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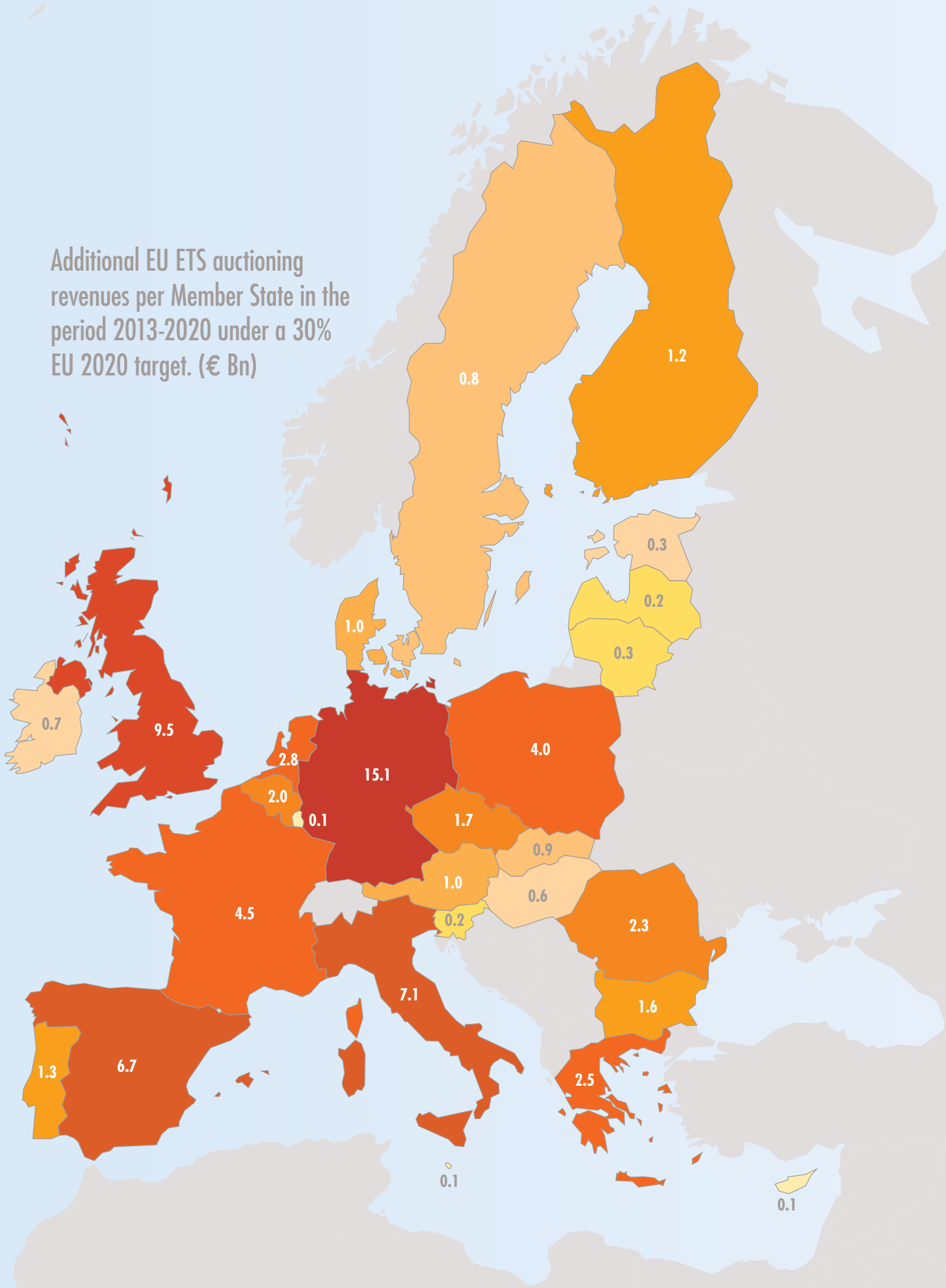
Why Europe should strengthen its 2020 climate action

A REPORT BY CLIMATE ACTION NETWORK EUROPE



Moving to a -30% 2020 EU greenhouse gas target will have a positive impact on Member States' budgets.

Additional EU ETS auctioning revenues per Member State in the period 2013-2020 under a 30% EU 2020 target. (€ Bn)



Climate Action Network Europe is Europe's largest coalition working on climate and energy issues.

With over 140 member organisations in 26 European countries, CAN-Europe works to prevent dangerous climate change and promote sustainable energy and environment policy in Europe



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...we believe that the move to 30 per cent is right for Europe. It is a policy for jobs and growth, energy security, and climate risk.

Most of all, it is a policy for Europe's future.

Chris Huhne, UK Environment Minister

Dr Norbert Röttgen, German Environment Minister

Jean-Louis Borloo, (former) French Environment Minister

JULY, 2010

Introduction

It's getting warmer

According to the World Meteorological Organisation (WMO) and National Oceanographic and Atmospheric Association (NOAA), 2010 is now proven to be the warmest year on record [1,2]. In fact, 8 of the 10 warmest years on record occurred after the year 2000. Last year (2010) and the beginning of 2011 saw a high number of extreme weather events across the globe, with vast economical and societal costs.

The latest climate conference in Cancun did bring global action on climate change a step closer. However, according to the United Nations Environment Program (UNEP) current emission reduction and action pledges - including that of the EU - fall profoundly short of what is needed to limit the worst impacts of climate change.[3]

