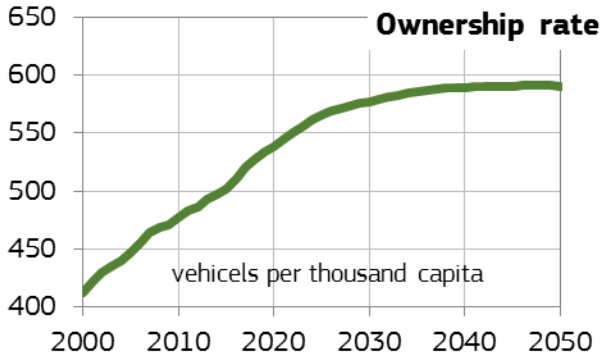
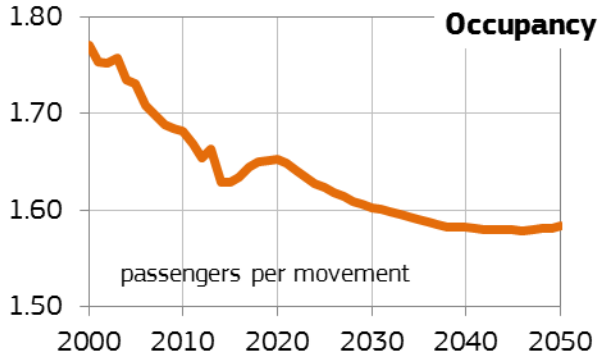
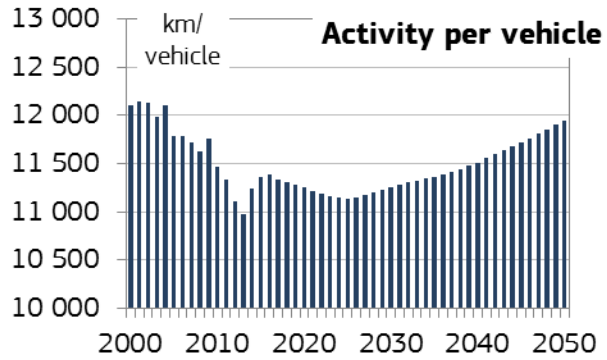
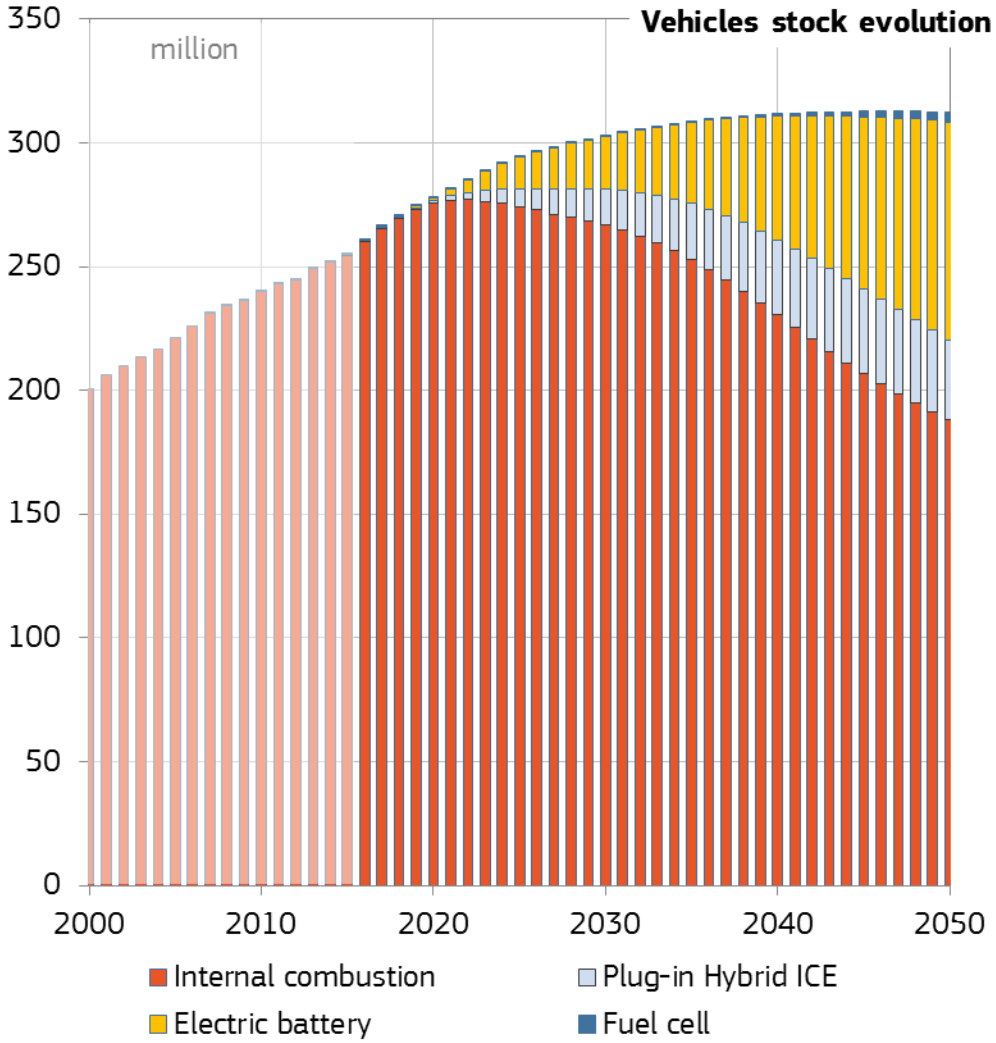
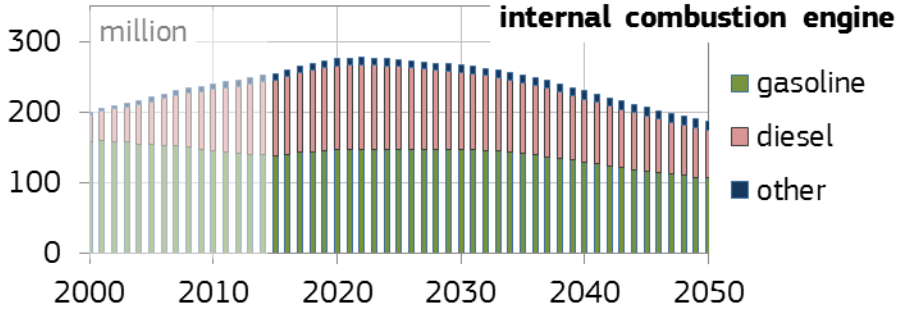
Transport: In focus – Private cars stock

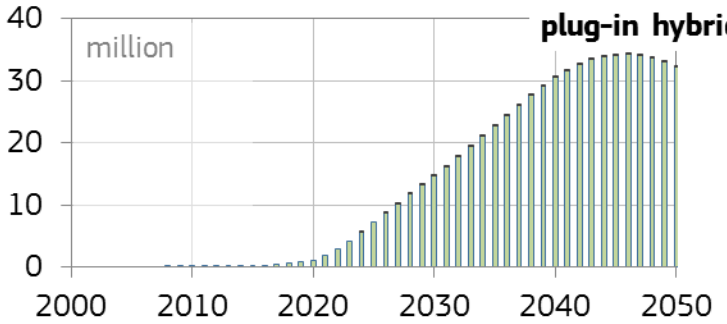


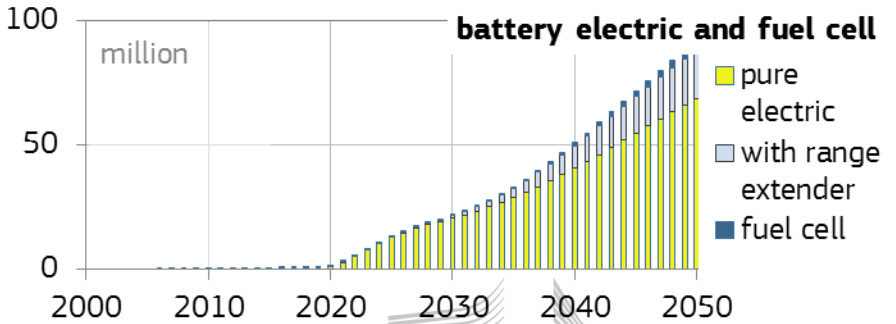












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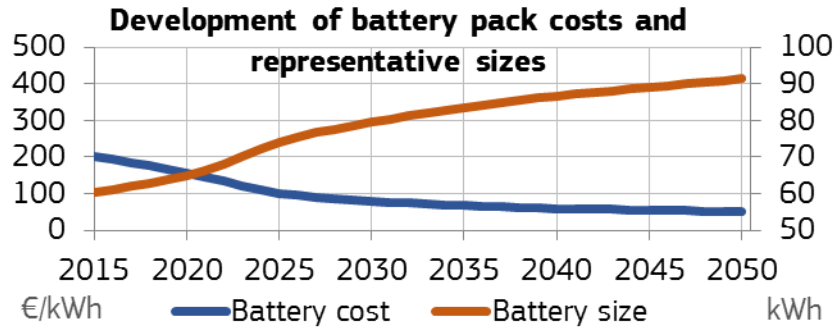
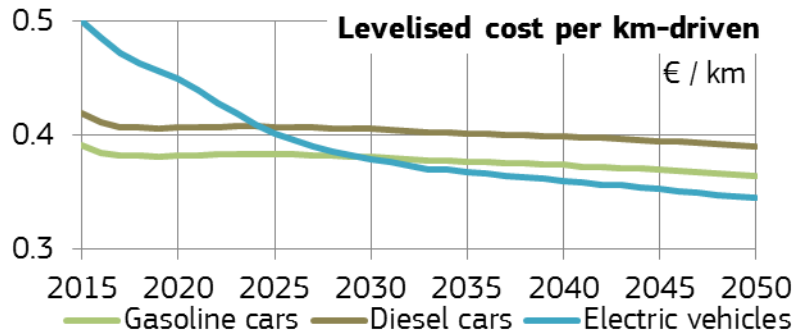
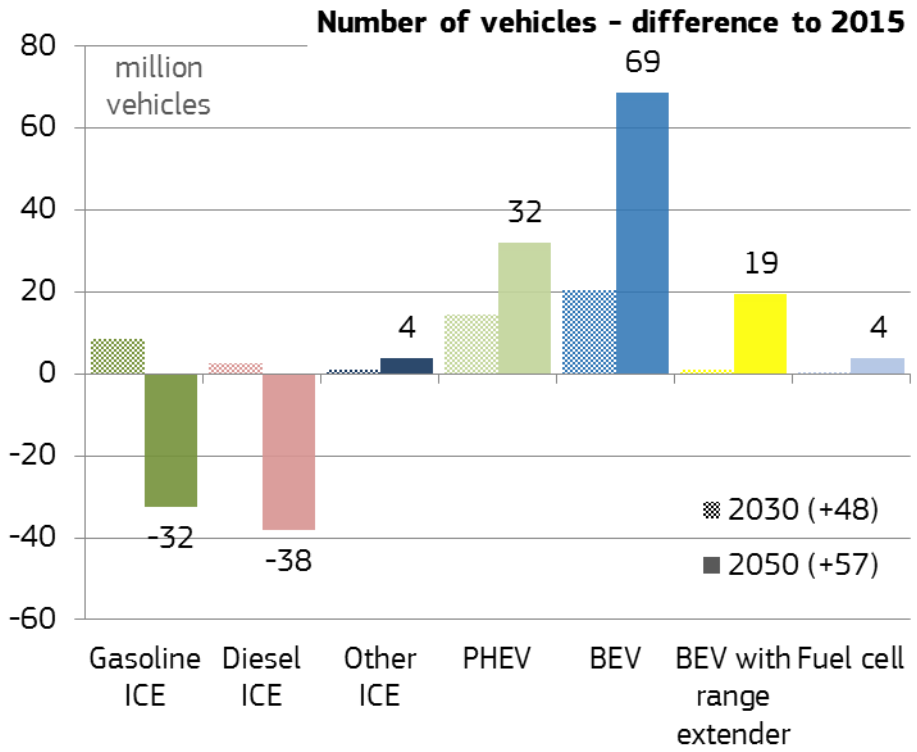
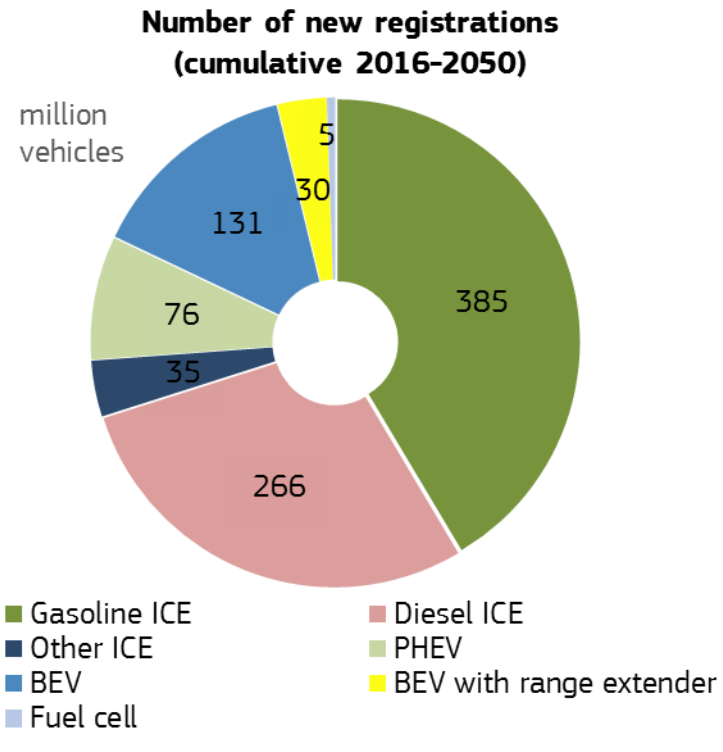
Transport: In focus – Private cars / Stock changes









930 million new vehicle registrations in 2015-2050

of which more than 70% in conventional technologies

electric vehicles only gradually enter the market

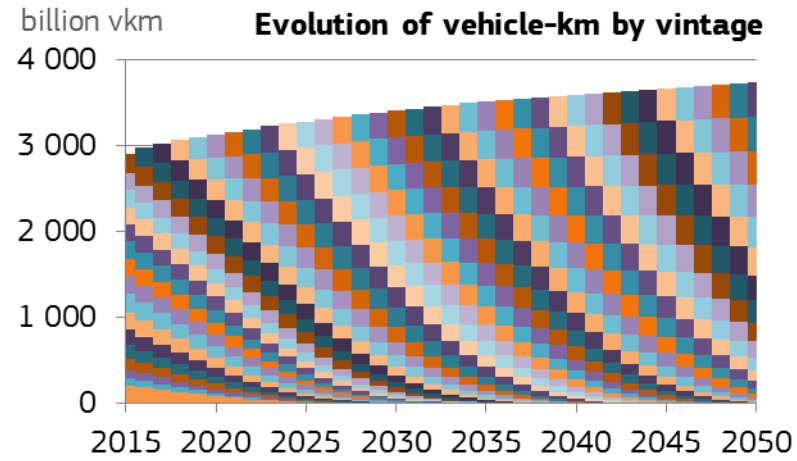
17% of new vehicle registrations in 2030; 40% of the stock in 2050

