

EU decarbonisation challenges for the Bulgarian energy sector

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Sofia, 6 November, 2020

Main Points of Discussion

- Modelling the long-term decarbonisation
- Decarbonisation Trajectories
- Policy visions and realities for the long-term decarbonisation

New Approach to Decarbonisation Modelling



2050 Pathways Explorers

Choose an example pathway

CORE -95%

- Key behaviours: 3.1
- Travel: 2.8
- Buildings: 3.4
- Diet: 3.5
- Consumption: 3.3
- Transport: 3.4
- Buildings: 2.8
- Services: 2.6
- Manufacturing: 3.1
- Energy production: 2.7

Total | Buildings | Transport | Industry | Energy production | Food and AFOLU

a. GHG emissions | Bulgaria

Total GHG emissions by sector

2035

- Total: 9.81 MtCO₂e
- Agriculture: 4.26 MtCO₂e
- Power: 0
- Oil by Refineries: 2.71 MtCO₂e
- District Heating: 0.41 MtCO₂e
- Waste and Others: 3.39 MtCO₂e
- Industry: 4.78 MtCO₂e
- Transport: 1.39 MtCO₂e
- Buildings: 0.51 MtCO₂e
- Land-Use: -7.28 MtCO₂e
- Power (Bioenergy Carbon Capture): 0
- Industry (Bioenergy & DAC efuel Carbon Capture): -0.36 MtCO₂e

NOTE: Illustrated scope is aligned with international standards and excludes international bunkers, and biomass emissions. International bunkers are visible in the total energy and transport energy sections, and biomass emissions can be estimated through the BECCS impact. The model only addresses CO₂, CH₄ and NO₂, CRF emissions in CO₂e including all gases are therefore slightly higher (~4%). The sectoral emissions include the effects of carbon capture. Separate negative BECCS segments are provided, because carbon capture combined with biomass or DAC efuels leads to negative emissions. The emissions storage of feedstocks made of biomass and DAC efuels are specified in the carbon capture graphs but not included here. This is a conservative modelling choice, because we assume some products will get burned, and we cannot therefore assume the carbon is fully stored in them. The model is aligned to official historical sources until 2015, 2016-2020 data is aligned with official sources, not but provides an approximation of real data. FUTURE REFINEMENT: Specify emissions segmented by energy vector (and process emissions, and sinks) along the primary energy perspective and along the final energy perspective.

