



E3G

# Building a sustainable and low carbon European recovery

How moving to a 30 percent  
emissions target is in the European  
interest

E3G

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## Summary

In the midst of global economic crisis, European countries face critical choices to preserve their future prosperity and security. Political attention is rightly focused on rebuilding fiscal balances and strengthening financial regulation, but these actions alone are not enough to revive European growth or protect against further economic shocks from rising oil prices.

Nor can we let the immediate crisis distract from the need to tackle the longer term risks of climate and energy security. Geographically and geopolitically Europe is particularly vulnerable to energy prices and the impacts of climate change compared to its major competitors, so has a strong interest in accelerating action towards a global low carbon economy. Post-Copenhagen, the task remains the same: the next generation of energy investment in all industrialised countries must be predominantly low carbon or we will face huge economic costs and security risks as the climate destabilises. Europe's current 20 percent emissions target is not only inconsistent with its long-term emissions reduction goal but could also serve as a brake on investment required urgently over the next decade. Other countries see the minimal effort needed to reach Europe's target, and this has taken the pressure off the US, China and India to increase their emissions reductions.

Europe's economic choices and its climate choices can have common solutions: if designed well, the action required to deliver Europe's long-term climate and energy security can be consistent with its shorter-term economic needs. Economic growth and stability can be delivered by stimulating much needed investment in low carbon European energy infrastructure. Putting the EU on track to meet its agreed 2050 climate goal would generate an additional €45 billion per annum of investment in European jobs and technologies by 2020. But this investment will not happen unless the EU emissions reductions target is increased from 20 percent to 30 percent below 1990 levels by 2020, and importantly, the overwhelming majority of this is achieved inside the EU.

The recession has lowered European emissions substantially. The European Environment Agency's latest report shows that emissions have fallen 17.3 percent from 1990 levels. Therefore, meeting the 20 percent target now only requires a fraction of the effort originally estimated in 2008. These reductions will be met almost completely by the current EU renewable energy targets and switching from coal to gas in the power sector. The cost of emissions reductions outside the EU ETS will crash to 4-5 €/tonne. There will be a structural overhang of bankable emissions permits by 2020 which could

total 5 years of total EU emissions. If nothing changes, European low carbon markets outside the renewables sector will be largely destroyed for over a decade.

Carbon prices will fall to around €16 per tonne, undermining investment incentives to replace Europe's ageing energy infrastructure, raising risks of medium-term energy security problems, locking-in high carbon investment (such as new coal power stations without CCS) and increasing the future cost of keeping to the EU's 2050 emissions reduction targets.

Moving to a 30 percent target would restore these investment incentives. The cost of moving to the 30 percent target is estimated by the European Commission to be an additional €33 billion-€46 billion per annum by 2020, depending on the amount of the target met by purchasing emissions permits abroad. But these costs are highly sensitive to the future price of oil. The Commission has used a conservative oil price forecast of \$88 bbl in 2020 - yet it is highly likely that oil prices will rise faster than this given the collapse in supply side investment, the impact of the BP Gulf of Mexico spill on deep sea exploration, the rise in Asian consumption and Euro depreciation.

If we look at broader oil price scenarios of \$115 and \$150 bbl oil by 2020, then the energy savings will outweigh the direct costs of moving to 30 percent. Energy import costs alone would decline by €40 billion-€68 billion a year by 2020. Moving to a low carbon energy system would save consumers an *additional* €40 billion-€96 billion a year in total oil and gas costs by 2020 under the higher oil price scenarios.

Moving to a 30 percent target would result in 100-250 percent growth in low carbon markets compared to their scale under the 20 percent target, with much of this occurring in labour intensive industries outside the power sector. European companies need this domestic growth if they are to retain their first-mover lead in low carbon markets - a lead which has only been created by Europe's leadership in tackling climate change. Today European companies have a global market share of 30-50 percent in major clean technology sectors, but they face increasing competition. EU companies now only represent 25 percent of the top innovators across the major low carbon energy technologies.

Although Copenhagen did not agree to a legally binding and ambitious 2°C target that the EU wanted, it did put the world on track to a *lower* carbon economy. This will generate trillions of dollars in demand for low carbon technologies in the next decade. All the major economies are betting on a clean energy future, with China, US, Japan and South Korea now leading the race to invest in developing low carbon technologies.

Already, all these countries are channelling more of their stimulus packages to low carbon investment than Europe.

The choice is clear. Europe can choose to invest in clean energy and energy efficiency at home to fuel the recovery, or continue to see increasing amounts of money flow out of the EU to import fossil fuel and energy technology, lowering growth and worsening trade balances.

But if the economic case for 30 percent is strengthened by the recession, the economic crisis *does* change how we should meet these targets. There is no point raising the EU target to 30 percent if we meet it merely through purchasing cheap emissions reduction credits from China and India. An economically sensible shift to 30 percent will need to prioritise investment in domestic European energy efficiency in homes, power stations and factories, and in the infrastructure and innovation needed to sustain reductions beyond 2020 and maintain European companies' competitive edge in the low carbon race. This should be supported by a green skills strategy that includes professional development, upskilling and technical retraining programmes as well as a removal of the barriers that restrict mobility to reflect the new structure of the European labour market.

The economic crisis also means we require different instruments to drive investment. Given the tight financial constraints on European companies, merely raising carbon prices will not efficiently and effectively drive new investment. Shifting from the status quo will require additional policy instruments which give stronger investment incentives, and new financial mechanisms to manage risk and help leverage new private investment into low carbon markets and technologies. Some actors are already responding to this challenge: the European Investment Bank has issued Green Bonds to raise funds for low carbon investment, KfW in Germany is financing home energy efficiency retrofits and the UK has announced the creation of a new Green Investment Bank on October 20<sup>th</sup>, 2010 which will implement significant power market reform to drive low carbon investment. These types of approaches will need to be rapidly expanded across the EU to deliver a 30 percent target.

In response to this evidence, opponents of shifting to the 30 percent target ask “why act now?” They argue that Europe is too preoccupied with vital economic issues to tackle climate change, and the lower cost of the 20 percent target should be taken as a welcome economic benefit during the recession. This analysis is both empirically wrong and strategically dangerous for European security and prosperity. Investment in European energy efficiency and infrastructure is profitable *now*, and will be more valuable as oil prices rise. But that investment is not happening because of market

failures and political barriers which must be removed by active policy. Surrendering Europe's lead on low carbon technology – just as the rest of the world has begun to follow its example – would remove one of the few clear growth advantages Europe has in the global economy.

The next argument made against moving to 30 percent is that European industries risk relocating overseas because of climate legislation. Independent economic analysis has repeatedly shown this “carbon leakage” risk to be over exaggerated. Europe's energy intensive industries have also already been given generous amounts of free allowances to shield them from carbon prices. The recession means they have even greater surplus allowances than anticipated, increasing their unearned profits at the expense of higher prices to electricity consumers. In reality, the carbon leakage debate is an economic distraction. The true risk to jobs in European heavy industries is not high carbon prices, but the current collapse of European demand in construction and infrastructure markets. Ironically, the one sure way to increase growth and jobs in these markets is to incentivise investment in large-scale low carbon infrastructure which is a voracious user of steel, cement, aluminium and chemicals.

The final argument against moving to 30 percent is that if Europe acts there is no guarantee that other economies will follow. This defeatist view ignores the reality that all major economies are currently investing heavily in low carbon markets. Although Europe's strategy of leading by example has worked, this could, hypothetically, change such that China, India and the US could decide to reject the risks of climate change and switch to investing in high carbon infrastructure. In this case, energy use globally will soar and with it oil prices; demand will outstrip investment in new oil supply which has already slowed due to the recession. In this dystopic future, Europe will be highly vulnerable. Failing to move now to an efficient, clean energy system would expose European businesses, consumers and taxpayers to extreme economic costs in the future from repeated oil and gas price shocks. A single three year oil shock where oil prices double in the years around 2020 would cost Europe an additional €300 billion if it stays on a high carbon trajectory. This is approximately the whole cost of the 30 percent target over the decade to 2020.

The simple conclusion is that there is no low cost, high carbon future for Europe. Under any plausible scenario of fossil fuel prices, climate change impacts and global low carbon competition, it makes sense for Europe to move more rapidly towards an efficient and clean energy economy. Current policy analysis often obscures this by simplifying the future and not reflecting the full range of uncertainties and risks Europe faces. Europe must design economic, energy and climate policies which are resilient to

these risks. The economic crisis must be managed, but it will pass. The tyranny of immediate problems must not distract European leaders from making the right choices for the future security and prosperity of their citizens.

Policies now need to be explicitly designed to maximise economic, competitiveness, energy and climate security to the EU. The debate in Europe needs to move from the sterile ground of whether we should or shouldn't do more, to a discussion of how to deliver the best value to European consumers, taxpayers, workers and citizens in the move to an efficient, low carbon economy.

