GLOBAL UTMANING

An International Climate Investment Community

— BREAKING THE DEADLOCK

By Allan Larsson and Måns Lönnroth
Co-authors: Karl Hallding, Niclas Ihrén, Peter Kleen,
Staffan Laestadius, Lars-Erik Liljelund, Anders Wijkman

OCTOBER 2010

An International Climate Investment Community

— BREAKING THE DEADLOCK

By Allan Larsson and Måns Lönnroth

Co-authors: Karl Hallding, Niclas Ihrén, Peter Kleen, Staffan Laestadius, Lars-Erik Liljelund, Anders Wijkman

Allan Larsson is Chair of the University of Lund, senior advisor at Global Utmaning, Stockholm and member of Conseil europeén d'orientation of Jacques Delors' Notre Europe. He has been the Swedish finance minister, a Member of Parliament, Director General for Employment and Social Affairs in the European Commission, member of President Barroso's High Level Group on Energy and Climate Change. He has also served as a member of Kofi Annan's Youth Employment Network, as advisor to the Director General of the ILO and as member of the Albright-De Soto Commission on legal empowerment of the poor.

Måns Lönnroth is a member of the board of the International Institute of Sustainable Development, Canada, a member of the board of the Volvo Research and Educational Foundations and senior advisor at Global Utmaning. He has been managing director of Mistra, the Swedish Foundation for Strategic Environment Research, international vice chair of the China Council for International Cooperation and Development and State Secretary in the Swedish Ministry of the Environment. His academic background is in applied mathematics and physics.

Karl Hallding heads the China programme of the Stockholm Environment Institute (SEI). Was formerly with the Swedish Embassy in Beijing 1998-99 with responsibility for environmental political relations. Principal author of UNDP's "China Human Development Report 2002 – Making Green Development a Choice". Co-author of "OECD Environmental Performance Review of China" (2007). His current work addresses the role of the BASIC alliance in global climate mitigation, and China's role in global climate and energy securities.

Niclas Ihrén, MSc, Lic. Eng., is a business leader and consultant in sustainable energy systems and radical innovation. He is senior climate change advisor to Global Utmaning, a senior advisor to the World Ecological Forum, and a senior advisor to World Climate Solutions. He is former CEO of Globe Forum, director of the Tällberg Foundation and CEO of Infinity Learning.

Peter Kleen is a trade policy consultant with experience of trade policy-related issues from over 30 years in public service. In 1992-2004 he was Director General of the National Board of Trade.

He has published articles and reports on multilateral trade, globalisation and trade-related climate issues. He is Senior Fellow of the European Centre for International Political Economy (ECIPE) in Brussels and a member of the Swedish Society for International Affairs.

Staffan Laestadius, PhD, is a professor of industrial dynamics and Vice Dean for Research at the School of Industrial Engineering and Management of the Royal Institute of Technology, Stockholm. He is a senior advisor at Global Utmaning with focus on the implications of climate change to industrial and technical re-orientation. He has held expert positions at the Swedish Government Offices and at the Institute for Futures Studies.

Lars-Erik Liljelund is Chief Executive of the Foundation for Strategic Research – Mistra – Stockholm, Sweden. He has been Director General of the Swedish Environment Protection Agency and the Swedish Prime Minister's special envoy on climate change. He is a member of the China Council – CCICED – and a board member of the International Committee for Mountain Development – ICIMOD. He has also been chair of the board of the European Environment Agency.

Anders Wijkman is a senior advisor to the Stockholm Environment Institute, vice chair of the Tällberg Foundation and vice president of the Club of Rome. He has been a Member of the European Parliament, assistant Secretary General of the United Nations and Secretary General of the Swedish Red Cross. He is also a member of the Swedish Royal Academy of Sciences.

Published by Global Utmaning
Stockholm, October 2010

Global Utmaning (Global Challenge) is an independent Swedish think tank. It is a network of people from business, politics and academia focusing on the challenges posed by a new economic, environmental and democratic world order.

Birger Jarlsgatan 27
111 45 Stockholm
Sweden
+46-8-787 21 50
www.globalutmaning.se

Layout: Global Reporting
Cover Photo: © Getty Images

Preface

The world is facing a huge challenge: to convert our economies and energy systems so that we move from today's strong dependence on abundant supplies of fossil energy to highly energy-efficient and secure solutions for the future. New technologies and the use of renewable energy resources will be required. It is possible, but it will demand massive investments and most of all, good governance.

That is exactly where UNFCCC was supposed to lead – good and coordinated governance for sustainable climate mitigation and adaptation worldwide. We are not there yet: it will take time to achieve global agreement. Like many other concerned citizens, think tanks and institutions, we think that the situation is far too serious to wait for a sufficiently far-reaching global convention. Present trends point to a 3-4 degree increase in temperature before the end of the century.

As a complementary approach to the stalled UNFCCC negotiations this report launches the idea of an International Climate Investment Community. The EU has been at the forefront before and can be again: it can take the lead in creating a community that would speed up innovations and investments, starting now. The key factor behind the transition would be a change in relative prices between fossil and low-carbon technologies that will give the markets the right incentives to change.

Global Utmaning (Global Challenge) has initiated a collaboration project with other think tanks in Europe to give European governments strong support in taking the necessary decisions. This report by a group of leading policy experts in Sweden marks the start of the project.

Stockholm 18th October 2010

Kristina Persson
President of Global Utmaning

Contents

Executive Summary

This report presents the idea of an International Climate Investment Community as a complementary approach to the stalled UN negotiations. The EU is the global leader in clean tech export, but other parts of the world, mainly Asian countries are determined to win "the green race". The EU has a comprehensive and ambitious climate strategy and should use its position to take the initiative and must give new momentum to energy investments, thus turning climate mitigation policies into a strategy for growth.

The good news – and the bad news

The good news about the UN negotiations is that industrialised nations have made public pledges to cut emissions by 2020, and a great number of developing countries have submitted plans to limit their emissions growth. This is a fundamental change in attitudes over a short period of time. The bad news is that there is no sense of urgency among policymakers and politicians to implement new policies:

- current energy and CO_2 trends emphatically bear out the repeated warnings issued by the Intergovernmental Panel on Climate Change (IPCC),
- the mitigation pledges up to 2020 amount to 12-19 per cent instead of the 25-40 per cent needed to limit global warming to +2 C,
- the prospects of the UNFCCC negotiations breaking the Copenhagen deadlock are poor. COP 16 in Cancún and COP 17 in South Africa are seen as merely steps in an open-ended process and not as the birth of a global, legally binding climate agreement.

