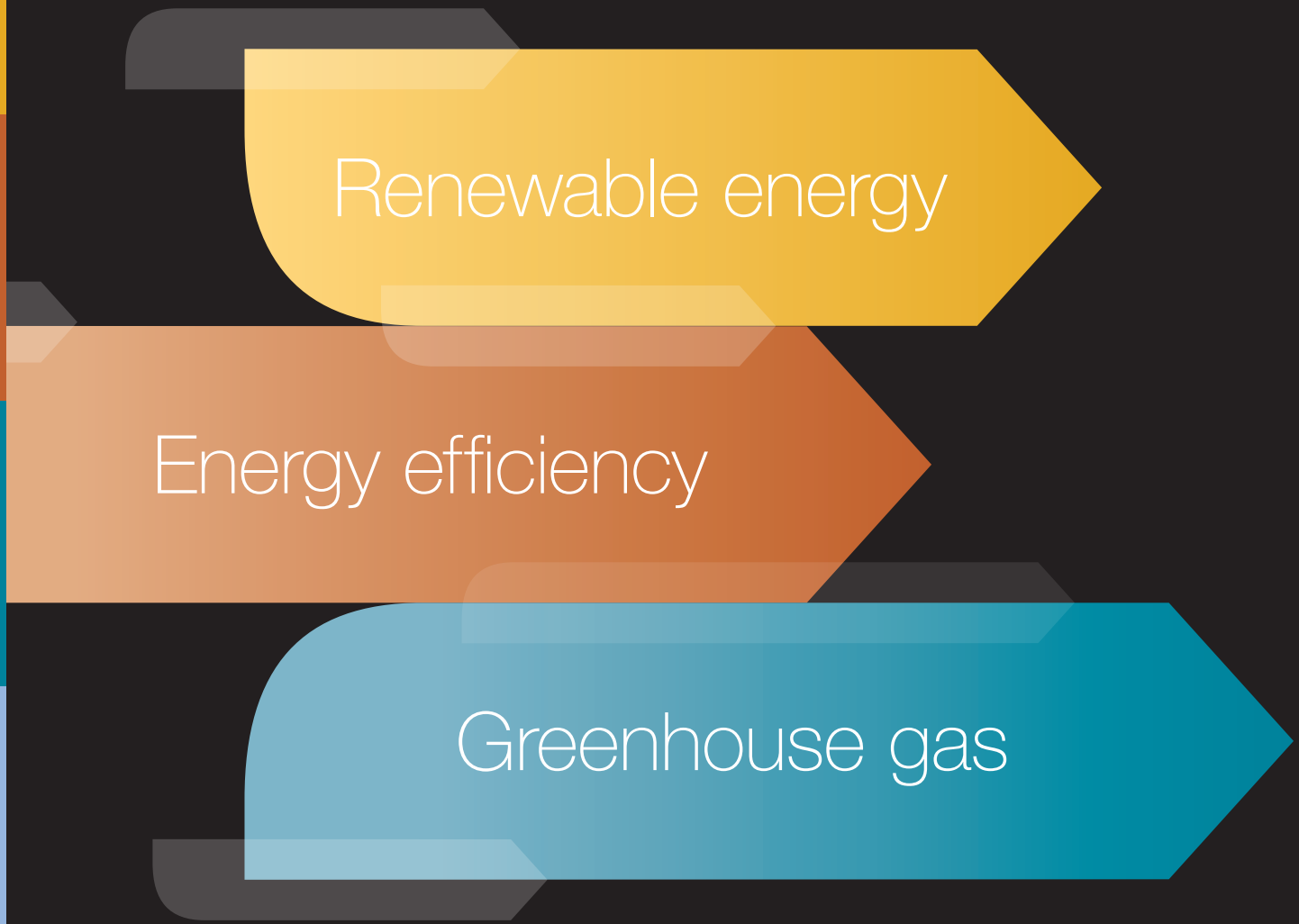
Hat-trick 2030

An integrated climate and energy framework



EREC EUROPEAN RENEWABLE ENERGY COUNCIL

Who is EREC?

EREC is the united voice of the European renewable energy sector 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 10 members, which in turn, comprise globally active companies within their membership. EREC represents an industry with an annual economic activity of more than €130 billlion employing more than 1 million 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)

EUREC Agency (European Association of Renewable Energy Research Centres)

EWEA (European Wind Energy Association)

EREC

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Introduction

Europe has the unique opportunity to leap into a new economic era of growth, employment and innovation. The successful economies of the next decades will be those which decrease resource use and greenhouse gas (GHG) emissions while creating new businesses through technology leadership, technology deployment and increasing employment.

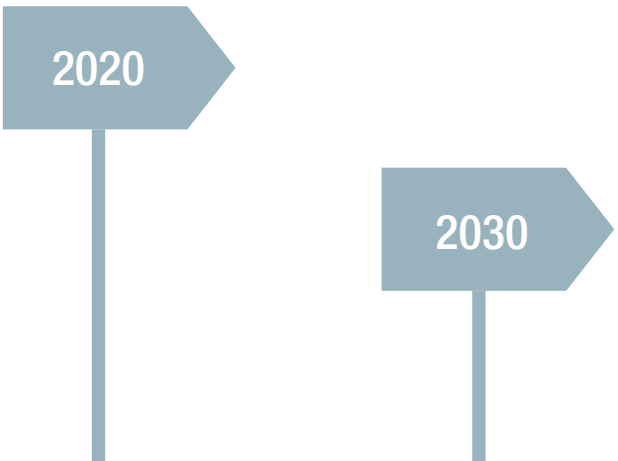
With the 20-20-20 policy framework the European Union (EU) has taken a positive step forward. The transition to a renewable energy, resource efficient economy is a tremendous chance to boost economic growth and create new jobs while securing environmental protection and mitigating climate change through to 2020. The 2009 Climate and Energy Package and its binding renewable energy targets have provided the energy sector with the necessary stability and predictability.

And there is a clear international consensus of the importance of such targets: the number of countries worldwide with renewables targets more than doubled between 2005 and 2012. Targets for renewable energy now exist in 118 countries; this is up from 109 countries in 2010.[1]

Due to the early adoption of legally binding EU and national targets, including national action plans and administrative reforms, Europe has achieved a share of 12.5% renewable energy in its energy mix with year-on-year growth in 2010 at its highest level since 1990.

However, the key driver of the current European renewable energy framework – its binding targets – expires in 2020. As a consequence, the European Commission expects renewable energy annual growth to slump from 6% to only 1%, resulting in the 2050 decarbonisation objective not being met.[2] Business-as-usual is therefore not an option.

The European Commission's Energy Roadmap 2050[3] identifies renewable energy, energy efficiency and infrastructure as "no-regrets" options - in any given scenario they are critical for decarbonisation towards 2050. It emphasises a high penetration of renewable energy beyond 2020 as a pre-requisite for a secure, zero-carbon energy system. It also recognises that increased investments in high added value renewable energy and efficiency equipment could constitute a major opportunity for the EU manufacturing industry to create growth and jobs.