Source: CLIMACT; EU Calc

Alternative Long-term Decarbonisation Scenarios

Level 1

- **Current ambition**
- Extrapolation of historical trends ⁽¹⁾

Level 2

- **Increased ambition**
- More extensive use of existing technologies

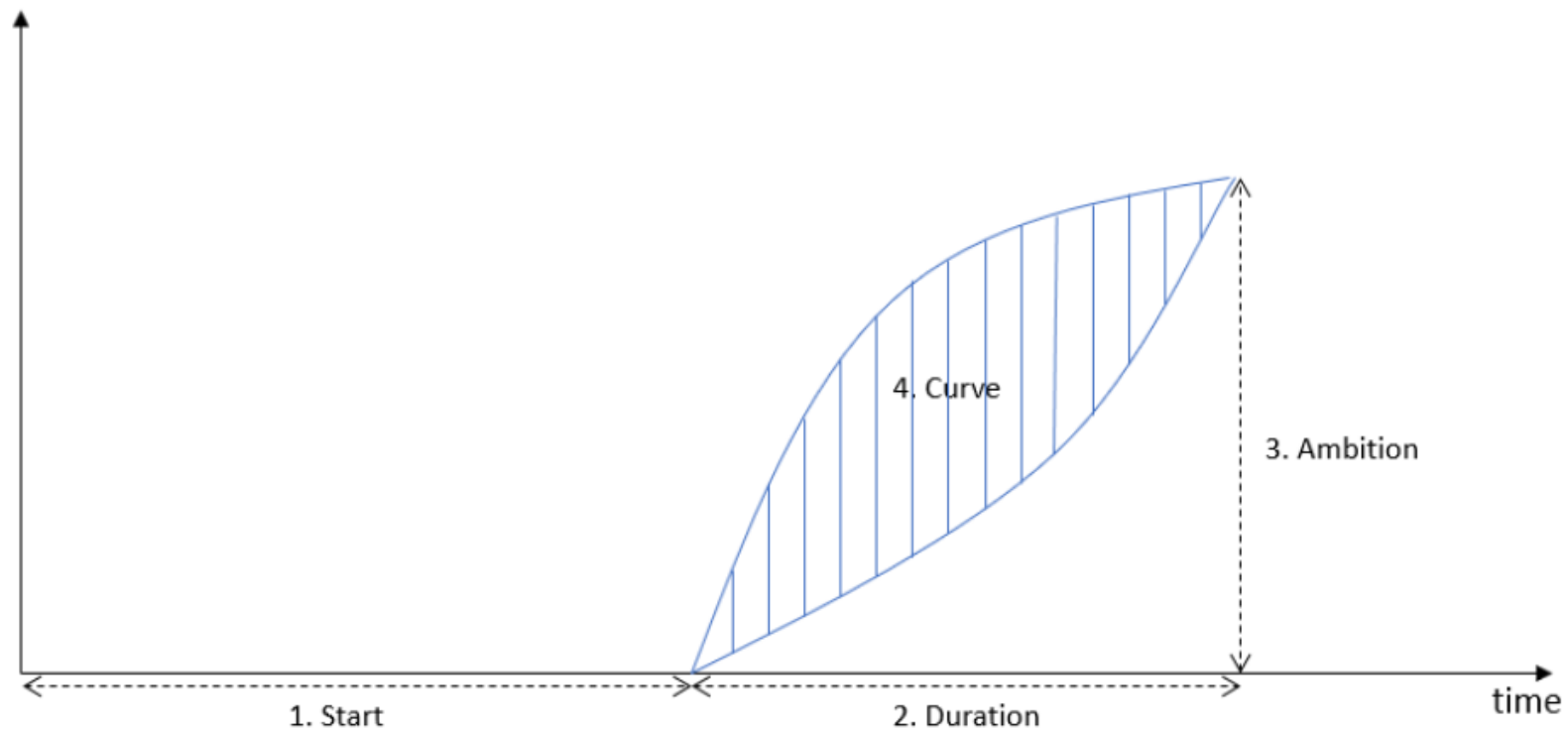
Level 3

- **Ambitious**
- Significant effort based on high implementation of available technologies

