E.DSO analysis of the 2040 EU Climate Target

Brussels, February 2024

I. Introduction

On 6 February 2024, following guidance from the European Scientific Advisory Board on Climate Change (ESABCC) and grounded on a comprehensive Impact Assessment, the European Commission unveiled its communication for a 90% reduction in net greenhouse gas (GHG) emissions by 2040, relative to 1990 levels. This proposed target for 2040 serves as a strategic milestone towards achieving climate neutrality by 2050, under the European Climate Law. The purpose of this Communication is to guide the development of the framework beyond 2030. It neither introduces new policy initiatives nor establishes fresh targets for specific sectors but emphasises that a series of enabling conditions will be needed.

II. Targets under different scenarios

The Communication examines various emission reduction targets, using an indicative greenhouse gas budget for the 2030‑2050 period. Its primary aim is to contribute to the planning of the framework that will follow 2030, without suggesting any new policy measures or establishing sector-specific targets. The choice of a 90% reduction target for 2040 stems from an in-depth impact assessment that meticulously analysed the potential outcomes of three different options for that year.

- **Option 1:** a reduction of up to 80% compared to 1990, consistent with a linear trajectory between 2030 and 2050.
- **Option 2**: a reduction of 85-90%, compatible with the level of net GHG reduction that would be reached if the current policy framework were extended to 2040 and
- **Option 3**: a reduction of 90-95%

The 90% reduction in emissions aligns with both the minimum recommendations provided by the European Scientific Advisory Board on Climate Change (ESABCC) and the commitments the EU has made under the Paris Agreement. To reach this target, it is crucial to fully implement the already agreed-upon framework for 2030. The evaluation of the three alternative options was conducted

using a sensitivity analysis known as LIFE[1], which calculates the impacts of changes in demand-driven lifestyles on each of the options.

The Commission deems however **Option 3** to be the most balanced approach, positioning it as targeting a 90% reduction in GHG emissions as the most cost-effective and equitable strategy. This target is endorsed by the ESABCC (European Scientific Advisory Board on Climate Change), suggesting it would result in the minimum emissions budget (16 GTCO2-eq) and represents a just contribution.

Selected excerpt:

"Electrification with a fully decarbonised power system by 2040 is the main driver of the energy transition. The share of electricity in the final energy consumption will double from 25% today to about 50% in 2040. The impact assessment shows that renewable energy in the majority complemented by nuclear energy will generate over 90% of the electricity consumption in the EU in 2040. Today, **the average yearly gain from the integrated electricity market for European consumers is about EUR 34 billion per year**."

"Electrification will be at the heart of the transition,.." (Annex)

III. E.DSO assessment

The Communication implies that the Commission's future agenda will likely blend existing policies with new initiatives, thereby opening up new pathways and political dialogues starting as of 2025. It is however important to keep a stable regulatory framework for investments in the electricity sector to reach to "Fit for 55" targets. Furthermore, regulatory changes related to the 2040 target should be meticulously analysed for their impact on the EU economy in a wider global context.

However, one should acknowledge that none of the scenarios or a mix of them can fully forecast the precise future agenda. The European Commission is ramping up actions across all sectors to meet the 2030 and 2040 objectives well within each deadline.

More importantly, the document prioritise the development of electricity grids, as well as the integration of system flexibility and storage capabilities. The focus seems to shift away from the sector coupling approach, aiming instead for a faster electrification process. Such a change is expected to bring about an increase in both funding and support for electrification endeavors. To support this commitment, an updated EU Energy Governance Regulation is expected to be introduced to delineate the responsibilities of Member States. This aims to establish a more coordinated and efficient approach to energy strategy throughout the EU.

The question remains whether the new 90 target has become the new 55? The Commission argues that reaching the 2040 target depends in large part on implementing current policies, particularly the 'Fit for 55' package, rather than hosting new legislation.

[1] "LIFE" is not attached to a specific target option and is not used to compare the different target options. It serves to illustrate how these demand-side driven actions can complement the supply-side technology deployment analysed in the core scenarios.

3.1. Need for speed

The communication emphasises an urgent approach, particularly in the scenario aiming for a 90% reduction in emissions. This approach prioritises early investments, within the decade of 2030 to 2040, in deploying clean technologies such as hydrogen, carbon capture use and storage (CCUS), and industrial carbon removal techniques, instead of delaying these efforts until the period of 2040 to 2050.