1
REN21: *Renewables 2012. Global Status Report.* 2012

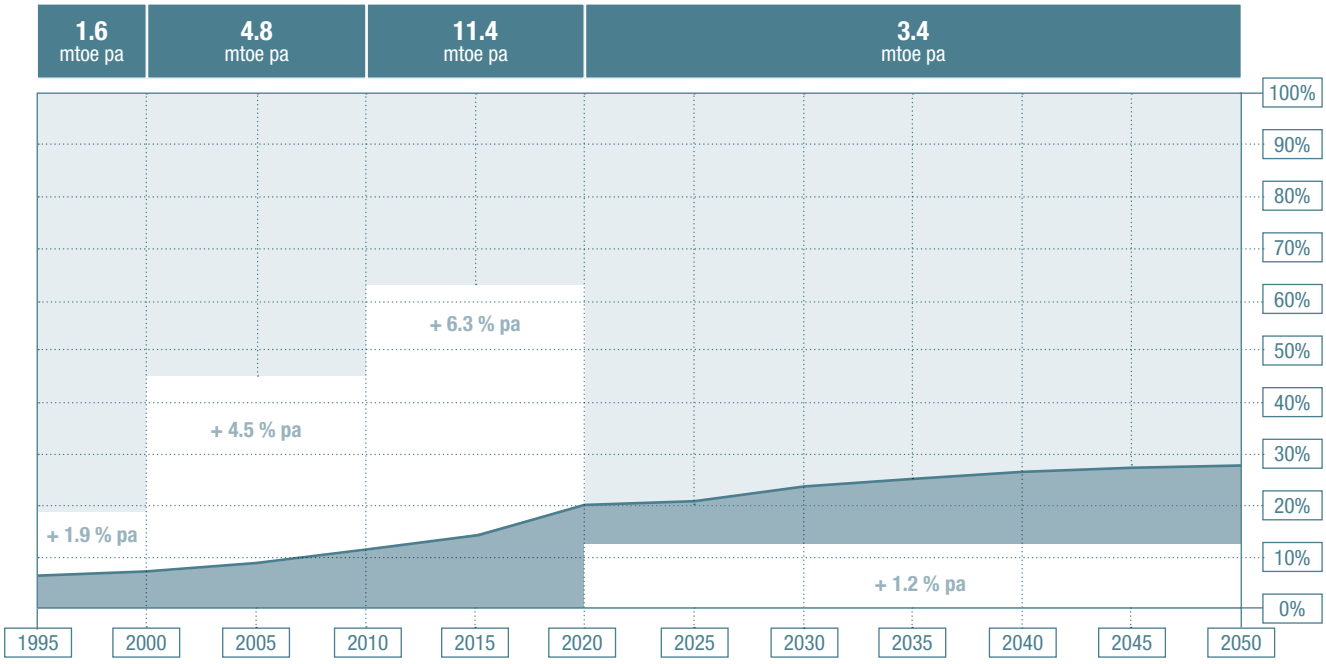
2
European Commission: *Renewable Energy: a major player in the European energy market.* 2012

3
European Commission: *Energy Roadmap 2050.* 2011

FIGURE 1

EU renewable energy current and projected growth

Source: European Commission

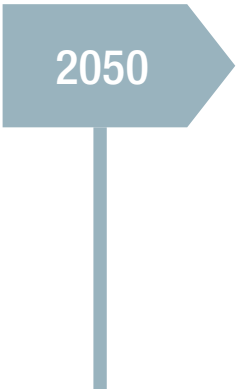


At the end of 2012, the Council acknowledged the need for ensuring continuity and stability for Europe's renewable energy sector by calling for a solid and effective post-2020 policy and gave a mandate to the European Commission to work on a new renewable energy framework;[4] work which began with a Green Paper and public consultation in March, 2013.[5]

This paper sets out a number of reasons why an integrated renewables – greenhouse gas – energy efficiency 2030 policy approach with an ambitious and binding renewable energy target yields more benefits for European citizens and industries than a one-legged policy based on a supposedly "technology-neutral" GHG-only approach.

4
Council of the European Union:
Council conclusions on Renewable Energy.
3.12.2012

5
European Commission:
A 2030 Framework for Climate and Energy Policies.
27.03.2013



Executive summary

A 2030 hat-trick approach will ensure the following key benefits:

1 Providing a clear signal for investors

By providing the necessary long-term predictability of market volumes and direction, a binding 2030 renewables target will decrease the costs of uncertainty while at the same time facilitating the achievement of the existing 2020 targets in the most efficient way.

2 Growing the economy

The 2020 energy and climate framework has made the renewable energy sector one of the most recession-resistant areas of European economy; renewable energy, energy efficiency and ICT are those sectors which have shown positive growth in the face of the crisis.[6] The renewable energy industry contributes 1% of the EU's GDP. The binding 20% renewable energy target will lead to a net GDP increase of 0.25% in comparison to a scenario with no renewables policies.[7] By 2030 this could further increase to a minimum net GDP growth of 0.45%.

3 Reducing the costs of decarbonisation

Successful innovation and decarbonisation policy needs to provide both a "demand pull" (via markets created) and a "supply push" (via R&D) in order to develop a broad portfolio of environmentally friendly and competitive technologies. Renewable energy targets enable a timely scale-up of a wide set of renewable energy technologies, thereby reducing long-term decarbonisation costs and allowing the energy sector to drastically decarbonise by 2050.

4 Reducing the costs of financing

Investments in the energy sector have become significantly more difficult due to the uncertainty about the mid and long-term policy perspectives. Policies which ensure stability and predictability mitigate risk and increase the confidence of market actors. This in turn reduces the cost of capital and helps to unlock private investments.[8]

5 Reducing the need for support mechanisms

Increasing the share of renewable energy by setting a 2030 target does not mean a continuation of existing support mechanisms for all renewable energy technologies. A coherent, stable and predictable 2030 framework, including an ambitious binding renewables target, will significantly minimise the costs of uncertainty, lowering the investment risk, reducing the costs of capital and hence the level of support needed. Post-2020 an increasing number of renewable energy technologies will be able to move away from existing support mechanisms into a fair and properly functioning energy market for electricity, heating & cooling and transport.

6 European Commission: *Exploiting the employment potential of green growth.* 18.04.2012. Staff Working Document.

7 Fraunhofer ISI et al.: *EmployRES. The impact of renewable energy policy on economic growth and employment in the European Union.* 2009

8 Ecofys et al.: *Financing renewable energy in the European energy market.* 2011

6 Enhancing EU technology leadership

Dedicated and binding policies for renewable energy helped the EU to establish a first-mover advantage in global markets and made it a front runner in renewable technology innovation. China, the U.S., South Korea, Japan, India, and the EU are engaged in a competition for technology leadership in tomorrow's markets. European policy-makers should ensure that the EU is fully equipped for this competition, even in times of austerity.