A big stumbling block for a global legally binding climate agreement is a fear among governments of constraints to their pursuing national development strategies. This situation is likely to remain for years, given the complex set of conditions that a global treaty has to meet. The failure to reach a global agreement has resulted in weakened momentum for the investments needed to realign our energy systems towards a low-carbon economy.

The huge challenge: realigning our energy systems

The aim of an International Climate Investment Community is to break the political deadlock by building momentum for a fundamental realignment of our energy systems and thereby a modernisation of our economies. This is a huge challenge that has been the subject of in-depth study by all the leading global institutions in the fields of economy, technology, energy and climate. Taken together, their reports carry two powerful messages:

- an energy revolution, based on widespread deployment of low-carbon technologies, is needed to tackle the climate change challenge.
- a low-carbon future is also a powerful tool for promoting economic development and enhancing energy security – it is within our reach and will help modernise our economies.

These studies show that massive investments will be needed to meet the world's growing energy needs. The investments will need to be considerably higher in the low-carbon scenario than in business-as-usual. At the same time the energy technology revolution holds significant potential for excellent returns on investment and lower energy costs compared with business-as-usual. The consensus between the studies among different institutions is striking. It is urgent to turn this consensus into political action and policies.

The policy dilemma: subsidies or pricing?

When designing new policies aimed at transforming an energy system into one of long term sustainability, all governments face the same dilemma. Theoretically, the choice is between two alternatives:

either

- subsidising low-carbon technologies until they are economically viable in competition with the present predominant fossil technologies, which do not pay the cost of CO_2 emissions,

or

- putting a price on CO_2 – through taxation and auctioning of emission permits – creating a level playing field where all necessary low-carbon technologies can compete with fossil technologies.

In this report we argue for the second alternative, what we call "a technology-neutral CO_2 price". One advantage is that consumers and businesses, not governments, will choose the technologies. Another is that it will end today's habitual

expectations of excessively low fossil fuel price levels. A third advantage is that it will not merely reduce the burden on public finances, but also bring revenues to the national governments.

However, making a stable and predictable carbon price a cornerstone in a climate investment strategy does not rule out subsidies and regulation. Such measures are needed in an integrated framework of climate mitigation policies, as stated by the IEA in its Energy Technology Perspective 2010. Effective regulation is needed, particularly for improvements in energy efficiency representing half the abatement potential. There are strong arguments for subsidising research and the early development of new technologies, and such policies will be all the more effective once a technology-neutral CO_2 price is established.

A technology-neutral CO_2 price – to guide business and investors

Our basic idea of a technology-neutral CO_2 price is based on the insight that the present CO_2 price level, around €15 per ton, is too low to make the predominant fossil technologies pay the real costs. In fact, there is a "subsidy" of at least €25 per ton emission on the old fossil technologies. This perverse situation has to be reversed.

To make low-carbon technologies profitable, a CO_2 price of at least €40 per ton CO_2 emission will be needed no later than 2020. It should level the playing field between fossil technologies and low-carbon technologies.

We suggest a price trajectory that gives business guidance and predictability for long term investment. The price should be established and maintained through cap-and-trade, i.e. the European Emissions Trading System, ETS, and with complementary national CO_2 taxes and other measures.

We agree with the World Development Report 2010 that "pricing carbon ….is the optimal way of both generating carbon-finance resources and directing those resources to efficient opportunities". The revenues from the ETS and from the CO_2 taxes should accrue to the nation states in question to be used at the discretion of the national governments for example for "greening" the tax systems and fulfilling commitments towards developing countries in the Copenhagen Accord.

A European initiative – inviting partners around the world

A new and complementary approach is needed that can shift the perspective from sharing burdens to sharing opportunities and benefits. Our suggestion is that the EU takes the initiative to build an International Climate Investment Community together with partners around the world who share the same concern for climate change. Such a Community should have the double aim of tackling the political deadlock and giving new momentum to climate mitigation investments. It should include four basic elements:

- focus on investment and business opportunities, rather than regulation of emissions. This will let Member States benefit from being forerunners
- a technology-neutral CO_2 price, rather than subsidies, as a driver of new technology and investments
- a gradual, step-by step approach to building a Community of Member States, rather than a global convention signed by every government and ratified by all parliaments,
- governance based on the open method of coordination, rather than a comprehensive global legal system.

Our proposal for an International Climate Investment Community is not a longer term alternative to a global treaty. It is a medium-term approach for giving new momentum to the necessarily massive investment process. With growing experience of the impact of investments, the global treaty should become less threatening to governments wary of constraints on national development.

The great strength of establishing such a Community is that it can grow step by step – much like the European Community grew from six to nine to twelve to fifteen to 25 and then 27 members based on a set of jointly agreed rules and principles (acquis communautaire). A gradual, step-by-step approach based on established rules and an agreed organisation could over the years grow into something that resembles a global framework with considerable impact on investments and the development and dissemination of new, carbon-efficient technology.

A basis for discussion, not a blueprint

The ideas put forward by Global Utmaning (Global Challenge) in this report are not unique. There are now a number of ideas and initiatives that point in the same direction. Our proposal addresses some key issues, but not all. It is a concept, not a blueprint. We will continue to develop the basic ideas by inviting participants to reflection and debate.

CHAPTER 1.

The huge challenge: Breaking the deadlock, transforming our energy systems

Negotiations on a global convention to combat climate change have now continued for twenty years. The recent IEA report[1] summarises the present understanding of climate change as follows:

- Current energy and CO_2 trends emphatically substantiate the repeated warnings sent by the United Nations Intergovernmental Panel on Climate Change (IPCC).
- Recent studies suggest that climate change is occurring even faster than previously estimated.
- Even the "50 per cent by 2050" goal may be insufficient to prevent life-threatening climate change.
- The present state of climate change negotiations can be summarised as follows:
- COP 15 in Copenhagen did not deliver the agreement that could unlock large scale investments. Neither will COP 16 in Cancún do this, nor COP 17 in South Africa, as stated by leading climate negotiators.
- At the same time, COP 15 at Copenhagen represents an achievement in terms of national commitments towards combating climate change.