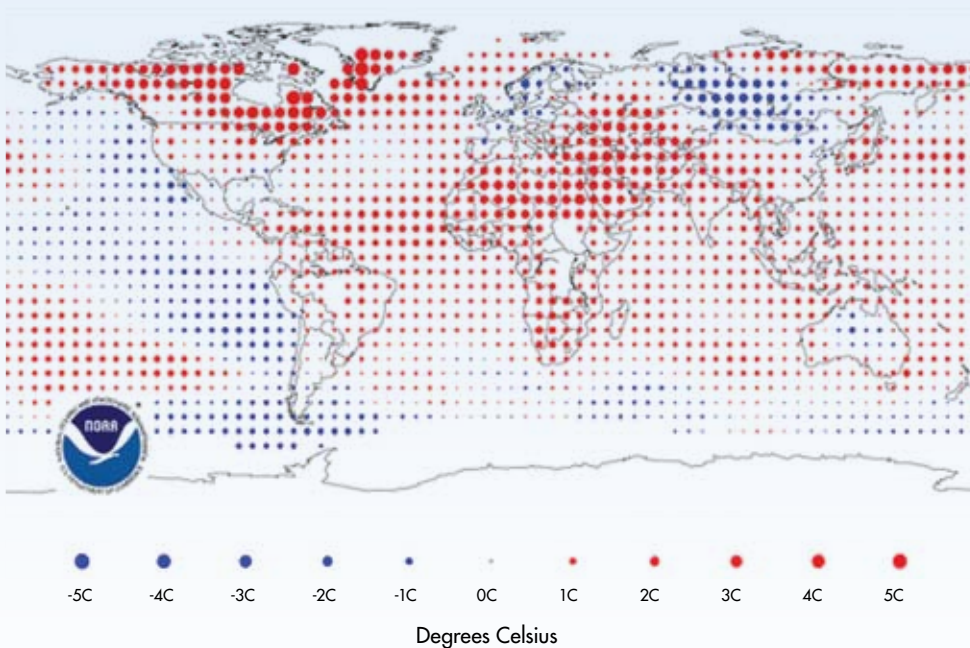
In May 2010 the European Commission investigated the effects of an independent EU move toward 30% emission cuts. It concluded that such a move would spur green job creation and innovation, reduce energy costs and dependency and mitigate health problems related to air pollution.

In addition to the European Commission, different research institutions looked at the impact of enhancing Europe's 2020 climate targets.

This report attempts to summarise the current state of knowledge on a number of issues related to a scenario where Europe moves from a 20% to 30% reduction target by 2020. It looks at jobs, competitiveness, innovation, cost savings, energy security and health, and maps out the costs and benefits of more ambitious climate policies.

The abundance of evidence presented in this report makes more than a compelling case in favour of enhancing Europe's 2020 climate action.

Moving reduction targets from 20 to 30% now becomes an imperative for jobs, growth, energy and climate security.



Temperature anomalies from January to November 2010 with respect to a 1971-2000 base period.

Source: National Climatic Data center / NESDIS / NOAA, 2011

30 is the new 20

A change has come

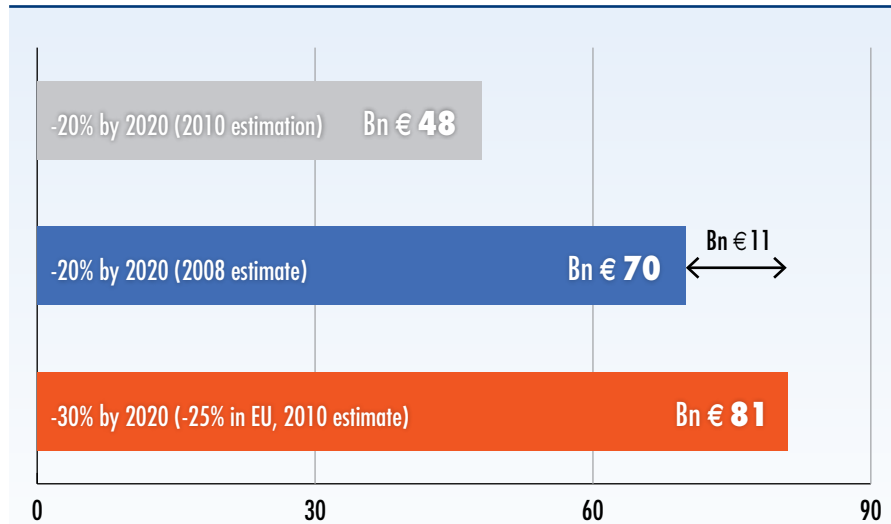
The EU, together with the countries under the United Nations Framework Convention on Climate Change (UNFCCC), endorse the fact that, to avoid dangerous climate change, global average temperature increase needs to stay below 2°C compared to the 19th century. To achieve this, the Intergovernmental Panel on Climate Change (IPCC)[4] estimates that developed countries need to lower their greenhouse gas (GHG) emissions by 25 to 40% by 2020 compared to 1990s levels.

In 2007, the EU set out to lower its GHG emissions by 20% compared to 1990 GHG emission levels by 2020 and by 30% under certain conditions.

In May 2010, the European Commission, published a Communication analyzing the effects of moving towards a 30% GHG reduction target by 2020 [5]. The analysis concluded that such a move would be both economically and technically feasible. One of the key arguments was that, due to the current economic crisis, the 20% target is almost reached. According to the European Environment Agency (EEA), the decline in economic activity and the impact of current climate policies made fossil fuel consumption fall by 5.5% in 2009. Additionally, the use of renewable energy sources (excluding biofuels) in the energy mix increased by 8.3%. In total, the EU-27 GHG emissions in 2009 are down 17.3% from 1990s levels. [6]

This reduction of GHG emissions has large implications for calculating the costs of reaching the 2020 targets. When the impact assessment for a 20% reduction target was made (2008), the annual costs of realising the emission reductions were estimated to €70 billion. However, the costs are now closer to €48 billion. Right now, achieving a 30% reduction by 2020 would only be €11 billion more expensive as the original climate and energy package of 2008. [7]

In 2009 Europe's greenhouse gas emissions were 17.3% below 1990 levels.



The cost of achieving a 20% or 30% reduction target by 2020 has been reduced significantly in the last 2 years.

Source: European Commission, 2010

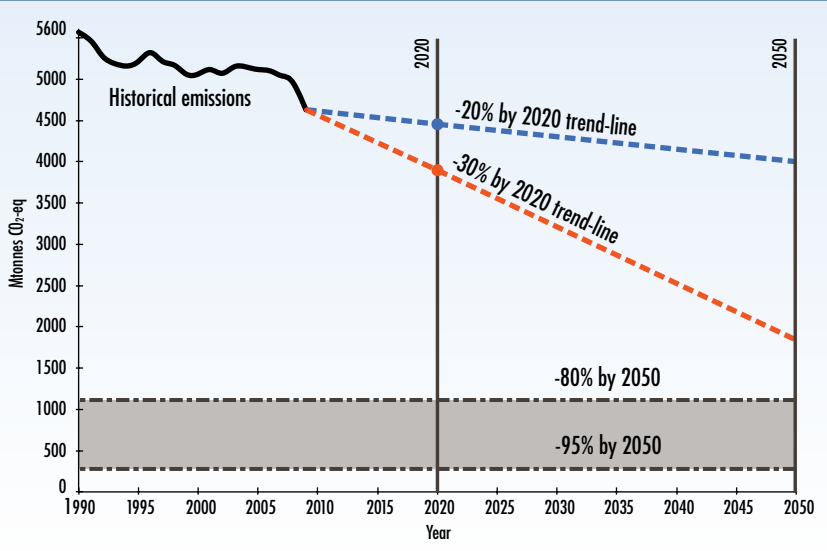
In the last part of this report, we will look at the additional health benefits of a move to -30% to show a complete cost assessment.