7 Replacing fossil fuel imports

In 2011, the EU's combined trade deficit was €150 billion. At the same time the net import bill for fossil fuels to the EU amounted to €388 billion, more than 3% of EU GDP, and more than twice the trade deficit. Analysis shows that the EU´s fossil fuel demand can be reduced by about 550 Mtoe by 2030, representing approximately €370 billion.[9] This is equivalent to the total combined energy consumption of Belgium, Germany, Latvia, Poland, the UK and Spain.[10]

8 Creating jobs

The EU renewables sector directly and indirectly employs around 1.2 million people, an increase of 30% on the 2009 figure.[11] By 2020, 2.7 million people in the EU will be employed by the renewables sector.[12] Ambitious 2030 renewable energy targets could result in 4.4 million jobs in the EU.[13]

9 Protecting the environment

Renewable energy deployment is not just about reducing CO_2 emissions: Renewables avoid or reduce emissions of air pollutants, such as methane, carbon monoxide, nitrous oxides (NO_X), sulphur dioxide (SO_2), and ozone as well as reduce water consumption, thermal pollution, waste and adverse impacts on soil.

10 Diversifying technology

Renewable energy technologies include a large number of different technical options, which can be used across the three energy sectors; a binding renewables target would therefore leave a wide and flexible choice for Member States to decide on their energy mix, both in terms of energy sectors and the technologies contributing in each of those sectors.

9
EREC: *45% by 2030. Towards a truly sustainable energy system in the EU.* 2011

10
Eurostat

11
EurObserv'ER : *The State of Renewable Energies in Europe.* 2012

12
See both Fraunhofer ISI et al.: *EmployRES. The impact of renewable energy policy on economic growth and employment in the European Union.* 2009
and EREC: *45% by 2030. Towards a truly sustainable energy system in the EU.* 2011

13
EREC: *45% by 2030. Towards a truly sustainable energy system in the EU.* 2011

01 Providing a clear signal for investors

14
European Commission:
Renewable energy strategy post-2020. Impact Assessment.
2012

Europe has provided the energy sector with clarity up to 2020. Setting a binding 2030 renewables target as part of a comprehensive framework will stabilise the market by signalling to investors that renewable energy continues to be considered a long-term priority for the EU and the direction in which Europe will go.

As rightly pointed out by the Impact Assessment of the European Commission`s Renewable Energy Strategy, the time horizon of policy frameworks have a fundamental impact on investor decisions: payback periods to 2030 change business models compared to shorter periods to 2020.[14] It should be noted that reluctance to facilitate and invest in infrastructure - allowing physical flows and trade - as well as investors' hesitation to invest in new capacity or storage, from R&D to deployment, will continue as long as there is no long-term political commitment, beyond 2020.

Today´s infrastructure planning, however, refers to new power, heating and cooling and transport networks that will enter in operation in the early 2020s, with a typical lifetime of 30 years or more. Efficient and effective infrastructure planning therefore requires a clear signal on the energy pathway 2030 and beyond. By setting ambitious 2030 renewable energy targets, governments provide the necessary basis for effective long term planning, triggering a virtuous circle where the expectation of sufficient infrastructure reduces the risks and thus the costs of renewable energy deployment. In contrast, the lack of a long term renewable energy perspective risks triggering a vicious circle, where the uncertainties about the availability of networks become an obstacle to renewable energy deployment.

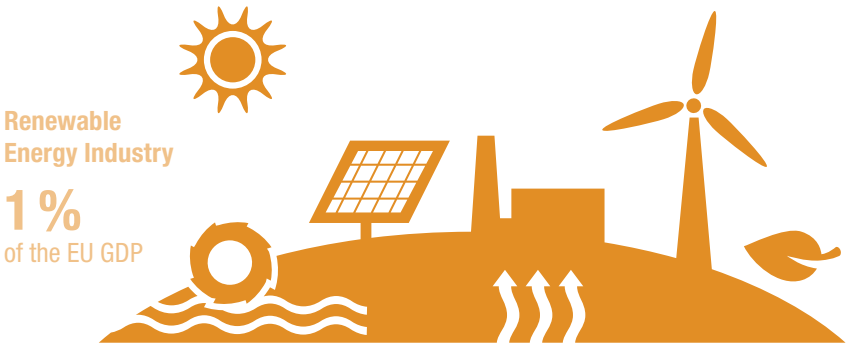
By providing the necessary long-term predictability of market volumes and direction, a binding 2030 renewables target will decrease the costs of uncertainty, and thereby facilitate the achievement of the existing 2020 targets in the most efficient way.

A narrow GHG-only approach will be a signal of political divestment for investors, citizens, the financial sector and decision-makers all over the world. It would undermine the 2020 framework, and in particular renewable energy target fulfillment as renewables would no longer be considered a priority for Europe`s future. This is why a binding hat-trick approach is necessary.

Growing the economy

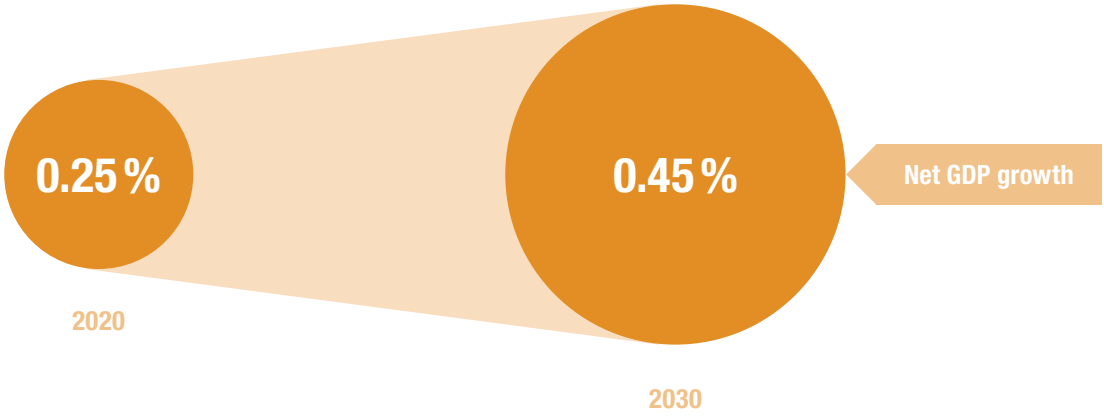
02

The 2020 energy and climate framework has made the renewable energy sector one of the most recession-resistant areas of European economy: renewable energy, energy efficiency and ICT are those sectors which have shown positive growth in the face of the crisis.[15] The economic activity of the 27 Member States for 2011 stemming from renewable energy is valued at more than €137 billion – a 14% increase on 2009 (€120 billion).[16] The renewable energy industry contributes 1% of the EU's GDP. This is more than the clothing industry and comparable to the furniture industry, which contributed 0.62% and 0.99% respectively.[17]



Policy makers should therefore see renewable energy as a way to drive economic growth, and not only as a way to mitigate climate change and improve energy security.

It has been calculated that achieving the binding 20% renewable energy target will lead to a net GDP increase of 0.25% in comparison to a scenario with no renewables policies.[18] By 2030 this could further increase to a minimum net GDP growth of 0.45%.



A narrow GHG-only approach fails to understand the significant boost to the economy resulting from dedicated renewables policies and squanders growth potential. This is why a hat-trick approach is necessary.