# 1. The impact of the economic crisis on European energy and climate security

In the midst of the greatest ever post-war economic crisis, all European countries face critical choices to preserve their future prosperity and security. Political attention is rightly focused on rebuilding fiscal balances and strengthening financial regulation, but these actions alone are not enough to revive European growth or protect against further economic shocks from rising oil prices.

Nor can we let the immediate crisis distract from the need to tackle the longer term risks of climate and energy security. Europe is a major importer of fossil fuels and is highly vulnerable to the risk of oil price spikes as Asian demand rises and investment in supply stagnates, especially after the BP Gulf of Mexico disaster. In the medium-term, the balance between oil supply and demand will increasingly tighten, with the majority of estimates placing the timing of “peak” supply between 2020 and 2030<sup>1</sup>. Though unconventional gas may provide some alternative solutions for Europe, the potential of these reserves has yet to be proven and there are likely to be legal and commercial challenges to production in addition to strong opposition on environmental grounds. It is clear that reducing exposure to fossil fuel prices will be a critical part of European energy security and economic stability in the coming decade.

Geographically and geopolitically Europe is also particularly vulnerable to the impacts of climate change compared to other major economies, surrounded as it is by zones of political fragility and high climate vulnerability in Africa, the Middle East and Central Asia. Europe therefore has a strong interest in accelerating action towards a global low carbon economy.<sup>2</sup>

Post-Copenhagen the task remains the same. The next generation of energy investment in all industrialised countries must be predominantly low carbon or we will face huge economic costs and security risks as the climate destabilises.

EU climate and energy policy is at a crossroads. Three issues require urgent direction and ambition: the inconclusive outcome from the UN international climate change discussions, the €1 trillion capital investment needed to meet European energy demand

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<sup>1</sup> For a comprehensive “meta-analysis” of 500 studies on global oil depletion see UK ERC (2009), Global Oil Depletion, London 2009. <http://www.ukerc.ac.uk/support/tiki-index.php?page=Global+Oil+Depletion>

<sup>2</sup> For recent UK government analysis of the security consequences of going beyond the 2°C limit see <http://www.metoffice.gov.uk/climatechange/news/latest/tackling-temps.html>. Similar conclusions have emerged from detailed analysis carried out by the European Commission and the US National Intelligence Council.

by 2020<sup>3</sup>, and the risk that Europe could fall behind the US and China in the global race to win new low carbon markets.

This paper examines how to deliver **all** of Europe's critical and interconnected economic, energy and climate interests over the next decade, rather than assuming from the outset that they intrinsically conflict with each other. Only through such an approach can we look to maximise value to European citizens, taxpayers, worker and consumers. These issues are analysed below in three sections:

**Section 2** compares the impact on European interests of both maintaining the current 20 percent target and moving to 30 percent reductions by 2020. It argues that there are greater economic risks to the EU from delaying action than from moving decisively to a low carbon economy, if the policy package to do this is designed in the right way.

**Section 3** counters the arguments which have been put forward against moving to 30 percent by various interest groups and countries, particularly the idea that European leadership on climate change is economically damaging and diplomatically ineffective. The analysis concludes that there is no plausible future scenario where Europe would be better off pursuing a status quo high carbon, energy inefficient future.

**Section 4** puts forward a portfolio of policies covering energy efficiency, emissions trading, infrastructure development and innovation which would deliver high economic, energy and climate security benefits if implemented in the next decade. This is not meant to be a definitive new EU energy and climate package, but rather a balanced illustration of the type approach we believe needs to be developed.

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<sup>3</sup> Citigroup Global Markets (October 2009), 'Pan European Utilities'.

## 2. Why a 30 percent target is in Europe's economic, energy and climate interest

For over a decade Europe has championed the goal of limiting average global temperature rises to below 2°C and even succeeded in having 2°C recognised by all parties to the Copenhagen Accord. Putting this target into practice would require a rapid peak and decline in CO<sub>2</sub> emissions from 2020 at the latest. The International Energy Agency (IEA) estimates this would require an additional \$10 trillion (€7.5 trillion) in energy investment to 2030, together with a shift of most of the baseline energy investment, about \$25 trillion (€19 trillion) into cleaner energy.<sup>4</sup> The current pledges made by the parties to the Copenhagen Accord will not deliver all of this, but they do add up to around €3 trillion in additional low carbon investment to 2030 and a large shift in existing financial flows away from high carbon business-as-usual investment.<sup>5</sup> In other words, the world is betting on a low(er) carbon economy but is not yet committed to a transition consistent with 2°C.

In light of this, Europe now faces a choice between leading a global effort to accelerate the low carbon transition or accepting the inconclusive status quo, which leaves Europe exposed to high climate change risks. A decade ago, when the US turned its back on the Kyoto Protocol, the EU made a strategic decision to show leadership by establishing its own Emissions Trading System (ETS) and by working with progressive developing countries to drive forward action internationally. Now the EU faces a similar choice about how to shape global politics in order to protect its own future climate security. There are many lessons on climate diplomacy to be taken from Copenhagen, but perhaps the most important is that domestic actions speak much louder than international words. The single most important driver behind the progress made at Copenhagen was Europe's commitment of 20 percent reductions by 2020 with the option to move to 30 percent.

Some argue that the EU has already gone far enough with its existing 20 percent target and should now wait for commensurate action by economic rivals. This paper argues instead that staying at 20 percent would be a fundamental mistake for Europe in both the short and long-term. Failure to move to 30 percent would:

- > expose European businesses, consumers and taxpayers to unnecessarily high economic costs from high oil and gas prices as well as unacceptable climate security risks,

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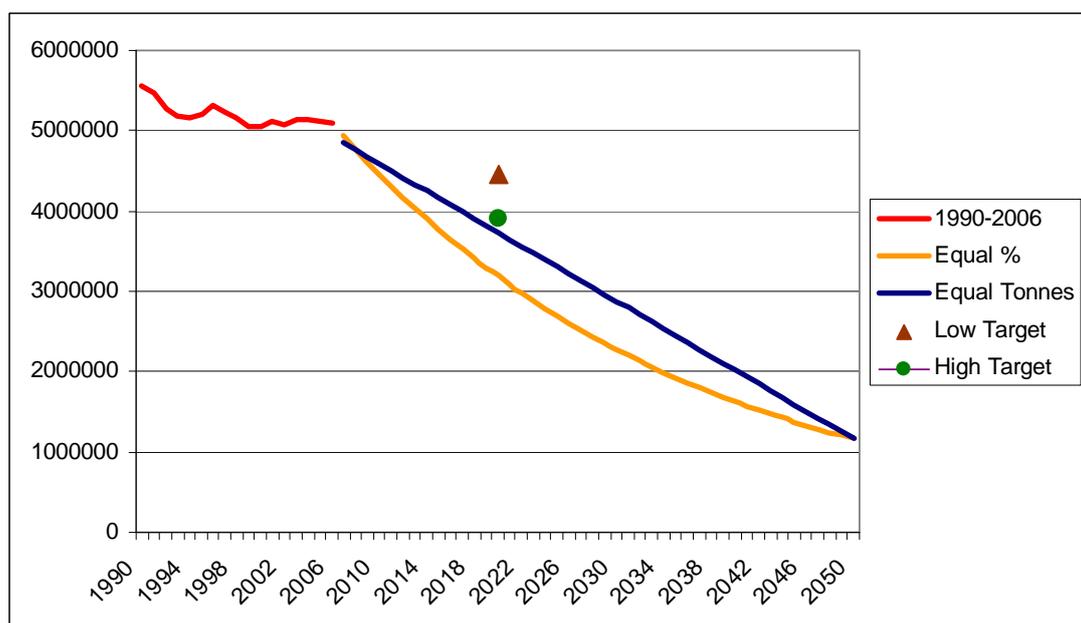
<sup>4</sup> IEA (2009), 'World Energy Outlook', OECD, Paris.

<sup>5</sup> Investment estimate from IEA Alternative Scenario (IEA World Energy Outlook 2008) resulting in a 550-650 ppm consistent emissions trajectory comparable to the Copenhagen Accord pledges.

- > reduce economic growth by stalling clean energy investment outside the directly supported renewable energy sector and risk locking-in high carbon energy infrastructure investments which will become expensive stranded assets,
- > waste the EU's current clean energy investments and early mover advantage in the global race to secure new fast growing low carbon markets.

Any attempt to evaluate the 2020 target should take into account the EU's longer term commitment to reducing emissions by 80-95 percent below 1990 levels by 2050. Assuming a linear trajectory, meeting the low end of this range would mean reducing emissions by at least 40 percent by 2020 and 60 percent by 2035. Analysis by Climate Strategies (see Figure 1 below) shows that a 20 percent target puts the EU well outside the required trajectory, while increasing the target to 30 percent would mean the EU was roughly consistent with at least one pathway to a low carbon EU in 2050.