Delay equals costs

Damage caused by climate change has an effect on GDP levels globally. For example, the Stern Review estimated negative effects to range between 5 to 20% of global GDP each year. [8]

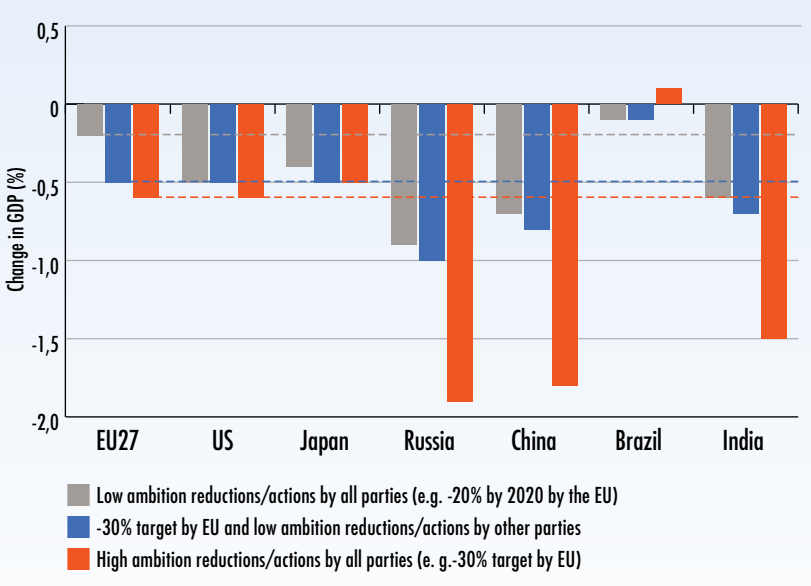
To avoid the worst of these effects, according to the IPCC, emissions in the EU need to go down by 80%-95% by 2050. [9] Europe is now clearly off-track to reach its own identical 2050 goals (see figure on pg. 8). Moving from a 20% to 30% reduction target by 2020 would bring us closer and make it possible to achieve these long-term targets. Delaying action towards a 2050 target means that the EU must catch up with deeper and steeper emission reductions at a later stage. This will increase the costs substantially.

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The International Energy Agency (IEA) estimates that such a delay in developing low carbon technologies would cost €300-400 billion per year globally. [10] On the other hand the European Commission expects that a move from a 20 to a 30% target would cost only 0.2% to 0.3% of GDP. [11] A recent additional economic analysis by Ecofys and others shows that moving to a -30% target now will lead to GDP gains of about 10% by 2050 [12]. This demonstrates that engaging in enhanced climate action now is the ultimate guarantee for Europe's economic future.

Is Europe more ambitious than the rest of the world?



How does Europe's climate action compare to other economies in terms of GDP cost (%) by 2020?

Source GEM E3 model, European Commission, 2010 [13]

It is often claimed that a unilateral move by the EU towards a 30% reduction target would bring economic disadvantages compared to other non-European countries. However, a macro-economic model (GEM E3) used by the European Commission shows a quite different picture.[13] According to the European Commission the impacts of such a move have a negligible effect on the EU's GDP when compared with the GDP impact of low ambition reduction pledges in China, India, United States, Russia and Japan. Similar low effects are seen for the energy intensive industries' production outputs in the EU compared to international competitors [14]. It is also remarkable that, according to the same GEM E3 model, the current European -20% 2020 target is among the cheapest (expressed as % of GDP) compared to the cost of low target pledges in most big non-EU economies [see figure on page 8]. This puts the claim of Europe's targets being the most ambitious in a different light.

The current European -20% 2020 target is among the cheapest to achieve compared to the reductions and actions announced by big non-EU economies.
 Source: GEM-E3 model, European Commission, 2010

For Germany a revenue loss of 15 billion EUR is at stake. For Italy and Spain the loss would be €7.1 and €6.7 billion respectively.