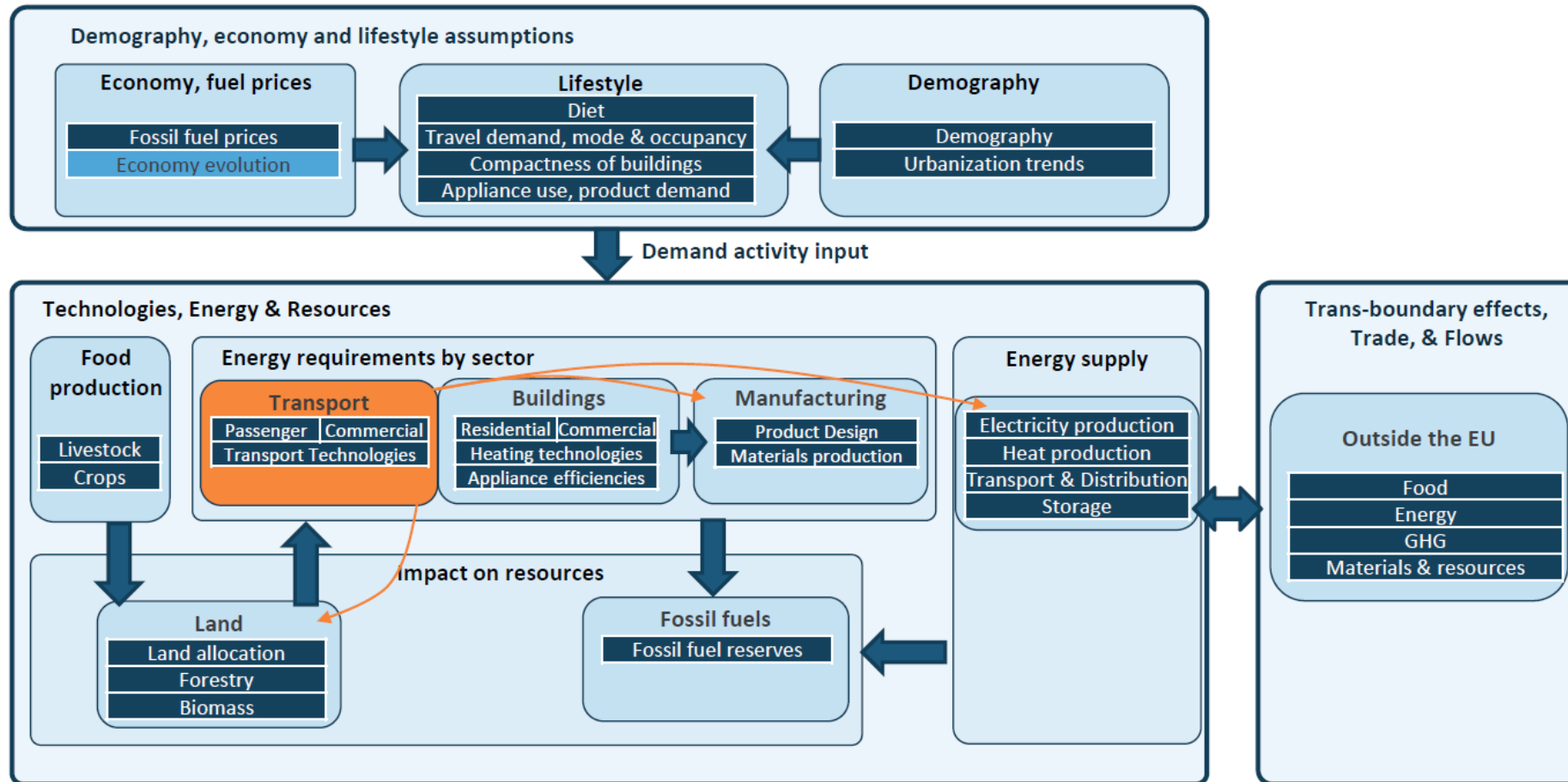
Level 4

- **Transformational**
- Max implementation requiring fast deployment and, in some cases, some type of innovation

Timeframe Logic of Decarbonisation Trajectories



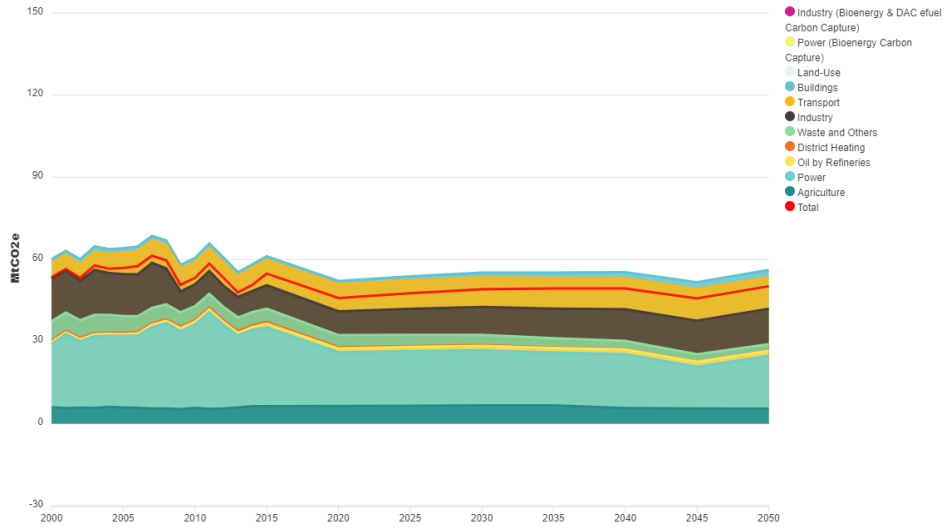
All-Economy Modelling of Long-term Decarbonisation



