Towards a truly sustainable energy system in the EU

45% by 2030
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Moving to 2030

Strong words demand strong actions. There is a far reaching agreement that Europe’s energy system must undergo radical change. This is seen as the key element for fulfilling the European Union’s commitment to reducing greenhouse gas emissions by 80-95% by 2050 in order to avoid the most serious effects of climate change for the well-being of our societies.

With today’s policies, however, the EU is set to fail meeting its long-term climate ambition. The European Commission estimates that a continuation of current trends and policies would result in only a 40% reduction in greenhouse gas (GHG) emissions by 2050. EU energy policy, building upon its 2020 targets, needs to be geared up to reach significant greenhouse gas emissions reductions by 2050, while increasing energy security and competitiveness for the benefit of European citizens.

Renewable energy sources and energy savings are the most straightforward means of both reducing emissions and improving security of energy supply. Energy related CO₂ emissions have already been reduced by more than 20% against 1990 levels due to the deployment of renewable energy technologies. In addition, the renewable energy industry is one of the fastest growing sectors, providing jobs and bringing new technologies to the market, thereby helping to ensure that Europe maintains its technological leadership in global industrial innovation. However, the EU is increasingly being globally challenged by new market players. In order to keep its pole position, clear signals for investors are needed.

The decisions made today will determine the direction the energy sector will take in the long-term. It has to be made clear that high-carbon investments are expensive, and will remain so in the future. Only then will markets be capable of triggering the vital private investments (including capital intensive and long-term investments) which are needed for a transition to a resource-efficient and renewable energy system, not least in times of tight public budgets.

Investors need a long-term perspective guided by an ambitious and stable policy framework. Targets have proven to be one of the key elements for ensuring a progressive development of the energy sector.

In 2004, the European Renewable Energy Council (EREC) called for a legally binding EU target of 20% renewable energy by 2020, a claim which has been supported by various stakeholders and finally enshrined in law with the 2009 Renewable Energy Directive. Now it is time to take the next step and lift up our ambitions for the post-2020 decade.

EREC calls on the European Commission, Member States and the European Parliament to deliver on the European Union’s long-term climate commitment by proposing and endorsing a legally binding EU target of at least 45% renewable energy by 2030.

Moreover, EREC believes that the current energy policy needs to be enhanced by setting a binding 20% energy savings target and a 30% domestic GHG reduction target for 2020. This is the successful triangle for an 80%-95% GHG emission reduced Europe by 2050.

It is now high time to decide whether to opt for a polluting, fossil fuels dependent energy pathway or one based on clean, sustainable, widespread and available renewable energy sources. Strong goals demand strong targets.
Renewable energy has become more and more significant in the European energy market and will, without a doubt, play a key role in the long-term. Within less than two decades, renewable energy has developed from an alternative energy source in a niche market to one of the most important energy sources worldwide and a driving force for a sustainable 21st century economy. Renewable energy reduces import dependency and diversifies energy sources, contributing to future economic development in Europe. Decisions that can help continue this economically and environmentally important trend will depend on an understanding of what has nurtured its growth so far.

Energy for the Future – The 1997 White Paper

With its White Paper on Renewable Sources of Energy in 1997, the European Union started working towards a target of a 12% share of renewable energy by 2010 representing a doubling of the contribution from renewable energy compared with 1997. It included targets for the various renewable energy technologies for 2010. In most cases these targets were already achieved or exceeded ahead of 2010.

Photovoltaic electricity, for example, reached a cumulative installed capacity of almost 30 GW in the EU in 2010. This is more than nine times higher than the target foreseen in the 1997 White Paper. At the same time, geothermal heat exceeded three times the projected installed capacity of 5 GWt, achieving about 15 GWt, while the wind industry had already installed the 40 GW envisaged by the White Paper in 2005, five years ahead of the Commission’s target. Wind power’s cumulative installed capacity accounted for 85 GW in 2010, more than double the White Paper target.

The modest market development of renewable heating and cooling technologies can be explained by the lack of dedicated European legislation and the absence of clear and ambitious targets for the heating and cooling sector.
Until 2010, the development of energy from renewable sources in the EU was mainly driven by two key pieces of legislation: Directive 2001/77/EC on the promotion of electricity from renewable energy³ and the Directive 2003/30/EC on the promotion of biofuels,⁴ both setting ambitious national and EU targets for 2010.

### The 2001 Renewable Electricity Directive

Following the 1997 White Paper, the European Union established the 2001 Renewable Electricity Directive, its first renewable energy legislation, leading to the creation of stable policy frameworks and improving planning regimes and electricity grid access for renewable energy in each Member State. The Directive set an overall target to source 21% of electricity from renewable sources by 2010.⁵ Each EU country has a national indicative target for renewable electricity to contribute towards this overall goal.