**Figure 1: Trajectory indicator for the EU-27**



Source: Adapted from M. Ward and M. Grubb (2009): Comparability of efforts by Annex 1 Parties, an overview of issues, Climate Strategies report.

The longer term trajectory is critical as it is unlikely the EU will be able to “catch up” to a 2°C pathway post-2020 due to the massive amount of capital stock that will be built over the next decade. Without a stronger cap on emissions the majority of this capital

stock will be high carbon, which would then need to be abandoned and rapidly replaced by low carbon infrastructure in later years. 6 A delayed approach such as this would be very costly and would increase the risk to European energy security.

## Box 1: The low carbon technology race

One of the justifications for sticking to 20 percent despite the evidence above is that the EU's original international negotiating conditions for 30 percent have not been met<sup>7</sup>, in particular there is concern that the world's two largest emitters, China and the United States have not made comparable commitments. However, thinking strictly in terms of the international context overlooks important signals that Europe's two primary economic competitors are sending through their domestic policies and public support for low carbon industries.

In an effort to help achieve its goal of reducing carbon intensity below 2005 levels by 40-45 percent by 2020, China's 12<sup>th</sup> Five Year Plan may include a carbon tax as well as other environmental and resource taxes, and a boost in subsidies for low carbon technologies.<sup>8</sup> It is also likely to include a firm target to reduce carbon intensity and may include stricter regulation of thermal emissions standards.<sup>9</sup> Since 2006 China has closed 468 inefficient coal-fired power stations accounting for 164 million tons of CO<sub>2</sub>.<sup>10</sup> More importantly, China is now the biggest investor in clean energy among G20 countries<sup>11</sup>, and has also become the most attractive country for renewable energy investment, beating the US, Germany and India.<sup>12</sup> The Chinese government plans to spend 5 trillion Yuan (\$750 billion) in clean energy over the next decade.<sup>13</sup> In August 2010, the Chinese government revealed a list of low carbon pilot cities and provinces, which will lead the nation's low carbon transformation.

Although the US has not passed a climate bill in the Senate, the Environmental Protection Agency (EPA) has been given a mandate to regulate 70 percent of the nation's emissions from July 2011.<sup>14</sup> President Obama recently signed an Executive Order setting environmental performance goals for federal agencies. This will ensure the federal government, as the largest consumer of energy in

<sup>6</sup> Project Catalyst (February 2010). Taking stock – the emissions levels implied by the pledges to the Copenhagen Accord. Briefing paper

<sup>7</sup> The EU is committed to raising its target to 30% if other developed countries take comparable efforts and developing countries contribute adequately according to their responsibilities and capabilities.

<sup>8</sup> Fu Jing, 'Carbon tax likely, expert forecasts', China Daily, May 10, 2010.

<sup>9</sup> Leslie Hook, 'Intensity targets are being taken very seriously', Financial Times, September 13, 2010.

<sup>10</sup> Yvonne Chan, 'China closing down small coal-fired plants', BusinessGreen, 31 July 2009.

<sup>11</sup> Pew Center (March 2010), 'Who's Winning the Clean Energy Race', Pew Center on Global Climate Change, Arlington, Virginia.

<sup>12</sup> Ernst & Young (August 2010, Issue 26), 'Renewable Energy Country Attractiveness Indices: Global Highlight', UK

<sup>13</sup> Li Woke, 'Clean Energy to Garner Foreign Investment, Technology', Global Times, 21 September 2010

<sup>14</sup> Sindya N. Bhanoo, 'The EPA Announces a New Rule on Polluters', New York Times, May 13, 2010.

the US, reduces its emissions by 28 percent below 2008 levels by 2020.<sup>15</sup> Twenty six states have adopted renewable portfolio standards, with a further ten having adopted alternative energy standards or goals.<sup>16</sup>

It is clear that both the public and private sector in the US and China see low carbon as a strategic market for investment; in particular both countries are betting on enormous growth in electric vehicles and supporting infrastructure in the coming years. The US recently came top of an electric vehicle index developed by the consultancy McKinsey<sup>17</sup> and channelled \$6 billion of stimulus money into advanced vehicles and biofuels.<sup>18</sup> The number of US factories producing electric vehicle batteries is expected to climb from 2 to 30, giving it a 40 percent share of the global market by 2015.<sup>19</sup> The world's first mass-produced plug-in hybrid was launched by Chinese company BYD in December 2009. The company has also signed a memorandum of understanding with Daimler AG to jointly develop electric vehicles for the Chinese market.<sup>20</sup> The Chinese government is reportedly planning to invest £20 billion over the next two years in developing and promoting demand for alternative fuel vehicles, including offering cash rebates to buyers of electric cars and buses in 13 of its largest cities.<sup>21</sup> A new policy will introduce a target of constructing 1 million electric cars by 2020 coupled with a 10 billion Yuan spending programme to stimulate this fledgling market<sup>22</sup>.

Looking more broadly at low carbon transport, China plans to spend \$300 billion into dedicated high-speed-rail corridors by 2020.<sup>23</sup> China and the US are also cooperating through a joint electric vehicles initiative<sup>24</sup> and recently held an advanced vehicle summit. Both the US and China have either launched or are seriously pursuing innovative mechanisms to catalyze low carbon investment and technologies. The US has established the Advanced Research Projects Agency for Energy (ARPA-E) modelled on the Defence Advanced Research Projects Agency (DARPA). Its remit is to focus on funding for high risk projects that reduce foreign energy imports, cut energy-related

<sup>15</sup> Environmental Leader 'Obama orders government to slash GHG emissions 28%', January 29, 2010.

<sup>16</sup> [http://www.pewclimate.org/what\\_s\\_being\\_done/in\\_the\\_states/rps.cfm](http://www.pewclimate.org/what_s_being_done/in_the_states/rps.cfm)

<sup>17</sup> Bernard Simon, 'US tops electric-vehicle index', Financial Times, August 9 2010.

<sup>18</sup> The White House (August 2010), 'The Recovery Act: Transforming the American Economy Through Innovation', Washington, DC.

<sup>19</sup> The White House (July 2010), 'Electric Vehicles, Advanced Batteries, and American Jobs: Another Piece of the Puzzle in Holland, Michigan', Washington, DC. Available at <http://www.whitehouse.gov/blog/2010/07/15/electric-vehicles-advanced-batteries-and-american-jobs-another-piece-puzzle-holland>

<sup>20</sup> [http://www.chinadaily.com.cn/bizchina/2010-03/02/content\\_9526276.htm](http://www.chinadaily.com.cn/bizchina/2010-03/02/content_9526276.htm)

<sup>21</sup> <http://www.businessgreen.com/business-green/news/2258926/daimler-byd-team-electric-car>

<sup>22</sup> <http://www.businessgreen.com/business-green/news/2271666/china-produce-million-electric>

<sup>23</sup> James Glave and Rachel Swaby, 'Superfast Bullet Trains Are Finally Coming to the US', Wired, January 25, 2010.

<sup>24</sup> The White House, Office of the Press Secretary (November 17 2009), 'Fact Sheet: US-China Joint Electric Vehicles Initiative', Washington DC. Available at: [http://www.energy.gov/news2009/documents2009/US-China\\_Fact\\_Sheet\\_Electric\\_Vehicles.pdf](http://www.energy.gov/news2009/documents2009/US-China_Fact_Sheet_Electric_Vehicles.pdf)

greenhouse gas emissions, and improve efficiency across the energy spectrum.<sup>25</sup>

Europe's two largest economic competitors are moving on climate, as are other developed and emerging economies. In a recent analysis of low carbon competitiveness, only Mexico and Argentina were improving carbon productivity fast enough to meet ambitious reduction targets, followed by China, South Africa and Germany.<sup>26</sup> If Europe is serious about climate change and growing itself out of recession, the real question for policymakers is not whether the EU target is fair, but whether it represents the stimulus needed to grow the low carbon economy that will be needed to compete in a carbon constrained world. If intelligently designed our analysis suggests that the move to 30 percent would deliver strong economic and energy security benefits to Europe, and taken together this provides a very high value investment for Europe in its own security and prosperity. Conversely, failing to act would expose European consumers and citizens to extremely high economic risks which dwarf the direct costs of delivering the 30 percent target and render the current competitiveness debate futile. The Health and Environment Alliance (HEAL) and Health Care without Harm Europe (HCWH Europe) recently assessed the economic benefits from a 30 percent reduction target that focuses on the reduction of greenhouse gas and non-greenhouse gas pollutants in sectors such as energy and transport and concludes that up to €30.5 billion could be saved through targeted measures in these sectors.<sup>27</sup>

## 2.1 Delivering European energy investment through the recovery

European economic growth and stability can be delivered by stimulating much needed investment in low carbon energy infrastructure. Putting the EU on track to meet its agreed 2050 goal of 85 percent emissions reductions would generate an additional €45 billion per annum of investment in European jobs and technologies by 2020<sup>28</sup>. But this investment will not happen unless the EU emissions reductions target is increased from 20 percent to 30 percent, importantly, and the overwhelming majority of this is achieved inside the EU.