15
European Commission:
Exploiting the employment potential of green growth
18.04.2012. Staff Working Document.

16
EurObserv'ER: *The State of Renewable Energies in Europe.*
2012

17
Eurostat

18
Fraunhofer ISI et al.:
EmployRES. The impact of renewable energy policy on economic growth and employment in the European Union.
2009

03 Reducing the costs of decarbonisation

Incumbent conventional energy technologies have undergone more than 150 years of systematic research and learning, and have benefitted from decades of indirect and hidden subsidies[19] as well as under-priced externalities. This has reduced their costs to levels relatively low compared to some renewables. Today EU subsidies for fossil fuels are four times the level of support allocated to renewable energy,[20] and are considered as the "public enemy number one" by the IEA.[21]

Most renewable energy technologies are at a relatively early stage in their learning process, but have already shown tremendous potential for learning.[22] Such innovation and cost reduction is driven by early deployment of technologies in the marketplace. However, some stakeholders argue that it is only research and development (R&D) which should lead to innovation and cost reductions. Not only is this contrary to contemporary innovation research which shows that technological innovation occurs most commonly among users,[23] it also neglects the fact that Europe's R&D has been chronically underfunded for decades and that a dependence on public budgets risks costly stop-and-go developments.

Technological capabilities and innovation success in renewable energy result from a wide range of beneficial factors influencing the innovation chain, not merely from effective R&D efforts. As highlighted by the IEA, policies need to change as deployment levels increase, from the inception to take-off through to the consolidation phase.[24]

From a certain phase of technical development, large scale market deployment is essential for achieving economies of scale and cost reductions. This effect is stronger still for novelties which not only rely on technical, but also social and economic aspects, for example with demand-side-management (DSM) and response (DSR). DSM and DSR can, however, be an important element for a cost-effective integration of large amounts of renewable energy into the energy system.

A focus on GHG reduction, accompanied by a strong Emission Trading Scheme (ETS), could potentially reduce the short-term costs of climate change mitigation. However, as clearly stated by the European Commission, innovation driven only by carbon pricing would narrow the focus of technology deployment to the lowest cost, i.e. closest to market technologies, at the expense of the broad range of critical renewable energy technologies - which could be competitive in the mid-term[25] and which are necessary for the long-term cost-effective decarbonisation of the energy sector and the economy at large.[26]

19
In the case of nuclear some 70 years.

20
European Commission: *Renewable Energy: Progressing towards the 2020 target.* 2011

21
EWEA 2013 Annual Event, 04.02.2013. See: – *Fossil Fuels Subsidies are "Public Enemy Number 1"* – says IEA Chief. 2013

22
For example: Every doubling of the overall installed solar thermal collector capacity has led to a reduction in production costs by 23% since 1995. PV system prices have decreased from €30/W in 1980 to €1.5/W in 2012. Onshore wind investment costs fell by 10% between 2008 and 2012. Roughly 40% cost reduction was achieved by concentrated solar power since 2007.

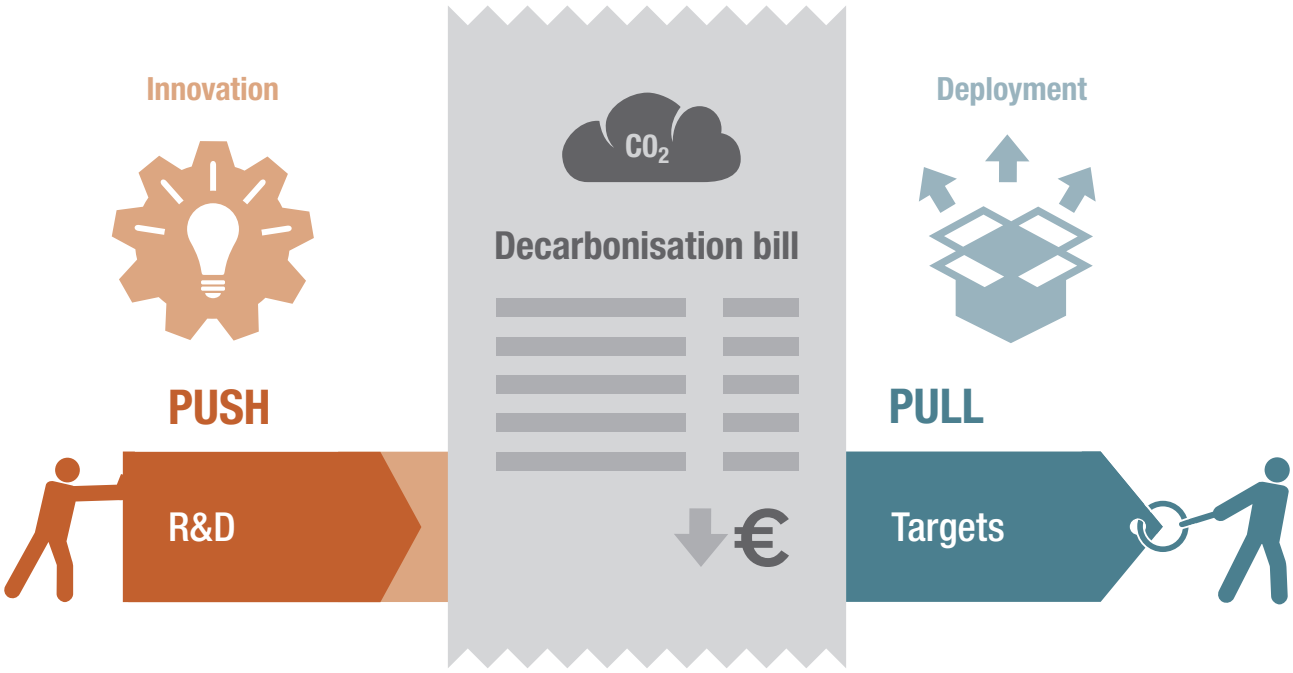
23
Eric von Hippel: *Democratising Innovation.* MIT Press, 2005

24
International Energy Agency (IEA): *Renewable energy – Policy considerations for deploying renewables.* 2011

25
European Commission: *Renewable energy strategy post-2020.* Impact Assessment. 2012

26
European Commission: *Low-carbon economy Roadmap 2050.* 2011

Research shows that for newer renewable energy technologies that are currently more costly than conventional ones but have a big potential for cost reduction,[27] overall costs of buy-down will be much lower if policies target that specific market than if a generalised tool is used, such as carbon pricing.[28] Indeed, a so-called "technology neutral" ETS-only approach with CO_2 prices high enough to promote newer, higher cost technologies is far more economically disruptive and less likely to be effective than facilitating learning through dedicated targeted policies, using tools which investors have confidence in: targets for renewable energy and energy efficiency.



Successful innovation and decarbonisation policy therefore needs to provide both a "demand pull" (via markets created) and a "supply push" (via R&D) in order to develop a broad portfolio of environmentally friendly and competitive technologies. Market prospects and clarity on market volumes, are key stimulants to investments in research and innovation as much as deployment of technologies in a market is an important source of information to further improving R&D,[29] and hence reducing costs. In fact, renewable energy targets enable a timely scale-up of a wide set of renewable energy technologies, thereby reducing long-term decarbonisation costs and allowing the energy sector to drastically decarbonise by 2050.