The encouraging signs are as follows. The views of key nation states have evolved over the last few years. The serious message from climate science is now essentially accepted. Countries that even a few years ago refused to even recognise climate change as an issue are now implementing national programmes. Furthermore, in accordance with the Copenhagen Accord, all industrialised countries have made public pledges to cut emissions by 2020 and a great number of developing countries have submitted plans to limit their emissions growth. This is a fundamental change in attitudes over a short period of time. The Copenhagen Accord therefore represents a significant step in building consensus and commitments even if it was a failure in terms of reaching an agreement to unlock global investments.

The big stumbling block for a global legally binding climate agreement is a fear among governments of constraints to their pursuing national development strategies. The present political deadlock in the US is a major problem that shows no signs of being overcome in the near future. A number of countries are not willing to take on commitments unless the US takes action. Many governments are uneasy over the short term impacts of a climate change policy on economic development and competitiveness Also, the international requirements for national transparency and due legal processes are a major concern in key developing countries. These problems are likely to remain for years, given the complex set of conditions that the global treaty has to meet.

1 IEA, ETP 2010

> The big stumbling block for a global **legally binding** climate agreement is a **fear** among governments of a loss of **national capacity**.

Two powerful messages

In this report, we propose a new complementary initiative – an International Climate Investment Community – to break the political deadlock. The aim of such a Community is to build new political momentum for a fundamental realignment of our energy systems and thereby a modernisation of our economies. Achieving such a transformation is a huge challenge for our generation of decision makers – and the next. This challenge has been the subject of in-depth study by all the leading global institutions in the field of economy, technology, energy and climate[2]. Taken together, their reports carry two powerful messages:

- an energy revolution, based on widespread deployment of low-carbon technologies, is needed to tackle the climate change challenge,

2 **Stern, N.** (2006). "Stern Review on The Economics of Climate Change". HM Treasury, London, **International Energy Agency:** ETP 2010, **EU Commission:** Analysis of options to move beyond 20 per cent greenhouse gas emission reductions and assessing the risk of carbon leakage, 2010, **World Bank:** World Development Report 2010, **MEF Global Partnership:** Global Gaps in Clean Energy Research, Development and Demonstration, **World Business Council for Sustainable Development:** Vision 2050, **European Climate Foundation:** Road Map 2050.

- a low-carbon future is also a powerful tool for enhancing energy security and economic development – it is within reach and will help modernise our economies.

The messages from these institutions form a striking consensus. It is time to turn this consensus into policy and a powerful growth strategy.

This predicament and the risks related to climate change – as well as to the risks of decreasingly secure energy supplies – are outlined in an appendix to this reportA scenario for a dramatically different future

The most recent and comprehensive study of energy, climate and the economy is the Energy Technology Perspectives 2010, ETP 2010, by the International Energy Agency, IEA. This study does not purport to forecast what will happen, but rather presents an analysis of various scenarios. A comparison of the two main scenarios, a Baseline scenario and a BLUE Map scenario, demonstrates that low-carbon technologies can lead to "a dramatically different future".

The Baseline scenario is a "business-as-usual" approach, assuming that governments introduce no new energy and climate policies. The BLUE Map scenario is target-oriented and sets the goal of halving energy-related CO_2 emissions by 2050 and examines the least-cost means of achieving that goal through the deployment of existing and new low-carbon technologies.

To meet the world's growing energy needs will be a challenge, and will require massive investments regardless of scenario. The required investments will be considerably higher in the low-carbon scenario than in a business-as-usual scenario. On the other hand, the energy technology revolution holds significant potential for excellent returns on investment.

In the business-as-usual scenario, total investments are estimated at USD 270 trillion between 2010 and 2050. Most of this, almost 90 per cent, represents investments by energy users in capital equipment such as vehicles, electric appliances and manufacturing and processing plants in heavy industry. To meet the growth in energy demand in the BLUE Map scenario, a further increase in investments of 17 per cent, or USD 46 trillion, will be needed.

The ETP 2010 highlights the fact that a low-carbon economy will lead to substantial savings due to efficiency improvements and lower fuel demand. ETP 2010 calculates that the additional USD 46 trillion in investments, calculated in the BLUE Map scenario, will yield savings equal to USD 112 trillion over the period from 2010 to 2050 – more than twice the investment cost of a business-as-usual scenario. Even if both the investments and fuel savings are discounted back to their present values the net savings amount to USD 8 trillion.

In this perspective, forward-looking companies will have an enormous potential for developing and deploying a wide range of new breakthrough and emerging technologies. This is the growth dividend of an ambitious climate strategy.

Government intervention "on an unprecedented level"

To be successful, a low-carbon economy should be based on market principles in which energy technologies are spread primarily through commercial transactions. However, as stated in the ETP report, many of the most promising low-carbon technologies have higher costs than the traditional fossil-fuel technologies which do not pay for the negative externalities they cause. Therefore, governments will need to intervene on an unprecedented level in the next decade to avoid the lock-in of high-emitting, inefficient technologies.

The IEA draws the conclusion that financing remains a substantial challenge as does identifying appropriate mechanisms to accelerate the deployment of low-carbon technologies in the world. A stable global carbon price is a necessary cornerstone of any successful policy in the longer term. Current carbon prices are not sufficiently high or stable to attract the required scale of investment in new technologies. For investors, a higher and more certain carbon price would help to remove uncertainty from the carbon markets and make investments more attractive.[3] [4]

The conclusion is, in the words of IEA, that "an energy technology revolution is within reach" and that such a revolution will help modernise and develop our economies, eventually bringing considerable opportunities rather than burdens.

3 PwC has published a report on attitudes in the international business community towards environmental regulation, legislation and taxes. The report, "Appetite for change: Global business perspectives on tax and regulation for a low- carbon economy", offers insights into corporate thinking on the subject of how tax and regulation can help drive a low- carbon economy: businesses want clear long-term investment signals, and input into the formulation of direction and derivative policies. Carbon taxes, emissions trading and incentives have widespread support in the business community.