<sup>25</sup> <http://arpa-e.energy.gov/>

<sup>26</sup> The Climate Institute and E3G, Prepared by Vivid Economics (September 2009), 'G20 Low Carbon Competitiveness', London, UK.

<sup>27</sup> Health and Environment Alliance and Health Care Without Harm Europe (September 2010), 'Acting now for better health: A 30% reduction target for the EU', Brussels, Belgium.

<sup>28</sup> European Climate Foundation (April 2010), 'Roadmap 2050 – A Practical Guide to a Prosperous, Low Carbon Europe', The Hague.

The decade to 2020 will see enormous capital stock added to energy infrastructure worldwide, to meet growing demand and replace out-dated supply. Europe's utilities sector as a whole is set for at least €1 trillion of capital expenditure by 2020, even under business-as-usual without accommodating carbon constraints<sup>29</sup>. The IEA estimates that cumulative investment in energy-supply infrastructure in Europe will reach €2.5 trillion by 2030.<sup>30</sup> This investment cycle is an opportunity to drive the European recovery. However if the new stock uses current high carbon technologies, that same stock will need to be decommissioned long before the end of its normal life in order to maintain the 2°C pathway, creating stranded assets – as well as necessitating massive and rapid replacement investments. It will be far more cost effective for Europe to invest in low carbon now, and avoid costs and disruption to economic growth post-2020.

The recession has reduced European emissions growth substantially. The European Environment Agency's latest report 'Tracking progress to Kyoto and 2020 targets' shows that emissions have fallen 17.3 percent from 1990 levels<sup>31</sup>. Depending on estimates of future GDP growth, meeting the 20 percent target now only requires 35-50 percent of the effort (in terms of tonnes of GHG reductions) originally estimated in 2008<sup>32</sup>. Recent analysis shows that around 70 percent of the current emissions reduction effort will be achieved through the target for renewable energy alone, with much of the rest delivered through short-term switching from coal to gas in the power sector. This leaves little pressure for action in other sectors<sup>33</sup>. The European Commission estimates that the cost of emissions reductions outside the ETS will crash to 4-5 € per tonne<sup>34</sup>. IEA estimates go even further, suggesting that the 20 percent target could potentially be met without any further domestic abatement taking place in the remaining ten years to 2020.<sup>35</sup>

The ETS was intended to play the central role in driving down EU emissions and driving forward investment in low carbon technology and energy efficiency. However, its impact has been weakened by a combination of falling allowance prices (now in the range of 12-15 €/t CO<sub>2</sub> compared to about 20-25 €/t CO<sub>2</sub> pre-crisis), generous over-allocation of free ETS allowances for industry and offset provisions enabling companies

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<sup>29</sup> Citigroup Global Markets (October 2009), 'Pan European Utilities'.

<sup>30</sup> IEA (2009), 'World Energy Outlook', OECD, Paris.

<sup>31</sup> European Environment Agency Tracking progress towards Kyoto and 2020 targets' 2010.

<sup>32</sup> E3G calculations based on: 52% - CE Delft (March 2010), 'Why the EU could and should adopt higher greenhouse gas reduction targets', Delft. 35% - European Commission, Staff Working Paper in support of Communication (May 2010), 'Unlocking Europe's potential in clean innovation and growth: Analysis of options to move beyond 20%', Brussels.

<sup>33</sup> Van Engelen, Wiskerke and Wit, 'Consequences of RES for ETS: Implications for cap-setting and carbon leakage', Natuur en Milieu, 2010

<sup>34</sup> European Commission Working Paper May 2010, op. cit.

<sup>35</sup> IEA (2009), 'World Energy Outlook 2009', OECD, Paris.

to buy reductions overseas rather than taking action at home.<sup>36</sup> Under the 20 percent target, carbon prices are now estimated by the European Commission to remain low – at only around €16 per tonne by 2020<sup>37</sup> and increase slightly to €18.70 per tonne by 2030<sup>38</sup>. There will also be a structural overhang of bankable emissions permits by 2020 which could total 5 years of total EU GHG emissions<sup>39</sup>. If nothing in this situation changes, then European low carbon markets outside the renewables sector will be largely destroyed for over a decade.

Low carbon prices raise significant risks of medium-term energy security problems as companies delay new supply side investment until the strength of the climate regime beyond 2020 (and the ability to use banked permits) becomes clearer. This will help to drive new investments which may currently be stalling in sectors other than renewables due to hedging and “asset sweating” strategies. Most of EU power investment is now indirectly supported by the renewable energy sector which does not depend on the carbon price. European Commission modelling of the 20 percent target also suggests that a significant number of new coal power stations will be built to deliver energy supply, but that carbon prices will be too low to incentivise the use of carbon capture and storage. Such lock-in to high carbon infrastructure will increase the future cost of reaching the EU’s 2050 carbon targets and could eventually put the 2°C trajectory out of reach.

On the other hand, the Commission proposals also show that the recession has made moving to a 30 percent target significantly cheaper than was envisaged in 2008.<sup>40</sup> Direct costs are estimated at €33 billion–€46 billion per annum in 2020, with the lower costs relying on purchasing 50 percent of required reductions outside the EU. Separate analysis suggests that achieving a 30 percent target by 2020 is now in fact less costly than the 2008 predictions for the 20 percent target.<sup>41</sup>

The conclusion is clear: basing EU climate policy on a 20 percent emissions reduction target is an implicit acceptance of business-as-usual, rather than a serious move towards a low carbon future. That choice would have severe economic costs in terms of

<sup>36</sup> European Commission, Communication (May 2010), ‘Unlocking Europe’s potential in clean innovation and growth: Analysis of options to move beyond 20%’, Brussels.

<sup>37</sup> Ibid

<sup>38</sup> European Commission (2010), ‘EU Energy trends to 2030: Updated 2009’, Luxembourg.

<sup>39</sup> IEA (2009), ‘World Energy Outlook 2009’, OECD, Paris.

<sup>40</sup> European Commission (April 2010), ‘Speech 10/182: Connie Hedegaard, Exchange of views of Commissioner Connie Hedegaard with European Parliament’s Committee on the Environment, Public Health and Food Safety.’, Brussels. Available:

<http://europa.eu/rapid/pressReleasesAction.do?reference=SPEECH/10/182&format=HTML&aged=0&language=EN&guiLanguage=en>

<sup>41</sup> New Carbon Finance (20 March 2010) ‘Recessions lowers cost of EU Emissions Trading Scheme by half’.

reduced activity in European low carbon markets, and in terms of further deepening the problem of high carbon lock-in and stranded assets.

## 2.2 Managing energy security risks to the European economy

Despite the apparent costs of moving to 30 percent, postponing action until after economic recovery is not a cheap option. The cost estimates by the European Commission of moving to 30 percent are highly sensitive to the future price of oil used in their analysis. The Commission has set a conservative oil price forecast of \$88 bbl in 2020, but it is highly likely that oil prices will rise faster than this given the collapse in supply side investment, impact of the Gulf of Mexico spill on deep sea exploration and the rise in Asian consumption.

Reduced/delayed supply side investment due to the recession has significantly increased the risk of a shortfall in global oil markets: the IEA estimates that worldwide upstream oil and gas investment budgets for 2009 were cut 19 percent compared with 2008 – a reduction of over €67 billion.<sup>42</sup> If oil prices rise to 2008 levels as global growth revives in 2011, then the oil import bill of the US, Europe and Japan alone will rise by over \$800 billion a year. This is equal to nearly a half on their total planned stimulus (tax cuts and public spending) from 2008-2010<sup>43</sup>. Wider economic recovery could also be choked off by rising energy prices, potentially leading to the worst-case scenario of a double-dip recession.

EU energy networks based on large-scale centralised production and a cheap and plentiful supply of coal and natural gas are especially vulnerable. With indigenous gas production continuing to decline, EU gas imports are expected to increase from 61 percent in 2008 to 73 percent by 2020.<sup>44</sup> As Figure 3 shows, on a business-as-usual pathway the EU is increasingly more vulnerable than many of its major competitors in terms of the absolute value of fossil fuel imports.