A narrow GHG-only approach fails to understand that technological innovation and cost reductions are to a large extent driven by market deployment and economies of scale and that without specific renewable energy targets longer-term decarbonisation costs are unnecessarily high. This is why a 2030 hat-trick approach is necessary.

27
Such as Enhanced Geothermal Systems (EGS), Biogas, Offshore Wind or Ocean energy.

28
Imperial College London - Robert Gross et al.: *On picking winners: The need for targeted support for renewable energy.* ICEPT/WP/2012/013. 2012

29
International Energy Agency (IEA): *Interactions of policies for renewable energy and climate.* Working Paper 2011.

04 Reducing the costs of financing

In the EU`s liberalised energy markets, the growth of renewable energy depends on private sector investment.

Being capital intensive, low or zero fuel cost energy technologies with low operation and maintenance costs, renewable energy investors need to cover mainly the upfront costs of capital. Access to and costs of capital are hence a key element in an investment decision.

However, access to capital becomes more and more an issue in the face of economic and political uncertainty. Today, political or regulatory uncertainty is playing a more significant role in delays than it has done for more than a decade, resulting in a drop in overall investments.[30] Investments in the energy sector have become significantly more difficult due to the uncertainty about the mid and long-term policy perspectives. This is not only the case for investments in new power generation or infrastructure, but also for the transport or heating sector where building owners throughout the EU are postponing the refurbishment of their heating systems.

In order to ensure private investment in energy projects, the correct balance must be struck between risk and return. Much of the public and political discourse surrounding renewables tends to focus on the return to investors, while not considering that the level of these returns is largely determined by the risk associated with the investment. Policies which ensure stability and predictability mitigate risk and increase the confidence of market actors. This in turn reduces the cost of capital and helps to unlock private investments.[31]

In this context, carbon pricing alone will not be able to remove investment risks. While the ETS can in theory create conditions that make renewable investments comparatively more attractive, uncertainties related to wholesale prices, carbon prices or decisions on CO_2 taxes remain. Several factors, including international cooperation, domestic policies on effort sharing or the overall economic situation, will continue to make the price of CO_2 volatile, even after structural deficits of the ETS are addressed. These uncertainties make renewable energy investments more risky and in turn increase the costs of capital with investors requiring higher returns on investments.[32]

In contrast to a GHG-only approach, dedicated renewables policies offer a lower risk environment for investors, with regards to price risks, thereby lowering the costs of capital. As a result the costs for consumers are lower too. Research shows that a long-term commitment to renewable energy leads to 10% to 30% reduction in the levelised costs of electricity.[33]

A narrow GHG-only approach does not lead to reduced costs of capital. This is why a hat-trick approach is necessary.

30
Ernst & Young: *Renewable energy country attractiveness indices. Issue 35.* November 2012.

31
Ecofys et al.: *Financing renewable energy in the European energy market.* 2011

32
Imperial College London - Robert Gross et al.: *On picking winners: The need for targeted support for renewable energy.* ICEPT/WP/2012/013. 2012

33
Ecofys et al: *Financing renewable energy in the European energy market.* 2010

FIGURE 2

Energy Project Risk Factors

■ PHASE • Risks

PRE-CONSTRUCTION
- Technology risk
- Project design
- Debt and equity financing

CONSTRUCTION
- Construction delays
- Cost overruns
- Environmental mitigation plans
- Social mitigation plans

OPERATION
- Operation and maintenace costs
- Output quality/volume
- Ressource fluctuations
- Electricity sales payments (PPA contracts etc.)

COUNTRY RISK
- Currency devaluation
- Currency convertibility/transfer
- Political force majeure
- Environmental force majeure
- Regulatory risk

Source: International Renewable Energy Agency

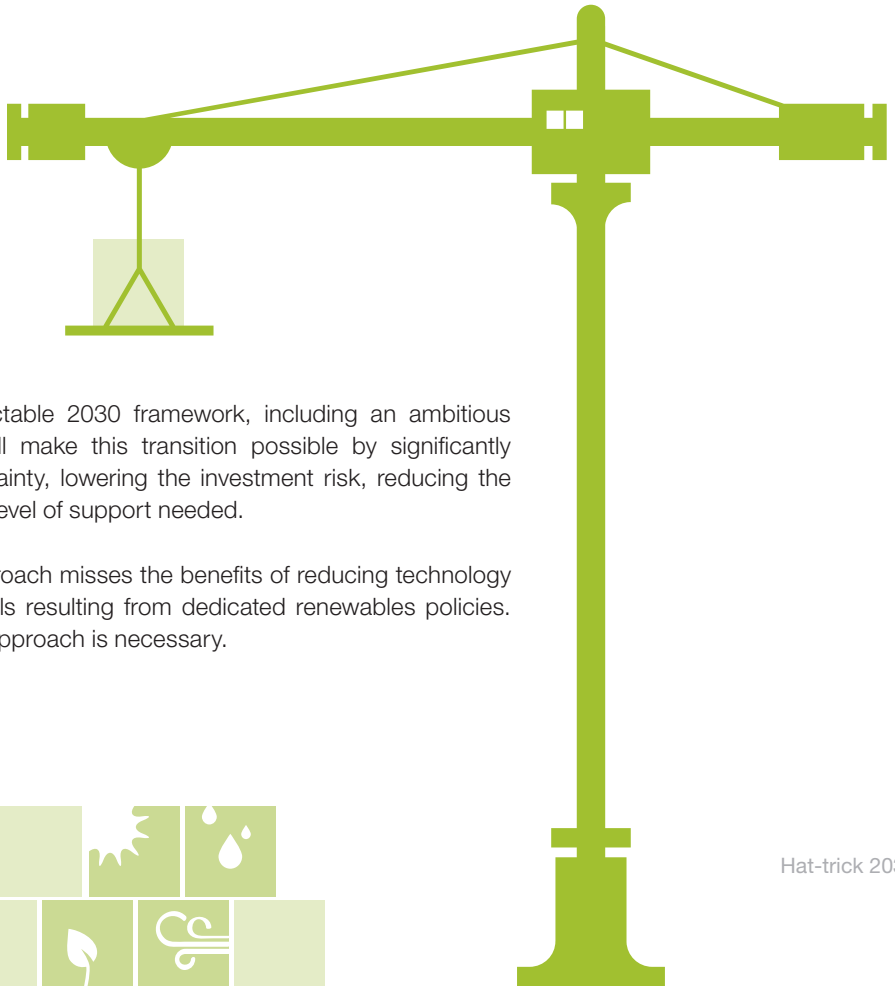
Reducing the need for support mechanisms

05

Increasing the share of renewable energy by setting a 2030 target does not mean a continuation of existing support mechanisms for all renewable energy technologies. On the contrary, by increasing the cost-competitiveness of renewable technologies through a 2030 target, the need for support mechanisms to bridge the increasingly narrow cost gap is progressively decreasing for different technologies, segments and regions.