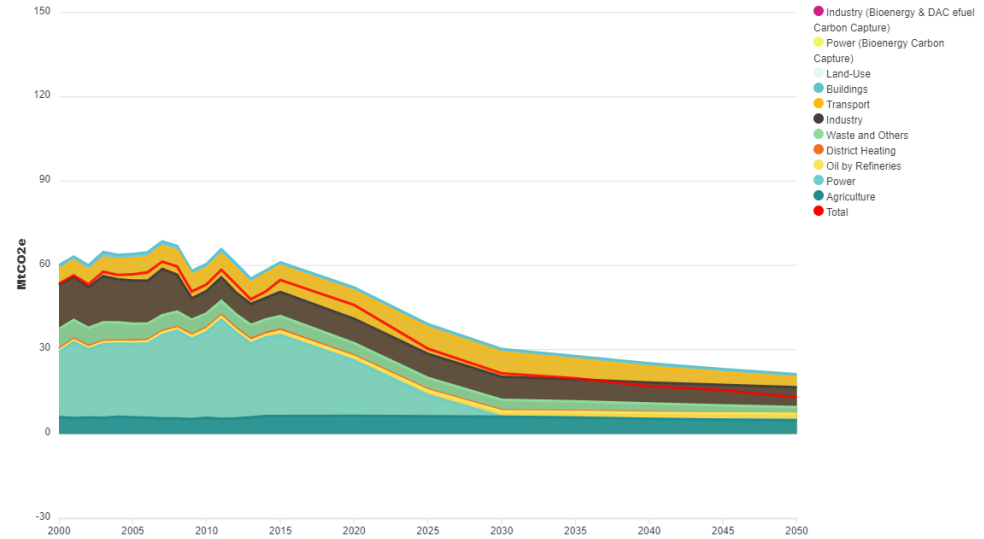
Source: CLIMACT; EU Calc

GHG Emissions by Scenario

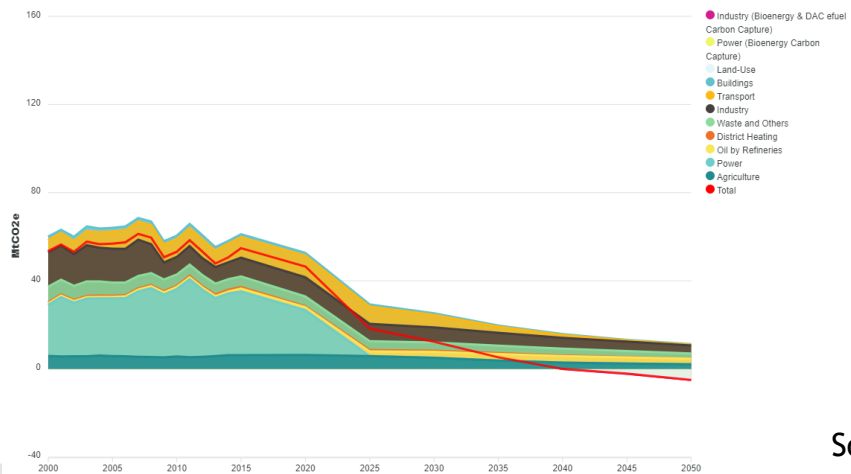
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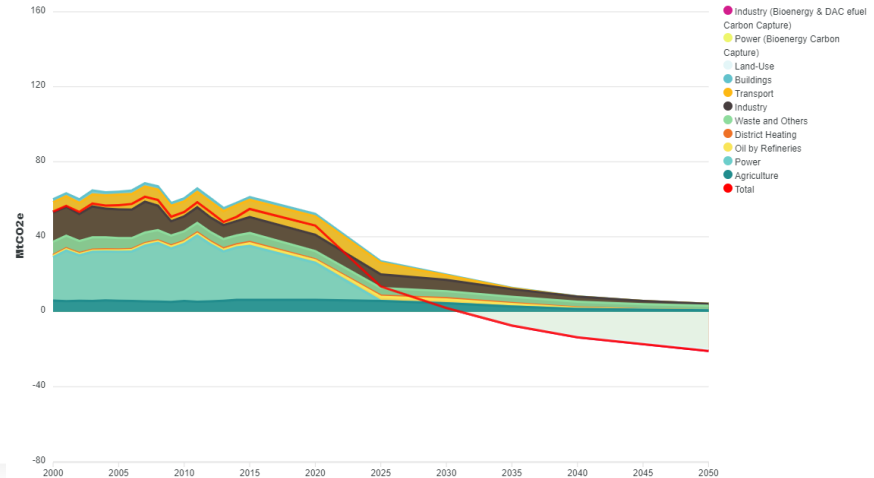
Ambition 2



