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The unrecognized contribution of renewable energy to Europe's energy savings target

Robert Harmsen [a,*], Bart Wesselink [b], Wolfgang Eichhammer [c], Ernst Worrell [a]

[a] Department of Innovation and Environmental Sciences, Utrecht University, Heidelberglaan 2, NL-3584 CS Utrecht, The Netherlands
[b] Ecofys Netherlands, PO Box 8408, NL-3503 Utrecht, The Netherlands
[c] Fraunhofer Institute for Systems and Innovation Research, Breslauer Str. 48, DE-76139 Karlsruhe, Germany

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ABSTRACT

We show that renewable energy contributes to Europe's 2020 primary energy savings target. This contribution, which is to a large extent still unknown and not recognized by policy makers, results from the way renewable energy is dealt with in Europe's energy statistics. We discuss the policy consequences and argue that the 'energy savings' occurring from the accounting of renewable energy should not distract attention from demand-side energy savings in sectors such as transport, industry and the built environment. The consequence of such a distraction could be that many of the benefits from demand-side energy savings, for example lower energy bills, increase of the renewable energy share in energy consumption *without* investing in new renewable capacity, and long-term climate targets to reduce greenhouse gas emissions by more than 80%, will be missed. Such distraction is not hypothetical since Europe's 2020 renewable energy target is binding whereas the 2020 primary energy savings target is only indicative.

1. Introduction

It is commonly recognized that with increased energy savings it is easier to increase the share of renewable energy in energy supply. In Europe's Renewable Energy Directive 2009/28/EC the European Commission states e.g. that 'energy efficiency and energy saving policies are some of the most effective methods by which Member States can increase the percentage share of energy from renewable sources, and Member States will thus more easily achieve the overall national and transport targets for energy from renewable sources laid down by this Directive' (European Commission, 2009, recital 17)

Less known is the fact that renewable energy contributes to Europe's target to save 20% primary energy by 2020. The aim of this article is to unravel and clarify this interaction of renewable energy with primary energy savings and to discuss its relevance for Europe's energy savings policy. In doing so, we first provide some background on Europe's energy savings target. Then, we show how increasing the share of renewable energy sources leads to primary energy savings. Subsequently, we analyze the interaction of Europe's energy savings target with the binding renewable energy target and quantify the primary energy savings impact of renewable energy in a scenario approach. Finally, we discuss the results of our analysis and their relevance for Europe's energy savings policy.

2. Europe's energy savings target: 20% energy savings in 2020

Europe aims to achieve 20% primary energy savings in the period 2005–2020. This target is non-binding (indicative) and originates from the 2005 Green Paper on Energy Efficiency (European Commission, 2005). It was restated in the Action Plan for Energy Efficiency in 2006 (European Commission, 2006), politically endorsed at the Spring Council of 2007 (European Commission, 2007), reconfirmed as part of the EU's Climate and Energy package in 2008 (European Commission, 2008a) and finally adopted 17 June 2010 by the European Heads of State of government (the European Council) as part of the 'Europe 2020' strategy (European Commission, 2010a, 2010b). Also in the Energy Efficiency Plan 2011 (European Commission, 2011a) and Europe's 2050 roadmap (European Commission, 2011b), the 20% target has been restated.

In none of the above mentioned documents from the European Commission it is documented how the 20% target should be interpreted, i.e. whether it is defined as a *fixed* energy savings *volume* or whether it is a target *relative* to a *moving* baseline scenario or a *fixed* baseline scenario.

In case the target should be interpreted as a fixed volume of energy savings, the amount of savings to be achieved is fully

* Corresponding author. Tel.: +31 302534419; fax: +31 302532746.
E-mail address: r.harmsen@geo.uu.nl (R. Harmsen).

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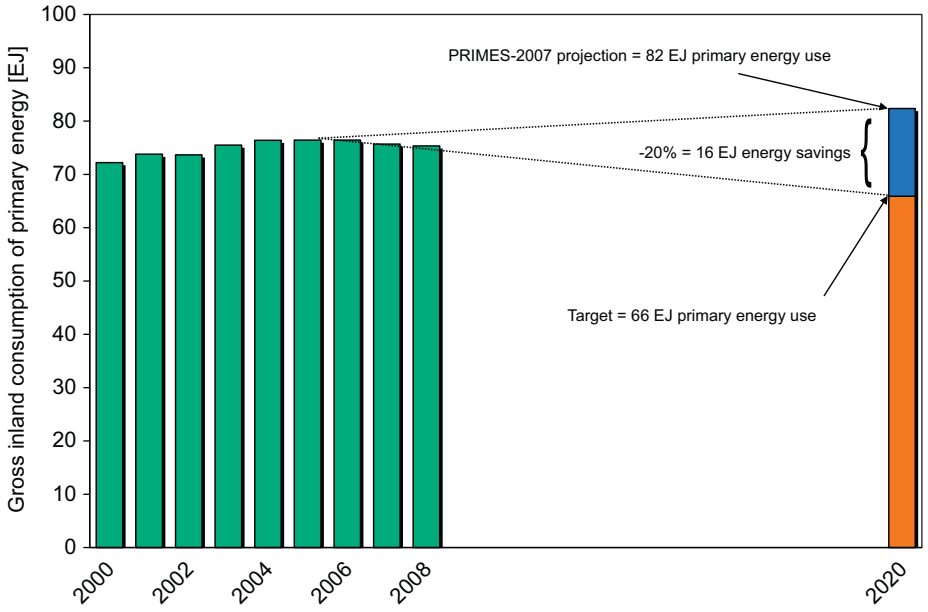