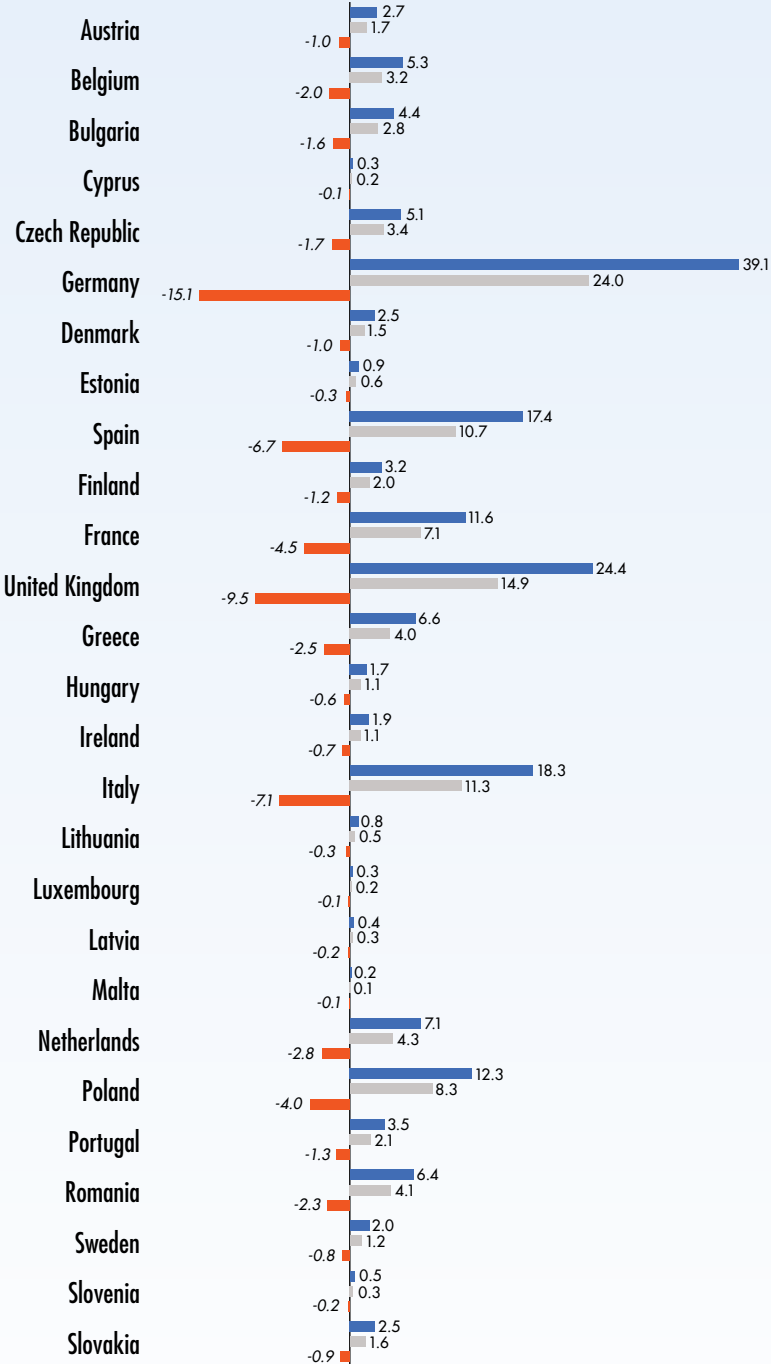
Revenue loss for EU governments

Finally, there is an important economic side-effect to the lower current and projected emissions following the economic crisis. In 2008 the European Commission expected an EU emissions trading system (ETS) allowance price of around €30 per tonne of CO₂ by 2020 under a -20% scenario.

In 2010, due to new economic circumstances, this expected carbon price was almost cut in half. [15] European governments are now at risk of losing almost €70 billion revenue (in the period 2013-2020) from the auctioning of EU ETS allowances due to this collapsed carbon price. [16] For Germany a revenue loss of 15 billion EUR is at stake. For Italy and Spain the loss would be €7.1 and €6.7 billion respectively.

Only by creating more scarcity in the EU ETS, will governments be able to recover these potential losses. This requires a move to a 30% reduction target.

According to the European Commission, a cut of 1.4 Gtonnes of allowances for sectors under the EU ETS in the period 2013-2020 is needed to make the EU ETS cap consistent with a -30% EU wide goal. [17] Such a cut would at the same time restore the expected auctioning revenues for EU governments.



■ EU ETS auctioning revenues (Billion €) under -30% scenario in period 2013-2020
 ■ EU ETS auctioning revenues (Billion €) currently projected under -20% scenario in period 2013-2020
 ■ Difference between both scenarios (Billion €)

Source: ÖKO institut, 2010, for more information on scenario and assumptions see reference [16]

Employment and innovation

Boosting employment in Europe

Climate and resource efficiency policies, together with low carbon technologies, are becoming major drivers of green growth. They spur innovation and competition towards more sustainable production. The European Union has long been a frontrunner in strong environmental and climate legislation, making the region highly successful in reaping the benefits of a growing green market segment.

To stay in the forefront of technological change and production methods, Europe needs to actively enhance its climate policies and create green jobs, tackle international competition and foster innovation.

Green jobs in ecological industries [18] are among the booming sectors of the EU economy with yearly growth between 5 and 8%. Strong regulative measures and smart incentives, both on an EU and Member State level (such as Denmark, Spain and Germany), have enabled remarkable growth in green jobs.

Today European eco-industries employ approximately 3.4 million Full Time Equivalents (FTE), which is ten times more than the direct employment in the EU's steel sector in 2007 [19]. These sectors represent 2.5% of EU GDP, which is significantly more than the contribution of Europe's steel sector (1.4% of EU GDP) [19] [20,21]. Furthermore, European companies take up 30% of the global green business market shares. For the renewable energy sector alone this is almost 40% of the global market share.

The greening of specific sectors, accomplished by stepping up Europe's climate action, can be highly beneficial. Buildings account for 42% of EU total final energy consumption, produce 35% of the EU's GHG emissions, and over 50% of all materials that are extracted from the earth are used in the building process. Hence, it is clear that greener construction has huge potential to contribute to the EU's climate, energy and environmental goals. Simultaneously, the construction industry is currently the largest industrial employer in Europe. Public and private spending on greening

EU eco-industry at a glance	
Employment	3.4 million FTE's
Share of GDP	2.5%
Annual turnover	€319 billion
Annual growth rate	5-8%
Global market share	20-50%

buildings, in particular through retrofitting existing building stock, can create massive co-benefits in terms of energy savings, job opportunities, health improvements and innovation. It has been estimated that energy-efficient buildings can save 460 million tonnes of GHG emissions annually, reduce oil consumption by 3.3 million barrels a day and create 530,000 jobs, all at a negative cost for the EU. [22]

A large-scale energy retrofit programme for buildings in Hungary, could yield up to 130,000 new jobs.

Source: Center for Climate Change and Sustainable Energy Policy (3CSEP) of Central European University, Budapest, 2010 [23]

Indeed, energy efficiency measures create jobs. The European Commission estimates that around 1.000 direct jobs are created per million tonnes of oil equivalent (mtoe) saved. This would imply that a move to a 30% target creates an additional 60.000 direct jobs. [24]

In 2005, direct and indirect employment in the EU's renewable energy sector reached almost 1.4 million jobs. Under a 30% scenario a substantial addition to this sum is expected. According to the European Commission, this would add more than 2 million direct and indirect jobs by 2020. [25] 2,000,000!