Ambition 3

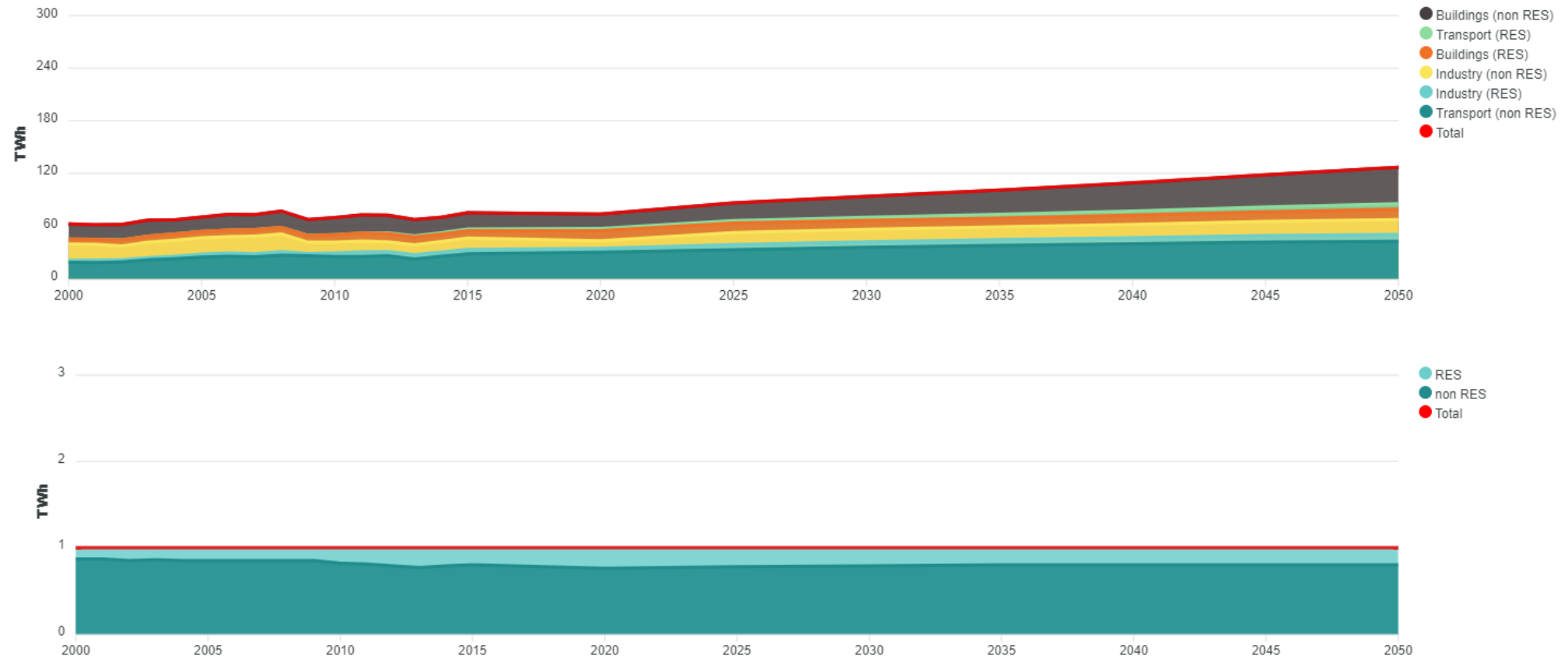


Ambition 4



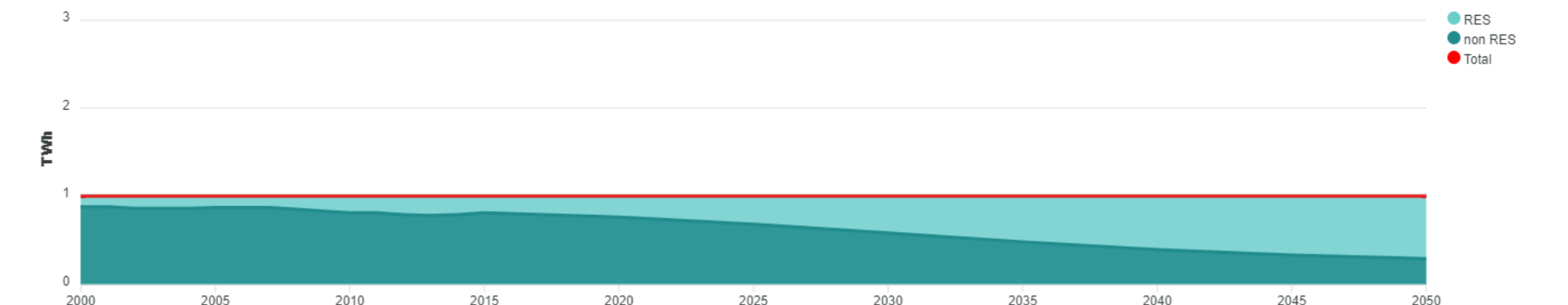