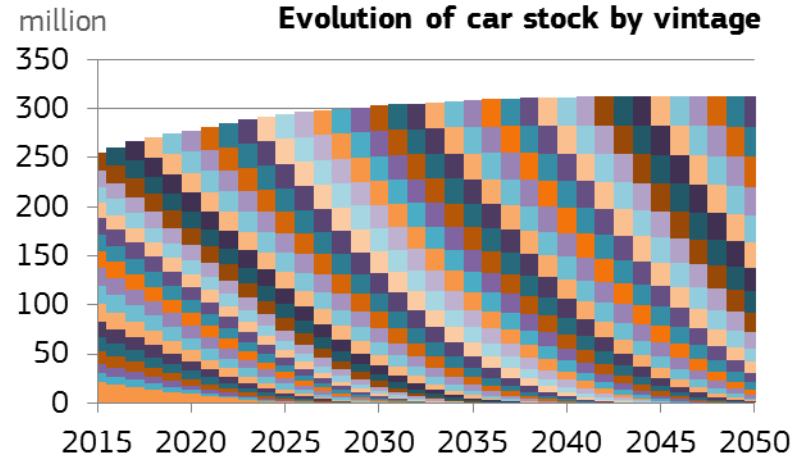
European Commission

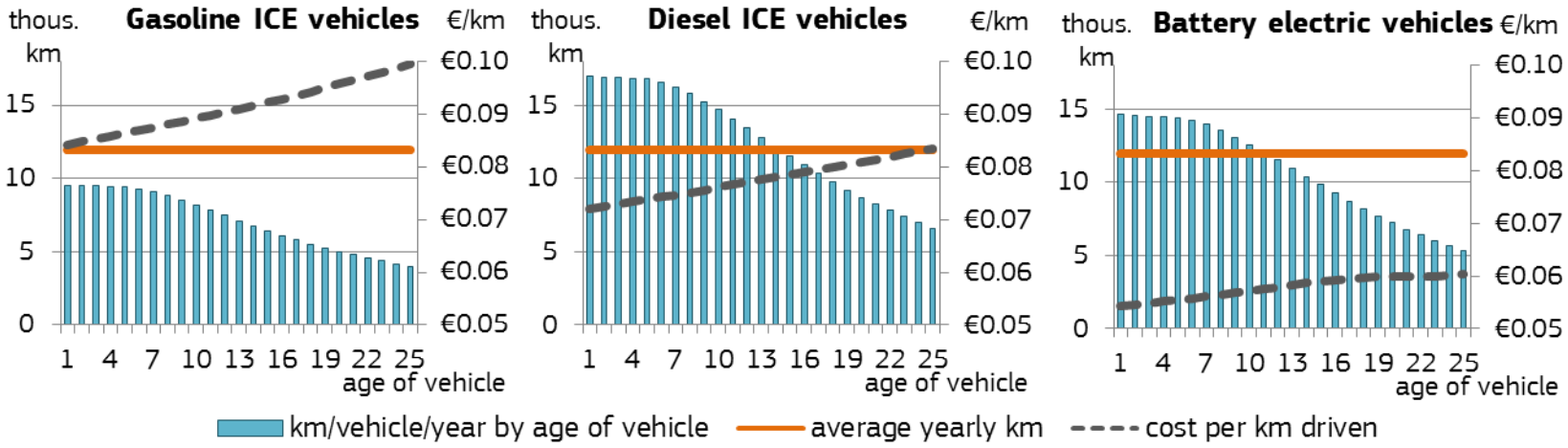
The Central scenario

Transport: In focus – Usage by vintage and type

- Annual km driven per vehicle depend on its vintage
  - In 2050 newly registered vehicles drive some 10% above average
  - Oldest vintages drive up to 37% less
- Vehicle types are also used differently
  - Newly registered electric vehicles drive 22% more due to low costs
  - Diesel vehicles continue operating well above average
  - Gasoline vehicles are operated well below (-20%) due to high costs







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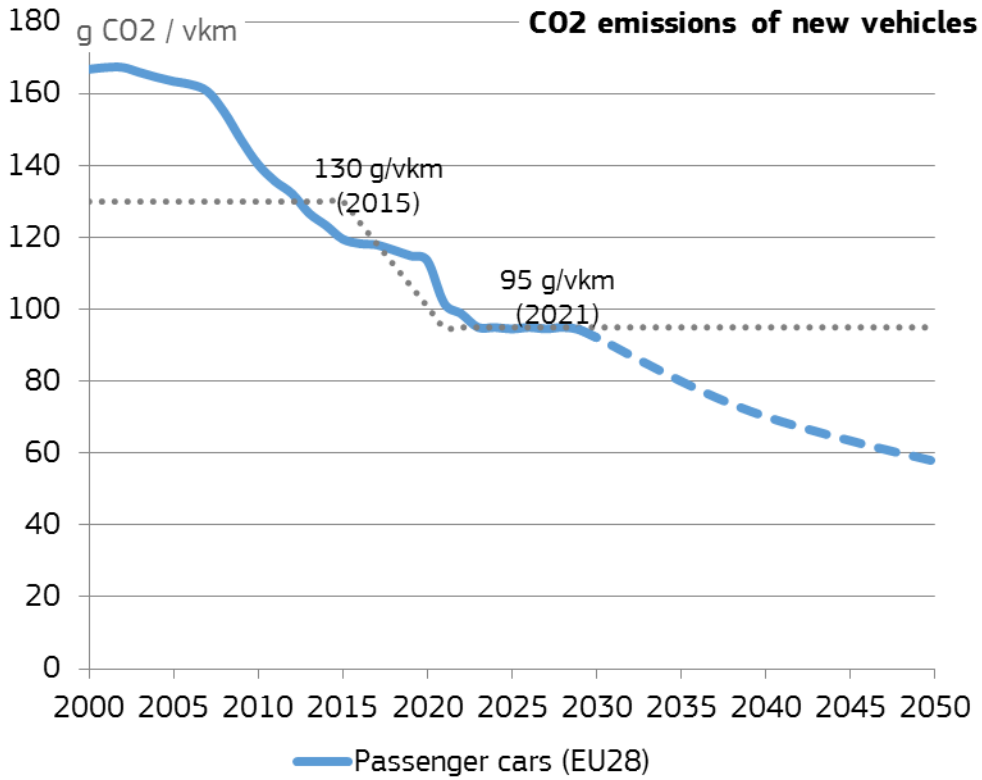
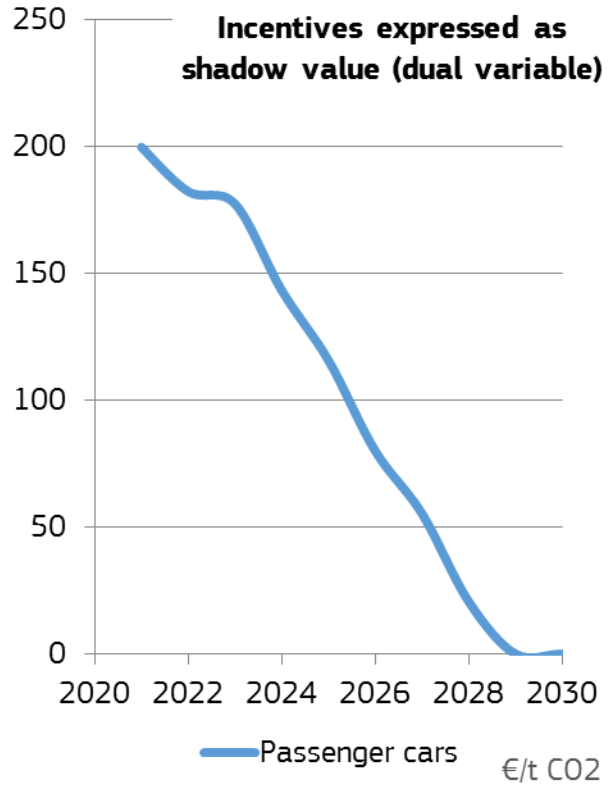
The Central scenario

Transport: In focus – CO_2 standards in private cars

- CO_2 performance standards for new vehicles met at EU level
  - Emissions expressed according to the NEDC test cycle
  - 95 grams of CO_2 per kilometre from 2021 onwards
  - Super-credits are being taken into account and contribute in meeting the target until 2023
- Beyond 2028 technology progress paves the way in meeting the 2021 CO_2 standards without the need of any policy incentive





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The Central scenario

Power generation: Main drivers

Increased electrification

- driven by electro-mobility in transport and the continued electrification of industry

Nuclear phase-out policies + decommissioning schedules

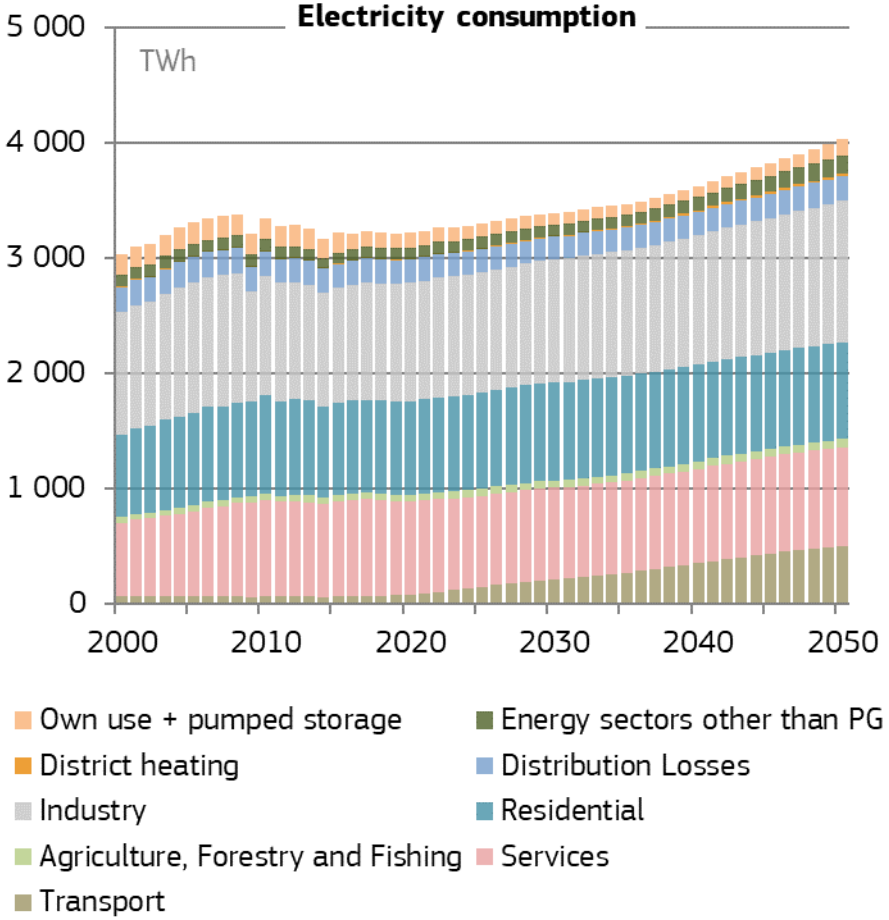
Technology progress

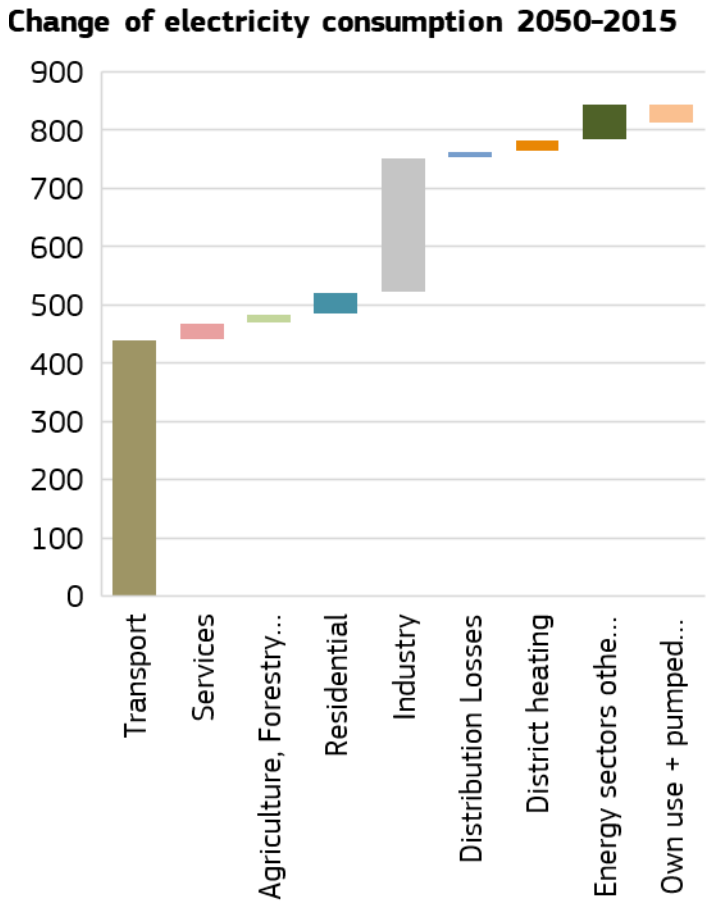
- solar photovoltaic becoming the cheapest power generation technology, followed by (onshore) wind
- carbon capture becoming a viable and cost competitive option in the long run
- maturing of flexible storage options (battery installations)

The EU ETS

The Central scenario

Power generation: Electricity consumption





Electricity consumption increases by 25%

Transport sector accounts for 54% of incremental needs in 2050

Industry for 28%

New players in the market include

- district heating (8-fold growth)
- hydrogen production beyond 2035

Own use in the power sector declines (-24%)

Partially counterbalanced by pumped storage (+33%)