Already today several renewable energy sources including traditional biomass, large hydro or geothermal have competed for decades in markets without the need for support mechanisms. Post-2020 an increasing number of renewable energy technologies will be able to move away from existing support mechanisms into a fair and properly functioning energy market for electricity, heating and cooling and transport.

Investments made possible by well-designed support mechanisms help drive down costs – both capital expenditure and the cost of capital – and will enable on-going reduction, and ultimately remove the need for today's support mechanisms. Well-designed renewable energy support mechanisms also promote cost reduction by encouraging innovation and economies of scale. Moreover, support schemes can be reduced further by streamlined administrative procedures, building obligations or grid access conditions. These factors alongside a long-term stable legislative framework will allow renewable energy technologies to reduce their costs faster.



A coherent, stable and predictable 2030 framework, including an ambitious binding renewables target, will make this transition possible by significantly minimising the costs of uncertainty, lowering the investment risk, reducing the costs of capital and hence the level of support needed.

A narrow GHG-only policy approach misses the benefits of reducing technology costs and related support levels resulting from dedicated renewables policies. This is why a binding hat-trick approach is necessary.

06 Enhancing EU technology leadership

China, the U.S., South Korea, Japan, India, and the EU are engaged in a competition for technology leadership in tomorrow's markets. European policy-makers should ensure that the EU is fully equipped for this competition, even in times of austerity.

Dedicated and binding policies for renewable energy ensured the EU specialised at an early stage in the supply of novel renewable energy technologies which are characterised by high knowledge intensity and learning potential. This successful policy strategy helped EU Member States to establish a first-mover advantage in global markets as trade and competition expanded and made it a front runner in renewable technology innovation. Europe now needs to continue in its pioneering role and remain competitive internationally so that it can fully reap the benefits of its advantageous early market presence.

Renewable energy over the past decade has experienced impressive yearly growth, averaging 11% for developed markets.[34] The strong and expanding domestic markets provide the basis for many EU companies to be active in worldwide markets.

However, the growth potential of these industries has not been lost on the EU's international competitors: Since 2011, European markets have forecasted an average growth of only 5%, compared with an average 13% year-on-year growth across new markets.[35] China and emerging economies in Latin America are investing heavily and increasing their market shares in renewable energy. This trend will continue in the future.

The current world market share in renewable energy technologies of the EU of 70% shows a descending trend. This decrease in share however does not constitute a decline in real market volume. Provided dedicated policies are in place an overall strong increase in volume is anticipated such that the current market volume may triple by 2030.[36]

34
Ernst & Young: *Renewable energy country attractiveness indices.* Issue 35. November 2012

35
Ernst & Young: *Renewable energy country attractiveness indices.* Issue 35. November 2012

36
Fraunhofer ISI et al.: *EmployRES. The impact of renewable energy policy on economic growth and employment in the European Union.* 2009

37
US Energy Information Administration : *Energy Independence and Security Act of 2007: Summary of Provision.* 2008

38
REN21: *Renewables 2012. Global Status Report.* 2012

39
Global Economy & Development : *After Fukushima: What's Next for Japan's Energy and Climate Change Policy.* 2011

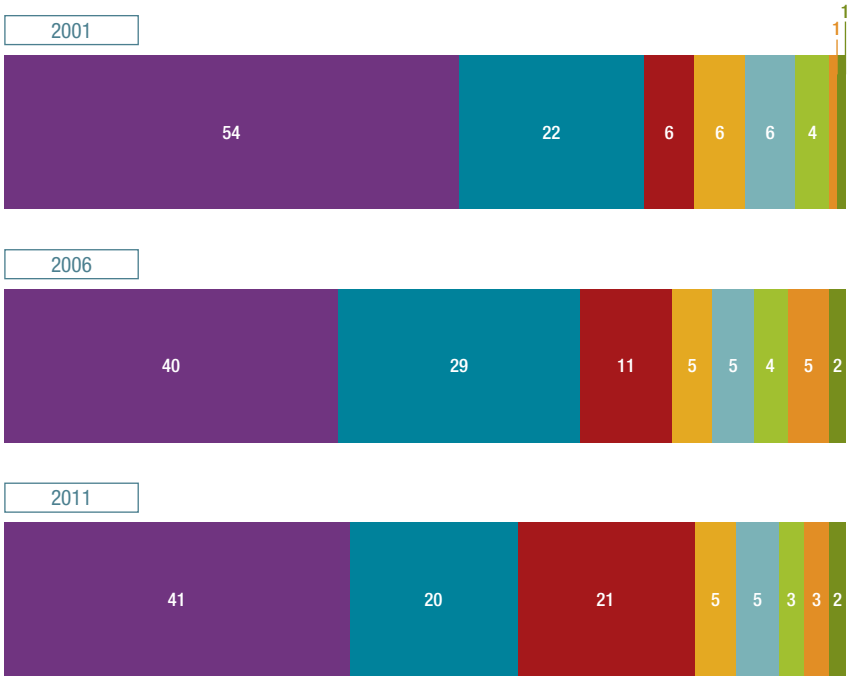


FIGURE 3

Renewable Energy Investment
%

Source: Ernst & Young

Europe still has a technological leadership in renewable energy technologies. This leadership stems not only from manufacturing expertise, but also from leadership in related activities such as system integration. If EU policy makers are able to provide the necessary binding commitment for 2030, then high quality, cost-competitive products will be further developed in the EU as a competence cluster. This will allow the European economy to capitalise on exporting opportunities in growing global markets and will have positive impacts on domestic markets. Failing that, the EU puts its technological and market leadership at risk. Many competitors already have renewable energy targets in place extending beyond 2020 such as the US,[37] South Korea,[38] or Japan.[39]

A narrow GHG-only approach fails to promote EU economic interests in the global competition for leadership in the renewable energy technology sector. Neither would it realise the benefits from establishing the EU as the international competence cluster for renewable energy technologies and capitalise on its first mover advantages. This is why a binding hat-trick approach is necessary.

07 Replacing fossil fuel imports

40
Eurostat

41
International Energy Agency (IEA): *World Energy Outlook.* 2012

The EU is the world´s largest energy importer with more than half of the energy it consumes coming from third countries. In just one decade the EU's total import dependency increased from 47% in 2001 to 54% in 2011.[40] Reducing energy dependency and spending on energy imports will have a positive effect on the current account balance: in 2011, the EU's combined trade deficit was €150 billion. At the same time the net import bill for fossil fuels to the EU amounted to €388 billion, more than 3% of EU GDP, and more than twice the trade deficit. Action must be taken to address this imbalance or competitiveness inside the EU will continue to be hindered.

€388 billion
Import of Fossil fuel in the EU

€150 billion
EU trade deficit

According to the IEA`s World Energy Outlook 2012 the EU will increase its reliance on oil and gas imports through to 2030.[41] If no further action on renewable energy and energy efficiency is taken, import levels could reach more than 70% of the EU overall energy needs.

