27% RENEWABLE ENERGIES IN THE EUROPEAN UNION BY 2030 - LESSONS LEARNT AND RECOMMENDATIONS ON THE WAY FOWARD

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Overview

As an important first step in defining the framework for RES within the European Union post 2020, a binding EU-wide RES target of achieving at least 27% as RES share in gross final energy demand was adopted by the European Council and Parliament in October 2014 [1]. On the 30 November 2016, the next step was taken: The European Commission published a package of proposals for legislative measures for the time horizon from 2020 to 2030 called "Clean Energy for all Europe-ans" commonly referred to as the winter package. It aims at further promoting the clean energy transition while developing the internal market for electricity and thus fostering the Energy Union.

Within the Intelligent Energy Europe (IEE) project Towards2030-dialogue[1] we have facilitated and guided the RES policy dialogue for the period towards 2030. This strategic initiative aimed for an intense stakeholder dialogue for establishing a European vision of a joint future RES policy framework. The dialogue process was coupled with in-depth and continuous analysis of relevant topics that included RES in all energy sectors but with more detailed analyses for renewable electricity. Within a model-based analysis distinct RES(-E) policy pathways for 2030 have been assessed, such as options to coordinate and align national support schemes as well as the clustering of regional support schemes. This paper aims to present some of our key results gained together with recommendations on the way forward.

Methods

The work presented in this paper builds on detailed quantitative and qualitative assessments conducted in the IEE project Towards2030-dialogue (cf. [2]). Concerning the quantitative analysis we made use of TU Wien's specialised energy system model (Green-X (cf. www.green-x.at) for identifying and assessing possible RES developments up to 2030, indicating RES deployment at sector, at technology and at country level that can be expected under distinct policy concepts. Complementary to results on deployment, related impacts on costs (generation cost), expenditures (capital and support expenditures) and benefits (fossil fuel and related CO2 emission avoidance) were a core element of the RES policy analysis. For specific purposes, e.g. for assessing the interplay between RES and future electricity market design that involves an analysis of the merit order effect and related market values of the produced electricity for variable and dispatchable renewables, Green-X was complemented by its power-system companion – i.e. the HiREPS model – to shed further light on the interplay between supply, demand and storage in the electricity sector thanks to a higher intertemporal resolution than in the RES investment model Green-X.

Results and conlusions

Below we list some key conclusions drawn from our results and findings:

Moderate dedicated support for renewables is required to reach the 2030 target of 27% renewables.
To which extent dedicated support for renewables can be phased out in the upcoming decade mainly depend on the costs of renewable energy technologies, on future power and carbon prices and on risks associated with investments in power assets. Further cost reductions for renewable energy technologies can be expected in the upcoming decade, also due to the increasingly global deployment of renewables. This will lower the costs of supporting the deployment of renewables. Future power and carbon prices are, however, subject to higher uncertainty. The EU carbon market is currently confronted with an oversupply of CO2 emission allowances, while many EU power markets are struggling with overcapacity. Resolving these issues is also a matter of political intervention and therefore subject to high uncertainty.

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Our model-based assessment of future renewables deployment at national and EU level assuming achievement of the 27% target by 2030 confirms that the necessary remuneration for renewables is expected to decline over time, cf. Fig. 1. Overall, the need for net support, i.e. the difference between necessary remuneration and market value, is shrinking for renewable electricity through to 2030: compared to the current situation (2015) a strong decline or even a phase-out of the need for net support may be achieved by 2030 – if energy and carbon will evolve as projected in recent EC forecasts (cf. [3]).

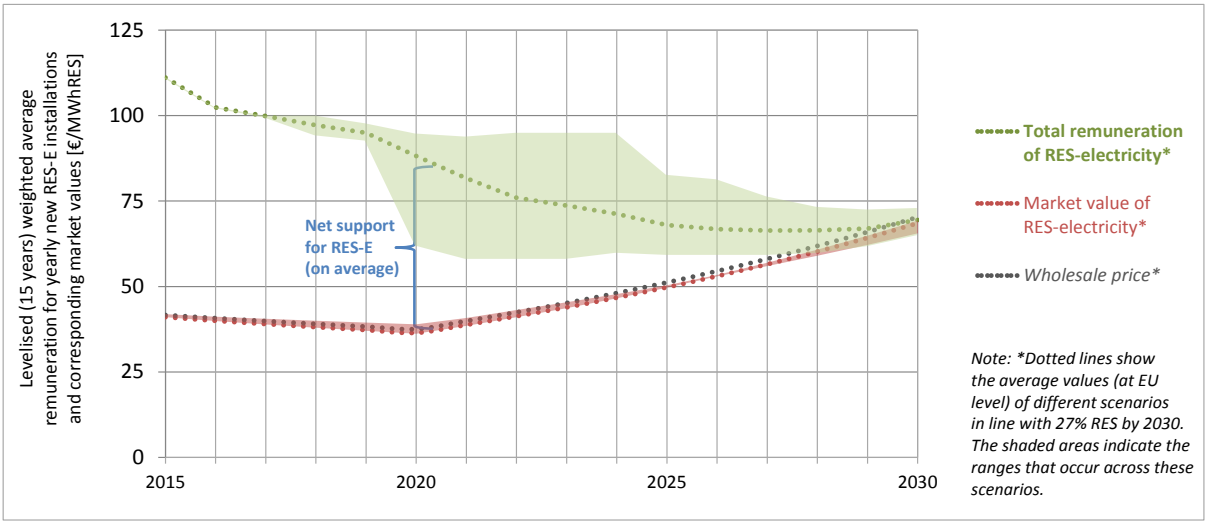

Fig. 1. Future development of remuneration levels and corresponding market values of renewable energy technologies (on average) at EU-28 level according to a Green-X scenario of meeting 27% renewables by 2030 (Source: Own assessment (Green-X) based on PRIMES scenarios)

Other key findings and conclusions are:

- RES ambition and the role of energy efficiency: to maintain the ambition level for renewables the newly established 30% energy efficiency target calls for an increase of the targeted renewables share.
- The bulk of support expenditures in the forthcoming decade will be dedicated to RES installations that have been erected in the years up to 2020
- The harmonisation and/or convergence of European RES policies remain as topics of key interest within the political debate. Guiding and framing this process will be a major task for the evolving Energy Union.
- Concerning RES-E policy pathways for meeting the 2030 RES target our model-based analysis shows clear preferences for feed-in premium schemes where support levels are determined in a tendering procedure in comparison to quota schemes with certificate trading. Beneficial appears also the allocation of RES investments at a multinational level.
- Delayed action would lead to lower support expenditures in early years post 2020 but in the long-run policy costs may be significantly larger in magnitude than in case of stringent and constant policy ambition for renewables.

References

[1] EUCO 169/14, European Council (23 and 24 October 2014), Conclusions on 2030 Climate and Energy Policy Framework, Brussels, 24 October 2014.

[2] Resch G., L. Liebmann, A. Ortner, J. Geipel, M. Welisch, A. Hiesl, 2017. Towards2030-dialogue - a quantitative assessment of RES policy pathways and 2030 (RES) targets. Final scenario report compiled within the project towards2030-dialogue, supported by the EASME of the European Commission within the "In-telligent Energy Europe" programme. TU Wien, Energy Economics Group, Vienna, Austria, June 2017. Accessible at www.towards2030.eu.

[3] European Commission, 2016g. EU energy, transport and GHG emissions trends to 2050: Reference Scenario. Based on PRIMES modelling done by NTUA on behalf of the European Commission. DG Energy, DG Climate Action and DG Mobility and Transport. Brussels, 2016.