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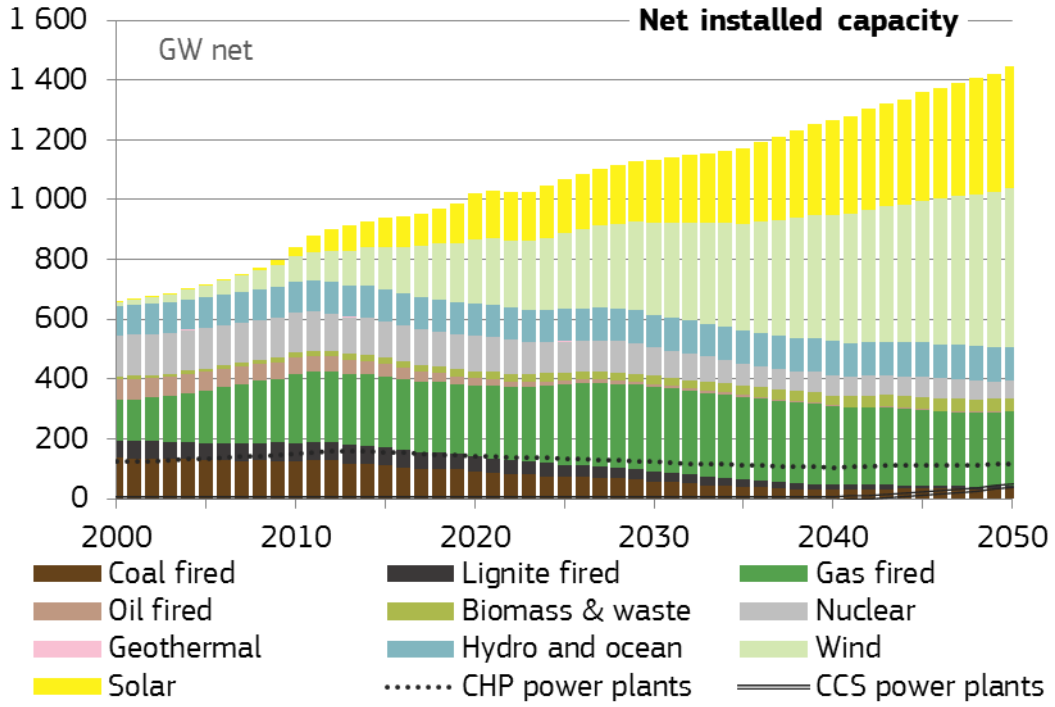
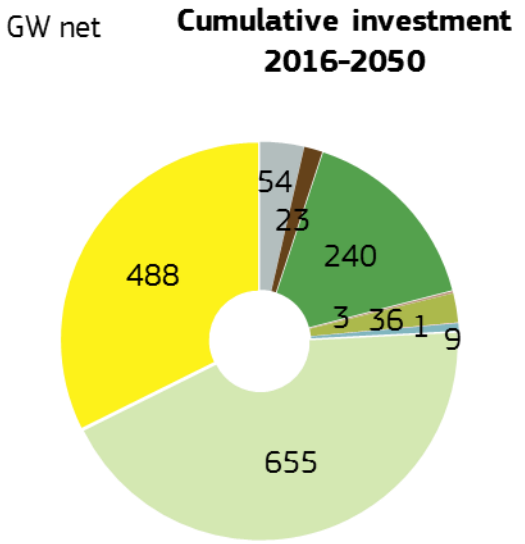
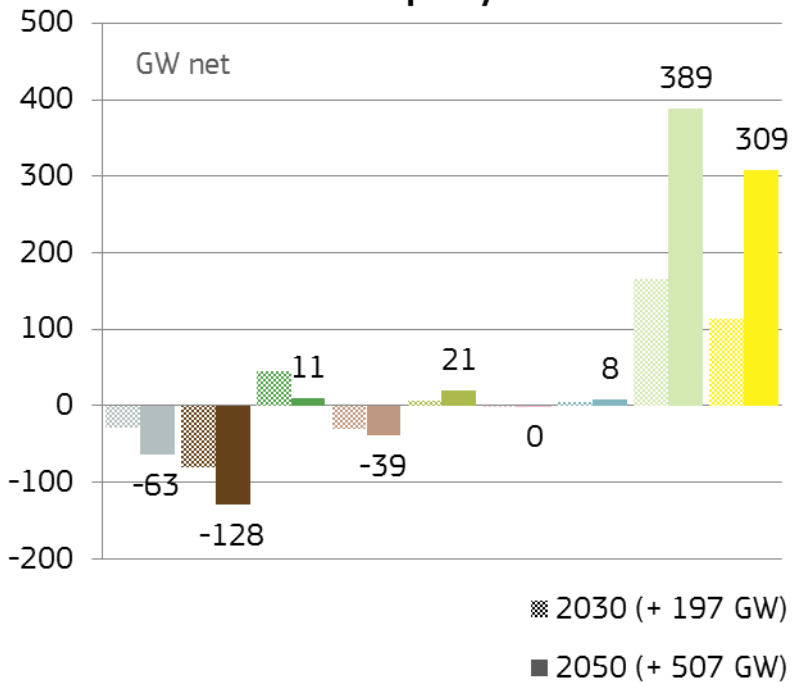
The Central scenario

Power generation: Installed capacities







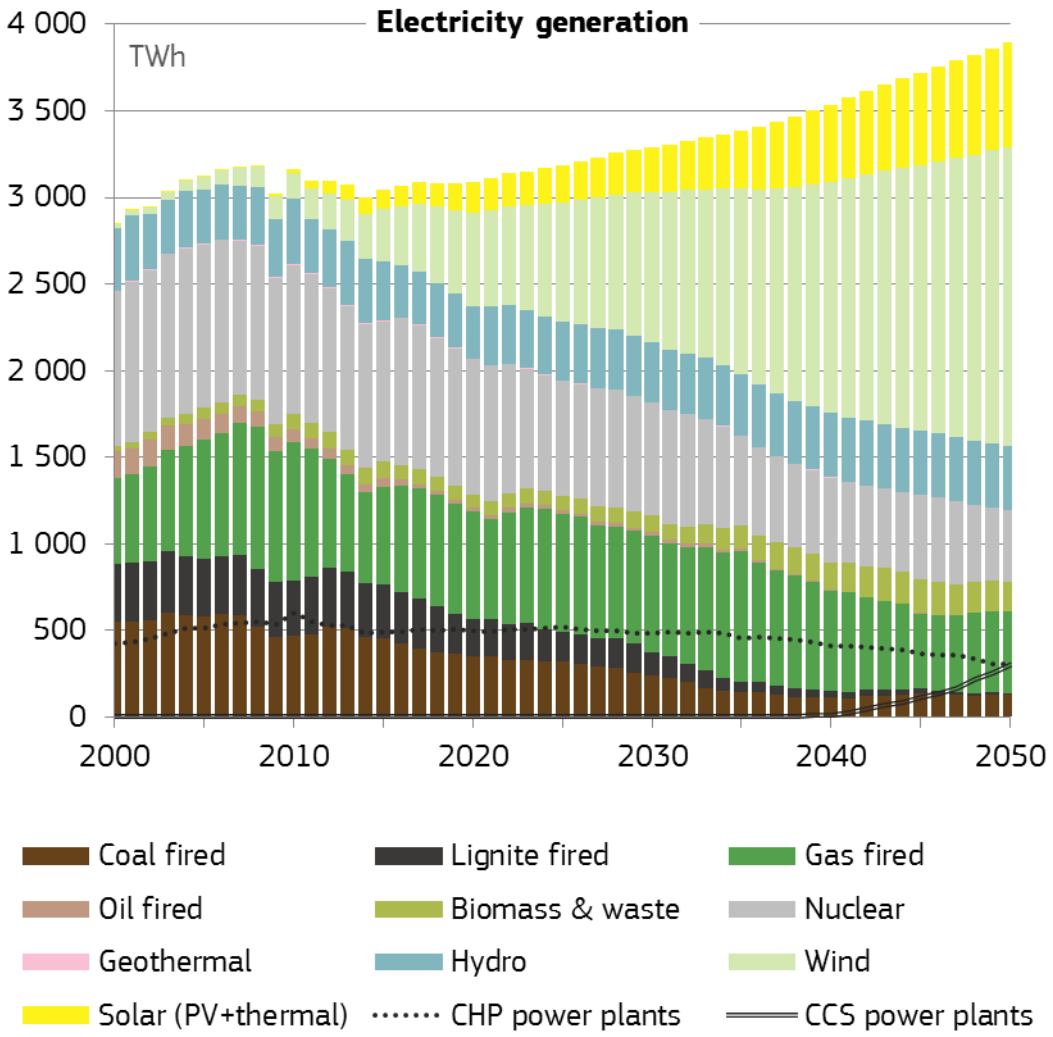
Net installed capacities in 2050 total 1.49 TW, 51% up from the 2015 level

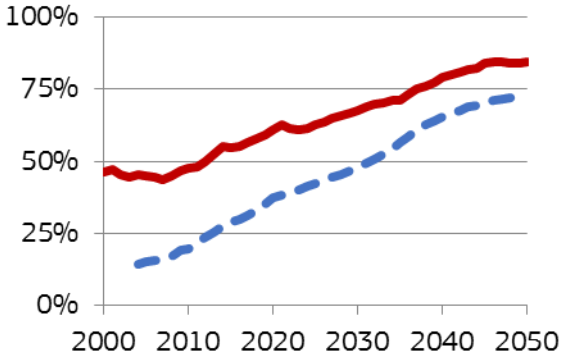
- fossil-fuel based power plants drop from 46% in 2015 down to 22% in 2050
  - of which 12.5% (from 4%) biomass fired; 15% equipped with CCS; 34% CHP
- wind accounts for 36% (from 14%) and solar for 27% (from 10%)
- nuclear share constantly declines (from 12% in 2015 to 4% in 2050)

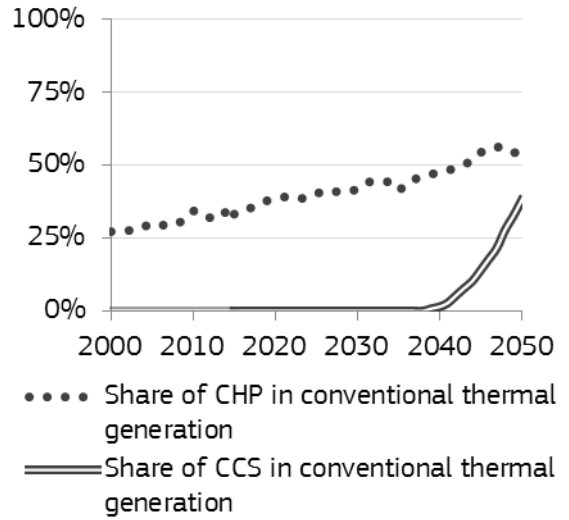
European Commission

The Central scenario

Power generation: Electricity generation







Carbon free electricity generation constantly grows

by 2050, 79% of net electricity is generated without emitting CO_2

- intermittent renewables account for 69% up from 25% in 2015
- nuclear limited to 11% from 26%

conventional thermal electricity undergoes significant changes

- 55% is generated in CHP power plants (from 33% in 2015)
- biomass role also increases (22% in 2050 from 6% in 2015)
- CCS emerges beyond 2040 accounting for 38% of conventional thermal electricity in 2050

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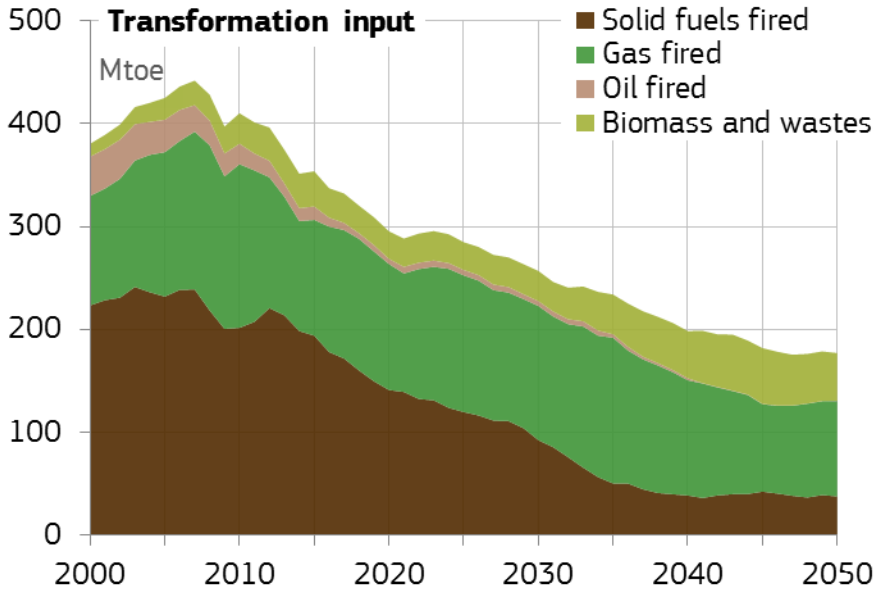
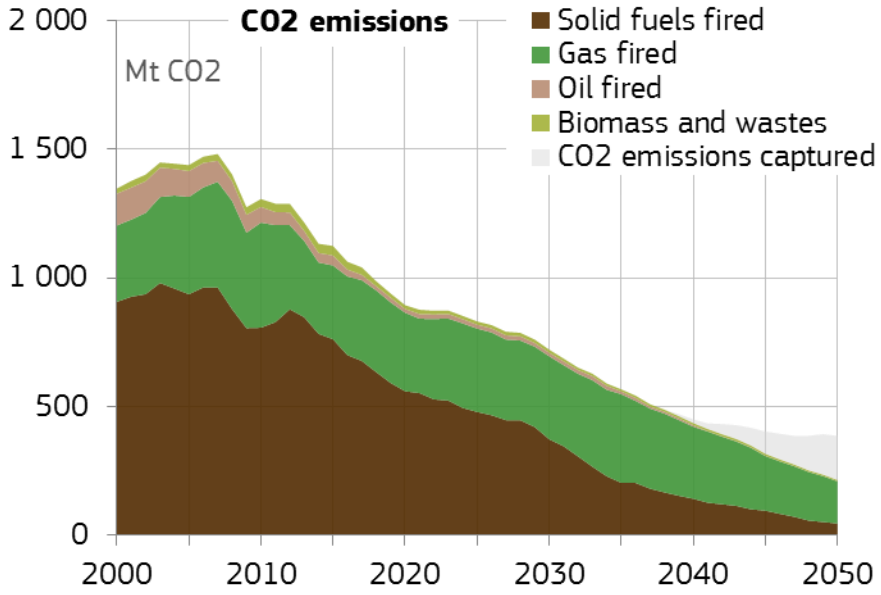
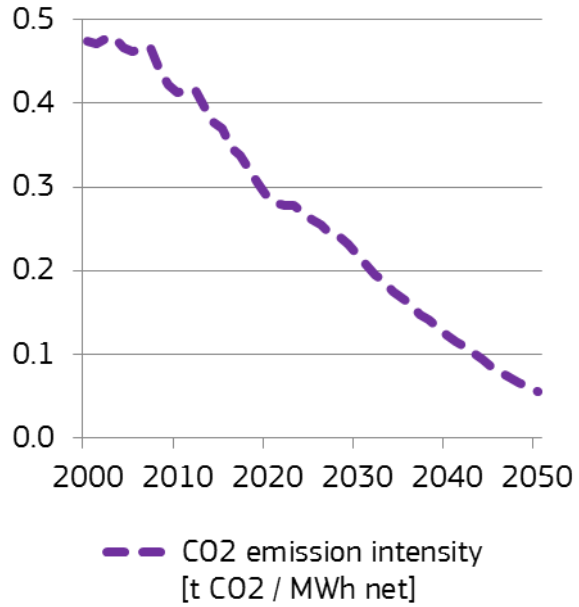
Power generation: Transformation input and CO_2







Fuel input in conventional thermal power plants halves in 2050 from 2015 levels

- input in CHP units increases from 37% up to 64%
- biomass share reaches 26% (from 10%)
- in 2050 CCS equipped power plants account for 38% of fuel input

CO_2 emissions drop below 20% of 2015 levels

- the carbon intensity of electricity generation drops by a factor of 7
- 45% of total CO_2 emissions are captured in 2050