Provisional data for 2009 show that renewable energy sources produced about 19.9% (608 TWh) of the EU’s total electricity consumption (3,042 TWh).⁶ Hydropower contributed the largest share with 11.6%, followed by wind energy with 4.2%, biomass with 3.5%, and solar power with 0.4%. This represents a significant increase on 2008, when renewable power generation provided 16.6% (558 TWh) of gross electricity consumption (3357 TWh).

Furthermore, renewable power capacity is set to increase further moving towards a situation where newly installed renewable energy electricity capacity is predominant. New renewable energy power installations increased from just 1.3 GW in 1995 to 13.3 GW in 2008, and 17.3 GW in 2009. In 2010, more renewable electricity capacity was installed in the EU than ever before: a record 22.7 GW.  

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⁵ The target was set in Directive 2001/77/EC at 22.1% and was realigned to 21% when the new Member States joined the EU.


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**Figure 2**

New Installed Power Capacity per Year 1995-2010 (MW)

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Source: EWEA (2011)
The transport sector relies on an unbroken and relatively cheap supply of oil for its survival. 95% of transport consumption is covered by petroleum products, mainly petrol and diesel for land transport. Biofuels are the only available large scale substitute. Given the precarious security of oil supply, in 2003 the EU adopted the Biofuels Directive, with the aim of boosting both the consumption and production of biofuels.

The Directive established an indicative target of 5.75%, calculated on the basis of energy content, of all petrol and diesel for transport purposes, for the share of biofuels and other renewable fuels to be placed on the market by 31st December 2010, compared to a share of just 0.5% in 2003. Biofuel consumption has developed considerably over the last few years, triggered by the EU targets for the share of biofuels in transport. In 2008 its share in transport was 3.5%, up from 2.6% in 2007. Four Member States – Austria, Germany, Slovakia and Sweden – had already met the 2010 transport target in 2008, with France being certain to join this group in 2009. Preliminary data for 2009 show that biofuels consumption amounted to 12 Mtoe, representing a 4% biofuels share in transport.

The Missing Renewable Heating and Cooling Directive

Despite being the dominant energy sector, accounting for about 50% of the EU final energy consumption, the growth in renewable heating and cooling has been less rapid than in the other sectors. This can be explained by the absence until 2010 of any EU legislation to promote heating and cooling from renewable sources. The 12% White Paper target did, however, create an implicit heating and cooling target of 80 Mtoe in order for the 12% overall target to be met.

The share of renewable heating and cooling in 2007 was 11.5%, compared to 10.3% in 2006. In 2008 heating and cooling from renewable sources accounted for approximately 67 Mtoe, increasing its share further to 11.9% of final heat demand.

Overall, the EU-27 progressed rapidly within one decade from a renewable energy share of 6% in 1997 to about 10% in 2007. In 2009 preliminary data show a share of renewable energy in final energy consumption of about 11%. Linear estimates from the European Commission see the overall renewable energy share in the EU reaching 11.6% in 2010 with further growth in all three sectors.
Decarbonising the EU’s Energy Supply

The steady increase of renewable energy was at the expense of fossil fuels. The net GHG saving achieved by biofuels production and consumption in 2008, for instance, are estimated to be 15 Mt CO$_2$ to 17.4 Mt CO$_2$. This translates into an overall weighted GHG saving of 43% to 49% relative to fossil fuels replaced. In 2010, the installed wind power capacity of 85 GW avoided 126 Mt CO$_2$ emissions. In total, the deployment of renewable energy avoided about 880 Mt of energy related CO$_2$ emissions in 2010. This is equivalent to a total reduction of energy related emissions of about 22% against 1990 levels. Considering a carbon price of €20/t, the additional total CO$_2$ benefit can be calculated as being about €18 billion in 2010.

Investing in Renewable Energy

In the 2000-2010 decade, financial transactions – and hence investments – in renewable energy rose strongly, amounting to €55 billion and €62 billion in 2008 and 2009 respectively.

In addition to the constant increase of renewable energy investments, a change in financing patterns can be observed. While at the beginning of the decade, balance sheet financing was clearly the dominant financial instrument, debts or loans have become more prominent in recent years. From an investor’s and lender’s point of view, that could be explained both by technological development and by the strong political commitment of binding renewable energy targets, which has the clear result of reducing risk.
A new decade of opportunity:
Prospects for 2020

The 2009 Renewable Energy Directive

The 2010-2020 decade started out with a groundbreaking and ambitious proposal: legally binding targets for renewable energy across the EU. On 5th June 2009, the Directive on the promotion of the use of energy from renewable sources entered into force and had to be transposed into national law by December 2010. The Directive covers energy consumption as a whole, including heating and cooling, and lays down legally binding national targets, to ensure that the EU achieves a share of at least 20% renewable energy by 2020. It also contains a much reinforced set of provisions to facilitate the development of renewable energy, such as a legal requirement for the Member States to prepare National Renewable Energy Action Plans (NREAPs).