4 The Institutional Investors Group on Climate Change (IIGCC) has published a report, "Shifting Private Capital to Low Carbon Investment", stating that the EU ETS has not yet provided investors with the strong, long-term price signals that are necessary to commit to long-term low carbon investments at scale. The IIGCC requests the EU to provide clarity on the EU ETS up to 2030 and to set ambitious caps to create sufficient scarcity and a robust price signal in line with the longer lifetime of climate relevant assets.

CHAPTER 2.

Governments' dilemma: subsidising new technologies or pricing CO_2?

All governments will face a dilemma when designing policies that can transform the present energy systems into systems of long term sustainability. There are, theoretically, two choices:

- either subsidising low-carbon technologies until they are economically viable in competition with the present predominant fossil technologies, which do not pay the cost for CO_2-emissions, or
- putting a price on CO_2 – through taxation and auctioning of emission permits – in order to create a level playing field where low-carbon technologies can compete with fossil technologies.

In this report we argue for the second option, what we call "a technology-neutral CO_2 price". There are three main arguments against subsidies and in favour of CO_2 pricing:

The first argument stems from the difficulties in making political choices between different technologies, often described as "the problem of picking winners". The advantage of pricing CO_2 is that it will eliminate the need for political choices between different technologies. What governments have to do is to establish a solid mechanism for CO_2 pricing and a price high enough to allow investors and consumers to make their choices between different technologies.

The second argument is that subsidising new technologies in a market which in itself is founded on too low a price level contributes to unsustainable price expectations.

The third argument concerns the difficulties in securing revenues to pay for ever higher subsidies for low-carbon technologies. These subsidies will have to compete with other political objectives. Given the present deficit levels in most EU countries, it is most unlikely that national commitments to subsidies would create a level playing field for investors. The present discussion in several countries on the need to reduce the subsidies inherent in so-called feed-in tariffs is a case in point. Moreover, a CO_2 tax as a complement to ETS will also generate revenues that can be used in e.g. reforming taxation systems and shifting taxation from labour to carbon.

We share the views expressed in the World Development Report 2010 that "pricing carbon (whether through a tax or through a cap-and-trade scheme) is the optimal way of both generating carbon-finance resources and directing those resources towards efficient opportunities"[5]. For these reasons we firmly believe that a strategy based on commitments to maintain a price level is preferable by far to a strategy based on commitments to uphold a given level of subsidies.

However, making CO_2 pricing a cornerstone in a climate investment strategy does not rule out subsidies and regulation. Such measures are needed in an integrated framework of climate mitigation policies, as stated by the IEA in its Energy Technology Perspective 2010. Effective regulation is needed, particularly for energy efficiency improvements, representing half the abatement potential. There are strong arguments for subsidising research and the early development of new technologies and such policies will be all the more effective when a technology-neutral CO_2 price is established. Nuclear power, for instance, would never have become a non-military technology without massive subsidies in the fuel cycle. The same goes for renewables like wind and solar energy.

Pricing carbon is the optimal way of both **generating** carbon-finance resources and **directing** those resources to **efficient opportunities**.

5 World Bank: World Development Report 2010

CHAPTER 3.

Long term and stable rules for investment in low-carbon technologies: How to do it

So far, governments and businesses have expected the framework for the investment process to follow upon a legally binding global climate agreement. The commitment to keep the increase in global temperature below +2 C should be followed by commitments to reduce emissions, followed by emission trading, leading to a global CO_2 price giving incentives to investment in low-carbon technologies, transforming energy systems worldwide. This is the top-down process for a market based investment framework.

However, the political negotiations will take much longer than previously expected, and the present mechanisms to establish drivers for investment in new technologies are not effective in bringing about investments on a scale that will rapidly and significantly reduce emissions. Public and private actors must therefore be given long term, stable incentives in other forms. The key issue is the CO_2 price.

Today's CO_2 price is €15 per ton, be compared to the €40 per ton, which is the **price needed** to allow low-fossil technologies, to compete on a **level playing field** with **fossil fuel** technologies.

A new order: a technology-neutral CO_2 price

Today's CO_2 price in the ETS is €15 per ton, highly volatile and extremely difficult to predict over extended periods of time. This price should be compared to the €40 per ton which is the price needed to allow low-fossil technologies, including Carbon Capture and Storage, as well as renewable energy generation, to compete on equal terms with fossil fuel technologies.

Thus, fossil technology is "subsidised" at around €25 per ton. This is a perverse situation. We suggest a floor for the CO_2 price and a trajectory to 2020 and beyond to create a level playing field – a technology-neutral CO_2 price – that will give business guidance and predictability for long term investment.

The CO_2 price floor has to be high enough to make the necessary technologies for climate mitigation economically viable. The price floor should be established and maintained through the ETS in combination with complementary national CO_2 taxes. The technology-neutral CO_2 price can be estimated from studies of abatement costs for different technologies, cf. Appendix 1. It is a prerequisite in these studies[6] that Carbon Capture and Storage, CCS, is assumed to be a critical component in the technology mix between the present fossil economy and the future low-carbon economy, because of the large assets locked in current coal-based power plants. It must pay to develop and invest in CCS technologies. CCS will make medium- to long-term use of coal possible in those countries that are concerned about their installed coal-fired capacity and their coal mining communities.

A CO_2 price of no less than €40/ton is estimated to create attractive market conditions for the major renewable energy technologies, and also estimated to make CCS viable in the long run. This price is a working target to be reached as soon as possible and no later than 2020. This price level will create the necessary conditions for many alternative energy technologies to be competitive with fossil fuel and also for improvements in energy efficiency. The CO_2 price may have to be even higher in the longer term[7]. Different studies give a variety of indications on how rapidly the price will have to subsequently increase. Agreements on the mechanisms to reach and maintain the technology-neutral price are key in an International Climate Investment Community.

Here are our ideas for how to combine cap-and-trade, taxation and energy efficiency measures to support investments in low-carbon technologies.

6 The EU IMPACT Study 2007, UK DEFRA 2007, France Commission Quinet

7 France Commission Quinet

Combine the EU Emissions Trading Scheme and national CO_2 taxes to create a price floor

We suggest a combination of the EU-wide Emissions Trading Scheme, ETS, and national CO_2 taxation. The ETS should be used as far as possible and the national CO_2 taxation as much as necessary. In addition, it is essential to renew standards and regulations regarding energy efficiency to create incentives where market mechanisms are insufficient.