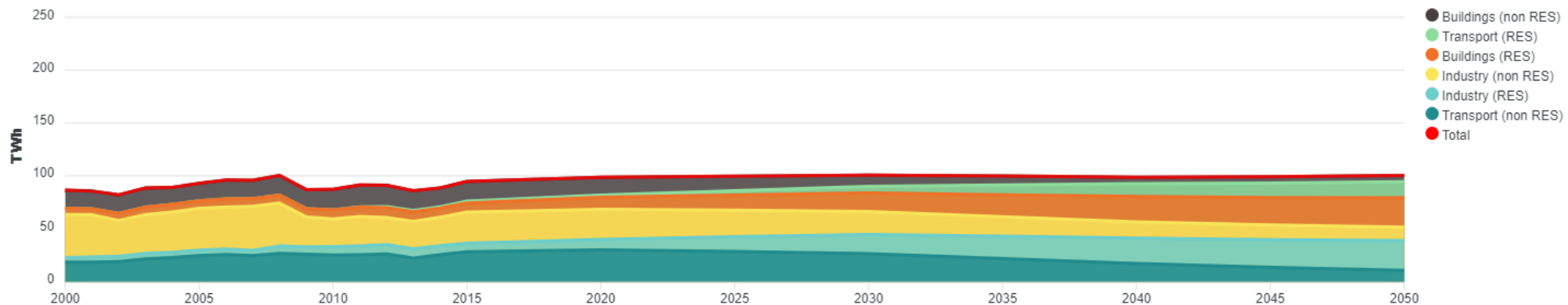
Source: EU Calc

Energy Demand by Sector and RES Composition (REF)