The review of Member States’ NREAPs shows that the approach continues to pay off. A comprehensive and binding regulatory framework is proving catalytic in driving forward renewable energy development to achieve the ambitious climate and energy targets that the EU has set itself. Member States’ projections show that renewable energy will grow at an even faster pace in the years up to 2020 than in the past.18

Member States’ Expectations for 2020

According to the 27 plans that Member States submitted to the European Commission in 2010,19 the EU will exceed its target of 20% renewable energy. Total renewable energy consumption will more than double from 96 Mtoe in 2005 to about 245 Mtoe in 2020. This represents a 20.7% share of renewable energy in 2020 final energy consumption.

Figure 6
Member States’ NREAPs projections for 2020

<table>
<thead>
<tr>
<th>Countries meeting their 2020 targets</th>
<th>Overachieving countries</th>
<th>Underachieving countries</th>
</tr>
</thead>
</table>

Source: EREC based on NREAPs


10 45% by 2030
16 Member States expect to exceed their 2020 binding targets: Austria, Bulgaria, the Czech Republic, Denmark, France, Germany, Greece, Hungary, Lithuania, Malta, the Netherlands, Poland, Slovenia, Slovakia, Spain and Sweden. 9 Member States will meet their national binding targets, including Belgium, Finland, and the United Kingdom etc. Only two Member States (Italy and Luxembourg) plan to resort to Cooperation Mechanisms to achieve their binding 2020 goals.

These predictions show that the vast majority of European countries clearly understand the benefits of deploying renewable energy technologies.

**Renewable Electricity**

Based on Member States’ plans, more than one third of the EU’s electricity consumption will come from renewable energy sources in 2020. The share of renewable electricity will increase from more than 14% in 2005 to 34.3% in 2020.

**Renewable Heating and Cooling**

More than one fifth of the EU’s heating consumption in 2020 is expected to come from renewable sources. Renewable heating and cooling is set to increase from 10% in 2005 to more than 21% in 2020.

**Renewable Transport**

The share of renewable energy in transport is projected to reach 11.3% of diesel and gasoline consumption in 2020, hence overtaking the binding transport target of 10%.

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**Figure 7**

Renewable Energy Sources in the Electricity Mix in 2020

- Hydro: 65.7%
- Bioelectricity: 2.4%
- PV: 0.3%
- CSP: 0.5%
- Wind onshore: 6.6%
- Wind offshore: 0.3%
- Geothermal: 10.5%
- Biodiesel: 0.1%
- Bioethanol/ETBE: 0.2%
- RES-E (road transport): 0.2%
- RES-E (non road transport): 0.3%
- Others: 1.7%
- Conventional Energy Sources: 6%

**Figure 8**

Renewable Energy Sources in the Heating Mix in 2020

- Geothermal: 79%
- Solar Thermal: 1%
- Bioheat: 1%
- Aerothermal and Hydrothermal Heat Pumps: 2%
- Biodiesel: 0,1%
- Bioethanol/ETBE: 0.2%
- RES-E (road transport): 0.3%
- Others: 2%
- Conventional Energy Sources: 6%

**Figure 9**

Renewable Energy Sources in the Transport Mix in 2020

- Conventional Energy Sources: 45%
The Directive 2009/28/EC provides a strong and stable regulatory framework for the development of renewable energy in Europe. With the transposition of the Directive by 5th December 2010 and the adoption of National Renewable Energy Action Plans, the foundations for determined EU action on renewable energy have been laid.

**Decreasing Greenhouse Gas Emissions by 30%**

Besides the target of at least 20% renewable energy share by 2020, the EU made a unilateral commitment of reducing greenhouse gas emissions to 20% below 1990 levels and to 30% in the event of an international climate agreement.

Based on Member States’ NREAPs, it is clear that renewable energy will provide a significant part of the EU’s legally binding emissions reductions. Renewable energy deployment by 2020 will reduce energy related CO₂ emissions by about 1,690 Mt, which is equivalent to a reduction of energy related CO₂ emissions of more than 40%. Given that energy related CO₂ emissions account for about 70% of total GHG emissions today, this translates into an overall emissions reduction by 2020 of more than 20%. Assuming a CO₂ cost of €25/t, the additional total carbon benefit would account for more than €42 billion in 2020.

It is currently being debated whether the EU should move unilaterally beyond 20% by 2020. EREC believes that moving to 30% domestic GHG reduction is urgently needed.

In 2009 both the European Parliament and the European Council endorsed the need to set an EU objective of reducing emissions by 80-95% by 2050 compared to 1990 levels in order to keep climate change below 2°C. Even before the economic crisis, 2007 emissions were about 8% below 1990 levels. This represents approximately all domestic action required with the 20% GHG target, as the rest of the reduction can be met via CDM/JI in developing countries. Moving to 30% is hence not out of reach.

