

The 35% renewable energy and 35% energy efficiency targets voted for by the European Parliament enable greenhouse gas emission reductions of 50% in 2030

An assessment of greenhouse gas emissions in 2030 associated with a 35% renewable energy target and an 35% energy efficiency target

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As part of the 2030 climate and energy framework, the EU has set key targets for greenhouse gas (GHG) emission reductions, as well as for the share of renewable energy and the improvement of energy efficiency. The aim of the EU is to reduce GHG emissions with at least 40% by 2030, compared to 1990 emission levels.¹ These targets were agreed before the importance of achieving deeper emissions cuts in order to keep global temperature increases below 1.5 °C was stressed in the Paris Agreement.² As part of the Clean Energy package presented on 30 November 2016, the European Commission published proposals for a revised Renewable Energy Directive and a revised Energy Efficiency Directive.³ The revised directives should “ensure that the share of renewable energy in the EU final energy consumption reaches at least 27% by 2030” and introduces a “30% binding energy efficiency target for 2030 at EU level”.⁴ Ecofys, a Navigant company – commissioned by the European Climate Foundation – has calculated the impacts of the 35% renewable energy and the 35% energy efficiency target proposed by the European Parliament. We show that achieving such higher targets would result in emission cuts of approximately 50%.

35% renewable energy and 35% energy efficiency targets will enable emissions reductions of 50%

In response to the proposed revisions of the Renewable Energy Directive and the Energy Efficiency Directive, the European Parliament voted for binding EU-level targets of a minimum 35% share of energy from renewable sources in gross final energy consumption and a 35% improvement in energy efficiency.^{5,6} As part of the European Commission’s impact assessment work in 2016, various scenarios with 27-30% renewable energy targets and 27-40% energy efficiency targets have been modelled, achieving GHG emission reductions up to 47%.⁷ Our calculation provides insights in the 35% renewable energy and 35% energy efficiency target, which was not included in the European Commission’s impact assessment.

¹ European Commission, 2014. 2030 Climate and Energy Framework. Available at: http://ec.europa.eu/clima/policies/strategies/2030/index_en.htm. European Council, 2014. European Council (23 and 24 October 2014) – Conclusions. Available at: http://www.consilium.europa.eu/uedocs/cms_data/docs/pressdata/en/ec/145397.pdf.

² See for example the assessment of the EU climate policy by the Climate Action Tracker on <http://climateactiontracker.org/countries/eu.html> and the Ecofys blog on a fair contribution of the EU to the 2°C on <https://www.ecofys.com/en/blog/what-is-a-fair-contribution-of-the-eu-to-the-2c-limit/>.

³ European Commission, 2016. Clean Energy for All Europeans. Available at: <https://ec.europa.eu/energy/en/topics/energy-strategy-and-energy-union/clean-energy-all-europeans>.

⁴ Proposal for a Directive of the European Parliament and the Council on the promotion of the use of energy from renewable sources (recast) [COM(2016) 767] and Proposal for a directive of the European Parliament and of the Council amending Directive 2012/27/EU on energy efficiency [COM(2016) 761]

⁵ The renewable energy target is defined as the percentage of the gross final consumption. The energy efficiency target is defined with respect to projected 2030 primary energy consumption in the PRIMES 2007 baseline.

⁶ European Parliament, 2018. MEPs set ambitious targets for cleaner, more efficient energy use. Available at: <http://www.europarl.europa.eu/news/en/press-room/20180112IPR91629/meps-set-ambitious-targets-for-cleaner-more-efficient-energy-use>. European Parliament, 2018. Briefing EU Legislations in Progress. Promoting renewable energy sources in the EU after 2020. Available at:

[http://www.europarl.europa.eu/RegData/etudes/BRIE/2017/599278/EPRS_BRI\(2017\)599278_EN.pdf](http://www.europarl.europa.eu/RegData/etudes/BRIE/2017/599278/EPRS_BRI(2017)599278_EN.pdf). European Parliament, 2018. Briefing EU Legislations in Progress. Revised Energy Efficiency Directive. Available at:

http://www.europarl.europa.eu/RegData/etudes/BRIE/2017/595923/EPRS_BRI%282017%29595923_EN.pdf.