We assume that all subsidies to fossil fuels are removed, as stated by the G20.

Cap-and-trade

The EU ETS has been in operation since January 2005 and it is the main pillar of the EU climate mitigation strategy. However, the ETS has been called into question for two reasons: firstly, high volatility in the CO_2 price and secondly an over-allocation of permits by national governments. This over-allocation has led to a fall in the CO_2 price from €20–28 per ton in the beginning of 2008 to €10–15 per ton at the end of 2009 and the beginning of 2010. Thus, the EU ETS has so far not established a sufficiently high and stable CO_2 price. It should be borne in mind that the ETS was not constructed to maximise investments in low-carbon technologies, but only to lower emissions in the most cost-effective way. The allocation of emission rights does not take into account economic business cycles – only the emission targets. This means that in the economic downturn and its aftermath, the carbon market has in reality been subjected to over-allocation of emission rights.

The ETS is now undergoing reform and will be strengthened through the "climate and energy package" which came into force in July 2009. The cap on emission allowances for the sectors covered by the system – power generation, energy-intensive manufacturing industry, and from 2012, aviation – will be cut annually in a linear fashion from the year 2013. The scope of the system will also be extended to include further big industrial emission sources, such as the chemicals and aluminium sectors. The current system of fixing 27 national caps on emissions from the ETS sectors will be replaced from 2013 by a single EU-wide cap. Instead of receiving emission allowances for free, businesses covered by the system will have to buy a progressively higher share at auction. From 2013 roughly half of the total allowances will be auctioned and the goal is to reach full auctioning by 2027.

To reach the technology-neutral price the EU should make full use of a reformed ETS. The effect of these reforms will be seen above all after the second phase of ETS, starting in 2013. Our view is that the ETS shall primarily be evaluated with respect to its contribution to maintaining a technology-neutral CO_2 price and thus with respect to the need to transform our energy systems. This price should follow the suggested price trajectory with limited volatility, since this will be a prerequisite for long-term investments in low-carbon technologies. To stabilise the price on a predetermined price trajectory, it may be required to adjust the availability of emission rights at a higher frequency than today, possibly through centralised buying/selling of emission rights in the ETS.

CO_2-taxation

Taxing CO_2 in sectors not covered by the EU Emissions Trading System would be a cost-effective way to meet the EU's commitments to a low-carbon economy. The EU Tax Commissioner has put this issue high on the EU agenda, with the aim to finalise the long awaited Commission proposal for a revision of the Energy Taxation Directive before the end of 2010.

Taxing CO_2 would be a **cost effective** way to meet the **EU's commitments** to a low carbon economy.

The revision is envisaged to provide for an adapted and modernised framework of rules for the single market: 1) it would introduce framework rules for CO_2 taxation for emitters not included in the EU Emissions Trading System with a mandatory CO_2 tax in the Member States' national legislations and 2) it would streamline other energy taxation to make it neutral and enable fairer competition.

It will be the responsibility of the Member States to ensure that the discussions in the Ecofin Council lead to a new Energy Taxation Directive that Member States can use to make the necessary decisions to complement the EU ETS with effective CO_2 taxation.

Countries which have implemented CO_2 taxes have found them easy to calculate and administer. The relation between average carbon content and CO_2 emissions is generally well known for the different fuels. The key administrative question is defining whom to tax, but this question too is solvable. Another conclusion from these Member States is that it is preferable to include a CO_2 tax in a broad and general revision of national tax systems, including successive reforms and moving tax burden from jobs and employment to energy, i.e. a greening of the tax systems.[8]

8 The "gross funding potential" of a CO_2 pricing scheme – including all EU countries, all CO_2 emissions (4000 Mt/year) and ETS as well as CO_2 taxes – is in the magnitude of €160 bn/year for a CO_2 price of €40/ton. Depending on how the ETS is included and how many countries join the International Climate Investment Community it may be assumed that CO_2 funds made available for governments will be in the region of €40 – 80 bn/year (all of this is not necessarily "new" money). This is roughly between a third and a half of the EU budget or less than 0.5 per cent of EU GDP.

Standards and regulation

The potential to reduce CO_2 emissions through energy efficiency improvements represents roughly half the abatement potential. Many opportunities in this field are already profitable, but are not fully leveraged due to conservative practices, lack of information, ill-functioning markets, etc. The positive effects of increased energy efficiency could however be obviated by rebound effects. Efficiency increases lead to lower energy use, which leads to financial return and a lower price, both of which may lead to higher energy consumption, the so-called the Jevons Paradox. This rebound effect could be avoided by "converting the non-binding 2020 efficiency goal into a requirement to deliver the target whilst allowing Member States flexibility on how this should be achieved", according to Roadmap 2050.

The EU-wide target is to reduce energy consumption by 20 per cent by 2020, with an indicative target of 9 per cent reduction per country set to be achieved by 2016. With existing technologies for energy efficiency, we can achieve increased efficiency by 2 per cent yearly according to "Roadmap 2050". Through innovation in new technologies, materials and practices, this can be increased significantly.

Existing EU policies related to energy efficiency are addressed differently in different Member States. Each country has a National Energy Efficiency Action Plan, NEEAP, describing the national strategy for reaching EU-wide targets for energy efficiency. These strategies contain a multitude of initiatives and policies that stimulate energy efficiency in different countries in different ways. The instruments for energy efficiency are in some cases working well, in others less well. The action plans need to be further elaborated in order to become more effective. In some cases, the directives are fairly new, like the new legislation on CO_2 from passenger cars with phasing in from 2012. In other cases the directives were prepared and decided upon several years ago. In most cases they were prepared under resistance from different stakeholders, leading to compromises and a watering down of the original intentions.

The time has come to review the energy efficiency directives in the light of the EU commitment to emission reductions by 2020. One important aim is to make a concerted effort to overcome resistance from business and other interest groups, and to include a commitment to strengthen the tools for energy efficiency in an International Climate Investment Community. The EU should make full use of the Internal Market legislation and speed up improvements in energy efficiency and reduce fossil fuel consumption. The EU product legislation and standards setting should be aligned with the EU commitments to emission reductions and to a technology-neutral CO_2 price.