**Figure 10**

Costs of a 30% GHG Reduction Target

![Figure 10 Costs of a 30% GHG Reduction Target](source: European Commission (2010))
The incentives for renewable investments have reduced as a result of the significantly lower than expected carbon price in the EU Emissions Trading System (ETS). Moving to a 30% reduction target would restore these incentives, urgently needed to maintain the EU’s pole position in developing a resource-efficient and renewable energy economy and to meeting its long-term GHG commitment by 2050.\textsuperscript{24}

Moreover, as underlined by the European Commission, with its current policies the EU is on track to meet the 20% GHG target. Reaching 20% energy efficiency by 2020 would enable the EU to achieve a 25% domestic GHG reduction by 2020. Such a reduction has been identified as being the cost-efficient pathway to meeting the long-term GHG reduction commitment by 2050.

For all these reasons, EREC firmly supports moving to a 30% domestic GHG reduction target for 2020.

**Investing in Europe’s Energy Future**

While facing the largest economic crisis since the creation of the EU, Member States are committed not only to meeting their binding targets by 2020, but even to exceeding the EU’s overall target of 20% renewable energy.

Major effort and significant investments are a crucial requirement for the mass deployment and roll out of current technologies, which are needed to reach the EU 2020 targets, as well as developing and deploying advanced technologies for a resource-efficient and renewable energy sector. For this reason it is essential that there is a stable and predictable environment for the financing of renewable energy. While it is clear that financing instruments both at European and national level need to be further optimised and adjusted to follow the cost decrease of technologies, any retroactive changes should be avoided.\textsuperscript{25} Otherwise, this could risk freezing investments, that are vital to meeting the 2020 target and identified to be in the order of about €60 to €70 billion annually.\textsuperscript{26}


\textsuperscript{25} See the letters on retroactive cuts in solar tariffs, cosigned by Commissioners Hedegaard and Oettinger, to the authorities of Spain and Czech Republic on 22.02.2011 and 11.01.2011 respectively (available on the web).

A binding renewable energy target for 2030

European and national renewable energy policies were founded on the need to address climate change, improve the security of energy supply and develop Europe’s competitiveness as well as industrial and technological innovation. With a binding renewable energy target of at least 20% of final energy consumption by 2020, Europe has embarked on a sustainable pathway. However, there is a need to continue on this path and speed up the transformation of the EU’s energy system. With current policies being projected to reduce emissions to -20% in 2020, -30% in 2030 and around -40% in 2050, Europe will clearly fail to meet the Heads of State’s commitment of reducing GHG emissions by 80%-95% by 2050. Further actions will be required to reach these emission levels.

The deployment of renewable energy technologies has already significantly contributed to the reduction of energy related emissions and is one of the most efficient and effective means of meeting the goal of the EU ETS: reducing emissions. In order to ensure Europe achieves its long-term emissions reduction ambitions, policies promoting renewable energy must be extended. This will not only ensure meeting emissions reduction targets, regardless of any shortcomings of the ETS, but also stimulate further development of innovative solutions, create new job opportunities, maintain Europe’s first mover advantage in renewable energy technologies, and unlock private investments, especially needed in times of short public budgets. If this is going to happen, it is important to ensure a stable and progressive investment climate across the EU. Investors need the right signals today to make Europe a resource-efficient and renewable energy economy by 2050. Given that 2050 is only one investment cycle away, clarity on the future legislative framework is needed. Otherwise the EU risks steering itself into a “lock-in situation” with high-carbon investments and stranded cost in the associated assets. Climate and energy policies in the coming decade will therefore require a combination of strong carbon pricing and reliable instruments that attract and secure private investments.

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29 As the lifetime of, for instance, a coal power plant is about 35-40 years.
In many sectors of the economy, targets are used to provide clarity and stability to industry, to allow them to plan and invest with a higher degree of certainty. Providing targets at the European level augments this stabilising impact. EU policy has the advantage of longer time horizons and avoiding the destabilising effects of market volatilities and short-term domestic political changes.

The setting of legally binding national targets in the Renewable Energy Directive (2009/28/EC) constitutes an important milestone for the development of a truly sustainable Europe. Such a move demonstrated that the European Commission had the mandate and the will to form directives tackling a sector that is extremely sensitive at Member State level. The setting of these targets helps to attract investments by providing stability and reducing market risks. This, in turn, contributes to the further reduction of GHG emissions and to security of supply as well as assuring the international competitiveness of the European industry.

Europe does not have the time for a “trial and error” strategy, rather needing to make use of policy instruments that have proven to generate the enabling environment for investing in a truly sustainable economy: binding renewable energy targets. A binding 2030 renewable energy target is thus increasingly supported by key stakeholders, including the European Commissioner for Energy and the European Commissioner for Climate Action.