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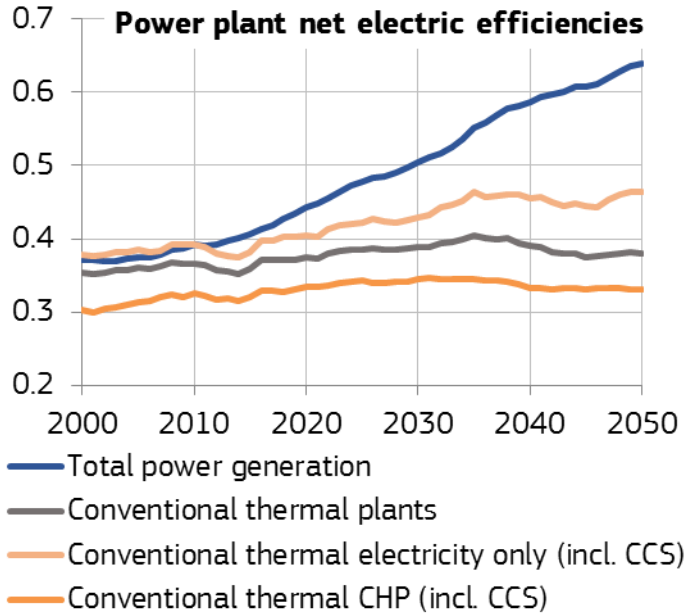
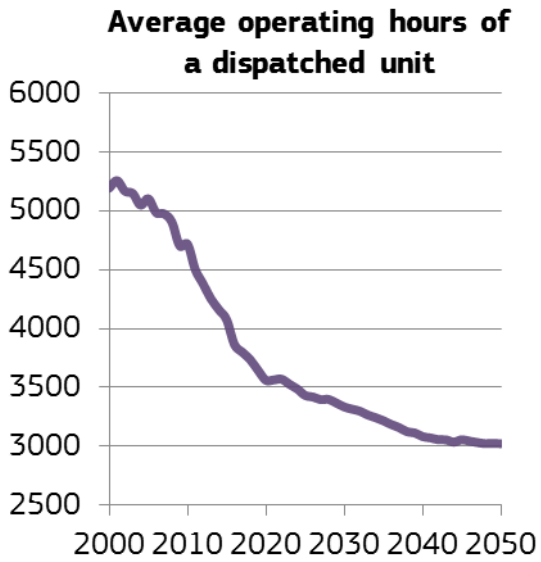
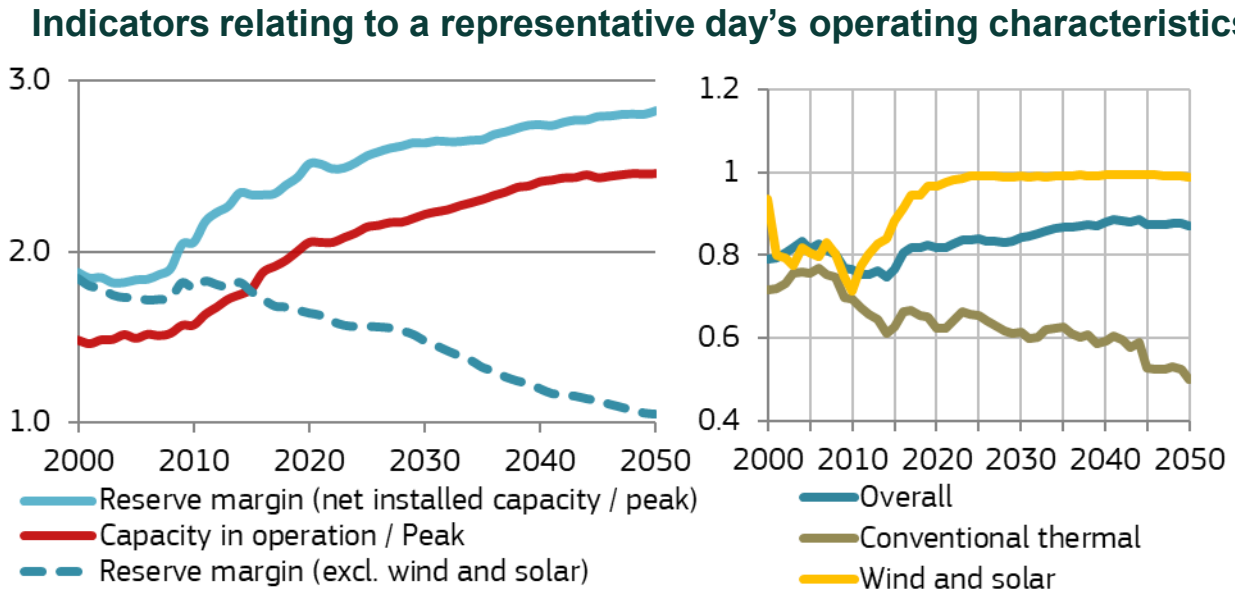
The Central scenario

Power generation: System indicators







Overall efficiency of electricity generation reaches 63% in 2050 from 41% in 2015

- CCS leads to a worsening of thermal power plants efficiency beyond 2035

The average annual operating hours of a dispatched unit drop from 4100 to 3000 hours

In the context of the representative day

- Overall reserve margin further grows but when excluding wind and solar capacities remains marginally above 1
- On average around 10% of the installed capacity remains idle (50% for thermal units)

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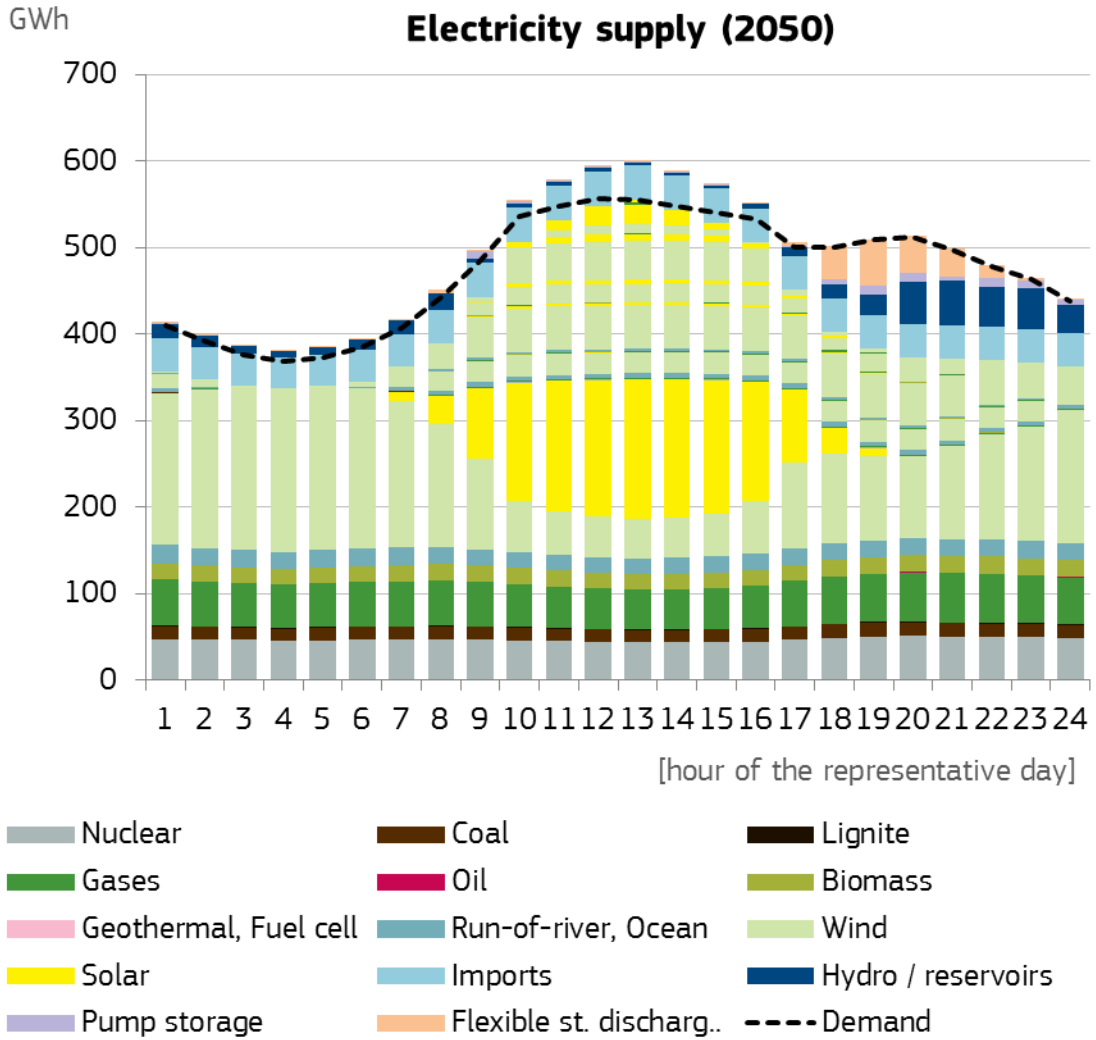
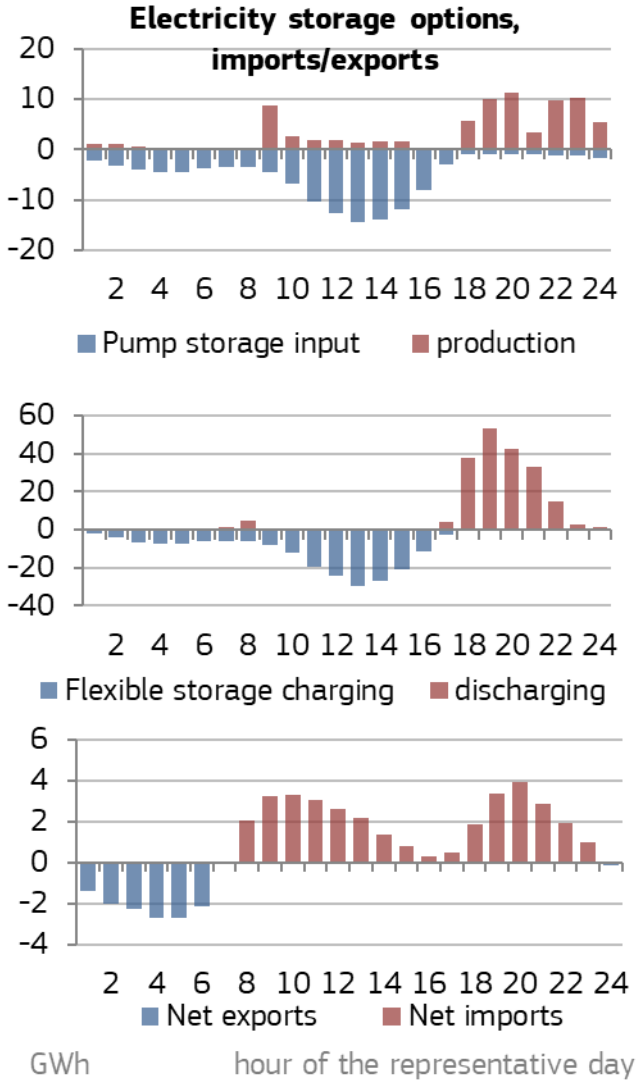
The Central scenario

Power generation: In focus – 2050 representative day





The shape of the overall generation pattern is dominated by solar PV (reflecting the natural light availability)

The availability of wind energy becomes almost constant along the representative day

The availability of **battery storage** plays an increasing role in balancing the load throughout the hours of the day

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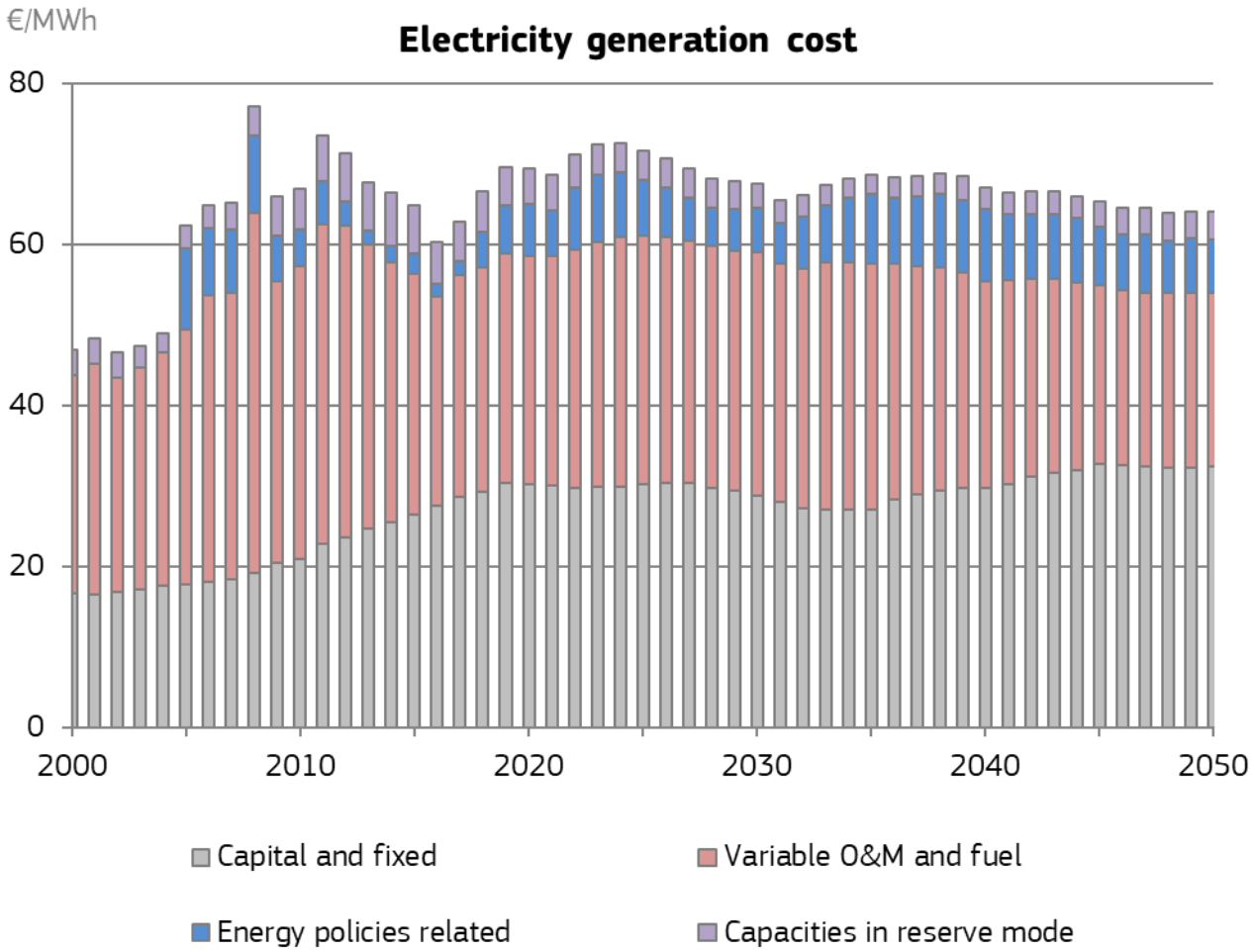
Power generation: Generation costs



- The unit costs of electricity generated remain remarkably stable
  - Peaks in mid-2020s at +12% from 2015 levels
  - From 2040 onwards electricity generation costs enter a declining pathway (-1.4% in 2050
- Capital costs account for 39% in 2050 from 32% in 2015
- Fuel costs drop beyond 2030 to 25% below 2015 levels in 2050
- Direct policy costs (ETS driven) account for between 8% and 13% of the total unit costs