Fig. 1. The EU 20% primary energy savings target (2000–2008 data are based on Eurostat; 2020 data are based on PRIMES-2007 with base year 2005).

transparent (i.e. a fixed number). However, the level of primary energy use in the target year is uncertain as it depends on economic growth rates.

The second option is to interpret the target as being relative to a moving baseline scenario. This would mean that the baseline projection is corrected for new insights in economic growth, energy price development, etc. In this case, both the level of primary energy use in the target year and the amount of savings to be achieved is uncertain.

In case the target is relative to a fixed baseline scenario, this would mean full transparency regarding the level of primary energy use to be achieved in the target year. Such target would however also mean that the amount (volume) of energy savings to be achieved is uncertain as the actual growth of activity in the economy might differ (lower or higher growth) from what is projected in the fixed baseline.

Although the European Commission has not been explicit in the interpretation of its target definition, it can be derived from the 2008 communication from the European Commission 'Energy efficiency: delivering the 20% target' (European Commission, 2008b) that the 20% target should be interpreted as being relative to a fixed baseline projection, more specifically, the PRIMES-2007 baseline scenario 'European Energy and Transport, Trends to 2030—Update 2007' (Capros et al., 2008). In the communication, the European Commission indicates that the 20% target should lead to a total primary energy use in the European Union (EU) of 66 EJ (1574 Mtoe[1]) in 2020 (European Commission, 2008b, Annex 1).

From Fig. 1 it can be derived that compared to the PRIMES-2007 2020 projection a volume of 16 EJ (394 Mtoe[2]) energy savings needs to be achieved to realize the 20% target. According to the 2006 Energy Efficiency Action Plan (European Commission, 2006) these savings should be achieved by end-use energy efficiency improvements and more efficient energy conversion in the supply sector. The following priority actions have been listed in the Action Plan (European Commission, 2006):

- Appliance and equipment labeling and minimum energy performance standards.
- Building performance requirements and very low energy buildings ('passive houses').
- Making power generation and distribution more efficient.
- Achieving fuel efficiency of cars.
- Facilitating appropriate financing of energy efficiency investments for small and medium enterprises and Energy Service Companies.
- Spurring energy efficiency in the new Member States.
- A coherent use of taxation.
- Raising energy efficiency awareness.
- Energy efficiency in built-up areas.
- Foster energy efficiency worldwide.

In the 2011 Energy Efficiency Plan (European Commission, 2011a), the emphasis is put on (1) the exemplary and leading role of the public sector, (2) paving the way towards low energy consuming buildings, (3) the competitiveness of the European industry, (4) appropriate national and European financial support, (5) energy savings by consumers and (6) improving the efficiency of the transport sector.

In the 2006 Action Plan (European Commission, 2006) the word 'renewable' or 'renewable energy' does not appear at all. In the 2008 Commission communication 'Energy efficiency: delivering the 20% target' (European Commission, 2008b) renewable energy is mentioned but in the 'classic' way: with energy efficiency improvement it becomes easier to increase the share of renewable energy in total energy use. The contribution of renewable energy to the energy savings target is not recognized

[1] The European Commission uses Mtoe (mega ton oil equivalent) as its default unit of energy (following Eurostat statistics). In this article, Mtoe has been converted into EJ (Exa Joule). Where deemed useful, the original Mtoe value is given between brackets.

[2] This figure can be found in Annex 1 of the communication 'Energy efficiency: delivering the 20% target (European Commission, 2008b). In the Energy Efficiency Action Plan 2011 (European Commission, 2011a), this figure is scaled down from 394 to 368 Mtoe. From the Impact Assessment accompanying the Energy Efficiency Plan 2011 (European Commission, 2011c), it becomes clear that the updated figure excludes the non-energy use projected for 2020 (126 Mtoe).

(*footnote continued*)
The 368 Mtoe is calculated as follows: (1968 Mtoe (2020 projection total primary energy use) − 126 Mtoe) × 20%.