Based on a series of analytical steps, including various breakdowns between the different energy sub-sectors and diverging energy demand assumptions, EREC believes that a legally binding EU target of at least 45% of renewable energy sources by 2030 is both feasible and desirable.

While the binding 2020 target has created the right framework conditions for increasing the market up-take of renewable energy technologies, a binding 2030 target will enable Europe to move towards a truly sustainable energy system.

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32 For a detailed description of the Methodology see Annex 1.
Renewable Energy up to 2030

According to EREC’s “Baseline Scenario”, renewable energy would meet more than 20% of EU final energy demand in 2020 and 30% in 2025. By 2030 renewable energy would account for 498.4 Mtoe, which represents a share of 42% of EU-27 final energy demand.

Assuming EREC’s “Advanced Scenario” for the market uptake of the various renewable energy technologies, renewable energy would satisfy 24% of the EU’s total energy demand in 2020, increasing further to 35% in 2025. In 2030, renewable energy would provide more than 570 Mtoe, achieving a share of 48%.

Renewable Electricity up to 2030

According to the “Baseline Scenario”, 1,217 TWh of renewable electricity will be produced in 2020, meeting 34% of EU electricity demand. This share will further increase to 45% in 2025. With 2,296 TWh of electricity being produced in 2030, renewable energy would thus account for about 57% of electricity demand.

Following the “Advanced Scenario”, renewable electricity would satisfy 42% of the EU’s power demand in 2020 with 1,490 TWh. By 2025 this share would be about 55% with renewable electricity technologies producing 2,157 TWh. In 2030 renewable power would reach a share of 67%-69%, with more than 2,800 TWh.
Renewable Heating and Cooling up to 2030

Assuming the “Baseline Scenario”, renewable heating technologies would produce 99.4 Mtoe in 2020, accounting for 19% of the EU’s heat demand. By 2025, renewable heating and cooling could reach 33%, covering almost half (47%-49%) of the EU’s heat demand in 2030.

Based on the “Advanced Scenario”, 21.5% of the heat demand in the EU-27 would be satisfied by renewable energy, increasing further to 36% in 2025. In 2030, renewable heating and cooling would produce 284 Mtoe, thereby meeting 52%-54% of final heat demand.

Renewable Transport Fuels up to 2030

According to the “Baseline Scenario”, renewable transport fuels (including biodiesel, bioethanol and biogas) would account for 9% of transport fuel demand by 2020 with 28 Mtoe. It has to be noted that this compares biofuels production to transport fuel demand, excluding for instance renewable electricity used for transport purposes. In 2025, biofuels would meet 11% of the EU’s transport fuel demand and account for 13.6% in 2030.

Following the “Advanced Scenario”, biofuels would satisfy 12% of the 2020 transport fuel demand, meeting 13% of the EU’s demand in 2025. With 45 Mtoe, biofuels production would cover about 15% of the transport fuel demand in 2030.

Regarding the transport sector in general, EREC assumes an uptake of electric vehicles (EVs) after 2020 and a steep increase after 2030. This is in line with the European Commission’s assumptions in which EVs reach a market share in new car sales of 1-2% in 2020 and 11-30% in 2030. Member States projections (NREAPs) show a contribution of renewable electricity to road transport of about 450 ktoe in 2020.

33 European Commission: Communication on a European strategy on clean and efficient vehicles. 2010.
A binding 2030 target: Assessing the impact

The impact in economic, social and environmental terms of achieving and implementing a binding 2030 target for renewable energy is of course in part predictable and measurable, as will be shown below, but it also comprises benefits which remain unquantifiable, being more of a qualitative nature. These include the revitalisation of industrial areas and social cohesion.

Avoiding Emissions and Carbon Costs

Besides increasing the security of energy supply and improving the EU’s industrial competitiveness, the deployment of renewable energy technologies has significantly contributed to the reduction of energy related emissions. The amount of CO₂ emissions that can be avoided through the exploitation of the EU’s renewable energy potential strongly depends on the way in which the renewable source is converted into heat, electricity or transport fuels, and which fossil fuels are replaced. The emissions avoided via the use of renewable energy sources are calculated on the basis of specific CO₂ emissions for conversion technologies.34

In total, the deployment of renewable energy will avoid approximately 3,750-4,328 Mt of energy related CO₂ emissions in 2030. This is equivalent to a total reduction of energy related emissions of 93-100% against 1990 levels.35 Considering a carbon price of €40/t,36 the additional total CO₂ benefit can be calculated to be in the range of €150-€173 billion in 2030.