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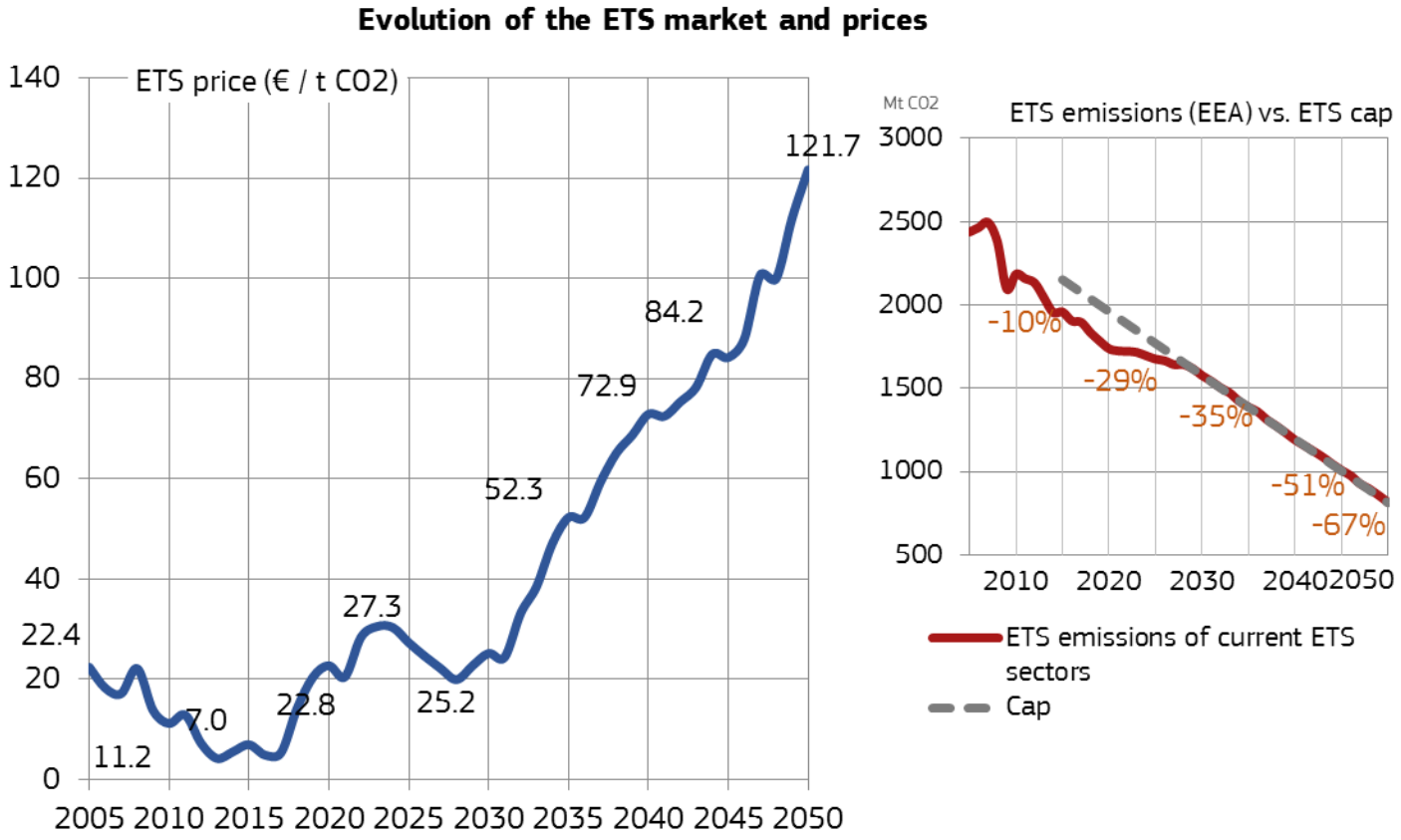
The Central scenario

The EU ETS



ETS prices are endogenously calculated to meet the evolving ETS cap

Until 2029, CO2 emissions remain below the cap

$\Rightarrow$ 20-30 $€_{2010}/tCO_2$

Afterwards, CO_2 emissions get on a pathway prescribed by the cap

$\Rightarrow$ 73 $€_{2010}/tCO_2$ in 2040

$\Rightarrow$ > 120 $€_{2010}/tCO_2$ by 2050

Reminder: the revision of the EU ETS (phase IV) is not included in the Central scenario

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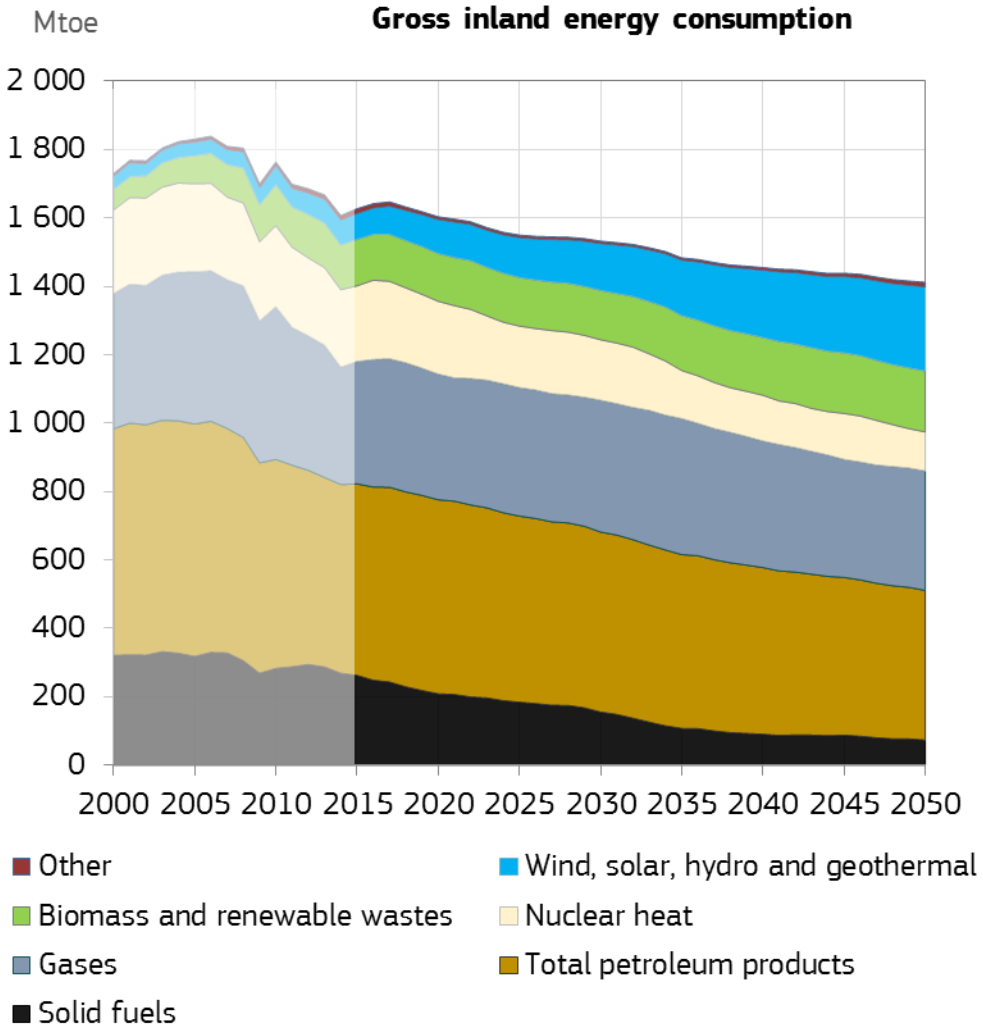
The Central scenario

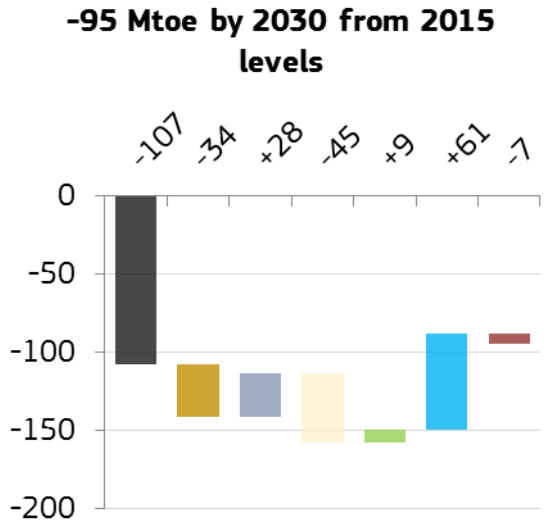
Primary energy needs

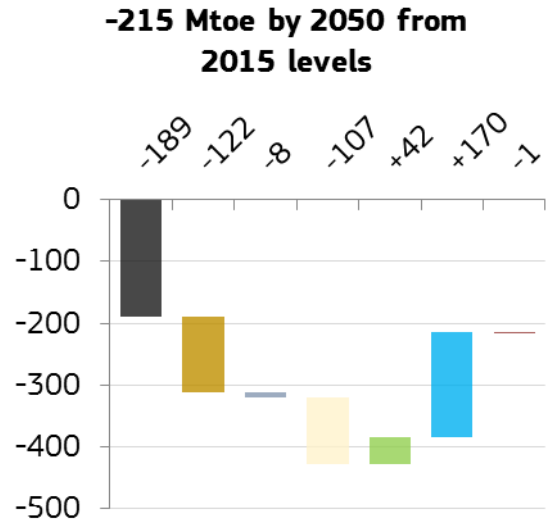


Gross inland energy consumption shrinks by 13% (2015-50)

Substantial changes in the fuel mix

- Tripling of renewables (less for biomass)
- Strong decline in solids (until stabilisation at low levels when CCS enters)
- Natural gas slightly increases market shares (acting as transition fuel)
- Decrease in nuclear heat following phase-out policies and limited new investment
- Liquid fuels remain the most important fuel (but reduce market shares)





The Central scenario

Renewables in the EU energy system

Share of renewables in the EU energy system more than doubles

- RES-share exceeds 39% of gross final consumption in 2050, from 17% in 2015
- By 2020, RES contribute 20%, 24.5% by 2030

RES-E shares reach 73% by 2050

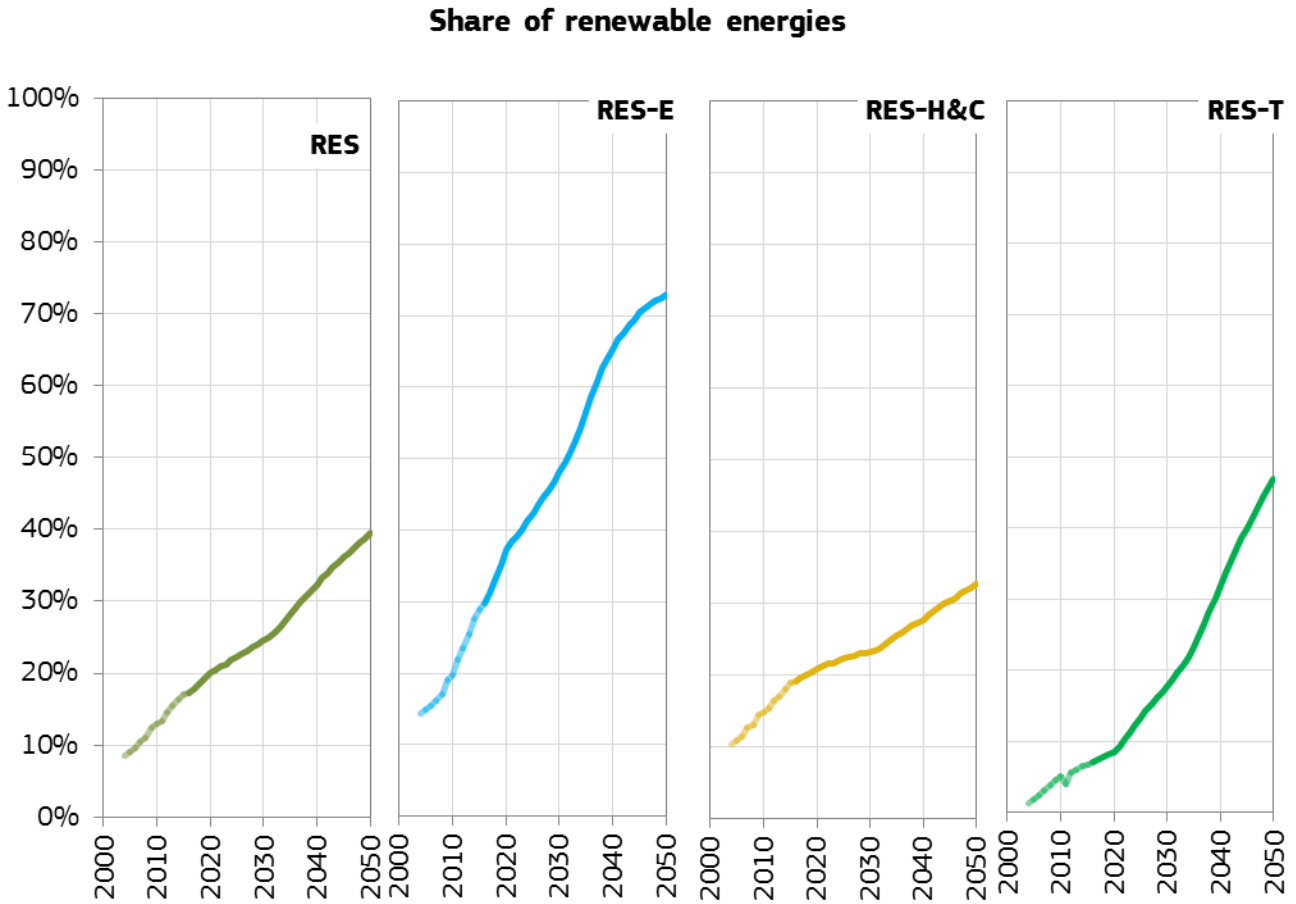
- Largely driven by solar (generation increases by factor ~ 6) and wind (factor 5.5)

RES-T shares rise from 6.6% to 47% in 2050

- Initially mainly stemming from biofuels
- Renewable electricity drive increase as of mid-2020s
- Bio-based kerosene enters towards the end of the projection period

RES-HC shares rise to 33%

- Uptake of heat pumps and solar
- Increase in biomass and derived heat



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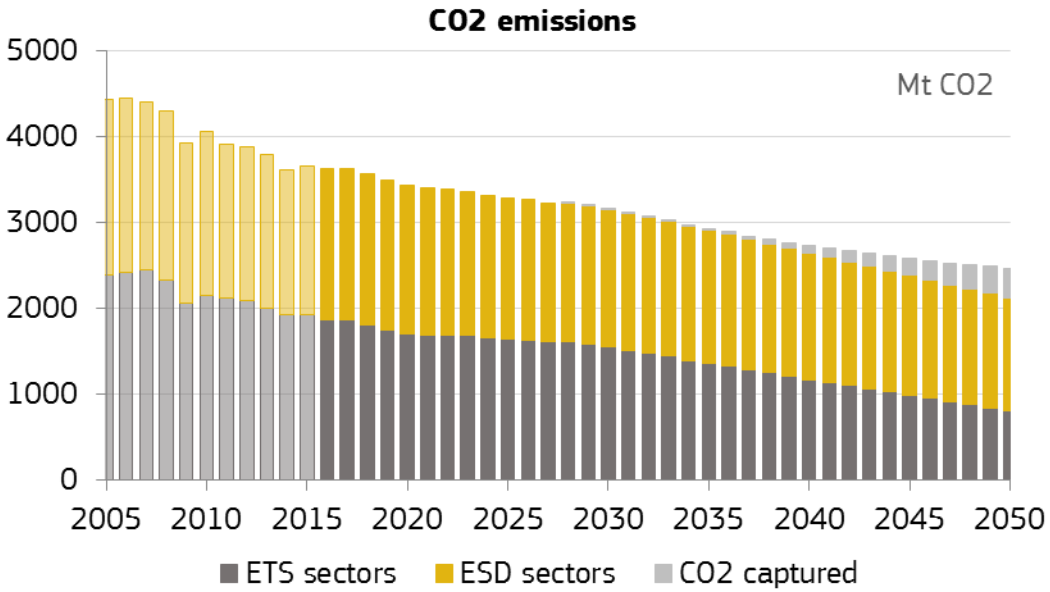
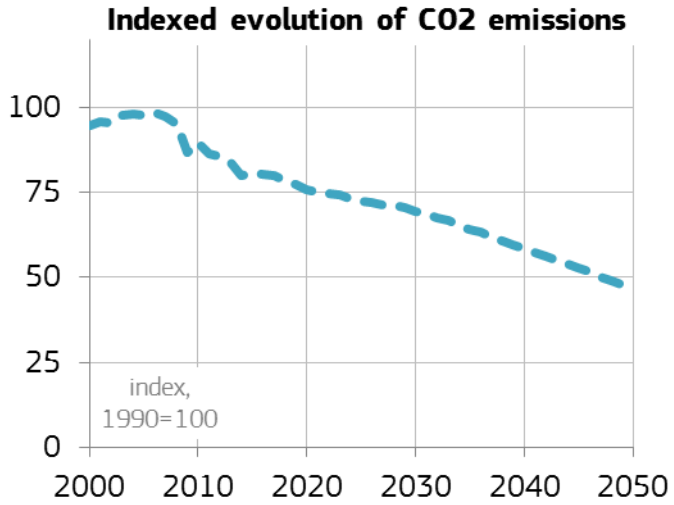
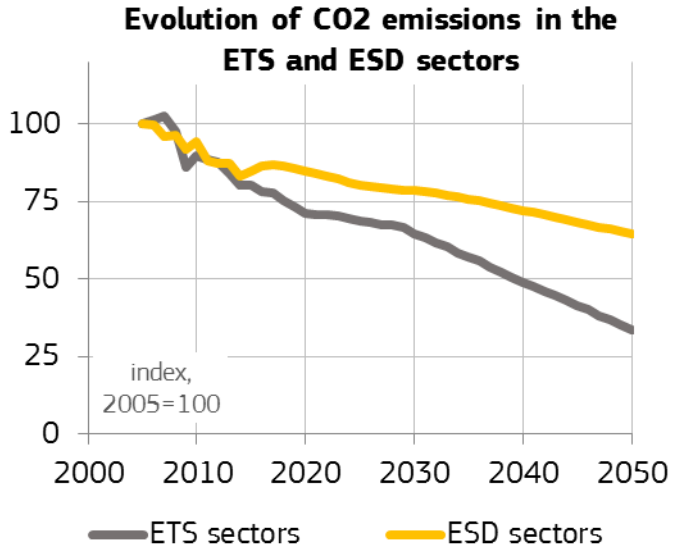
CO2 emissions