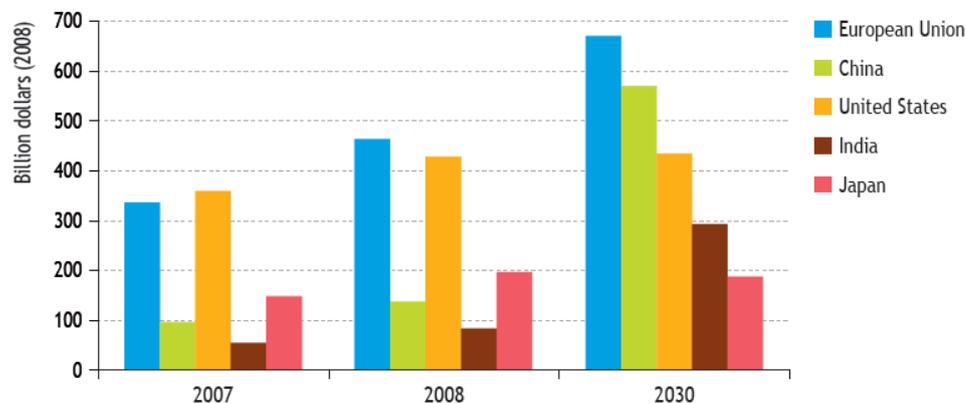
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<sup>42</sup> IEA (2009), 'World Energy Outlook 2009', OECD, Paris

<sup>43</sup> All estimates of fiscal stimulus expenditure used are taken from: IMF (2009a), 'Note to Group of Twenty Deputies meeting January 31- February 1 2009', HSBC January 2009; HSBC (February 2009), 'A Climate for Recovery', London.

<sup>44</sup> IEA (2008), 'IEA Energy Policies Review: The European Union 2008', OECD, Paris.

**Figure 3: Comparative energy imports 2007, 2008 and 2030<sup>45</sup>**



Note: Calculated as the value of net imports at prevailing average international prices. The split between crude/refined products and LNG/piped gas is not taken into account.

The IEA now forecasts that the price of oil will rise to \$100 bbl by 2020 and \$115 by 2030. Many experts expect oil prices to rise even faster, and global oil supplies to peak sooner.<sup>46</sup> Deutsche Bank for example forecasts that oil prices could hit \$175 by as early as 2016.<sup>47</sup> The UK Energy Research Centre meta-study of 500 estimates of peak oil production showed that the research consensus is that maximum global oil production is highly likely to occur before 2030 and that there is a significant risk of peak oil production occurring before 2020.<sup>48</sup> As Figure 4 shows, these future oil price rises would be greatly moderated if the world moved aggressively on to a 2°C (450ppm) consistent emissions reduction pathway. In this way, successful European action to accelerate global climate action will also generate direct economic benefits in terms of lower fossil fuel prices.

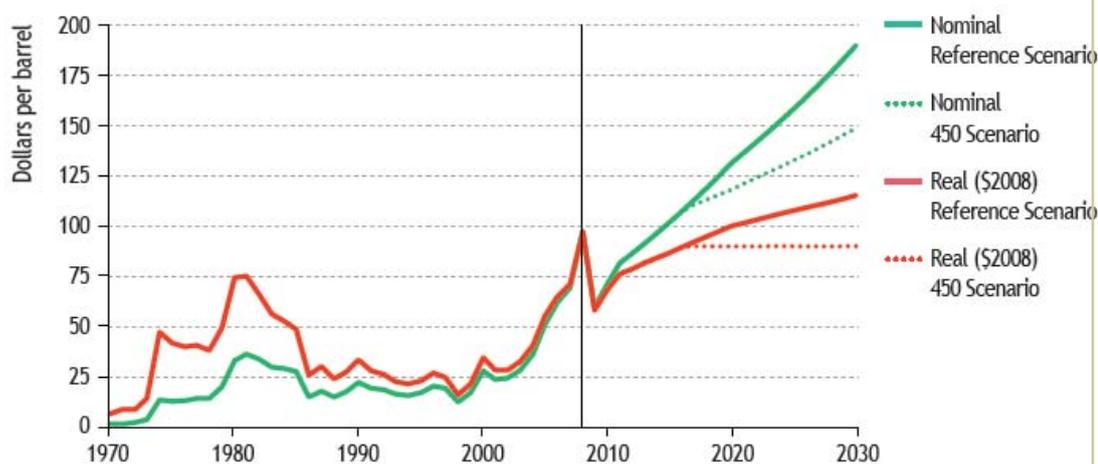
<sup>45</sup> IEA (2009), 'World Energy Outlook 2009, OECD, Paris.

<sup>46</sup> The Economist (10 December 2009), 'The IEA puts a date on peak oil production'.

<sup>47</sup> Deutsche Bank (October 2009), 'The Peak Oil Market: Price dynamics at the end of the oil age', United States.

<sup>48</sup> UK Energy Research Centre 2009, op. cit.

**Figure 4: Average IEA crude oil import price predictions to 2030.**



Source: International Energy Agency

Recalculating the cost of moving to 30 percent using a broader range of oil price scenarios of \$88 bbl, \$115 bbl and \$150 bbl oil by 2020 suggests that under many scenarios energy savings will outweigh the direct costs of moving to 30 percent. Energy import costs alone would decline by €40 billion-€68 billion a year by 2020 if the EU moves to 30 percent<sup>49</sup>.

New research by McKinsey and the European Climate Foundation shows affordability in a longer term perspective, suggesting that the EU can cut its emissions 80 percent below 1990 levels by mid-century in a way that leads to falling energy costs before 2020<sup>50</sup>. When a move to a low carbon energy system comparable to a 30 percent EU target (mainly achieved domestically) is input into this dataset, an *additional* €40 billion-€96 billion a year savings to consumers in total oil and gas costs by 2020 is shown under the broader range of oil price scenarios<sup>51</sup>. This is more than the estimated annual cost of moving to 30 percent. However, these benefits only occur if emissions

<sup>49</sup> E3G calculations based on European Commission Working Paper op. cit.: Cost range calculated for 2020 at oil prices of \$88 and \$150 bbl.

<sup>50</sup> European Climate Foundation (April 2010), 'Roadmap 2050 – A Practical Guide to a Prosperous, Low Carbon Europe', The Hague.

<sup>51</sup> E3G calculations based on European Climate Foundation (April 2010) *ibid*: Savings quoted are for incremental increase in the cost of EU expenditure on total oil and gas consumption at a 2020 oil price of \$115 bbl and \$150 bbl respectively compared to a baseline level of \$88 bbl.

reductions are achieved inside the EU and with a strong emphasis on increased energy efficiency investment.

### 2.3 Maintaining European competitiveness in the global low carbon race

The EU 2020 Strategy for smart, sustainable and inclusive growth,<sup>52</sup> endorsed by European leaders in March 2010, aims to support the shift towards a resource efficient low carbon economy which is a world leader in technology innovation. This is feasible, affordable and clearly in Europe's self-interest.

In 2007-8 the global market in low carbon goods and services was worth over £3 trillion (€3.4 trillion).<sup>53</sup> At \$530 billion (€467 billion), climate revenues from the equity market have now outstripped the aerospace and defence sector, and could exceed \$2 trillion (€1.76 trillion) by 2020.<sup>54</sup> These markets are created by political agreement, constructed through policy, and driven by technology. So far, the EU's political leadership on climate action has positioned its businesses at the forefront of low carbon technology growth, but our competitors are catching up fast<sup>55</sup>.

Before the economic crisis, meeting the 20 percent target required over 1000 million tonnes of emissions reductions per annum by 2020; current estimates are between 360-540 million tonnes in 2020. Moving to a 30 percent target would increase the amount of emissions reductions, thus the size of European low carbon markets by 100-250 percent compared to the current target<sup>56</sup>. The range of figures depends on estimates of baseline emissions growth and crucially on the proportion of emissions reductions achieved inside the EU: obviously the more reductions carried out outside the EU; the smaller the markets are for European businesses. Under the European Commission's scenario 50 percent of the move to 30 percent is delivered through purchasing external credits, which reduces the size of EU low carbon markets by 50 percent for a saving of just €13 billion per annum in direct costs and a permanent reduction in energy security benefits. Because much of the additional effort to move to 30 percent inside the EU would come from outside the power sector, in labour

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<sup>52</sup> European Commission COM (March 2010): 2020 'Europe 2020: A European strategy for smart, sustainable and inclusive growth', Brussels.

<sup>53</sup> UK Government, Department for Business Enterprise and Regulatory Reform (2009) 'Low Carbon and Environmental Goods and Services: an industry analysis', London, UK.

<sup>54</sup> Joaquim de Lima (September 2009) 'Climate Change – September annual index review', HSBC, UK London.

<sup>55</sup> See Vivid Economics, G20 Low Carbon Competitiveness Report, op cit.

<sup>56</sup> E3G calculation based on European Commission Working Paper 2010 and CE Delft 2010 op. cit.

intensive fields such as energy efficiency, achieving the target from effort outside the EU would also reduce employment gains<sup>57</sup>.

European companies need domestic growth if they are to retain their lead in low carbon markets. Until now, European companies have developed a strong global market share of 30-50 percent across many clean technology sectors<sup>58</sup>, but they face increasing competition. EU companies now only represent 25 percent of the top twenty innovators (as measured by patent holdings) across the major clean energy technologies: solar PV, wind, biomass, clean coal, carbon capture and storage, and concentrated solar power<sup>59</sup>.