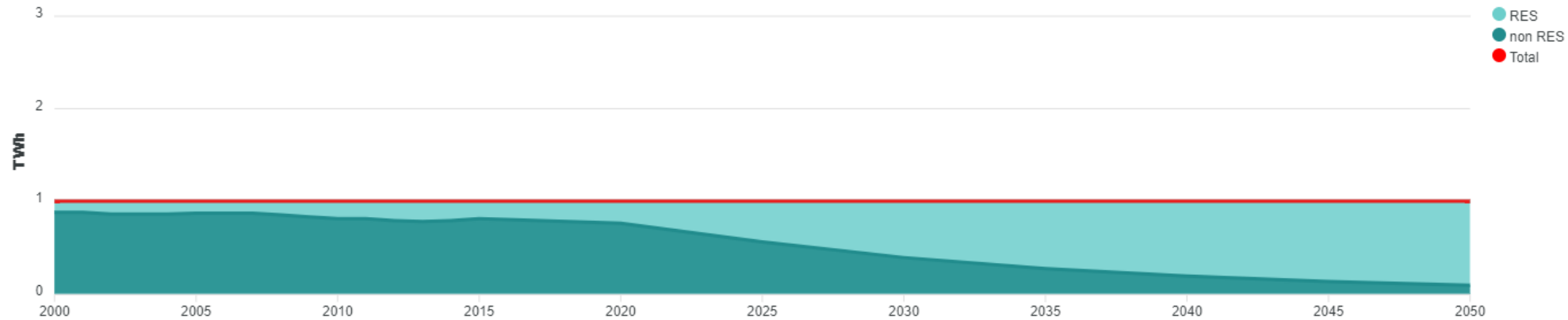
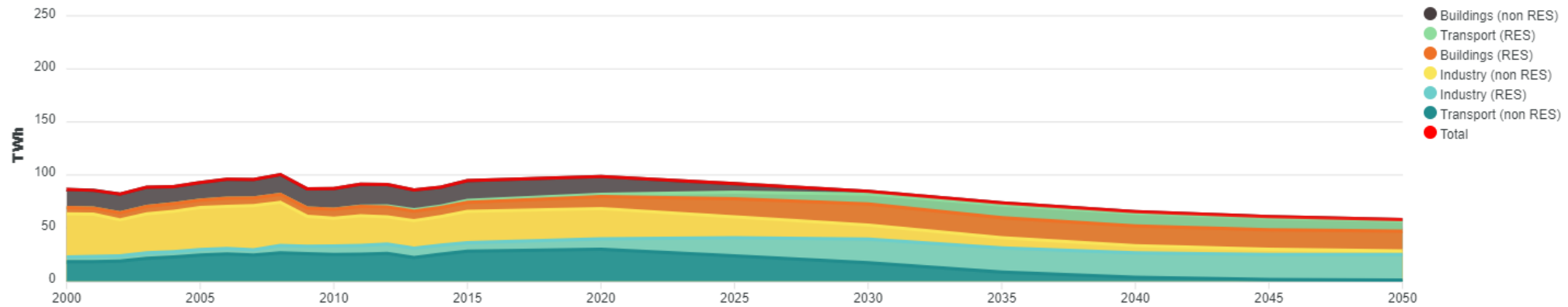
Source: EU Calc

Energy Demand by Sector and RES Composition (Ambition 2)



