Executive Summary

Study on 2030 Renewable Energy and Energy Efficiency Targets in the European Union

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Who we are?

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Study context

This study aims to provide a compact and well-founded basis for national and European decision-makers who are inclined to set more ambitious 2030 targets for renewable energy and energy efficiency in the European Union (EU), complementing already existing analyses and studies.

This study's main objectives are:

- Formulating alternative and more ambitious 2030 targets for renewable energy (RE) and energy efficiency (EE) for the EU, and indicating efforts that are required at Member State level for reaching such target levels.
- Assessing the feasibility of more ambitious 2030 targets for renewables and energy efficiency and conducting an analysis of related economic and environmental impacts.
- Demonstrating the decarbonisation potential when combining reduced energy consumption, in particular through better energy efficiency, with a substantially higher deployment of RE technologies.
- Showcasing the impact of higher target levels for renewable shares and energy efficiency on security of energy supply as well as on related economic factors, in light of the current political, social and economic crisis.
- Issuing policy recommendations on how to accelerate the deployment of renewables.

Approach and assumptions

The assessment of feasibility and impacts of alternative 2030 targets builds on a model-based analysis of the future renewable energy uptake across the EU, according to different energy demand developments that reflect distinct ambitions levels concerning energy efficiency, derived in the light of current global crisis. Below we inform in brief on the approach and the assumptions taken.

The applied modelling system:

Two energy system models were applied that complement each other well:

- For assessing a feasible renewables uptake over time as well as related economic factors, TU Wien's Green-X model was applied. Green-X is a well-known specialised energy system model that builds on detailed data concerning potentials and costs of available renewable energy technologies. Moreover, the model offers a sound incorporation of various renewable energy policy approaches and has been applied in various EU studies related to renewable energy throughout past years.
- Complementary to Green-X the open-source power system model Balmorel was used. Thanks to a higher intertemporal resolution, Balmorel enables a deeper analysis of the merit order effect and related market values of the produced electricity of variable and dispatchable renewables. Therefore, it serves to shed further light on the interplay between supply, demand and storage in the electricity sector.

Scenarios assessed:

As starting point, we took two distinct energy efficiency trends as basis:

- A *moderate increase in energy efficiency*, reflecting a 9% reduction of final energy consumption at EU level compared to the latest EU Reference scenario 2020, was assumed (named "EE9").
- As alternative to the above, a *strong increase in energy efficiency*, i.e. an 18% reduction of final energy consumption (compared to the EU Reference scenario, named "EE18").

In all policy scenarios we then assumed a strong policy ambition forrenewables and in consequence, if needed, a strong RE policy support. We then analysed the impact of currently prevailing *non-financial barriers*[1] that limit the future renewable energy uptake by presuming that currently prevailing RE barriers will be either only partly (named as "with (limited) RE barriers") or fully removed (named as "RE barriers removed") in future years up to 2030. The latter implies immediate policy action across the whole EU in accordance with related recommendations identified in the course of this study.

For assessing the impacts of those more ambitious RE deployment paths we then complemented the four ambitious RE scenarios with a reference scenario that reflects the former RE and EE policy ambitions underlying the existing national planning for deriving NECPs as derived in the years up to 2020.

Key takeaways from the model-based analysis

The feasible renewable energy uptake up to 2030

If we look back in time, we see that a strong growth of renewables has been achieved within the EU's energy sector throughout the past fifteen years, implying almost a doubling of renewable energy volumes achieved throughout this period. This impressive trend needs to be strengthened if we aim for a strong uptake of renewables in future years as assessed by our modelling:

As applicable from Figure 1, with only a partial removal of currently prevailing non-financial renewable barriers, a RE share in gross final energy demand (GFED) of at least 45.1% can be achieved by 2030 even under a moderate path for energy efficiency. With increasing efforts to reduce energy demand, a RE share of 50.8% appears to be in reach by 2030.

If we take further action to fully remove non-financial RE barriers that limit the RE uptake at present, even higher RE shares can be achieved in 2030, ranging from 51.7% in the case of moderate energy efficiency (EE9) to 58.2% under a very strong energy efficiency path (EE18).

Notably, all policy scenarios imply to strengthen the RE policy ambition rapidly across the whole EU by rapidly agreeing on ambitious RE targets and implementing strong RE policy initiatives that initiate a RE uptake at technology and sectoral level in all MS.

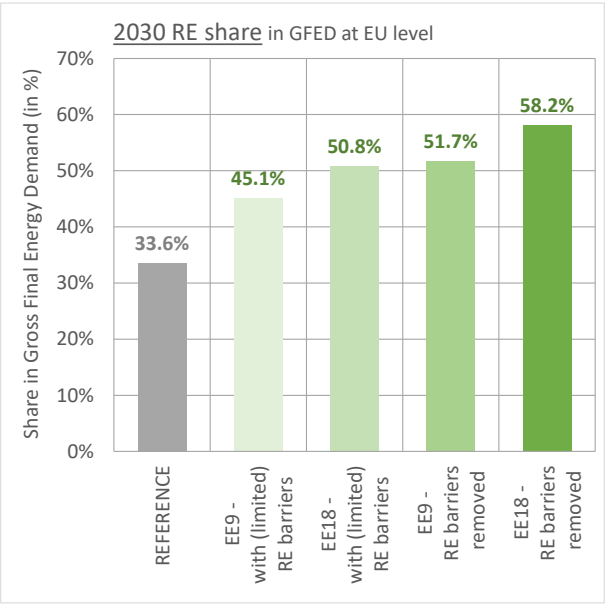

Figure 1: Overall 2030 RE share according to assessed scenarios (Source: Green-X modelling)