China and the US led the world in new clean energy technology and infrastructure investment in 2009, at \$35 billion (€26 billion) and \$18 billion (€14 billion) respectively.<sup>60</sup> Roughly \$94 billion (12 percent) of the \$787 billion US stimulus package was directed towards low carbon investments. In contrast, the EU Member States collectively had the lowest proportion of green investments in their stimulus packages of the major economies<sup>61</sup>. Meanwhile, together the US and China accounted for the top five clean-tech Initial Public Offerings (IPOs) in 2009.<sup>62</sup> While renewable energy investment in Europe grew just 2 percent in 2007-8, China achieved 18 percent over the same period.<sup>63</sup> And according to US Secretary of Energy Stephen Chu, China is spending \$9 billion per *month* on clean energy investment.<sup>64</sup>

In a recent analysis, the Carbon Trust emphasises that EU competitiveness is at risk: “As overall investment levels race ahead in North America, we are seeing that European businesses are poorly capitalised in comparison. Consequently, European companies are likely to be less competitive in the global clean energy marketplace.”<sup>65</sup> The table below shows that Europe needs to redouble its efforts to avoid being left behind in this low carbon race.

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<sup>57</sup> European Commission Working Paper op. cit.

<sup>58</sup> European Commission, Europe 2020, March 2010 op. cit.

<sup>59</sup> E3G analysis based on Bernice Lee, Ilian Iliev, and Felix Preston (2009), ‘Who Owns Our Low Carbon Future? Intellectual Property and Energy Technologies’, Chatham House, London, UK.

<sup>60</sup> Pew Charitable Trusts (2010), ‘Who’s winning the clean energy race?’ Pew Center on Global Climate Change, Arlington, Virginia.

<sup>61</sup> E3G (March 2009), ‘Delivering a Sustainable Low Carbon Recovery: Proposals for the G20 London Summit’, London, UK.

<sup>62</sup> The Cleantech Group 2009 and Deloitte. (2009), ‘Clean Technology Venture Investment Totaled \$5.6 Billion in 2009 Despite Non-Binding Climate Change Accord in Copenhagen’, United States. Available at: [www.deloitte.com/view/en\\_US/us/Services/additional-services/corporate-responsibility-sustainability/cleantech/press-release/Oddfda3555906210VgnVCM200000bb42f00aRCRD.htm](http://www.deloitte.com/view/en_US/us/Services/additional-services/corporate-responsibility-sustainability/cleantech/press-release/Oddfda3555906210VgnVCM200000bb42f00aRCRD.htm)

<sup>63</sup> UNEP (2009), ‘Sustainable Energy Finance’

<sup>64</sup> Harriet McLeod, ‘U.S. falling behind in clean-energy race: Chu’, Reuters, November 30 2009.

<sup>65</sup> Carbon Trust (2009), ‘Investment trends in North America and European clean energy 2003-2008’, London, UK.

**Table 1: EU, US and China comparison of low carbon investment**

	<b>Stimulus funding: HSBC data<sup>66</sup></b>	<b>Smart-grid investment: KEMA data<sup>67</sup></b>
EU	\$23 billion (€17 billion)	\$1.8 billion <sup>68</sup> (€1.4 billion)
US	\$112 billion (€84 billion)	\$7.1billion (€5.3 billion)
China	\$220 billion (€166 billion)	\$7.4billion (€5.6 billion)

Just as the revolution in information and communications technology fundamentally altered the global economy in the 1990s, the new decade offers new sources of low carbon jobs and growth. As a group of 27 closely integrated economies, the EU's most powerful asset is the size of its single market and its ability to create a smart regulatory framework within which companies compete for market share. This is the logic behind the Single European Market reforms in the '80s and '90s, and more recent initiatives like the ETS. Crucially, the influence of the single market has often enabled EU standards to become global standards, as seen in Chinese adoption of EU chemical safety and car emissions standards.<sup>69</sup> However, this influence cannot be taken for granted, and depends on Europe being a first-mover. Already the EU is paying the price of inaction in key areas: in November 2009, the US and China joined forces to shape the soon-to-be lucrative electric car market by establishing a bilateral Electric Vehicles Initiative with cooperation to standardise plugs, testing conditions, batteries and other essential components.<sup>70</sup>

To retain its current lead in the low carbon race the EU will need to increase domestic demand for low carbon goods and services by increasing its target to 30 percent. This means limiting the proportion of the target that that can be met outside the EU, implementing complementary measures in innovation policy and infrastructure (e.g. smart grids and interconnectors) and engaging in international cooperation on RD&D and standards setting. This should be supported by a green skills strategy that includes professional development, upskilling and technical retraining programmes as well as a removal of the barriers that restrict mobility to reflect the new structure of the European labour market.

<sup>66</sup> Nick Robins (February 2009), 'A Climate for Recovery', HSBC, London, UK.

<sup>67</sup> KEMA, 'Smart Grid Development Is Not Limited to the US', Arnhem, The Netherlands. Available at: <http://www.kema.com/services/consulting/utility-future/smart-grid/smart-grid-not-limited-to-US.aspx>

<sup>68</sup> Cumulative total for Spain, Germany, the UK and France.

<sup>69</sup> Oliver et al., (2009) 'China's Fuel Economy Standards for Passenger Vehicles', Harvard Kennedy School.

<sup>70</sup> White House (November 2009), 'FACT SHEET: U.S.-China Electric Vehicles Initiative', Washington DC. Available at: <http://www.whitehouse.gov/files/documents/2009/november/US-China-Fact-Sheet-on-Electric-Vehicles.pdf>

### 3. Addressing the arguments against moving to 30 percent

Opponents of shifting to a 30 percent target base their arguments around the straightforward question of: “why act now?” They argue that Europe is too preoccupied with vital economic issues to tackle longer term climate change risks, and the lower cost of the 20 percent target should be taken as a welcome economic benefit during the recession. They propose postponing debate on targets into an indefinite future. We consider this analysis to be both empirically wrong and strategically dangerous for European security and prosperity.

Investment in European energy efficiency and infrastructure is profitable *now* and will be more valuable as oil prices rise. This investment is not occurring because of market failures and political barriers. For example, efficiency improvements mainly in the buildings sector could deliver 363 million tonnes of additional emissions reductions – or 40-80 percent of the shift to 30 percent – at negative cost<sup>71</sup>. Surrendering Europe’s lead on low carbon technology (just as the rest of the world has begun to follow its lead) would remove one of the few clear growth advantages Europe has in the global economy.

The next argument is that European industries risk relocating overseas because of stricter climate targets. Independent economic analysis has repeatedly shown this risk is highly over-exaggerated<sup>72</sup>. The EU used a carbon price of €30 for its carbon leakage assessment which was almost double the current price which ranges between €13-15. Even with this inflated price, the impact is likely not to be as pronounced as claimed. In most European countries, energy intensive industries account for less than 1 percent of GDP (see Figure 4 below), and have already been given generous quantities of free allowances to shield them from carbon prices. ETS provisions allow sectors deemed to be at risk of carbon leakage to receive up to 100 percent of their allowances for free rather than having to purchase them through auctions. Evidence to date suggests that energy intensive industries have actually benefited under the ETS from the over-allocation of allowances - ten large European companies alone share 35 million “wind-fall” allowances worth an estimated €500 million at current prices.<sup>73</sup> Recent cases of cartel and anti-trust behaviour in the cement, steel, petroleum products and glass sectors indicate a lack of competitive exposure from European and non-European

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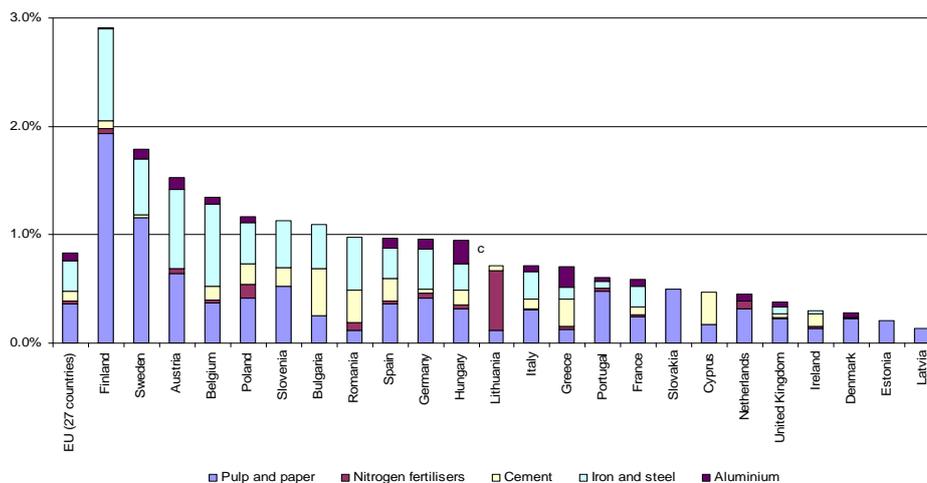
<sup>71</sup> CE Delft op. cit.