CO_2 emissions decline steadily throughout the projection period

- Compared to 1990, they are cut by 24% in 2020, 30% in 2030 and 53% in 2050

They decrease most rapidly in sectors falling under the scope of the EU ETS

- Direct consequence of the year-on-year cut in the cap for stationary allowances by 1.74%
- By 2050, they are – 67% below 2005 levels

ESD sectors' CO_2 emissions contract by 35% in 2050 (relative to 2005)

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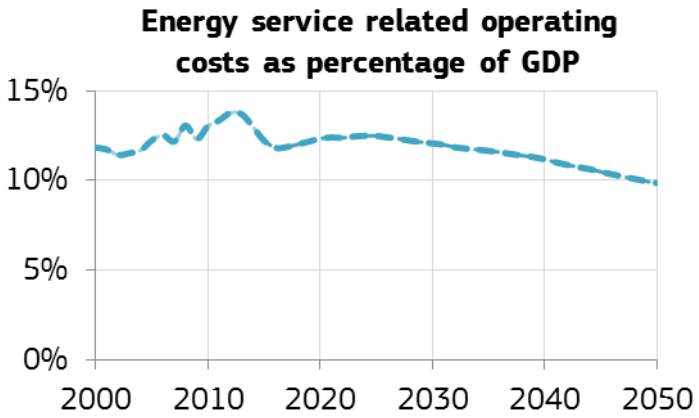
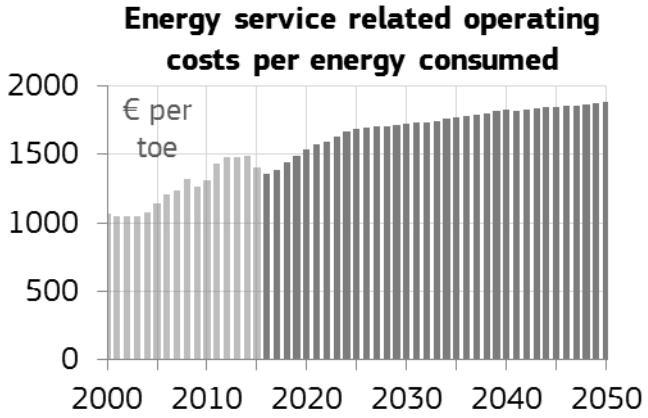
Costs



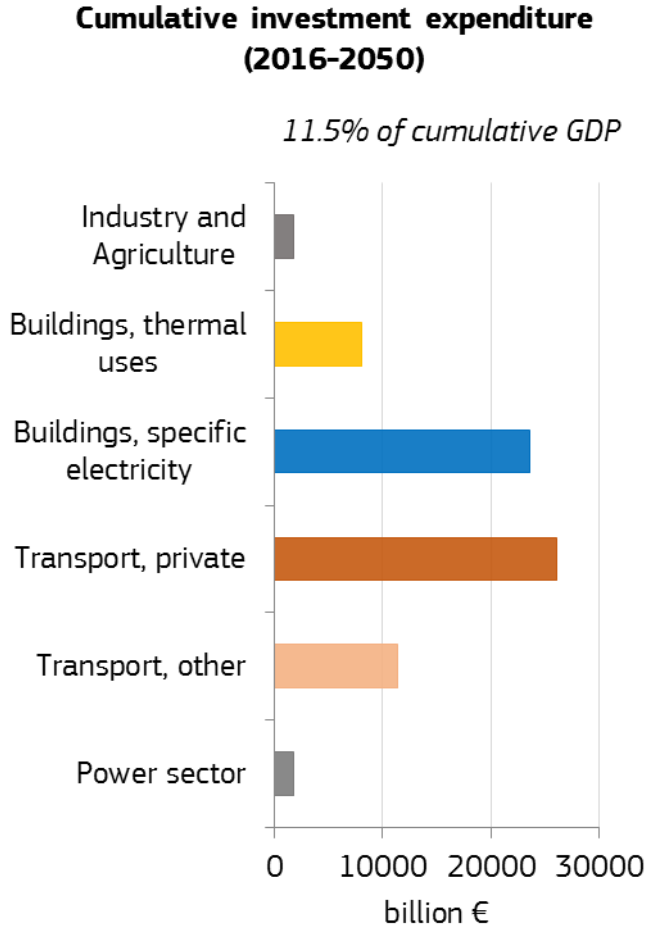


Energy-related O&M costs increase by 34% per unit of energy consumed

- excluding capital costs of demand side
- offset by efficiency gains leading to less energy consumed per service delivered
- **relative to GDP, decrease by 2.4 percentage points** (12.2% → 9.8%)

Substantial investment expenditures summing to 72.5 trillion $€_{2010}$ in 2016-2050

- representing 11.5% of cumulative GDP
- 3700 $€_{2010}$ annually per capita
- **but: bulk of investment into equipment that primary serves other purposes**
- (cars - 1400€, electric appliances - 1000 €)



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The Central scenario

Key figures and indicators

Policy indicators and key figures concerning the evolution of the EU energy system

Central results EU	1990	2005	2015	2020	2030	2050
Final energy consumption [Mtoe]	1 083	1 192	1 083	1 102	1 098	1 085
EU target				*1 086*	*956*	
Primary energy consumption [Mtoe]	1 569	1 713	1 529	1 499	1 424	1 303
EU target				*1 483*	*1 273*	
RES [%] - Share of energy from renewable sources		9.1%	17.0%	20.0%	24.5%	39.5%
EU target				*20.0%*	*32.0%*	
RES-E [%] - Share of electricity from renewable sources		15.0%	28.9%	37.4%	48.1%	73.0%
Total CO_2 emissions (with international aviation, without LULUCF) [Mt CO_2]	4 534	4 440	3 658	3 440	3 151	2 121
reduction to 1990		*-2%*	*-19%*	*-24%*	*-30%*	*-53%*
Emissions in current ETS sectors |(EU) [Mt CO_2]		2 396	1 925	1 708	1 550	802
reduction to 2005				*-29%*	*-35%*	*-67%*
Emissions in current ESD sectors [Mt CO_2]		2 044	1 733	1 732	1 602	1 318
reduction to 2005				*-15%*	*-22%*	*-35%*

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Using the Central scenario

Enhancing the analytical capacity

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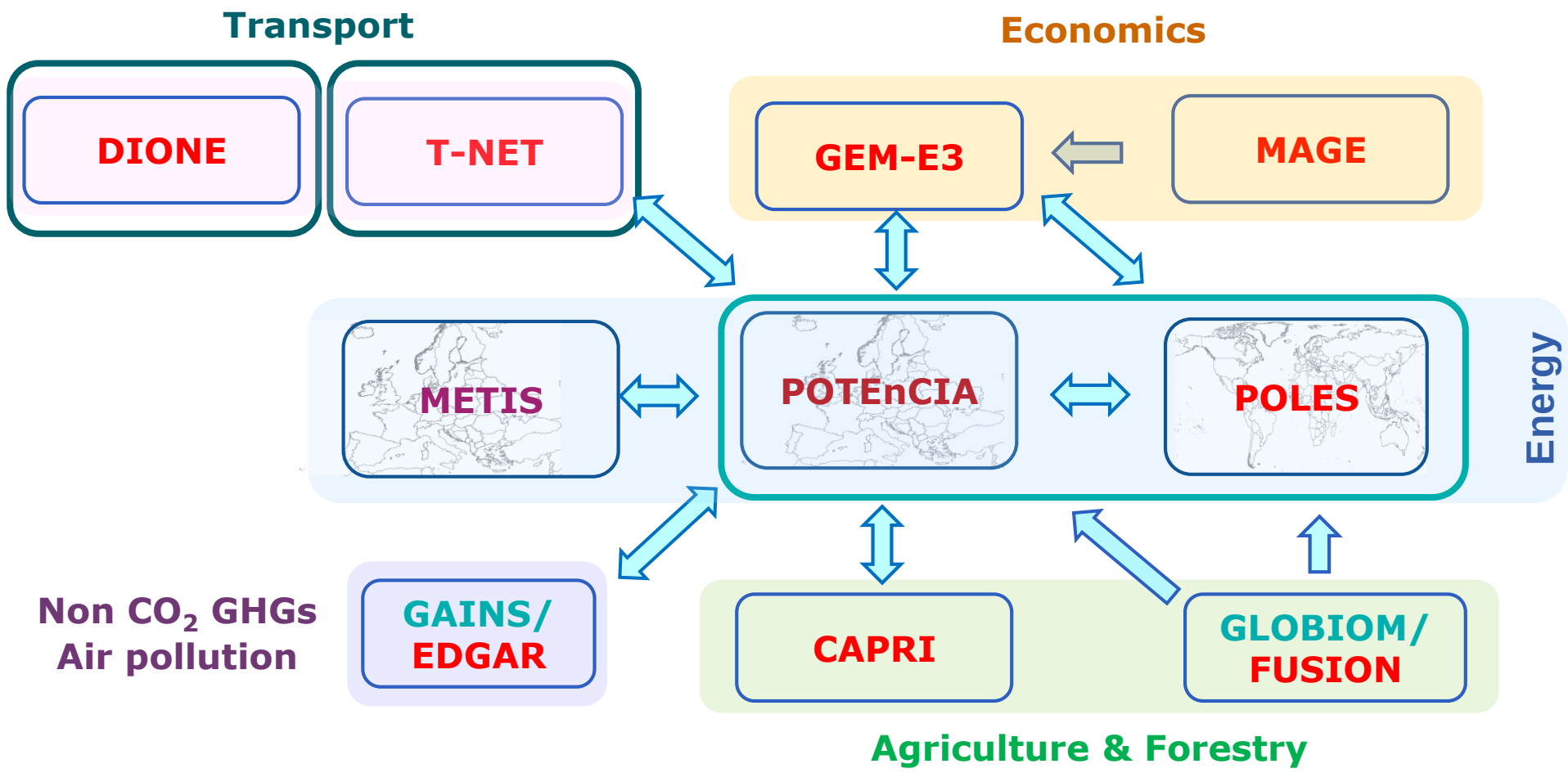
Enhancing the Analytical Capacity

Strengthening links between modelling tools



Global Energy Markets

JRC-POLES Model

https://ec.europa.eu/jrc/en/poles

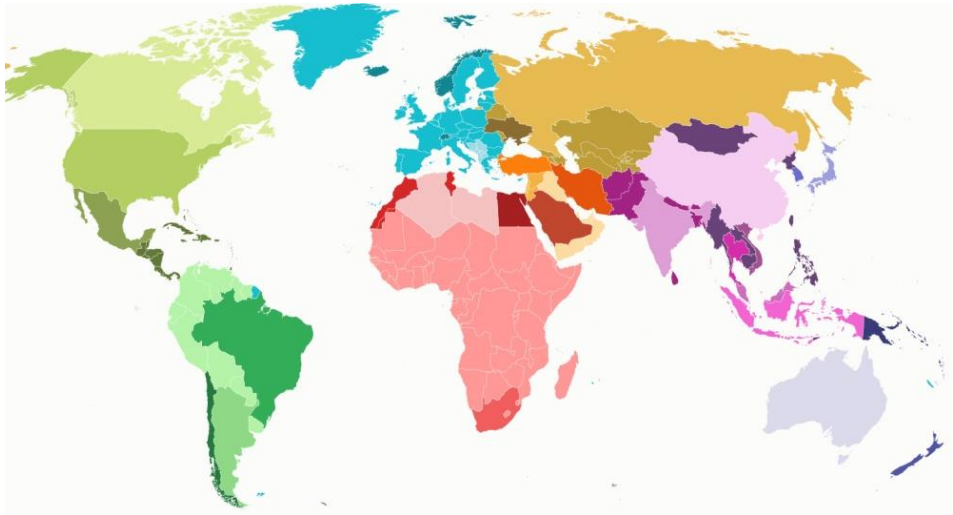
Prospective Outlook on Long-term Energy Systems

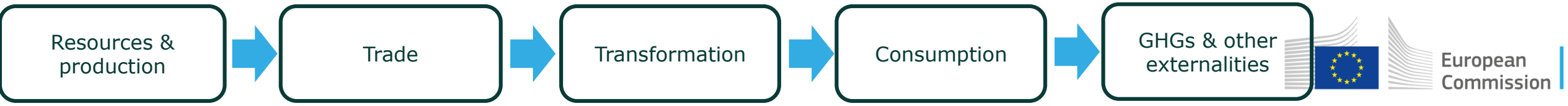
Simulating the evolution of the world energy system

- Annual steps until 2050/70
- EU28 + 38 countries / regions (OECD, G20)

Output

- Energy balances
- All energy sources and vectors
- ***International energy prices & trade***