CHAPTER 4.

A new and complementary approach to the UN climate negotiations: Why and how?

A major stumbling block for a global legally binding climate agreement is a fear among governments of constraints to their pursuing national development strategies. This situation is likely to remain for years, given the complex set of conditions that a global treaty has to meet. Failure to reach a global agreement has resulted in weakened momentum for investments needed to realign our energy systems towards a low-carbon economy, as set out in Chapter 1.

A complementary approach is needed. Nations that agree on the necessity to act should pool sovereignty and move forward together towards large-scale investments in greenhouse gas mitigation. This is why we are putting forward the idea of an International Climate Investment Community. Such a Community would be a co-operation between nation states which agree on aims, rules and organisation, laid down in a convention or a treaty, including a set of commitments which create strong and lasting incentives for investment in low-carbon technologies[9]. An International Climate Investment Community would be based on the following four elements:

Step-by-step rather than a single global convention

An International Climate Investment Community should be established by Member States of the European Union and should be open for other countries to join. We hope that all EU members will join but if there is no general consensus among the 27 Member States, it could be started by a smaller number of Member States, based on the new provisions of the Lisbon Treaty. The analogy is with the establishment of the European Community itself – Jean Monnet and Maurice Schumann succeeded because they began with a small group of countries. As the cooperation proved to be successful, more states applied for membership and joined.

Once an International Climate Investment Community has been established by the EU or by a group of EU Member States provision should be made for other nation states to join. The EU has made a huge institutional investment in the emissions trading system, and should make membership available to non-EU states that have the appropriate institutions.

Focus on technology, investment and business opportunities

We suggest a technology-and-investment approach with the aim of creating business opportunities and economic development, and building a competitive advantage for Member States in critical industries for the future.

A combination of existing and new technologies can make it possible to halve worldwide energy related CO_2 emissions by 2050. No single technology or small group of technologies can deliver change of the magnitude required. Achieving it will stretch the capacities of all energy-sector stakeholders and entail substantial initial investments, but in the long term these investments will be more than offset by the benefits.

The upside of the required investments is that the energy technology revolution holds significant potential for substantial financial returns. A rapid transformation of European industry should be welcomed and not resisted; social and labour market policies should be reinforced and adapted for this accelerated transformation.

A review of technologies and time frames is provided in Appendix 1 to this report.

A technology-neutral CO_2 price for low-carbon technologies

A technology-neutral CO_2 price is a price level that makes all technologies needed for climate mitigation economically viable. In effect, the present CO_2 price level subsidises fossil technologies, as the external effects are unaccounted for.

We also suggest a price trajectory that gives business guidance and predictability for long term investment. The price should be established and maintained through the ETS and with complementary national CO_2 taxes. This would be an improvement on the present order, where the prices set by the market have proven to be highly volatile and unpredictable and consequently counterproductive to long-term investments. The revenues from the ETS and from the CO_2 taxes should accrue to the nation states in question and be available for use at the discretion of the national governments. Governments may, for instance, choose to use the revenues for overall tax reforms and/or use some of the revenues to meet commitments to the least developed countries as expressed in the Copenhagen Accord.

The technology-neutral CO_2 price is further dealt with in Chapter 2 and 3.

9 Global Utmaning, A Climate Investment Framework, May 2010.

Governance based on the open method of coordination

Finally, we suggest governance rules, based on the open method of coordination. The reason for this is as follows.

The EU ETS is based on the community method of European legislation. However, the energy policy mix is a national responsibility and Member States show big differences in energy policies. It has already proven to be difficult to move forward to a new level of climate commitments and a new set of policies in the European Union. To build a broader coalition of countries outside the EU will be even more difficult and will require new forms of intergovernmental cooperation.

Experience from establishing and using the open method of coordination could be useful when drafting the rules for an International Climate Investment Community. The open method of coordination is treaty-based but rests on soft law mechanisms such as guidelines and indicators, benchmarking and sharing of best practices. This means that there are no official sanctions in the system. Rather, the effectiveness of the method relies on a form of peer pressure. Governance based on this method has been seen to be a practical way forward in fields where Member States are unwilling to give up national sovereignty. This form of governance can be adapted to lay the foundation for a broad coalition of countries committed to ambitious climate goals but restrictive when it comes to handing over national sovereignty to an international organisation.

New initiatives in the same direction

The ideas put forward by Global Utmaning (Global Challenge) are not unique. There are now a number of ideas and initiatives pointing in the same direction.

- The UK government is committed to a CO_2 price floor: "We will introduce a floor price for carbon, and make efforts to persuade the EU to move towards full auctioning of ETS permits"[10]. In the June budget, the UK government said it would publish proposals for reforming the climate change levy to support a carbon floor, with legislation expected in the finance bill in 2011.
- The German, French and UK environment ministers have suggested that the EU should aim for reductions in greenhouse gas emissions by 30 per cent rather than 20 per cent by the year 2020. This would require more stringent policies than those discussed so far.
- The Swedish government has initiated a debate on a "forerunners' climate coalition", but has kept open the question of form and content[11].
- The US think-tank Brookings has published a report on a price collar, including an initial price floor and price ceiling per ton of carbon-equivalent emissions and an annual real growth rate for both[12].
- The Potsdam Institute for Climate Impact Research has published a report on a modular, expandable carbon market whose integrity and time consistency are ensured by a World Climate Bank, to be created by participating countries. Based on regular and comprehensive auctions of emission allowances, the climate rent is shared among countries and distributed to citizens in a way that reflects common but differentiated responsibilities and respective capabilities to address climate change[13].

A concept, not a blueprint

The purpose of an International Climate Investment Community is to offer member states the advantage of being forerunners in technology and low-carbon investments. The key commitment is to investments rather than to percentage reductions. Unilateral commitments to implementing a technology-neutral CO_2 price do not require the same loss of sovereignty as the monitoring, reporting and verification procedures now discussed under the UNFCCC.

We would like to emphasise that our proposal for an International Climate Investment Community addresses some, but not all, key issues. It is a concept, not a blueprint. We will continue to develop the basic idea by inviting participants to reflection and debate.