The macroeconomic effects of fossil fuel volatility can be devastating. It is estimated that for every 10% increase in oil price in the US and EU there is a corresponding 0.5% loss in GDP.[42] As oil prices have increased by approximately 40% in recent years, GDP is projected to have fallen by 2% as a result – the equivalent of €300 billion, approximately the total GDP of Austria.

Increasing the use of renewable energy and energy efficiency will significantly reduce the EU's exposure to, and protect its energy consumers from, highly volatile fossil fuel prices. Analysis shows that the EU´s fossil fuel demand can be reduced by about 550 Mtoe by 2030, representing approximately €370 billion.[43] This is equivalent to the total combined energy consumption of Belgium, Germany, Latvia, Poland, the UK and Spain.[44] Compared to the Energy Roadmap 2050 Business-As-Usual (BAU) scenario, the European economy could save as much as €550 billion in 2050 by choosing a high renewables or energy efficiency pathway.[45]

A narrow policy of a GHG-only approach will not lead to an improvement of security of supply and fails to replace fossil fuel imports. This is why a hat-trick approach is necessary.

42
Awerbuch & Sauter: *Exploiting the Oil – GDP effect to support renewables deployment. Energy Policy 34 (2006) 2805-2819.*
2006

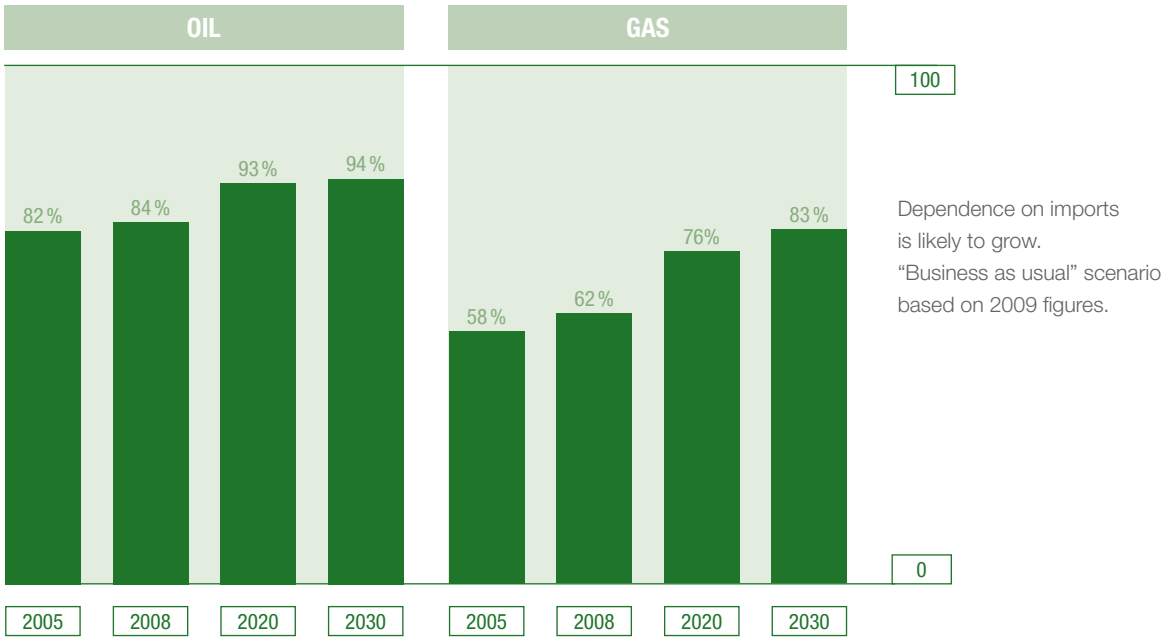
43
EREC: *45% by 2030. Towards a truly sustainable energy system in the EU.*
2011

44
Eurostat

45
European Commission: *Energy Roadmap 2050.*
2011

FIGURE 4

EU-27 Import Dependency



Source: European Commission

08 Creating jobs

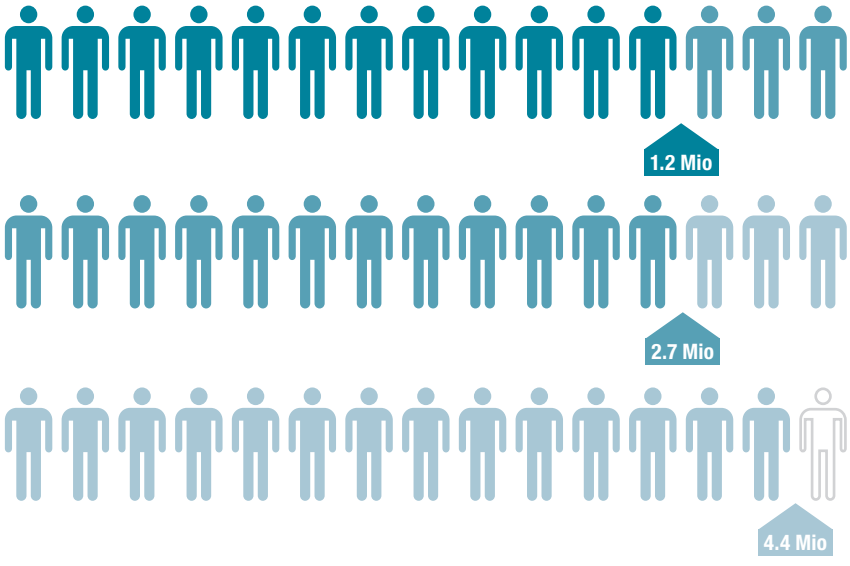
Investing in renewable energy and energy efficiency creates jobs across sectors, including areas such as construction which have been hit hardest by the crisis.[46]

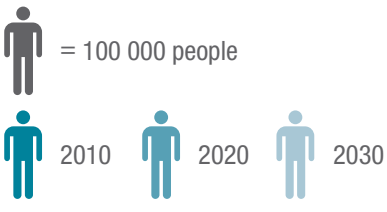
The EU renewables sector directly and indirectly employs around 1.2 million people, an increase of 30% on the 2009 figure.[47]

By 2020, 2.7 million people in the EU will be employed by the renewables sector.[48] On top of this, achieving the 20% energy efficiency improvement by 2020 is forecast to boost net employment by some 400 000 jobs. Ambitious renewables targets encourage investments in knowledge intensive technologies and hence increase the need for medium and high skilled positions in areas such as equipment manufacturing and distribution, project development, construction and installation, operation and maintenance.[49] Establishing policies to achieve ambitious 2030 renewable energy targets could result in as many as 3.6[50] to 4.4 million[51] jobs in the EU renewables sector.

The maintenance and operation sector create demand for products and services in forward and backward linked sectors which in turn increases production and employment in these sectors. Suppliers to renewable equipment manufacturers, service providers such as the transport, steel and cement sectors, the buildings sector and IT-service providers will also benefit from a strong hat-trick 2030 policy framework.

A narrow GHG-only approach fails to realise the huge job potential resulting from dedicated renewables policies. This is why a binding hat-trick approach is necessary.