Replacing Fossil Fuels – Increasing Energy Security

Security of energy supply was the main driver of EU energy policy in the mid-1990s in the move towards renewable energy.37 This concern has further increased as has the EU’s fossil fuel import dependency from 45% in 1997 to about 55% in 2008. Certainly, this dependency turns into a price risk as fossil fuels are globally traded commodities. According to the European Commission, these energy imports represent an estimated €350 billion, which is equal to around €700 annually for each and every EU citizen.38

Relying on natural sources for their “fuel”, one of the most attractive features of renewable energy technologies is that their increased use contributes to enhanced security of supply by decreasing fossil fuel dependency from third countries and diversifying fuel consumption within the EU. The EU will strengthen its security of supply if it sets a binding target of 45% renewable energy by 2030. The transition to a resource-efficient and renewable energy economy will bring with it a reduced European energy bill as well as a lower dependency on fossil fuel imports. One way to sum up the benefits is to look at the quantity of fossil fuels displaced by renewable energy. Assuming the EU achieved a 45% share of renewable energy, the annual reduction in fossil fuel demand can be calculated to be 556 Mtoe from 2030 onwards. This is equivalent to the total combined energy consumption of Belgium, Germany, Latvia, Poland, the UK and Spain.

34 1 TWh of renewable electricity avoids about 0.696 Mt CO₂, while 1 Mtoe of renewable heating avoids about 8 Mt CO₂ and 1 Mtoe of biofuels 1.5 Mt CO₂.

35 By 1990, EU-27 energy related CO₂ emissions were in the order of 4030.6 Mt – see European Commission: EU Energy Trends to 2030 – Update 2009. 2010.


The amount of fossil fuel costs avoided due to increased renewable energy production depends on the price of energy. Today, oil and gas prices are very closely linked, as is coal – to a lesser extent, and follow the price of oil. Therefore, the fossil fuel costs avoided due to increased renewable energy production can be calculated on the basis of the European Commission’s price assumptions in its “Trends to 2030”.39

Assuming an oil price of $106/barrel (€91/barrel), renewable energy will avoid fuel costs of approximately €371 billion in 2030.40 Hence, shifting towards a renewable energy pathway leads to a massive shift from fuel costs to possible investment expenditure.

Costs and Competitiveness

Energy market price signals remain distorted in favour of non-renewable energy sources,41 in particular due to the continued failure to internalise external costs. Although external costs are partially internalised through the EU’s ETS, fiscal instruments or support frameworks for renewable energy sources, current market prices are still far from reflecting true cost.

As the European Commission emphasises, striving to compete with incumbent energy companies as well as technologies, and with fossil and nuclear energy still receiving four times the level of subsidies, renewable energy is often more expensive than traditional sources.42

However, in contrast to fossil and nuclear energy, there has been a continued and significant reduction in the cost of renewable energy over the last 20 years. This trend will continue in the coming years, with a significant decrease in the generation costs of a series of technologies.

Nonetheless, a 45% binding target for renewable energy in the EU by 2030 will entail additional investments. The size of these will depend on the degree of competition in the market, the technology choices made and the mix of financial tools.

It is important to note, that a 10% increase in renewable energy share is estimated to avoid GDP losses in the range of €20-36 billion in the EU (€34-62 billion for OECD). These avoided losses offset one-fifth of the renewable energy investment needs up to 2020 and half the OECD investment projected by a G-8 Task Force.43

40 Using a conversion factor of 1 tonne of oil equivalent (toe) = 7.33 barrels.

Figure 16
Additional cumulative capital investments 2030 (€)

Source: EREC (2010)

Compared to the total cumulative renewable energy investments needed to meeting the 2020 target, additional cumulative capital requirements are about €660 billion to 2030.44 This would result in an additional average annual investment of approximately €66 billion.

The renewable energy industry will be one of the key growth sectors of the future and provide a competitive advantage for a wide range of manufacturing industries. In a world that is increasingly moving towards a resource-efficient and renewable energy economy, the widespread deployment of renewable energy technologies is considered as one of the key domains of future job creation.

**Greening the Economy – Effects on Employment**

Investment in renewable energy helps the economy by reducing energy costs, easing the over-use of precious natural resources and increasing employment in the energy sector. From a societal perspective, the renewable energy industry offers a variety of high-quality jobs in very different technologies, bringing an immeasurable benefit by encouraging a motivated and skilled workforce.

According to the European Commission’s Joint Research Centre (JRC), achieving, the EU’s 2020 10% renewable transport fuel target, for instance, would create additional employment estimated at €1.8 billion in distributed salaries over the 2007-2020 period.45

Facing the most serious economic crisis since its creation, the EU needs to create new jobs as quickly as possible. Beyond that time horizon, further efforts are needed to secure the development of the European economy delivering high levels of employment, prosperity, sustainability and international competitiveness.

Source: EREC (2010)
Completing the picture:

Additional policy measures

There are two major drawbacks of markets: they tend to discount future benefits and long-term risks. Legislation compensates for these two flaws, by providing a clear framework. Setting an intermediary renewable energy target for 2030 would allow the EU to progress in a cost-efficient, globally competitive pathway towards its long-term ambitions, while serving as an intermediate check point between 2020 and 2050. In the absence of such a legally binding target, possible corrective actions may be very costly and it may then even become impossible to achieve the EU’s long-term energy and climate goals. EREC therefore believes that stringent policies on energy savings and GHG emissions are needed alongside a binding target for renewable energy of at least 45% in 2030.