One or two issues should be mentioned already. The first issue is the risk of carbon leakage. The Commission discusses this issue in its communication of May 2010. The present EU policy is to give generous allowances to energy-intensive industries in order to reduce the risks of carbon leakage. There is thus a trade-off between incentives for investments in carbon-efficient technologies and the risk of carbon leakage in certain industrial sectors. How this trade-off plays out over the next few years will have to be closely monitored and should thus be agreed when an International Climate Investment Community is established. If the resulting investments in these sectors are too low, other mechanisms may have to be found. Whatever solutions may be agreed, the risk of overcompensating industries concerned must be addressed.

Another issue concerns the relationships between an EU-based International Climate Investment Community and other potential constellations with similar objectives. To take two examples: an International Climate Investment Community that includes both the EU and Japan and perhaps South Korea would have a dramatic impact on investor confidence. Moreover, a North American Climate Investment Community based on an emissions trading system comprising the US and Canada could easily exist in parallel with a European-based community and enjoy mutual benefits as carbon prices converge over time.

10 Cabinet Office: The Coalition: our programme for government

11 Andreas Carlgren, DN Debatt, Dagens Nyheter.

12 Warwick McKibbin, Adele Morris, and Peter Wilcoxen: "A Copenhagen Collar: Achieving Comparable Effort Through Carbon Price Agreements", Brookings, 2009

13 Daniel Klingenfeld, Evaluating Global Climate Policy – Taking Stock and Charting a New Way Forward, Potsdam Institute for Climate Impact Research, 2010

APPENDIX 1.

Low-carbon transformation: The required technologies and time frames

By Niclas Ihrén

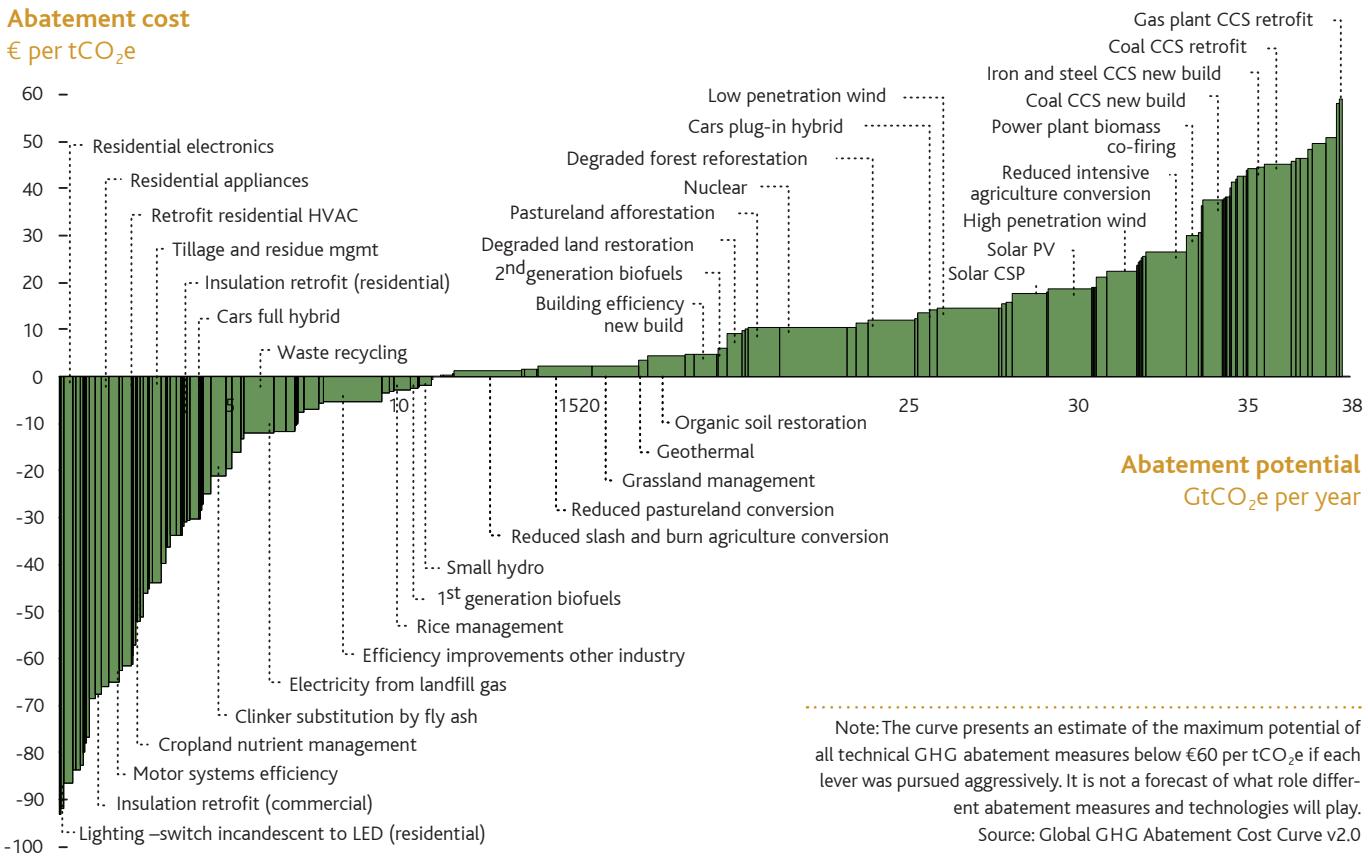
"Roadmap 2050", from the European Climate Foundation[1], shows that a transformation to a low-carbon society by 2050 is possible with existing technologies, and that it would generate total energy costs during the period that are lower by an estimated 20-30 per cent than in a business-as-usual scenario,. This means that the transformation makes good financial sense, in addition to reducing climate change and exposure to supply-security risks.

A broad portfolio of technologies will be needed since each technology has the theoretical capacity to cover only part of the necessary CO_2 abatement. This is also needed in order to continue to develop all technologies and to build a system more resilient to delivery risks. Furthermore, the suitable mix of technologies will be different in different regions.

1 Roadmap 2050, European Climate Foundation (2010), http://www.roadmap2050.eu/

GLOBAL GHG ABATEMENT COST CURVE BEYOND BUSINESS-AS-USUAL – 2030

This figure from McKinsey (2007) shows the abatement costs for different technologies. To the left are technologies and opportunities with negative costs, i e, opportunities that are profitable already, to the right are those technologies which are not yet profitable. CCS technologies can be found to the right in the diagram, with costs of between €40–50/ton CO_2, when the technology is commercially mature. This defines a technology neutral CO_2 price.