<sup>72</sup> For example see: Grubb & Brewer (2009), ‘Climate Policy and Industrial Competitiveness’, The German Marshall Fund; and The Climate Group (September 2009), ‘The Effects of EU climate legislation on Business Competitiveness: A survey and analysis’, London, UK.

<sup>73</sup> Sandbag (February 2010), ‘The Carbon Rich List: The companies profiting from the EU Emissions Trading Scheme’, London

producers<sup>74</sup>. The recession means they have even greater surplus allowances than anticipated, increasing their unearned profits at the expense of higher prices to electricity consumers.

**Figure 4: EU-27 GDP Shares of energy intensive industries.**



Source: Eurostat Structural Business Survey results for 2005 and National Accounts database

Giving away ETS allowances for free not only eases the pressure for industries to reduce emissions but also means less revenue for governments. In its impact assessment for the 2008 20:20:20 Package the European Commission predicted that a carbon price of €39 per tonne and 50 percent auctioning would generate new revenue of around €38 billion by 2020. Now the Commission’s draft review notes that current prices indicate Member States will face substantial losses of up to half of expected revenues, directly undermining their capacity to increase investment in low carbon research and development.

However, the carbon leakage debate is really an economic distraction. The true risk to jobs in European heavy industries is not high carbon prices, but the current collapse of European demand in the construction and infrastructure markets. Ironically, the one sure way to increase growth and jobs in these markets is to incentivise investment in

<sup>74</sup> European Commission, DG Competition. Cartel and anti-trust cases are listed at [http://ec.europa.eu/competition/cartels/what\\_is\\_new/news.html](http://ec.europa.eu/competition/cartels/what_is_new/news.html)

large-scale low carbon infrastructure which is a voracious consumer of steel, cement, aluminium and chemicals<sup>75</sup>.

The final core argument against moving to 30 percent is that Europe may act but other economies will not follow. This defeatist view ignores the reality that all major economies are currently investing heavily in low carbon markets. It also ignores that, if this changes, and China, India and the US decide to reject the risks of climate change and switch to investing in high carbon infrastructure, global fossil fuel energy use would soar, and with it oil prices. In this dystopic future Europe would be highly vulnerable. As discussed above, many experts already expect oil prices to rise very fast under business-as-usual scenarios and these pressures will be exacerbated if countries move away from current clean energy investment commitments.

Failing to move now to an efficient clean energy system would expose European businesses, consumers and taxpayers to extreme economic costs in the future from repeated oil and gas price shocks. A single three year oil shock around 2020 which doubled real oil, gas and coal prices above IEA projections could cost Europe an additional €300 billion if it stays on a high carbon trajectory. This is approximately the whole cost of the 30 percent target over the decade to 2020<sup>76</sup>.

The simple conclusion is that there is no low cost, high carbon future for Europe. The current 20 percent target amounts to a cartoon-like policy of standing in the middle of the road in the face of an oncoming truck marked “peak oil”, with another truck behind it labelled “technology competitors”. Yet the lesson of today’s economic crisis is that we must reduce our exposure to systemic risks of this kind rather than ignore them.

Under any plausible scenario it makes sense for Europe to move more rapidly towards an efficient and clean energy economy. But policies must be explicitly designed to maximise the economic competitiveness, energy security and climate change opportunities to the EU. The debate in Europe now needs to move away from the sterile ground of whether we should or shouldn’t do more, to a discussion of how to deliver the best value to European consumers, taxpayers, workers and citizens from the move to a low carbon economy.

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<sup>75</sup> IDDRI (May 2009), ‘Scenarios for transition towards a low carbon world in 2050: What’s at stake for heavy industries?’, *Enterprises pour l’Environnement & International Institute for Sustainable Development and International Relations*, IDDRI, Paris.

<sup>76</sup> Oxford Economics modelling for European Climate Foundation, *Road Map 2050*, The Hague, March 2010.

## 4. Designing and Financing a 30 percent Reduction Package

Although the economic case for 30 percent is strengthened by the recession, the economic crisis *does* change how we should meet these targets. There is no point raising the EU target to 30 percent if it is met merely through purchasing cheap emissions reduction credits from abroad. In the European Commission's scenario, 25 percent of abatement is achieved inside the EU and 50 percent through the Clean Development Mechanism. This means that European consumers will pay €8 billion per annum by 2020 to the main carbon credit producers in China and India, while gaining no economic growth, energy security or competitiveness benefits. In contrast, we believe the most economically sensible shift to 30 percent would prioritise investment in domestic European energy efficiency, and in the infrastructure and innovation needed to sustain reductions beyond 2020 and maintain European companies' lead in the low carbon race.

The economic crisis also means we will require different instruments to drive investment. Given the tight financial constraints on raising debt currently being experienced by European companies, merely raising carbon prices will not efficiently and effectively drive new investment. These constraints will last well beyond the immediate recession, as banks and rating agencies are taking a permanently more risk-averse attitude to company debt and the sort of "off balance sheet" project structures often used to fund large projects such as offshore wind<sup>77</sup>. Low carbon investments are also unattractive at a time of capital shortage as they have a shorter track record than conventional investments and often operate on unconventional, therefore risky business models too. Shifting from the status quo will require firstly correcting the emissions reduction trajectory so that it reaches zero before 2050 for key ETS sectors such as power, cement, steel and refineries. Additional policy instruments which give stronger investment incentives (e.g. technology neutral regulation), and new financial mechanisms to reduce risk (e.g. guarantees, mezzanine finance) and leverage additional investment from large institutional lenders into low carbon markets and technologies should also be deployed to ensure that the decarbonisation trajectory is not missed.<sup>78</sup>

Some actors are already responding to this challenge: the European Investment Bank has issued Green Bonds on Japanese markets to raise funds for European low carbon

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<sup>77</sup> Moody's Investor Services (March 2010), 'European Electric Utilities and the Quest for Debt Capacity: Complex Off-Balance Sheet Schemes Unlikely to Be the Answer', London, UK. Available at: <http://www.ijonline.com/Downloads/Marketing/b26da80d-85b2-4cce-bbc9-c96af36fd058.pdf>

<sup>78</sup> E3G and Climate Change Capital (March 2009), 'Accelerating Green Infrastructure Financing: Outline proposals for UK green bonds and infrastructure bank', London, UK.

investment<sup>79</sup>, the German national bank KfW is financing home energy efficiency retrofits, the UK is creating a new Green Investment Bank and will implement a wide range of power sector market reform (including a floor price for carbon and an Emissions Performance Standard on coal power stations) to drive low carbon investment<sup>80</sup>. These types of approaches will need to be rapidly expanded across other EU Member States in order to deliver a 30 percent target.

Moving to 30 percent also needs a comprehensive, coherent policy framework focused on domestic European action which drives key sectoral transitions, establishes a road to market for under-used existing technologies, massively increases investment in RD&D, and builds workforce skills. In this way, 30 percent can serve as a new European stimulus package.

Although the existing 20:20:20 Package and other current policies have had some success, they fall short of what is needed to efficiently deliver a decarbonised EU. Companies in all sectors are asking for stronger signals from government, saying that they lack the policy certainty they need to scale up investments<sup>81</sup>. On 13 October 2010, a coalition of leading European businesses signalled their direct support for a move to 30 percent<sup>82</sup>. Civil society organisations agree that the single most important factor which will deliver a prosperous low carbon transformation in a timely and manageable fashion is a strengthened, unambiguous EU target for 2020, together with a roadmap to 2050<sup>83</sup>.

How an EU 30 percent package is formulated is at least as important as the ambition itself. The package must deliver high value across all EU policy goals and under a range of future energy price and economic scenarios. Policies must deliver clean infrastructure, improve energy security and enable the internal market to drive innovation and investment. The package must move away from the type of approach outlined in the lead up to Copenhagen, where the EU signalled that the majority of a 30 percent target could be covered by creative accounting for forestry and land use sectors

<sup>79</sup> Alex Veys (May 2010), 'The Sterling Bond Markets and Low Carbon or Green Bonds', report for E3G, London

<sup>80</sup> See UK Government Coalition Agreement <http://programmeforgovernment.hmg.gov.uk/>. The structure and possible tasks of the GIB is discussed in E3G (March 2010), Accelerating the Low Carbon Transition: the case for a Green Infrastructure Bank, London, UK.

<sup>81</sup> The EU Corporate Leaders Group on Climate Change, (May 2010), 'Business welcomes consideration of more ambitious EU target on climate change', Brussels.