46 European Commission: *Exploiting the employment potential of green growth.* 18.04.2012

47 EurObserv'ER : *The State of Renewable Energies in Europe.* 2012

48 See both Fraunhofer ISI et al.: *EmployRES. The impact of renewable energy policy on economic growth and employment in the European Union.* (2009) and EREC: *45% by 2030. Towards a truly sustainable energy system in the EU.* 2011

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Protecting the environment

09

Renewable energy deployment is not just about reducing CO_2 emissions: Renewables avoid or reduce emissions of air pollutants, such as methane, carbon monoxide, nitrous oxides (NO_X), sulphur dioxide (SO_2), and ozone as well as reduce water consumption, thermal pollution, waste and adverse impacts on soil.

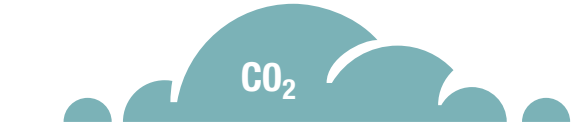
Conventional energy generation, transportation and energy-intensive industries are responsible for most of the human-induced air pollution and global GHG emissions. Pollution from coal-fired plants is accountable for up to €43 billion a year in health costs across the EU.[52]

Fossil fuel and uranium exploration, extraction and use also have major impacts on land and water resources. In contrast, most renewable energy technologies have significantly lower water consumption profiles than fossil-fuel and nuclear plants.[53] This is for instance the case for geothermal flash, PV, hydro and wind. Water is of growing importance in assessing the viability of energy projects, and needs for energy production are set to grow at twice the rate of energy demand.[54] Climate change will increasingly put a strain on water resources, making water-intensive energy production unfeasible.

Rising levels along EU coasts and seas, decreasing river flows in central and Eastern Europe, changes in terrestrial biodiversity and ecosystems cycles, reduced agricultural yields due to drought, reduced forest growth and extreme weather events are the already visible signs of climate change in Europe.[55]

About 80% of European citizens agree that mitigating climate change can boost the economy and create new job opportunities.[56] As highlighted by the European Commission's 2050 Energy Roadmap, renewable energy technologies will need to play a pivotal role if energy supply is to be secured and climate change to be mitigated.[57]

A narrow GHG-only approach ignores the dramatic negative environmental and health impacts caused by fossil and nuclear fuels and fails to address the environmental and health issues which are not linked to climate change. This is why a 2030 hat-trick approach is necessary.



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10 Diversifying technology

Renewable energy technologies include a large number of different technical options, which can be used across the three energy sectors; a binding renewables target would therefore leave a wide and flexible choice for Member States to decide on their energy mix, both in terms of energy sectors and the technologies contributing in each of those sectors.

Furthermore, the idea of a "fair competition" between energy technologies remains a myth, as technologies have different levels of maturity and starting conditions. Today's market rules, infrastructure system, network management and requirements for system services were designed around the needs and abilities of largely centralised, fossil and nuclear energy production, giving these technologies a systematic advantage compared to newer technologies.

A renewables target would provide Member States with sufficient flexibility to promote those technologies and sectors in which they have a potential advantage while a technology neutral system such as the ETS would determine which investments should be made and where in accordance with short-term costs. In this regard, it should be noted that the ETS only covers large plants, ignoring emissions from small-scale heating plants, which constitute more than 70% of the total heating installations.

A narrow GHG-only approach fails to provide a comprehensive and targeted energy policy for technologies and energy systems which have different starting conditions and potentials. This is why a binding hat-trick approach is necessary.

Next steps for policy-makers

11

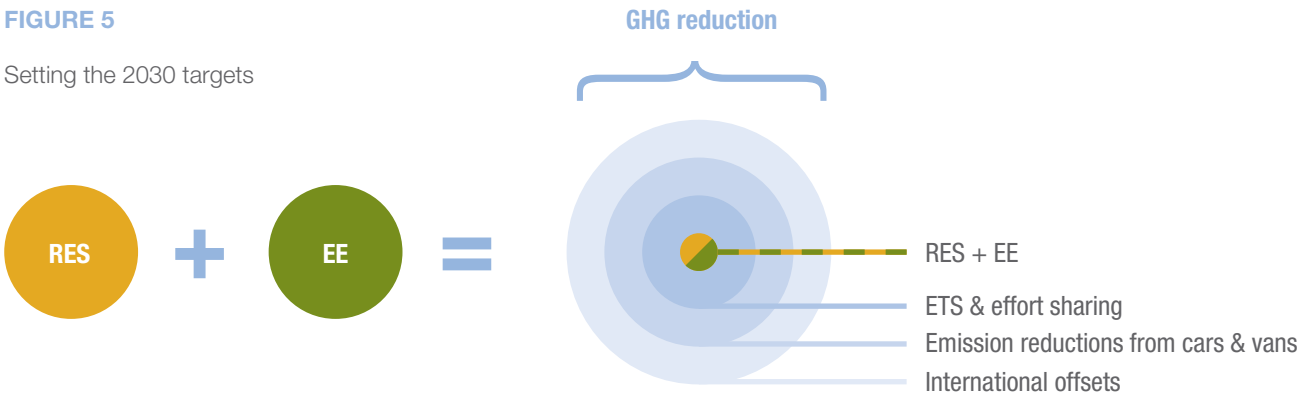
While a single policy target or instrument might work well when pursuing one single objective, it is highly likely that several objectives pursued together will require a set of coherent tools and targets. Pursuing the goals of decarbonisation, increased security of supply as well as greater competitiveness will therefore require an integrated renewables – greenhouse gas – energy efficiency framework: a 2030 hat-trick.

Consistency, predictability and investor confidence need to be secured in a European perspective. While the Energy Roadmap 2050 provides a basis for the decarbonisation of the energy sector by 85% of energy-related CO_2 emissions it has two severe shortcomings: It does not follow a comprehensive approach addressing the heating and cooling and transport sectors, but largely focuses on the power sector and it is missing a clear high efficiency-high renewables scenario.

Taking account of the interactions among policy instruments is needed. We therefore need a comprehensive analysis by the European Commission of tools and targets and their interactions to ensure the functioning of the internal market, the ETS and the deployment of a broad portfolio of renewables technologies needed to achieve Europe´s multiple objectives. As the impetus of a stringent climate and energy framework will have different impacts on each Member State the options to enable effective international cooperation and an equitable sharing of the effort will need to be assessed as part of the new binding framework. The acceptance of Members States, citizens and industry is a pre-requisite for the success of the 2030 hat-trick.

FIGURE 5

Setting the 2030 targets



The binding renewable energy and energy efficiency targets should be defined first given their strategic long-term climate mitigation role and multiple benefits for European citizens and the economy. The GHG target should then be defined ambitiously enough to take the resulting emissions reductions into account and provide additional incentives for emissions reductions beyond efficiency and renewable energy. In that way the three targets would work in a coherent and concerted way, underpinning and mutually supportive.

This is what a successful 2030 climate and energy policy should aim for.

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This paper sets out a number of reasons why an integrated renewables – greenhouse gas – energy efficiency 2030 policy approach with an ambitious and binding renewable energy target yields more benefits for European citizens and industries than a one-legged policy based on a supposedly "technology-neutral" GHG-only approach.

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