Less is More – An Ambitious Energy Savings Framework

Besides its 2020 targets of 20% GHG reduction and 20% renewable energy, the EU has set itself a target of achieving 20% energy savings by 2020, as compared to a business as usual energy use scenario. This target translates into an absolute reduction of primary energy use from 1,840 Mtoe in 2005 to approximately 1,500 Mtoe in 2020. However, while the GHG and renewable energy targets are legally binding, the energy savings target remains indicative.

Recent findings of the European Commission indicate that the energy savings potential is not being realised and that with the rates of implementation of the current policies in EU Member States, a reduction of only about 8.9% (-166 Mtoe) will be achieved in 2020. However, energy savings are fundamental in achieving the long-term 80-95% GHG reduction target, as they have the potential to cover at least half of it.

A binding energy savings target as well as an ambitious roadmap on how to improve energy efficiency are needed to further advance to a resource-efficient and renewable energy system.

Moving Beyond 20% – Strengthening the ETS

The EU needs to move to a 30% domestic GHG reduction target by 2020. Science clearly tells us that industrialised countries need to reduce domestic emissions by 25-40% by 2020, in order to give the world a 50% chance of avoiding a 2°C rise in temperature. With its 20% reduction target, the EU is not in line with this recommendation.

As has been shown in this report, renewable energy will provide a large part of the EU’s emissions reduction efforts. Energy related CO₂ emissions will be reduced by more than 40% by 2020, due to the deployment of renewable energy technologies, enabling the EU to meet its 20% GHG reduction target by 2020.

Furthermore, investment needs related to the climate and energy package, which in 2008 were estimated to be of at least €70 billion a year in 2020, have been reduced. Lower economic growth has reduced GHG emissions, effectively reducing the stringency of the 20% GHG target and leading to a depression of the carbon price. In addition, emission allowances not used for compliance in the EU ETS due to the crisis are being carried forward into the 2013–2020 ETS trading period, significantly lowering expected carbon prices in 2020.


As a consequence, the effectiveness of the ETS has been clearly undermined as a means of shifting the EU away from high-carbon fossil fuel investments. Instead, it has created vast windfall profits for heavy industry and led to cheap business-as-usual solutions. This is well documented by the fact that in 2010 – for the first time in years – more new coal power capacity was installed than decommissioned.\(^\text{48}\) This will have serious negative consequences for Europe’s emissions performance, both regarding its 2020 ambition and the 80-95% GHG reduction objective endorsed by the European Parliament and the European Council. To re-establish the effectiveness of the ETS and to avoid oversupply on the carbon market and hence a low price of carbon before 2020, the EU must raise the currently established emission reduction target to 30% domestic reduction in 2020.

Moving to 30% emissions reductions is the most effective way to establish the high carbon price, which is needed, alongside the binding 45% renewable energy target for 2030 and a mandatory 2020 energy savings target, in the move to a resource-efficient and renewable energy economy. EREC therefore calls on all EU Member States and the European Parliament to agree on a 30% domestic GHG reduction by 2020, putting the EU on a pathway to a maximum 2°C temperature increase.

The EU has from the start been the cradle of renewable energy innovation. This momentum needs to be kept. Acting earlier rather than later would have significant long-term benefits for Europe’s competitiveness by maintaining a strong EU position in a rapidly growing global market for renewable energy technologies. Furthermore, it would put EU emissions onto a trajectory compatible with achieving our objective of a 80-95% GHG reduction below 1990 levels by 2050.

ERECS believes that the EU needs to enhance and extend its current energy policy by setting a legally binding EU target of at least 45% renewable energy in 2030. This should be complemented by a binding 20% energy savings target and a 30% domestic GHG reduction target for 2020. This is the successful triangle for an 80%-95% GHG emission reduced Europe by 2050.
45% by 2030
References

Shimon Awerbuch, Raphael Sauter:

EurActiv, 17th March 2011:

European Commission (COM (97) 599):


Communication from the Commission. Analysis of options to move beyond 20% greenhouse gas reductions. 2010


European Commission:
Communication on a European strategy on clean and efficient vehicles. 2010

European Commission (Eurostat):
Electricity Statistics – Provisional Data for 2009. Data in Focus 14/2010

European Commission (Eurostat):
Renewable Energy Indicators. Data in Focus 30/2010

European Commission (JRC):
Renewable Energy Snapshots 2010. 2010

European Commission:
EU energy trends to 2030 – Update 2009. 2010

European Commission (COM (2011) 31 final):