<sup>82</sup> Joint Business Declaration by The Climate Group, The Corporate Leaders Group and WWF Climate Savers (June 2010), 'Increasing Europe's climate ambition will be good for the EU economy and jobs, say businesses'. The following companies signed the declaration **Acciona, Alstom, Asda, Atkins, Barilla, BNP Paribas, BSKyB, Capgemini, Centrica, Climate Change Capital, Crédit Agricole, DHV Group, Elopak, Eneco, F&C Asset Management, GE Energy, Johnson Controls Inc, Kingfisher, Google, Marks and Spencer, Nike, Philips Lighting, SKAI Group of Companies, Sony Europe, Standard Life, Swiss Re, Tryg, Thames Water and Vodafone.**

<sup>83</sup> Climate Action Network Europe (December 2009), 'NGO Briefing – Europe to 30 Percent'. Available at: <http://www.climnet.org/>

and the remainder covered by the international offsets<sup>84</sup> – an approach which would bring little domestic value to European citizens.

A balanced and high value portfolio of policies to deliver 30 percent reductions should be based on action in three key areas to deliver the real domestic emissions reductions:

- > Energy efficiency policies to realise cost effective reductions and create jobs.
- > Introducing binding sectoral agreements to transform the ETS and incentivize low carbon finance.
- > Driving innovation and low carbon infrastructure by prioritising delivery of a European super-smart grid and targeting support for electric vehicles.

#### 4.1 Energy Efficiency

Demand and supply side energy efficiency represents the largest and most cost-effective source of domestic emissions reductions and economic stimulus. These also bring significant additional benefits to society such as lower running costs, better living standards and better preservation of scarce resources. By the European Commission's own estimates, the EU wastes 20 percent of its energy due to inefficiency and this could cost more than €100 billion by 2020.<sup>85</sup> Improvements in this area will result in direct benefits to EU taxpayers through lower energy prices. According to analysis by Coveys, energy efficiency improvements in buildings alone could account for 19 percent of reductions (below 2005 levels) to 2020. Capturing the enormous macroeconomic potential of efficiency gains will keep the EU ahead of its competitors and create up to 1 million jobs in the process<sup>86</sup>.

#### 4.2 Reforming the ETS

The purpose of the ETS is to efficiently incentivise investment in low carbon technologies, but lack of demand and the low carbon price mean that the right incentives are not in place to deliver the necessary levels of finance. The ETS must be strengthened by moving away from a simple cap-and-trade approach to a combination of cap-and-trade *plus* targeted investments. Binding sectoral agreements should be introduced to drive specific low carbon solutions and provide coordinated financial

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<sup>84</sup> EU (2009) Informal submission by Sweden on behalf of the European Community and its Member States regarding the EU's proposed reduction commitments 2009. Document available on request.

<sup>85</sup> COM(2006)545 final, 'Action Plan for Energy Efficiency: Realising the Potential', Brussels.

<sup>86</sup> COM(2005) 265 final, 'Green Paper on Energy Efficiency: Doing More With Less', Brussels.

support within the ETS sectors. This helps to identify specific opportunities for investments which save energy, reduce carbon and the risk of high oil prices to businesses. This will make European industry more cost effective, efficient, reduces risk to high oil-prices and therefore increases their competitive outlook. Correcting the broken link between ETS auction revenues and earmarked investment in low carbon markets, technologies and solutions is vital for this and other initiatives. Additional emissions reductions could be found by bringing forward the inclusion of shipping emissions in the ETS to 2011.

Introducing quality criteria to the CDM can help Europe get value for money for its investments, ensuring rapid deployment of specific low carbon technologies into developing countries' energy and industrial systems. Similarly, sectoral approaches linked to CDM should be prioritised to drive truly transformational change in key countries and identify the optimal long-term cost reductions within specific sectors that must decarbonise at a quicker trajectory than others, as opposed to the current practice of simply finding the lowest cost emissions reductions which have also been blighted by concerns over their actual environmental impacts<sup>87</sup>. This is of paramount importance in the cement sector: explosive growth from urbanisation in Asia (outside China), Latin America and Africa will see cement use in developing countries rise by over 150 percent by 2030<sup>88</sup>.

#### 4.3 Innovation and Grid Infrastructure

Accelerating the process by which the most promising future low carbon solutions move along the innovation chain from R&D to mass market deployment is crucial. Historic diffusion rates for clean technologies globally will need to be doubled by 2025 to have a realistic chance of meeting climate goals.<sup>89</sup>

To build a super-grid capable of efficiently and reliably delivering the cheapest and most diverse sources of low carbon power to consumers, the EU will need a coordinated strategy at supranational level. The current pan-European grid is outdated and sub-optimal: transnational interconnections have been blocked by political, planning and financial barriers. Adding additional strategic interconnectors and active grid technology will produce direct cost savings through reduced need to build and operate

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<sup>87</sup> See CDM Watch & Environmental Investigation Agency (July 2010), 'HFC policy briefing in the context of the EU Emissions Trading Scheme', London, UK; Financial Times, 'Industry caught in carbon smokescreen', 26 April 2007; Financial Times 'Beware the carbon offsetting cowboys' 26 April 2007; Financial Times, 'Producers and traders reap huge windfalls', 27 April, 2007.

<sup>88</sup> IEA and WBCSD (2009), 'Cement Technology Roadmap', Paris.

<sup>89</sup> Chatham House (September 2009), 'Who Owns Our Low Carbon Future? Intellectual Property and Energy Technologies', London, UK.

reserve capacity<sup>90</sup>. The European Commission and Member States urgently need to commit funding for smart-grid pilot projects under the Strategic Energy Technology Plan.

To tackle transport emissions (the largest emitting sector under the Effort Sharing Directive) and secure a competitive stake in new world markets, the EU should increase the pace of transition away from fossil-fuel powered vehicles. The cost of electric cars can be brought down through innovative measures such as annually decreasing EU-wide cap on oil consumption which expires in 2050 and, for example, a technology neutral energy-efficiency standard for all new cars in place of the current kilometres-per-gallon matrix, which is technology specific to the internal combustion engine. A time-limited reverse super credit whereby each fossil fuel car built requires 3.5 electric vehicles to be produced would help bring down the production costs of electric vehicles and thus make them more cost competitive with the internal combustion engine<sup>91</sup>.

**Table 2: Overview of proposed interventions for achieving 30 percent**

Sector	Emissions reduction potential 2020	Sources
Energy efficiency savings in buildings (Combination of heat demand and energy conversion measures)	363 mtCO2	ECOFYS (2009). "Sectoral emission reduction potentials and economic costs for climate change."
Energy efficiency in the power generation sector	442 mtCO2	ECOFYS (2009). "Sectoral emission reduction potentials and economic costs for climate change."
Industrial sector agreements with targeted investments in energy efficiency and low carbon technology development	379 mtCO2	ECOFYS (2009). "Sectoral emission reduction potentials and economic costs for climate change."
Reserve super credit so for each fossil fuel car 3.5 electric cars are to be produced.	16 mtCO2	ECOFYS (2009). "Sectoral emission reduction potentials and economic costs for climate change."

<sup>90</sup> Costs savings based on transmission modelling by KEMA as part of European Climate Foundation, 'Roadmap 2050 – A Practical Guide to a Prosperous, Low Carbon Europe', op. cit.

<sup>91</sup> The CO2 emissions from passenger cars regulation (EC/443/2009) allows manufacturers to build 3.5 fossil fuel cars for every electric car built. For further information see Article 5 of this regulation.

Inclusion of European and non-European maritime emissions in the EU ETS with a 21 percent reduction from baseline emissions in 2006 of 310 MtCO <sub>2</sub> .	65.1mtCO <sub>2</sub>	E3G calculation based on data from CE Delft (2010). “Technical support for European action to reducing Greenhouse Gas Emissions from International maritime transport”.
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Designing the optimal scale and mix of specific interventions is beyond the scope of this paper. However, Table 2 shows that the overall emissions reduction potential of these types of policies far exceeds the projected “gap” of 530-880 MtC reductions needed in 2020 to reach 30 percent target even *if all of this is achieved inside the EU*.

The focus of the policy debate in Europe must now switch away from abstract discussion of the projected point costs of achieving an arbitrary mix of domestic and international emissions reductions, to a more considered debate on how best to secure the multiple interests of European businesses, taxpayers, workers, consumers and citizens concerned about the catastrophic impacts of uncontrolled climate change. This analysis should not simplify the future, but fully reflect the uncertainties and risks which Europe faces, both from high and volatile fossil fuel costs and fast emerging competition in low carbon sectors. We cannot wish away these risks, but instead must design realistic economic, energy and climate policy to be resilient to them.

A legacy of wise decisions in the EU to date has increased efficiency and controlled emissions. This means Europe is better positioned than its major competitors to make the political decisions which are now needed. Failing to move intelligently and in a timely way towards a 30 percent target would squander this legacy, expose Europeans to high economic and climate risks and damage European competitiveness. There truly is no low cost, high carbon future for Europe. The economic crisis must be managed, but it will pass. The tyranny of immediate problems must not distract European leaders from making the right choices for the future security and prosperity of their citizens.