In 2009, the European wind energy industry employed approximately 192,000 people. The future of jobs in the wind energy sector remains bright with 280,000 new jobs created by 2015 and 450,000 by 2020.
 Source: EWEA, 2010 [26]

Industrial innovation for competitiveness

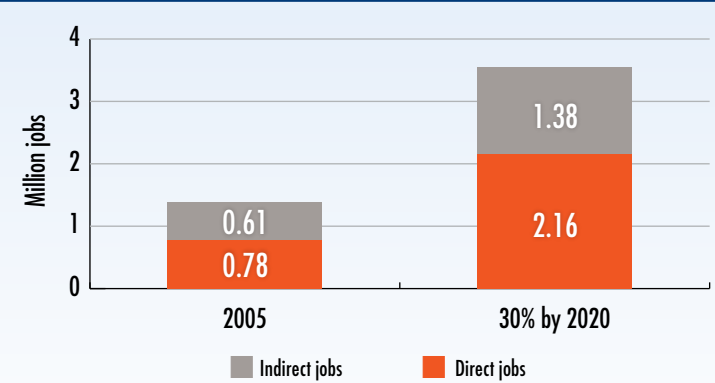
It is often argued that deep emissions reductions are technically impossible or that they would harm the economy and create unemployment. This fear has been holding back appropriate climate action in Europe and other parts of the world. In 2010 CAN-Europe asked the research institution CE Delft to look at the feasibility of such emissions reductions by 2050 in three of the most important manufacturing sectors in Europe: steel, cement and paper. [27]

In all three sectors examined CE-Delft identified technologies that are able to reduce greenhouse gas emissions by 80% or more. Most of those technologies are now in pilot phase or close to being applied in small scale demonstrator projects and will reach market maturity in the next 10 to 20 years.

For the steel sector, the public/private partnership under the umbrella of the Ultra Low CO₂ Steel (ULCOS) project is leading to some very promising technological innovations. The most advanced and promising technology is the Hisarna coke free steelmaking process, which will be able to reduce greenhouse gas emissions from steel production by 80% (in combination with Carbon Capture and Storage (CCS) compared to the current reference steel plant.

In the cement sector the most exciting development is the use of MagnesiumOxide cement clinker. This new type of cement has the ability to become a net CO₂ absorber or reduce more than 100% compared to the current emissions of a European cement plant.

For pulp and paper production the most promising technology roadmap relates to the efficient use of black liquor, a biomass-based by-product with a high energetic value, which can be turned into a useful synthesis gas (syngas fuel). If the CO₂ emissions of this



Jobs in the Renewable energy sector expected to reach 3.54 million FTEs by 2020 under a -30% 2020 target.

Source: European Commission, 2010

process are captured and stored, the net emissions of the paper sector can be negative. Ideally this has the potential to fully off-set the emissions from the entire European pulp and paper sector.

To drive and implement these innovations in Europe, a solid long term industrial vision and a low carbon policy roadmap is required. So far both of these this have been notably absent in Europe. The current EU emissions trading system (ETS), on its own, will not guarantee that these innovative technologies are implemented in Europe. This situation is because of the actual low carbon prices and the lack of political will to recycle more auctioning revenues into innovation research, development and deployment (RD+D) of new technologies.

This new type of cement has the ability to become a net CO₂ absorber or reduce more than 100% compared to the current emissions of a European cement plant.

The European Union needs to develop a climate-proof long term vision of the future for its manufacturing industry. This vision must be backed up by a mix of solid policy instruments which include full and solid carbon pricing and the use of part of the EU ETS auctioning revenues to support the development and deployment of new technologies.

The first step in support of such vision requires Europe to move its 2020 target from -20% to -30%.

Energy security and cost savings

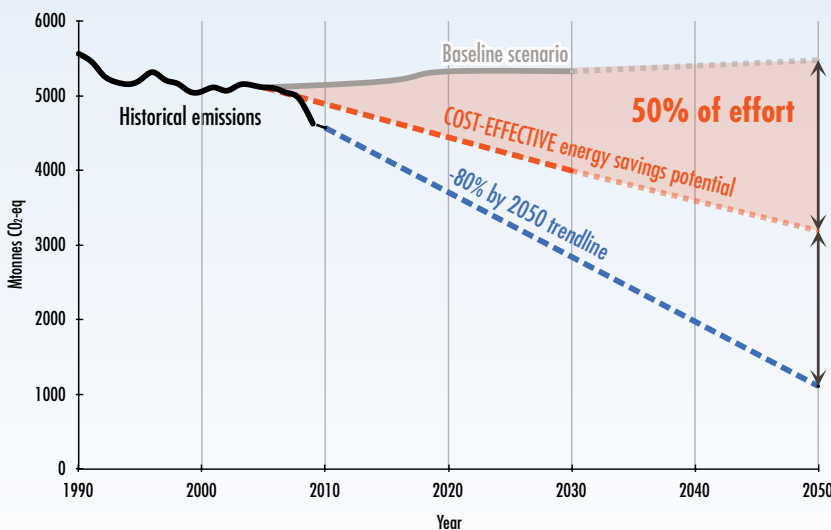
First things first

Stepping up energy savings efforts is pivotal if we intend to reach the 2050 goal to decarbonise large parts of the European energy system and to reach both short and long term climate objectives. Indeed, basic energy savings are potentially the largest and most cost-effective way to reduce GHG emissions.

Cost-effective energy savings measures have the potential to achieve half of the reductions required, for a -80% EU wide reduction by 2050 (see figure). [28]

Cost-effective energy savings measures have the potential to achieve half of the reductions required, for a -80% EU wide reduction by 2050

Energy savings also brings abundant co-benefits such as job creation and reduction of energy poverty. Import dependency on fossil fuels from outside the EU for electricity generation can be significantly reduced thereby increasing the security of the European energy supply.



Cost-effective energy savings measures show the potential to achieve a significant part of both the 2020 and 2050 climate targets of the EU.

Source: Ecofys and Fraunhofer Ise, 2010 [28]

Sophisticated economic tools, such as the ones developed by McKinsey, clearly show the cost-effectiveness of energy savings in the EU [29]. For example, improvements in the building sector (appliances, insulation and energy conversion systems) are estimated to come at a negative cost ranging from -60 to -12 € per tonne of CO₂ avoided. Energy savings in industry in forms of new plants and retrofits come with negative costs range from -107 to -74 € per tonne of CO₂ avoided [30].

Europe's non-binding 2020 target to save 20% of its primary energy consumption in practice equates to a reduction in the consumption of around 400 million tonnes of oil equivalent (Mtoe). However, right now, half of this goal representing 200mtoe (or €78Bn by 2020) will be missed due to lack of implementation [31]. In terms of greenhouse gas emissions around 560 million tonnes of CO₂ are therefore not avoided, equaling the annual emissions of France.