Cost, expenditures and benefits related to the RE uptake under distinct energy efficiency trends

As illustrated in Figure 2, our model-based assessment has shown that significant investments in renewable energy generation are required for achieving a strong uptake in renewable shares in accordance with more ambitious 2030 targets for both renewable energy and energy effiency. At the cost side, the burden can be kept low if appropriate policy design for renewables is provided, offering support tailored to the respective technology - and even site-specific needs.

At the benefit side, significant savings can be expected both in terms of CO_2 emission, other GHG emissions and fossil fuel avoidance, especially in times of high energy prices. Apart from environmental

[1] Non-financial barriers that limit the RE uptake include (long) permission procedures, limits in grid access, constraints in market readiness of involved actors or hurdles that occur due to a gap in spatial planning.

benefits, the avoidance of fossil fuels will thus have a strong positive impact on Europe's energy supply security. We can conclude that renewables and energy efficiency can strongly contribute to safeguard energy supply in a sustainable way, an issue being of key relevance in the current crisis.

Additionally, a closer look at energy efficiency has shown that an increase in ambition needs to go hand in hand with an increase in the ambition for renewables, since otherwise negative climate impacts may arise from an increase in electrification and the corresponding uptake of fossil fuel use in the power sector.

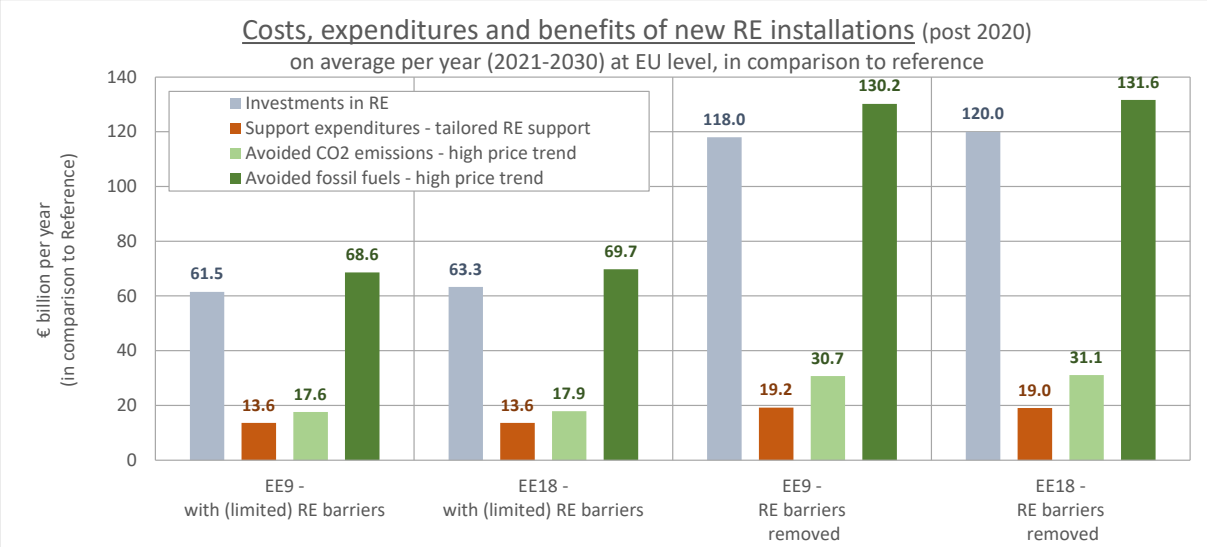

Figure 2: Summary of costs, expenditures and benefits related to the RE uptake at EU level on average per year in the period from 2021 to 2030 – in the case of high energy prices (Source: Green-X modelling and own assessment)

Identified policy needs – measures required to let the vision become a reality

For letting the envisaged vision become a reality we strongly encourage policy makers and stakeholders to take action in the following fields:

- Establishing ambitious 2030 targets and proactively communicating that renewables and energy efficiency are part of the cure, improving Europe's competitiveness and serving as key elements for mitigating global crisis
- Overriding public Interest in all energy policy and legal reform processes
- Fast-tracking permitting of renewables
- Making use of the full scope of renewable energy and energy efficiency technologies available today
- Designing energy markets that are fit for renewables
- Putting key emphasis on spatial planning
- Getting the hydrogen uptake right
- Promoting individual and collective self-consumption of renewable energy
- Enhancing the use of cross-border renewables cooperation
- Establishing and enhancing training programmes for skilled workers

Further details on the approach, results and on derived recommendations on the way forward are applicable in the detailed final report of our study, accessible at www.eref-europe.org.