⁷ E3MLab & IIASA, 2016. Technical report on Member State results of the EU CO₂ policy scenarios. Available at:

https://ec.europa.eu/energy/sites/ener/files/documents/20170125_-_technical_report_on_euco_scenarios_primes_corrected.pdf.

Our analysis shows that by implementing a 35% renewable energy target and an 35% energy efficiency target, GHG emission reductions of approximately 50% are feasible. Studies by IRENA and Fraunhofer ISI indicate that the EU could increase the renewable share in its energy mix cost effectively to 34% in 2030⁸ and that there is an energy savings potential of over 40%.⁹

We analysed the impact of renewable energy targets and energy efficiency targets by using the *2030 Target Tool* developed by Ecofys, a Navigant company. This tool is designed to assess consistent energy efficiency, renewable energy and GHG emissions reduction targets.¹⁰ Further details on the calculation are provided in the Appendix. In this paper we use the 35% renewable energy target and the 35% energy efficiency target as proposed by the European Parliament as input and calculate the associated emission reductions. Figure 1 below shows both the absolute and relative impact on GHG emissions as compared with the GHG emissions in case of a 27% renewable energy target and an 30% energy efficiency target.

GHG emissions [MtCO₂e]

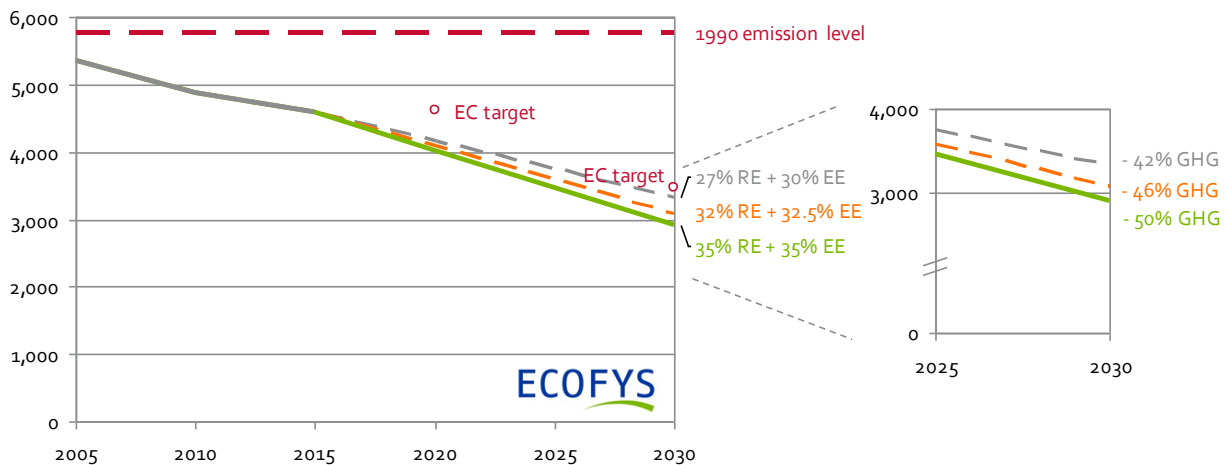


Figure 1. Emissions reductions enabled by a 35% renewable energy target and an 35% energy efficiency target. The 32% renewable energy and 32.5% energy efficiency target is added to illustrate the RED and EED conclusions from June 2018.

We find that if a renewable energy target of 27% and an energy efficiency target of 30% are implemented, the emissions cut is around 43% by 2030. Aiming for a 35% renewable energy targets and an 35% energy efficiency targets will make it feasible to achieve emission cuts of approximately 50%. Increasing electrification in transport and heating, the further phase out of coal, as well as the increased reduction of non-energy and non-CO₂ emissions could increase GHG reductions well over 50%. Leaked analyses undertaken by the Commission to illustrate the impact of 30-45% renewable energy targets and 30-40% energy efficiency targets, estimate GHG emission reductions of 41-53% with high renewable energy and energy efficiency targets.¹¹

⁸ IRENA, 2018. Renewable Energy Prospects for the European Union. Available at: <http://www.irena.org/publications/2018/Feb/Renewable-energy-prospects-for-the-EU>.