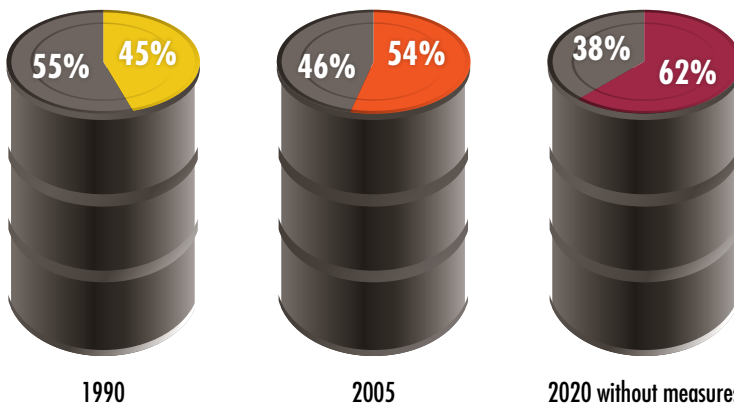
Saving to Secure Europe's energy needs

The EU receives more than 53% or about 1.01 billion [32] toe of its primary energy from outside Europe, making it a net importer. The main suppliers for the EU are Russia, which provides 33% of our oil and 40% of gas, and Norway which supplies 16% oil and 23% of gas. Fossil fuel dependency makes the EU vulnerable to gas spats between Russia and Ukraine and high and volatile oil prices. New analysis from the International Energy Agency found that oil import cost for member countries of the Organisation for Economic Co-operation and Development have shot up by \$200 billion to \$790 billion in 2010. The IEA analysis finds that this increase, triggered by high oil prices, is equal to an annual loss of income of 0.5 per cent of the OECD countries combined gross domestic product [33].

"Oil prices are entering a dangerous zone for the global economy" warns the IEA's Chief Economist Dr Fatih Birol. "The oil import bills are becoming a threat to the economic recovery. The stability of the global economy is under threat due to oil prices entering a "dangerous zone"."

On the other hand, such a hike in oil prices will make the cost savings from energy efficiency measures even more substantial. Europe's Fossil fuel import dependency is set to rise to 62% of total energy use by 2020 [34]. However, if the full energy savings target were implemented, import dependency on fossil fuels is estimated to be significantly lower by 2020. [35]

According to the European Commission, moving to a -30% domestic target would bring about cost savings from oil and gas imports of €14.1 billion per year by 2020. The total savings compared to the baseline amount to €45.5 billion [36]. These cost saving figures are most likely underestimated since they were counted using a price for imported crude oil of \$88.4 per barrel in 2020 [37], while right now, in a period of economic recovery, the oil price is already above \$90 and rising... [38]



Without action Europe's total primary energy needs will depend for 62% on imports by 2020.

Source: Primes 2009, ECOFYS, Fraunhofer isi [34]

"The oil import bills are becoming a threat to the economic recovery"

Fatih Birol, chief economist IEA, 2011



Rising oil prices: here we go again...

Source: US Energy Information Administration, 2011

The European Commission's cost saving numbers are most likely underestimated since it counted with a price for imported crude oil of \$88.4 per barrel in 2020 while prices are now already well above \$90

Health (co-)benefits

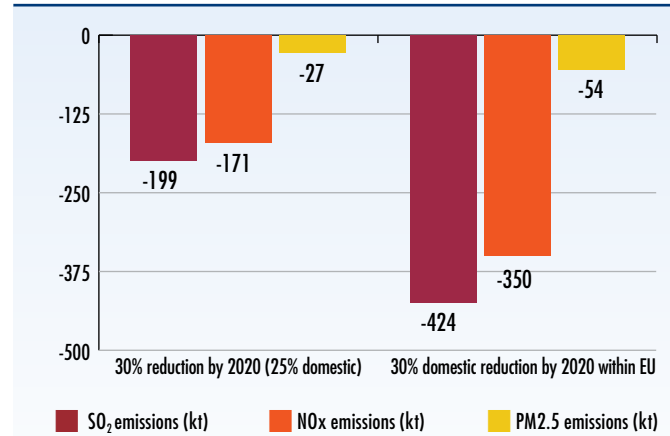
Clean Air for Europe

The impact of climatic changes on health is an often overlooked issue when discussing climate change policy. Yet, the world's leading medical journal the Lancet (39) has called climate change "the biggest global health threat of the 21st century" in the medical journal The Lancet (39). On a global scale the health related problems are potentially huge, with malnutrition due to food shortages, more extreme weather events such as heat-waves causing heat related deaths and changes in the spread of diseases and epidemics. For example, during the 2007 heat wave in Europe, Hungary reported over 500 excess deaths during the 8 days of extreme heat [40]. Links between health and climate change are increasingly recognised by medical associations and doctors. [41]

Climate Change is the biggest global health threat of the 21st century

Professor Antonio Costello et al, The Lancet, 2009 [39]

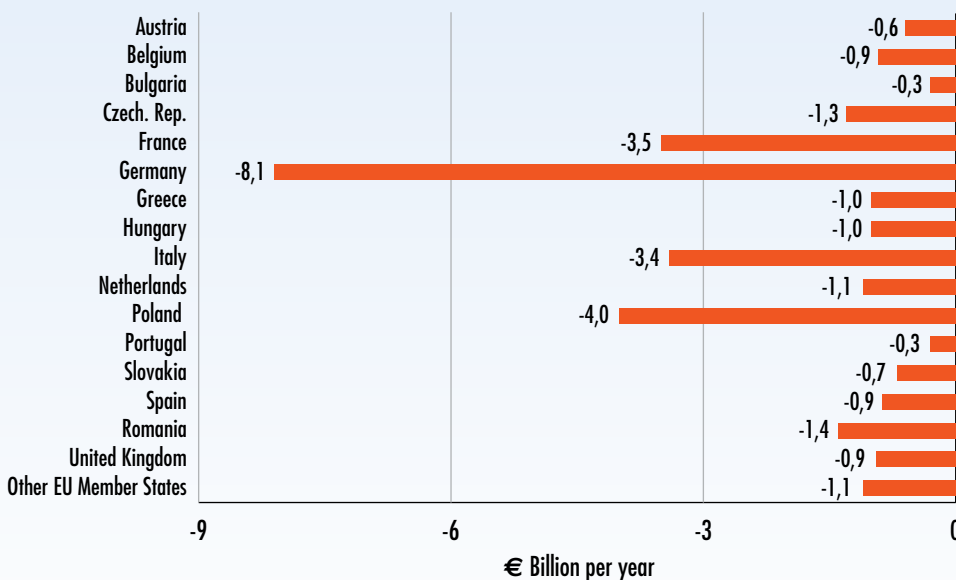
Air pollution has well-documented negative health effects including respiratory diseases, lowered life expectancy levels for people living in cities and an increase in child mortality [42]. For the EU, significant health benefits are possible through a reduction in air



Impact of 25% and 30% domestic emission reductions in the EU by 2020 on other air pollutants.