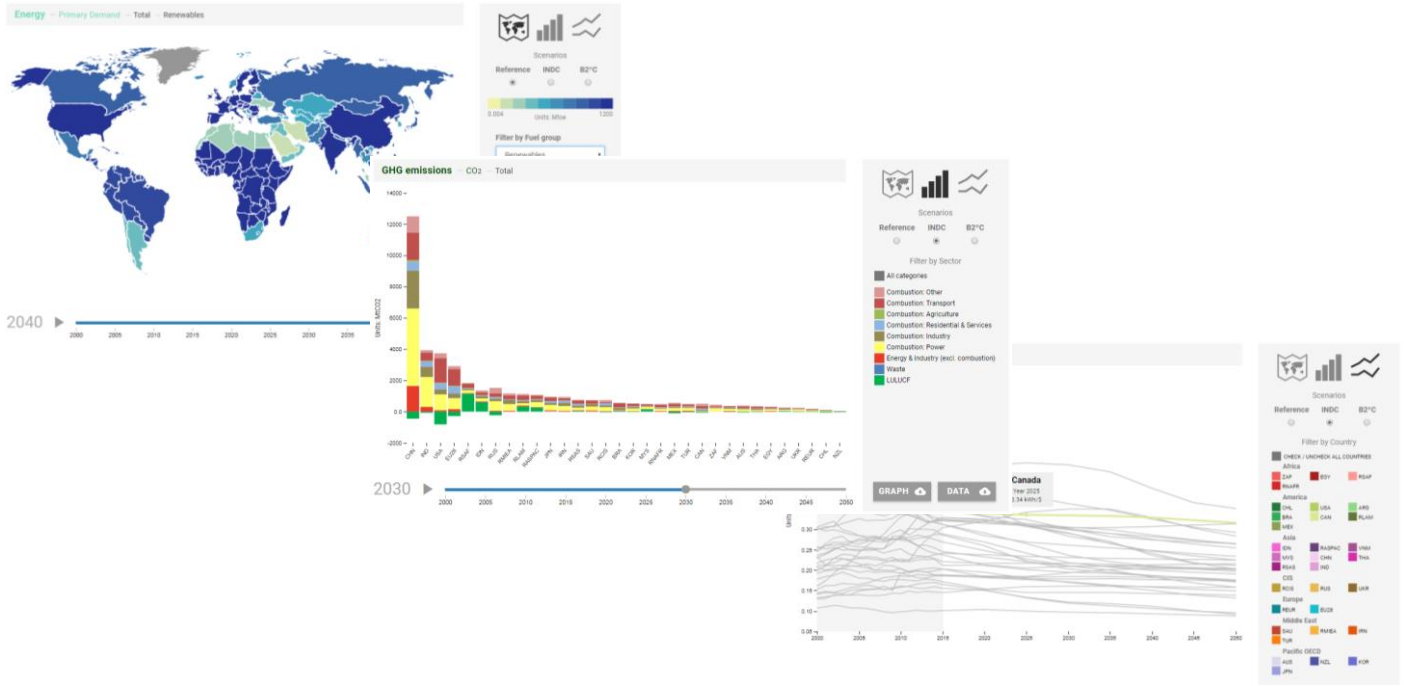
Global Energy Markets

JRC-POLES Model

https://ec.europa.eu/jrc/en/geco

Global Energy and Climate Outlook

GECO 2019: end of November



Capturing the response of global energy markets

- **International fuel prices**
- **Technology learning** (power sector; batteries)

Embed into global greenhouse gas emission pathways

European Commission

Hourly Dispatching

METIS model

https://ec.europa.eu/energy/en/data-analysis/energy-modelling/metis

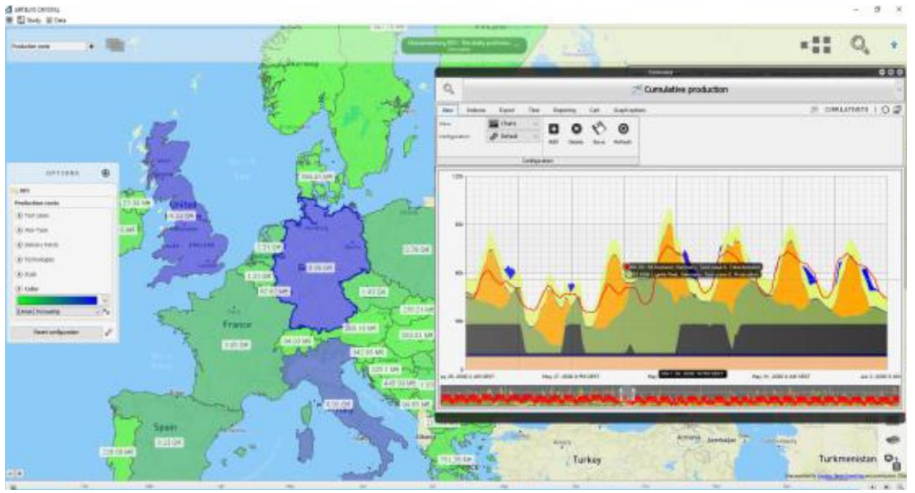
Simulates the operation of energy systems and markets on an hourly basis over a year

- EU28 + neighbouring countries
- Factoring in uncertainties like weather variations
- Module for reserve (FCR, aFRR, mFRR)

Input (focus on power markets)

- Exogenous capacity mix and demand

  → *link to POTEnCIA established*



Output

- Power system behaviour on hourly basis and system indicators
- Pricing, flexibility needs …

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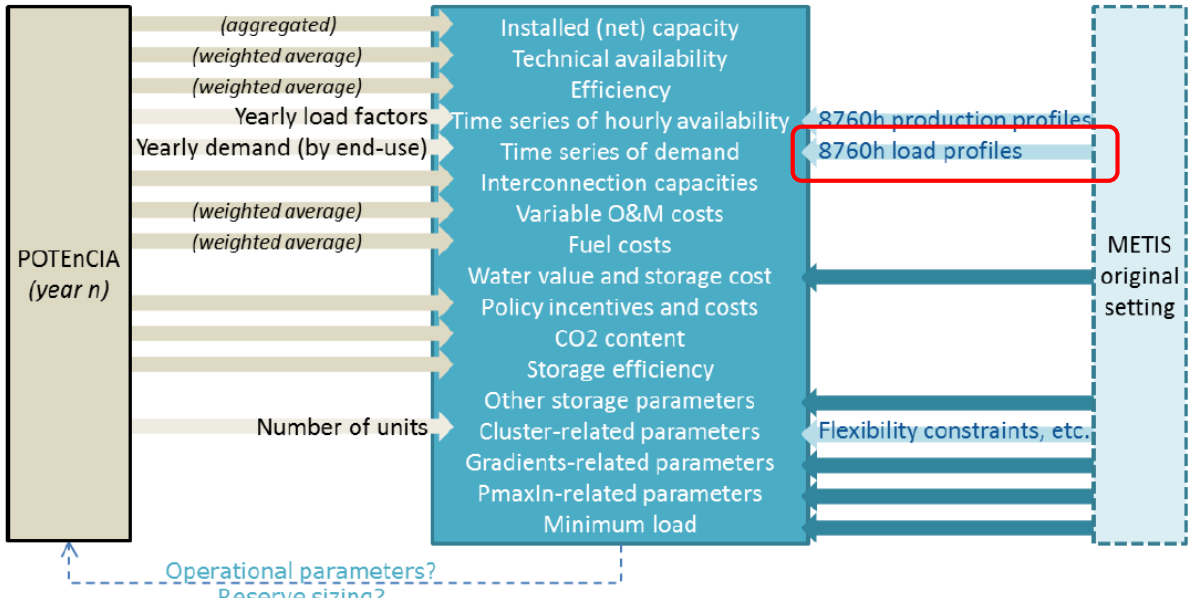
HOURLY DISPATCHING

METIS model – link to POTEnCIA



Improvements to enhance linkage *(planned)*

8760 hour time-series for demand end-uses instead of representative day *(incl. real peak)*

- Dynamically evolving over projection period
- Dynamic clustering to create representative day

Possibility to capture snapshots within POTEnCIA

Capturing events with a granularity of 1 hr

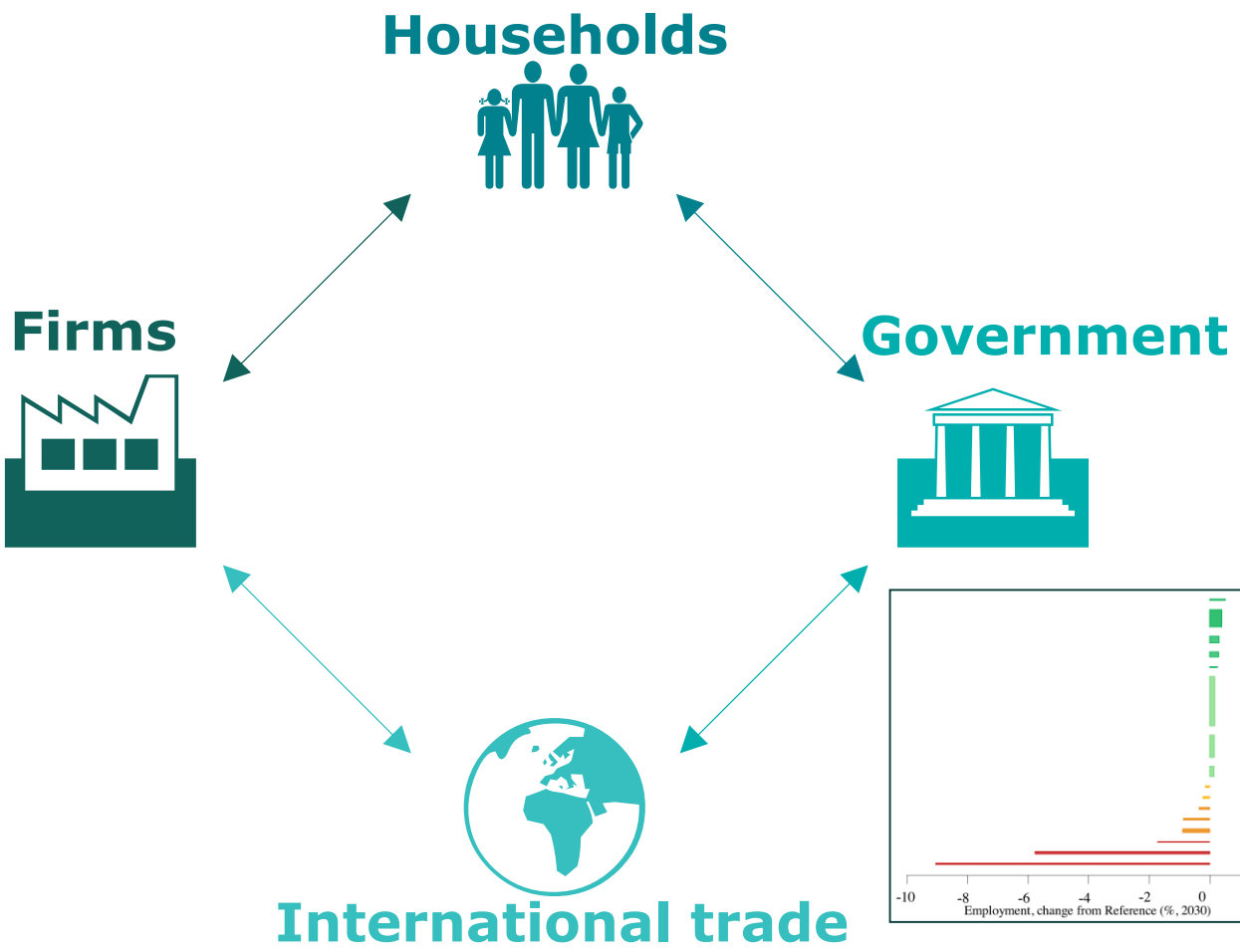
- Reserve sizing and impact of reserve market structure
- Imports and exports
- Market design and impact on revenue streams
- Management of hydropower reservoirs
- Evaluation of storage technologies

European Commission

MACRO-ECONOMY

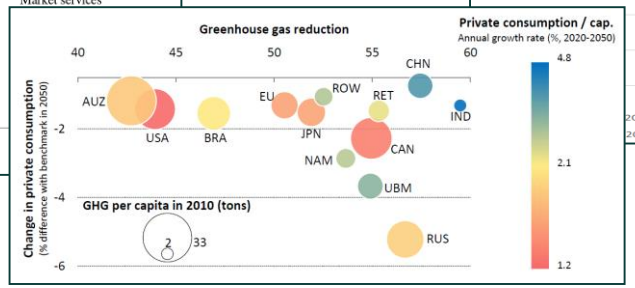
JRC-GEM-E3 Model

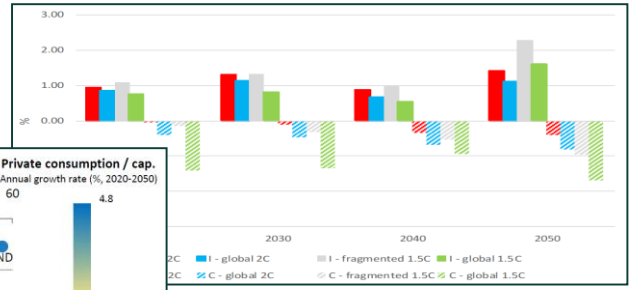
https://ec.europa.eu/jrc/en/gem-e3/model



Capturing macro-economic impacts

- Changes in value added
- Employment impacts
- Supply chain effects
- Trade and competitiveness
- EU and Global





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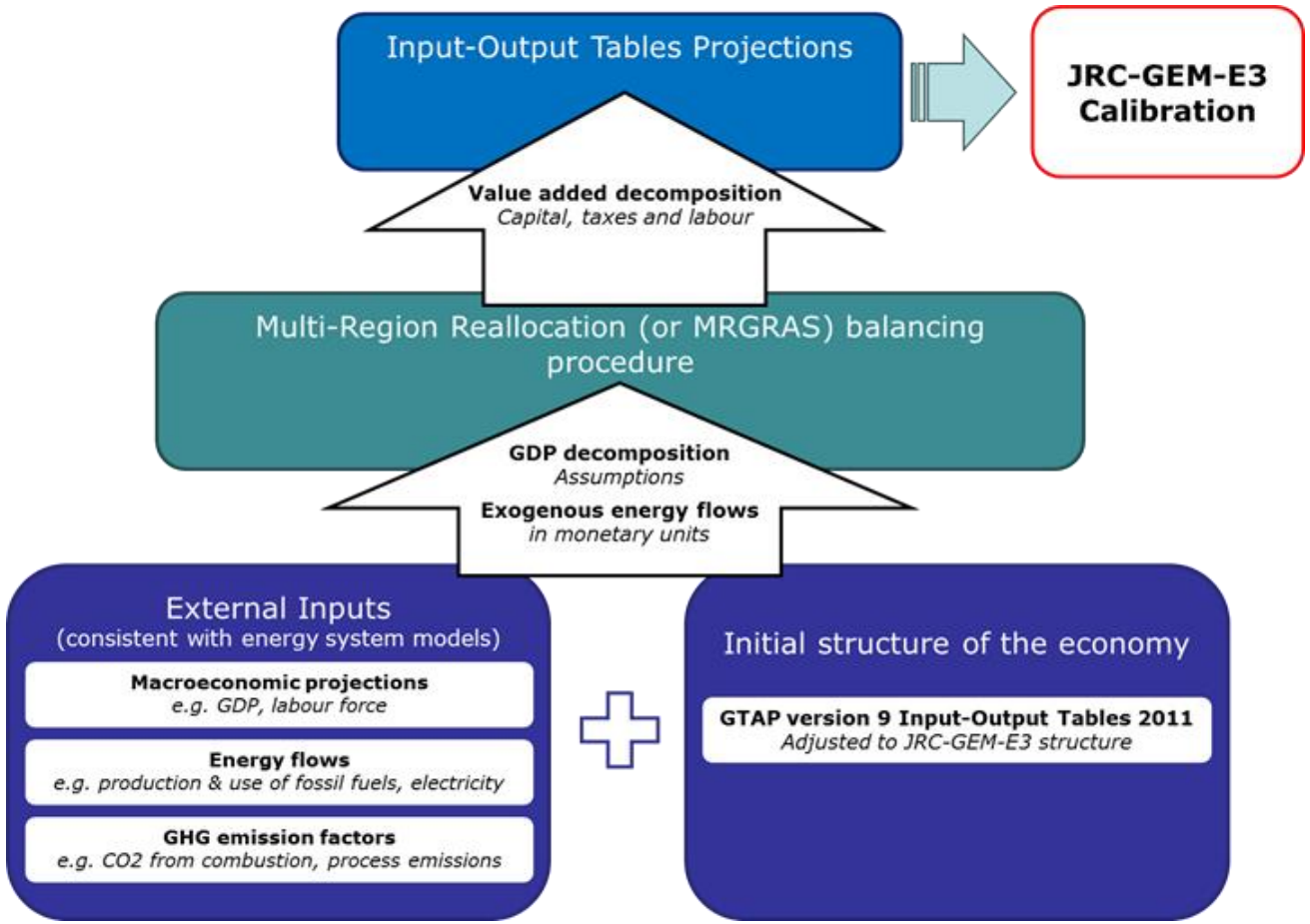
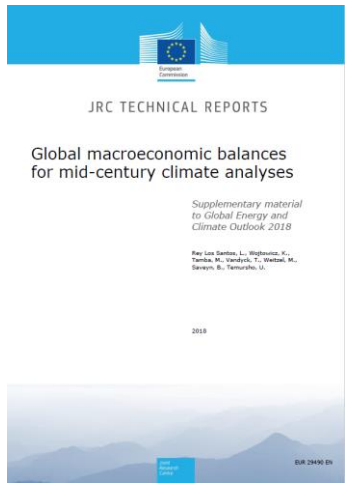
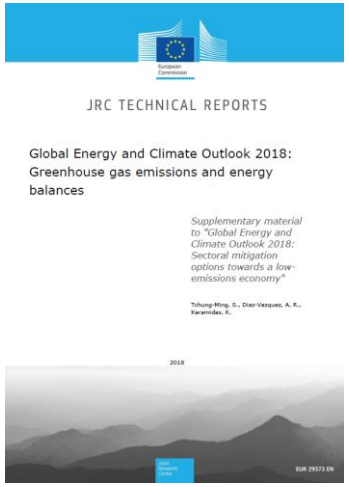
MACRO-ECONOMY