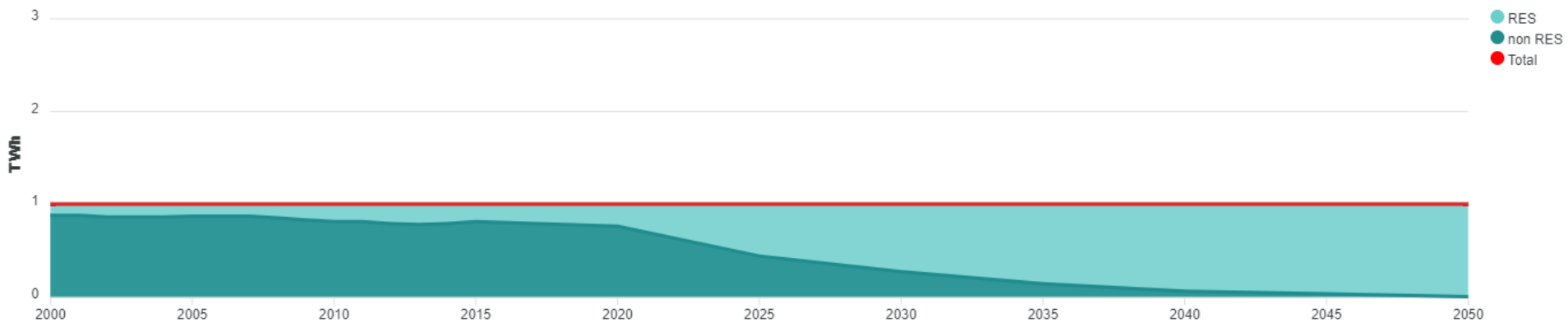
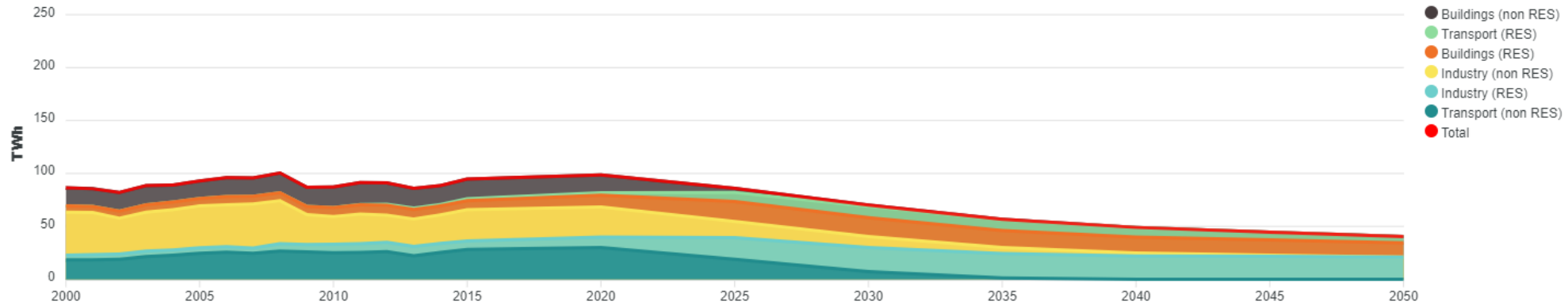
Source: EU Calc

Energy Demand by Sector and RES Composition (Ambition 3)



Source: EU Calc

Energy Demand by Sector and RES Composition (Ambition 4)



Source: EU Calc

Policy Reality Challenges

- Need for long-term strategy for decarbonisation including all economic sectors
- Need for coal phase-out strategy and breaking pathway dependence
- Removing contradictory energy policy objectives
- Moving away from focusing on large-scale projects towards small-scale residential and business investments
- Need of clear indicators and evidence behind planned policy initiatives
- Centralization of policy measures vs. regional and inclusive decision-making
- Developing and implementing incentives for changes in individual and collective energy choices

Policy Visions for Green Recovery

- Discontinuing life-support coal and other fossil fuel subsidies
- Industrial restructuring of coal regions with targeted investments in sectors with fast added-value growth
- Enabling regulatory and financial framework for energy efficiency and renewable energy integration
- Reform of fiscal rules to incentivize green investments in industry and agriculture
- Development of low-carbon and digitally-based infrastructure
- Alignment of the NECP, the 2050 Long-Term Strategy and the National Recovery Plan with the EU Industrial Strategy
- Integration of horizontal policies on energy, industry, building and agriculture
- Focus on changes of energy behavior by stimulating less carbon-intensive lifestyle affecting buildings' management, transportation patterns, diet and circular production

Thank you!

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