Notably, achieving the 90% reduction target is contingent upon establishing a fully operational industrial carbon management market by 2040. The European Commission's objective is to facilitate the execution of the current framework while introducing supplementary measures where necessary.

This effort will involve a collaborative approach with Member States, ensuring their **National Energy and Climate Plans** (NECP) are harmoniously integrated into EU policy. The approach will adjust based on the accomplishments of the Fit for 55 initiative and the demands of the new re-industrialisation agenda.

Overall, and notably under option 3, it appears that the European Commission is initiating a 'period of strong climate scrutiny,' which could result in a significant overhaul of current energy and climate policies. This reassessment has the potential to alter priorities and interim goals set for the period beyond 2030. It implies that certain existing proposals might be withdrawn, and the introduction of new climate-related policies could be introduced. Moreover, climate policies may be narrowed down or merged into wider goals, focusing on economic growth or the re-industrialisation agenda.

3.2. Investment needs in distribution grids

The European integrated electricity market currently yields an average annual benefit of approximately EUR 34 billion for customers. This indicates a strong economic argument for further integration and development of the electricity market.

The shift towards higher renewable energy shares and greater electrification requires significant investments in distribution grids. The investments will cater to the need for expanded distribution grids, dispatchable energy sources, flexibility market solutions, and sector coupling.

Investing in the grid infrastructure is essential for several key reasons:

- Firstly, it enhances the intelligence of our grids, enabling smarter energy management through advanced analytics and real-time data monitoring, which is crucial for optimising energy distribution and efficiency.
- Secondly, it increases the adaptation to fluctuating energy demands through advanced grid flexibility. This flexibility is essential in maintaining stability and reliability of the grid and of the whole electricity system, especially as we witness an ambition to rapidly deploy more variable energy sources like solar and wind power.
- Lastly, expanding grid capacity is fundamental to support the integration of renewable energy sources. As we transition towards a more sustainable energy mix, the grid must evolve

to accommodate larger volumes of renewable energy, requiring significant investments in infrastructure to ensure our energy systems are resilient, efficient, and capable of meeting future demands. This strategic investment not only addresses the immediate challenges of energy management but also lays the foundation for a low-carbon future, featuring the critical role of advanced grid infrastructure in achieving energy and environmental goals

The Communication also refers to the recent EU Action Plan for Grids and identifies it as a critical initial step towards achieving the 2030 and 2040 energy targets. Its prompt and effective implementation is emphasised as a priority for the Commission, Member States, and the industry.

The experiences from implementing the Grid Action Plan could inform the development of a comprehensive master plan aimed at accelerating the build-out of an integrated European energy infrastructure, enhancing security, and ensuring resilience.

3.3. Identified shortcomings

The ambitious increase in RES and the electrification of the economy will put the existing grid infrastructure under unprecedented stress. The need for substantial investments in distribution levels to accommodate higher renewable shares is clear. However, the pace and scale of these investments may not match the urgency required by the 2040 targets. There is a risk that grid infrastructure upgrades lag behind renewable energy deployments, leading to bottlenecks and inefficiencies that could impede the transition and lead to larger and growing costs in the coming decades.

While the shift towards RES is necessary, the intermittent nature of sources like wind and solar poses significant challenges to grid stability and reliability. The current grid is designed for predictable, centralised power flows, not the variable and decentralised generation patterns of renewables. Without significant advancements in grid management technologies and energy storage, the risk of grid instability could increase, potentially leading to higher costs and reliability issues.

The critical role of energy storage in balancing supply and demand cannot be overstated. However, the current capacity and technological maturity of storage solutions may not be sufficient to meet future demands.

Digitalisation and the deployment of smart grids are often advertised as solutions to many of the challenges posed by the energy transition. Indeed, these technologies offer significant potential to enhance grid management and efficiency. However, there are some challenges related to the deployment including data privacy, cybersecurity risks, substantial capital investments, and regulatory challenges.

Lastly, pace of necessary grid investments might be or even already has been slowed down due to (among others) shortages of key components on the global market. The Commission has acknowledged the issue of new dependencies on critical raw materials and some technologies in the Communication and the Impact Assessment, however, more focus on this issue is needed. Development of the EU output of key grid components is necessary not only to meet 2030 and 2050 targets, but also to strengthen resilience of our power system and of the EU economy.