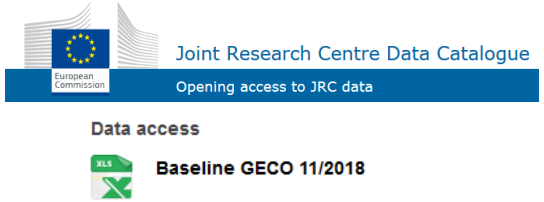
PIRAMID: Enhancing consistency between POTEnCIA and GEM-E3

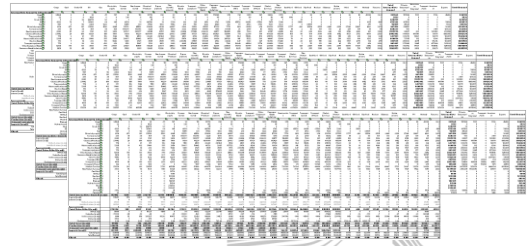
https://ec.europa.eu/jrc/en/gem-e3/model











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Non-CO_2-Greenhouse Gases

GAINS Model

https://www.iiasa.ac.at/web/home/research/researchPrograms/air/GAINS.html

GAINS Europe, model developed by IIASA with a well-established role in the policy arena

- Air pollution (CLRTAP convention, NECD)
- Greenhouse gases, in particular non-CO_2 GHGs

Model coupling: Building of GAINS scenarios with activity levels consistent with those used and produced by POTEnCIA in a given scenario, for all sectors of the economy, including

- Energy sector (gas distribution, FBC boilers)
- Domestic sector (air conditioning, heat pumps)
- Industrial sectors (chemicals, metals)

→ *link to POTEnCIA to be established on the basis of the Central scenario*

Capturing the non-CO_2 Greenhouse Gases

- CH_4
- FGASES
- N_2O

Enabling the analysis of multi-GHG CO_2 reduction strategies

- through MAC curves

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Detailed Vehicle Emission Calculations

DIONE Model

DIONE Emission Calculation

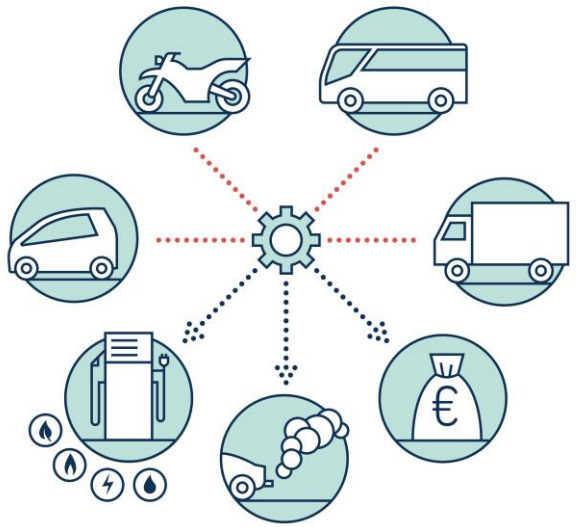
- GHGs and air pollutants
- Based on EMEP/EEA Guidebook methodology and emission factors for advanced EVs

Vehicle CO_2 Emission Reduction Cost Curves

- DIONE modules and cost curves developed in the context of EU CO_2 standards
- Available for LDV and HDV

Link to POTEnCIA being tested

- Ex-post emission calculations
- Validation of endogenous response in POTEnCIA on evolution of vehicles to a CO_2 constraints/incentive



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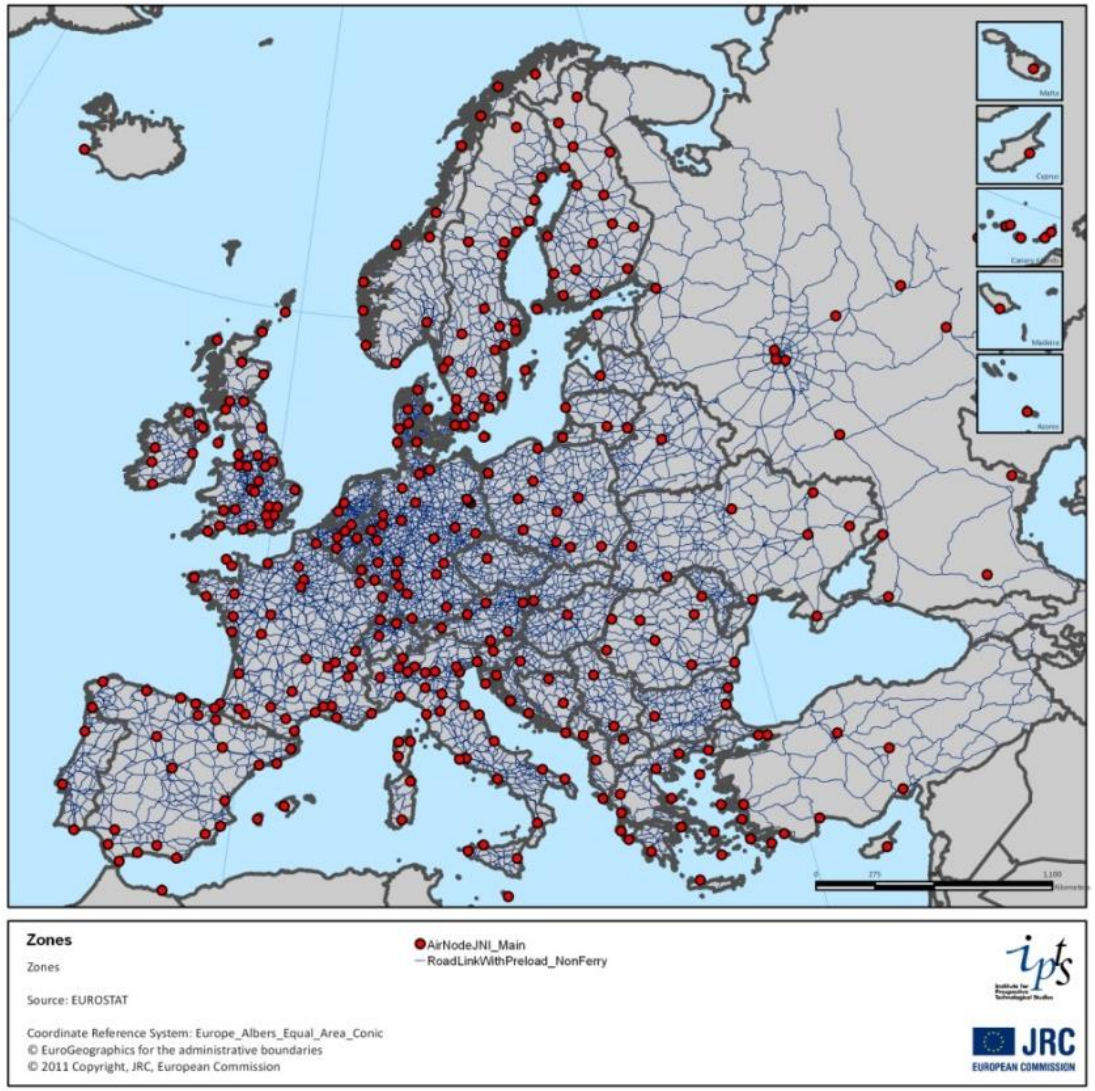
Transport Networks

T-NET Modelling platform



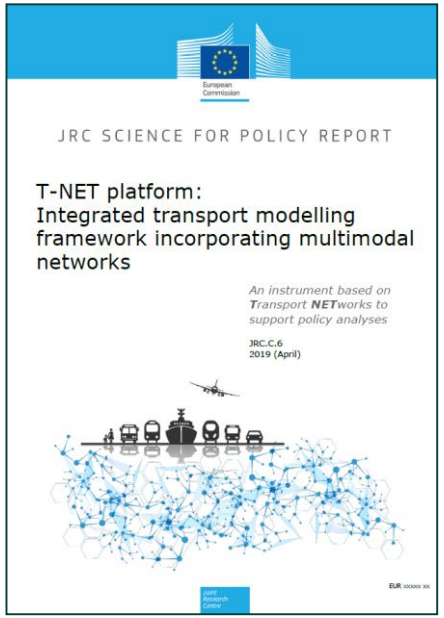
A modelling instrument to assess the economic, environmental and social impacts of EU transport policies

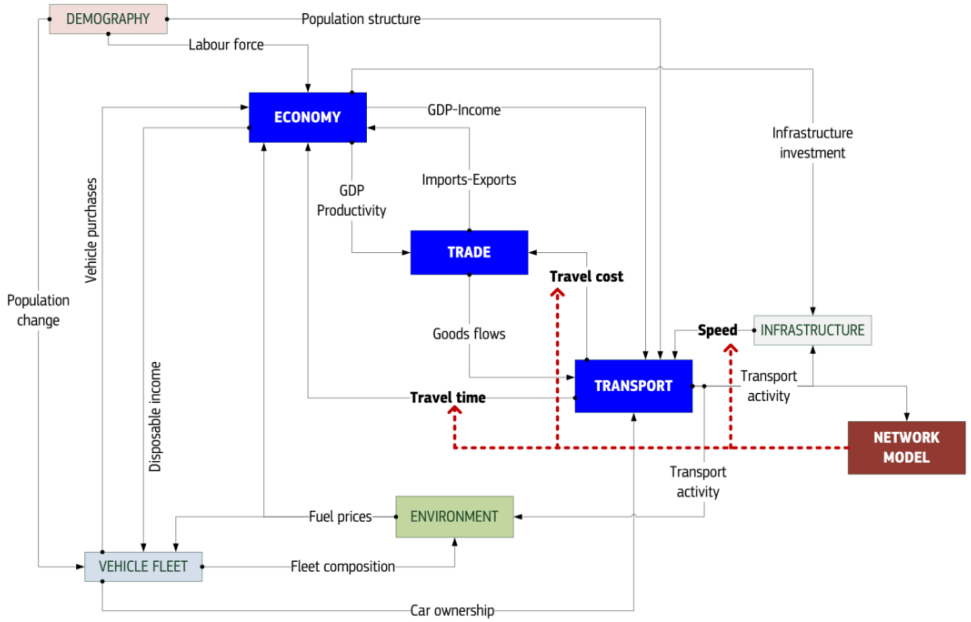
- Equilibrium of transport demand vs. transport infrastructure (times, costs and traffic flows)
- Coverage: Rail, Road, Air, Inland waterways, Maritime (freight and passengers)
- Transport demand: 1500 NUTS3 zones in Europe + 15 RoW zones (currently estimated via ASTRA-EC + in-house modelling tools)

European Commission

Transport Networks

T-NET Modelling platform





Capturing impacts of network-related policies in transport

- Infrastructure expansion/charging
- Congestion
- Related impact on activity

  including induced impacts on modal shifts

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LAND-USE

CAPRI /GLOBIOM/JRC-FUSION Models

CAPRI, model operated in-house by the JRC

- PE model of the European agricultural sector
- cost-supply curves for energy crops
- Also provides agricultural activity projections for GAINS

JRC-FUSION

- Platform merging two core forestry models, the Carbon Budget (CBM) and the Global Forest Trade (GFTM) Models

GLOBIOM

- IIASA´s Global Biosphere Management Model

- cost-supply curves for forest biomass

Capturing bioenergy costs and LULUCF emissions

- Cost curves for biomass streams (and potentials)
- Use of energy in agricultural (and forestry) sector
- GHG emissions and emission reduction options

SCENARIO ANALYSIS

building on the Central scenario

Exploratory development of NECP scenarios, representing the policies included in the final NECPs submitted by the Member States

- Includes also revised EU policies such as updated ETS pathway, updated CO_2 performance standards (including HGVs)
- Allows modelling of current 2030 climate and energy policy

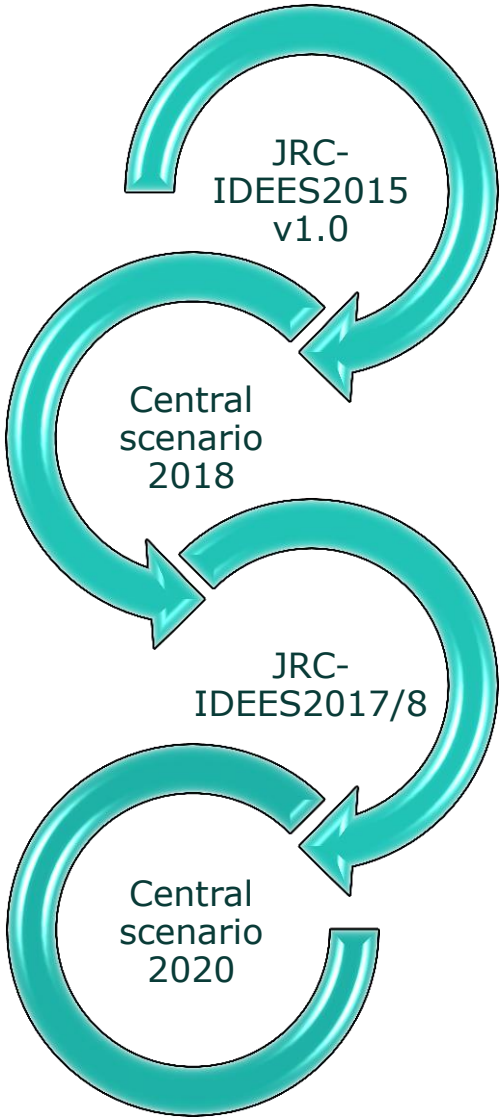
Possibility to develop **NECP+** scenarios (achievement of 2030 ambitions, increases in ambitions levels, deep decarbonisation in 2050, etc.)

→ *primarily exploratory work / development performed by the JRC*

Next steps

POTEnCIA

Next steps



Update of JRC-IDEES 2017/8

- New Eurostat balances
- Additional data sources
- Feedback received
- Widening consultation process

Extension to 2070

- Macro-economic and demographic assumptions available
- Breakdown into sectoral activities

Update of policies in place

European Commission

Thank you for your attention

JRC Science Hub –POTEnCIA:
ec.europa.eu/jrc/POTEnCIA

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