⁹ Fraunhofer ISI, 2012. Concrete Paths of the European Union to the 2°C Scenario: Achieving the Climate Protection Targets of the EU by 2050 through Structural Change, Energy Savings and Energy Efficiency Technologies. Accompanying scientific report. The energy savings potential is estimated to be over 40%, relative to the final energy consumption in the 2009 PRIMES baseline, which already outlines lower energy consumption levels than the 2007 baseline used for the EU energy efficiency targets.

¹⁰ Ecofys, 2014. The EU Parliament's resolution on 2030 climate and energy targets could exceed the 40% emissions reduction target by 5-14%pts: An assessment of the greenhouse gas emissions in 2030 associated with the 30/40 Resolution of the European Parliament. Available at: <http://www.ecofys.com/files/files/ecofys-2014-ghg-emissions-2030-in-view-of-ep-30-40-target.pdf>. Ecofys, 2016. Higher EU energy efficiency and renewable energy targets enable greenhouse gas emissions reductions of more than 50% in 2030. Available at: <https://www.ecofys.com/files/files/memo-higher-eu-energy-efficiency-and-renewable-energy-targets.pdf>.

¹¹ Described in the leaked "Non paper on complementary economic modelling undertaken by DG ENER regarding different energy policy scenarios including updated renewable energy technology costs in the context of Council and Parliament discussions of the recast of the renewable energy directive and the revision of the energy efficiency directive". Emission reductions for a 35% renewable energy and an 35% energy efficiency target amount to 48%.

Appendix: The 2030 Target Tool

The *2030 Target tool* is a compact calculation tool designed to assess consistent energy efficiency, renewable energy and GHG emissions reduction targets. The outcome of this analysis can be used to inform stakeholders on possibilities to increase the EU's GHG emissions reduction target in line with what was agreed at the COP21.

The GHG emission effect of the targets is analysed by modelling the changes in the EU energy consumption from 2015 to 2030. The 2015 energy balance for the EU-28 from the IEA is used as basis for the analysis. The 2015 energy balance is subsequently translated into the 2030 energy balance by performing several steps:

- Fuel shift: The future share of electricity in transport (2.4%) result in a shift from fossil fuels to electricity.¹² In addition, a shift from coal to gas in the electricity and central heating sectors as well as in the buildings and industry sector is assumed, resulting in a primary coal and gas demand of respectively 3.0 EJ and 12.2 EJ in 2030.
- Renewable energy: The growth of renewable energy in electricity (55%) and of biofuels in transport (10%) result in a shift from fossil fuels to renewables. To meet the renewable energy targets, the required share in the remaining energy consumption is calculated (44.8%).
- Energy efficiency: The steps above already result in a reduction of gross final consumption. As final step, an aggregate energy consumption reduction (8.9%) is calculated and applied to ensure that the energy efficiency target is met.

The energy CO₂ emissions are subsequently calculated by the primary energy consumption and the energy carrier specific emission factors. Non-energy and non-CO₂ emissions, including emissions from for example agricultural activities and waste, as well as greenhouse gasses other than CO₂, are not explicitly modelled but based on the EUCO scenarios. The non-energy and non-CO₂ emission reductions applied in the tool amount to -47% compared to 1990 values.¹³

¹² The future share of electricity in transport is based on the assessment of the electricity share in 2030 in the EU Reference Scenario 2016. Available at: https://ec.europa.eu/energy/sites/ener/files/documents/ref2016_report_final-web.pdf.

¹³ The non-energy and non-CO₂ emissions amount to 832-910 MtCO_{2e} in 2030, compared to approximately 1500 MtCO_{2e} in 1990. The non-energy emissions reduction is based on the EUCO scenarios E3MLab & IIASA, 2016. Technical report on Member State results of the EUCO policy scenarios. Available at: https://ec.europa.eu/energy/sites/ener/files/documents/20170125_-_technical_report_on_euco_scenarios_primes_corrected.pdf. In the Commission's impact assessment performed in 2014, reductions up to 51.4% were modelled.

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About Ecofys

Ecofys, a Navigant company, is a leading international energy and climate consultancy focused on sustainable energy for everyone. Founded in 1984, the company is a trusted advisor to governments, corporations, NGOs, and energy providers worldwide. The team delivers powerful results in the energy and climate transition sectors. Working across the entire energy value chain, Ecofys develops innovative solutions and strategies to support its clients in enabling the energy transition and working through the challenges of climate change. Additional information about Ecofys can be found at

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