Source: European Commission, 2010

pollution associated with lowering GHG emissions. The European Commission estimates the reduction in health-related cost to range from €3.5 – 16.7 billion depending on how much of the reductions are done in EU domestically. In addition to health related savings, the 30% greenhouse gas reduction target comes with the co-benefit of reduced costs in other air pollution control measures of €2.8 - 5.3 billion [43] because it will reduce the emissions of



Avoided health related costs for member states per year by 2020 if EU would move from -20% to a -30% domestic 2020 target.

Source HCHWE and Heal, 2010 [45]

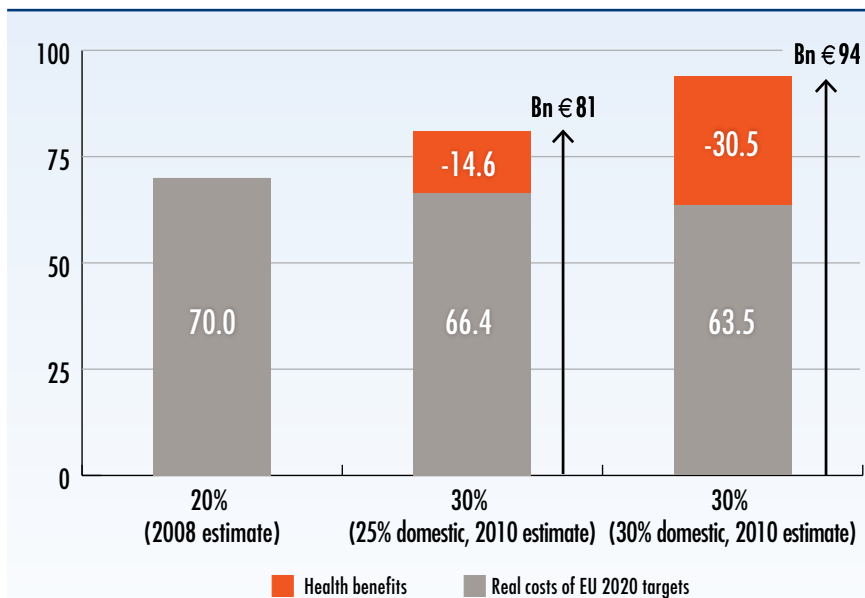
Poland can save up to €4 Billion health related costs per year if Europe moves to a -30% target

air pollution in terms of particular matter (PM), sulphur dioxide (SO₂), ozone and nitrogen oxides (NO_x) by 4-9% in the EU. Enhanced climate action thus will support the implementation of the 2005 Thematic Strategy on Air Pollution (COM (2005) 446) [44].

The Health and Environment Alliance (HEAL) and Health Care Without Harm Europe (HCWHE) estimated that the maximum additional health benefits from moving from a 20% to 30% target, range between €14.6 and €30.5 billion per year by 2020, depending on the actual implementation of the target [45]. The estimates are based on the following actual positive effects on human health:

- 140,000 additional years of life (due to an increase in life expectancy)
- 13 million fewer days of restricted activity (including 3 million fewer lost working days annually) for those with respiratory or cardiac diseases
- 1.2 million fewer days of respiratory medication use by adults and children
- 142,000 fewer consultations for upper respiratory symptoms and asthma each year
- 3,776 fewer hospital admissions for respiratory and cardiac conditions.

Including the health benefits from better air quality in the costs for achieving Europe's 2020 targets makes a 30% target, fully achieved in Europe, the most cost-effective approach.



Including the health benefits from better air quality in the costs for achieving Europe's 2020 targets makes a 30% target fully achieved in Europe the most cost-effective approach.

Sources: European Commission, 2010 and HCHWE and Heal, 2010

The numbers between the European Commission's own impact assessment and that of HEAL and HCWHE are different because, not all the health effects are incorporated in the cost analysis by the European Commission [46]. This, of course, gives an incomplete picture of the actual cost of moving to a 30% target.

Taking the lower estimation of EU27 health benefits by Heal and HCHWE of up to €14.6 billion, would make a 30% target (with 25% reduced in EU) less expensive than the original 20% estimate of 2008.

If, however, all of Europe's emission reductions under a 30% scenario would happen domestically, a maximum of €30.5 billion savings in health related costs would make this the most cost-effective option.