European Commission (COM(2011) 112 final):
Communication from the Commission. A Roadmap for moving to a competitive low carbon economy in 2050. 2011
European Commission (SEC(2011) 130 final):

European Commission (SEC (2011) 131 final):

European Council:
Presidency Conclusions 15265/1/09. 2009

Eurobserv’er:
Biofuels Barometer. 2010

European Renewable Energy Council (EREC):
RE-thinking 2050. A 100% Renewable Energy Vision for the European Union. 2010

European Renewable Energy Council (EREC):

European Union:

European Union:

European Union:

European Wind Energy Association (EWEA):
Wind in Power. 2010 European Statistics. 2011

European Wind Energy Association (EWEA):
Pure Power. 2011. Forthcoming

Frauenhofer ISI et al.:

IPCC:

Joint Research Centre (JRC) Working Paper:
Biofuels in the European Context: facts, uncertainties and recommendations. 2007

The Guardian, 2nd May 2011:
“Connie Hedegaard seeks renewable energy targets for 2030”, http://www.guardian.co.uk/environment/2011/may/02/connie-hedegaard-renewable-targets-2030
Annex 1:

Methodology

The analysis of the future development of renewable energy sources is based on a series of analytical steps. These include various breakdowns, into electricity, heating and cooling and transport, applying diverging energy demand assumptions, and taking as exogenous input EU Member States expectations on renewable energy until 2020 as outlined in their National Renewable Energy Action Plans (NREAPs).

Energy demand assumptions, including those for electricity, heating and cooling, and transport, are based on the European Commission’s “EU Energy Trends to 2030 – Update 2009” providing for a “Baseline 2009” and a “Reference Scenario”. The main difference between these two scenarios is that the “Baseline 2009” determines the development of the EU energy system under policies implemented until April 2009, excluding the renewable energy target, while the “Reference Scenario” takes the 2009/28/EC Directive into account assuming that the 20% target would be met. In addition, we apply for 2020 the energy demand assumptions of Member States national action plans (NREAPs – Table 1).

Contributions of the various technologies are based on two different scenarios: a “Baseline Scenario” and an “Advanced Scenario”. The “Baseline Scenario” is determined by Member States projections up to 2020 (NREAPs) and assumes a continuation of the envisaged trends and market developments in the decade up to 2030. The rather conservative projections for several renewable energy technologies as presented in the NREAPs, however, might lead to major underestimations of the technical and economic potential of those technologies and hence, result in fairly low assumptions for 2030. The “Advanced Scenario”, presented in this publication is based on the EU Industry Roadmap projections for 2020, which was developed in the framework of the REPAP2020 project. Though this Roadmap does not fully reflect each of the different European renewable industries associations’ own projections for 2020, it serves as point of reference for 2030 in the “Advanced Scenario”.

For the sake of consistency, the development of the various renewable energy technologies between 2005 and 2015 is derived from the NREAP statistics.

The main objective of this modelling exercise was not to discriminate between the various technologies, but to have a clear and consistent EU-wide view of future renewable energy development up to 2030.

Annex 2:  
Breakdown of figures

Table 1: Contribution of Renewable Energy Technologies to Final Energy Demand

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Source: EREC

*excluding pumped storage

45% by 2030

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Table 2: Contribution of Renewable Electricity Technologies to Electricity Demand

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Source: EREC

*excluding aerothermal and hydrothermal heat pumps

### Table 4: Contribution of Biofuels to Transport Fuel Demand

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Source: EREC

*excluding aviation and inland navigation

45% by 2030
Who is EREC?

EREC is the united voice of the European renewable energy industry encompassing all major industry, trade and research associations active in the field of photovoltaics, small hydropower, solar thermal, bioenergy, ocean, geothermal, wind energy, and solar thermal electricity. It now has 11 members, which in turn, comprise globally active companies within their membership. EREC represents an industry with an annual turnover of more than €70 billion employing more than 550,000 people.

EREC’ members:
AEBIOM (European Biomass Association)
EGEC (European Geothermal Energy Council)
EPIA (European Photovoltaic Industry Association)
EREF (European Renewable Energies Federation)
ESHA (European Small Hydropower Association)
ESTELA (European Solar Thermal Electricity Association)
ESTIF (European Solar Thermal Industry Federation)
EUBIA (European Biomass Industry Association)
EU-OEA (European Ocean Energy Association)
EUREC Agency (European Association of Renewable Energy Research Centres)
EWEA (European Wind Energy Association)

Contact details of EREC
European Renewable Energy Council
Renewable Energy House
Rue d’Arlon 63-67 - B-1040 Brussels, Belgium
T: +32 2 546 1933 - F: +32 2 546 1934
E: erec@erec.org - I: www.erec.org
ERECS calls on the European Commission, Member States and the European Parliament to deliver on the European Union’s long-term climate commitment by proposing and endorsing a legally binding EU target of at least 45% renewable energy by 2030.