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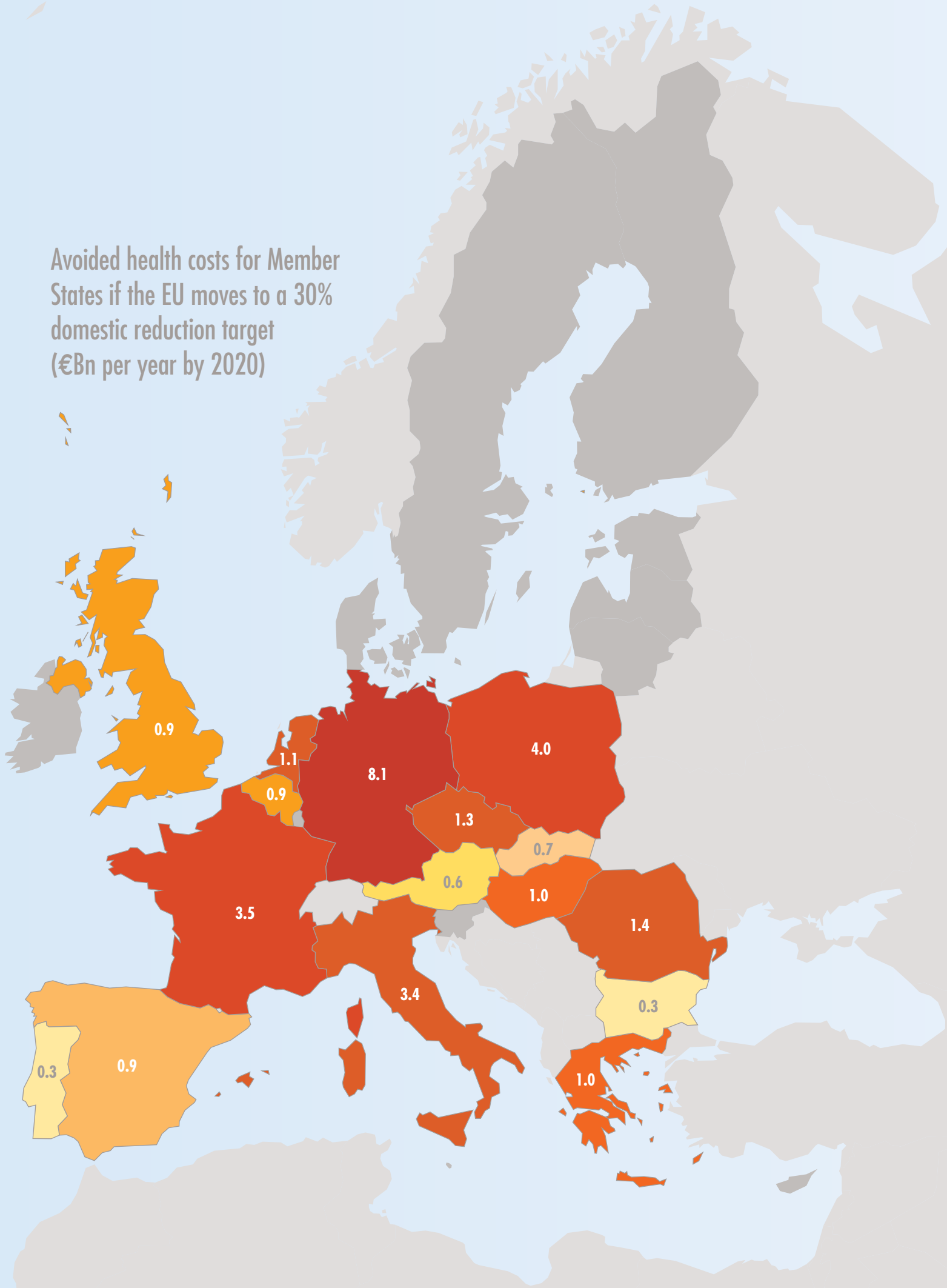
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- Table 12: Additional costs including costs in baseline and reference scenarios, p.47
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- Table 12: Additional costs including costs in baseline and reference scenarios, p.47. The GDP percentages of 0.2% and 0.3% are found by subtracting the GDP in the "Reference" column with respectively the "30% with flexibility, 25% internally" and "30% internally" columns in the table.
- [12] Emmanuel Guerin, Institut du Développement Durable et des Relations Internationales (IDDRI), Ecofys and Climate Strategies, Is there a case for the EU to move beyond 20% GHG emissions reduction by 2020? DRAFT interim results, 19th November 2010, pg.10 <http://www.climatestrategies.org/our-reports/category/57/271.html>
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- Table 15: Effects on GDP (% difference from reference), pg. 52, GEM E3 scenario with access to international credits.
- "The reference case for comparing the impact of the Copenhagen Accord is the case where the EU implements unilaterally its low pledge (a reduction of -20% versus 1990 by 2020) and the rest of the world does not act beyond baseline. In this reference case the EU is assumed to also use international credits to comply with the -20% target. This reference is compared with three stylized cases:
- (1) The EU as well as those countries that pledged targets or action under the Copenhagen Accord implement their low pledges. This scenario is called 'Low Pledges'.
 - (2) The EU goes towards its high end pledge (-30% versus 1990) but the others remain at their low end pledges under the Copenhagen Accord. This scenario is called 'Mixed Pledges'.
 - (3) The EU but also the other countries with pledges under the Copenhagen Accord go towards their high end pledges. This scenario is called 'High Pledges'."
- [14] idem Table 27: Impact of different allocation scheme on production in energy intensive industries (GEM E3), pg. 66
- [15] idem Table 7: Comparison of policy scenarios and its drivers, pg. 43 gives an estimate of 16.5 EUR/tonne EU Allowance (EAU) price in 2020. and
- EC 2008, Impact Assessment, Document accompanying the Package of Implementation measures for the EU's objectives on climate change and renewable energy for 2020, SEC(2008) 85/3 http://ec.europa.eu/clima/documentation/docs/sec_2008_85_ia_en.pdf Table III Overview of impacts at EU level for key scenarios of the impact assessment, pg.24 gives an estimate of 30 EUR/tonne EAU price in 2020 for the 2008 climate and energy package
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"Implementing the EU ETS target", pg. 47
- [18] Sometimes called Environmental Goods and Services (EGS).
- [19] European Commission, DG Trade, <http://ec.europa.eu/trade/creating-opportunities/economic-sectors/industrial-goods/steel/> "... The steel sector in the EU accounts for 1.4% of GDP. The sector has been hit hard by the economic crises since the end of 2008. After rather stable production at around 200 million tonnes per year during the last five years, the crude steel production in the EU started to fall sharply at the end of 2008. Employment in the steel sector has contracted steadily in recent decades from 1 million people working in the sector in 1970, to around 370 000 employed in the sector in 2007."
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pg. 56. "... In addition, analysis done in the context of revision of the energy efficiency action plan indicates that energy efficiency increases employment. For every Mtoe energy saved; it might create 1 000 direct jobs. Since a step of 20 to 30% (doing 25% internally and 5% through international credits) is expected to save some 60 Mtoe around 60 000 jobs might be created directly. This is in line with other studies that suggest that 40 to 60 jobs are created per PJ of (primary) energy saved or around 2 000 jobs/Mtoe saved."
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"The Commission's new Communication covers health co-benefits of mortality but not of morbidity (diseased condition or state).
Nor does it provide a breakdown of impacts by Member State.
This Technical Report provides the added health benefits of moving from the 20% cut to the '30% with flexibility' and '30% internal' cases.
It also provides additional information to that presented in the EC's new communication, as follows:
1. Estimates of health impacts including morbidity (ill health) as well as mortality
2. The economic equivalent of these effects
3. A breakdown of economic impact by Member State
4. Estimates of the cumulative health co-benefits of taking early action."



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