Note: The curve presents an estimate of the maximum potential of all technical GHG abatement measures below €60 per tCO_2e if each lever was pursued aggressively. It is not a forecast of what role different abatement measures and technologies will play.
Source: Global GHG Abatement Cost Curve v2.0

A complete transformation of the energy system is required to meet the challenge in the short time frame available. Work is required on supply, demand and the link between supply and demand, i.e. the power transmission system.

1. Improving Industrial and Domestic Energy Efficiency

According to a report by McKinsey[2], the most cost-efficient greenhouse gas abatement investments short-term lie in further improvements in energy efficiency in different sectors, see illustration. It is shown that the majority of investments in this area are already profitable. This indicates that with predictable prices for CO_2 and for fossil fuels, this area can expect large impacts on CO_2 emissions to be achieved in the short term. However, appropriate policy incentives through technical norms and standards have to be strengthened and implemented to lead the way. In Roadmap 2050 mentioned above, it is estimated that a yearly energy efficiency improvement of up to 2 per cent is achieved.

2. Transforming the transport sector and the building sector

In the coming decades, fossil fuels will also have to be completely replaced in buildings and in the transport sector by use of low-carbon alternatives, including bio fuels and electricity. Alternatives including fuel cells, heat pumps, district heating and geothermal energy will also continue to be developed and implemented. This area provides huge opportunities already. In Sweden for example, the reliance on district heating is about 50 per cent compared to the EU average of 6 per cent.[3]

3. Reducing emissions through Carbon Capture and Storage, CCS

Technologies related to carbon capture and storage offer important potential to reduce emissions while using available and already deployed energy sources. Carbon capture and geological storage (CCS) is a technique for trapping carbon dioxide as it is emitted from major point sources, compressing it, and transporting it to a suitable storage site where it is injected into the ground.

However, there is still a long way to go before CCS can be used on a large scale at existing plants. A major uncertainty remains how to find safe storage under ground as the technology is scaled up. CCS technology is from a CO_2 abatement perspective more expensive than many energy efficiency measures, and also when compared to many technologies for renewable energy. However, to make use of the enormous asset base of fossil fuel power plants in operation and in construction, CCS is an important alternative as a complement to switching fuels from coal to biomass. A CO_2 price of at least €40/ton is estimated to make CCS competitive long-term. With this price level used as a baseline, a large number of technologies for renewable energy and for energy efficiency are also competitive, based on long-term cost estimates. Initially, the CCS technology has a cost significantly higher than $40/ton, that has to be addressed by additional means, such as subsidised pilot installations.

It is to be noted that it is far from evident that CCS, which has often been assumed to be a bridging technology while waiting for long term sustainable solutions, will be available on a large scale early enough to have a significant impact on the necessary transitions in the period up to 2030.[4]

4. Investing in new power from wind, solar, hydro power and nuclear

The objective is to replace fossil fuel sources with low-carbon energy sources. In the long term, renewable sources will become the predominant sources of energy. The transformation has started but it needs to accelerate. In a recent report by PwC[5], it is concluded that sufficient technologies are already available and that prices are falling rapidly as implementation scale increases. This process can be accelerated if the present subsidies to fossil technologies are replaced by a fair pricing of emissions. In addition, different governments can choose to stimulate more rapid commercialisation of new technologies through e.g. feed-in tariffs, as in the case of Germany. This can have a dramatic impact on the commercial availability of new technologies, and thereby further level out the playing field for technologies at different stages of commercialisation.

It is important to consider some of the fundamental economics related to the transformation. Many countries and energy companies have considerable financial assets tied up in production units based on fossil fuels, especially coal. Even with stronger financial incentives supporting different renewable energy sources, these production units will have to be used for a long time, based on their remaining financial lifetime. Existing coal-fired power plants can be adapted to "low-carbon" technology in two ways, either through fuel-mixing/fuel switching to biomass, or through CCS. Both these roads will have to be used extensively, and fuel-mixing is available as a technology immediately, whereas CCS will take many years to introduce and scale up. This means, that in the short run, partially replacing coal with

2 McKinsey & Co, "Pathways to a Low-carbon Economy", 2007, http://www.mckinsey.com/clientservice/ccsi/pathways_low_carbon_economy.asp

3 Anna Bernstad, "Fjärrvärme idag och i framtiden", Handelskammarens rapport 4/2009, http://www.handelskammaren.com/fileadmin/user_upload/Analys_rapporter/Rapport_4_09_final.pdf

4 "Comparison of Renewable Energy Technologies with Carbon Dioxide Capture and Storage (CCS)", Wuppertal Institute, 2010.

5 "Come sun, rain, or high wind: Europe could create a 100% renewable electricity supply by 2050", PwC Report (2010), http://www.ukmediacentre.pwc.com/News-Releases/Come-sun-rain-or-high-wind-Europe-could-create-a-100-renewable-electricity-supply-by-2050-e5e.aspx

biomass in existing coal plants is likely to be one of the most important and effective means of abating CO_2 emissions.

The potential massive increase of biofuels in large power plants will lead to much higher need for biomass in Europe: **some estimates point to a doubling from the current level.** In order to manage this transition, the European Commission needs to reconsider defining the properties of biomass to be used for sustainable energy production.

5. Investing in a more robust and resilient power transmission system

Investments to meet electrical transmission requirements are making the energy system more efficient and thereby reducing overall capacity needs. They are needed in order to create an energy system much more dependent on electricity, with a 40 per cent expansion by 2050, and yet more resilient than the current system. In the Roadmap 2050 report, a number of conclusions are of importance:

- An EU regional perspective is required to balance local differences. Investments are needed with a regional perspective in mind: higher capacity in inter-regional transmission is needed. This will be a cost-effective way of increasing capacity and resilience. Grid investment requirements are around 10 per cent of generation investments.
- Intermittent renewable energy sources, e.g. wind and solar require some backup electric capacity to offset their intermittent nature. However, the report shows that the backup capacity needed in an EU perspective is only around 12-14 per cent.

It is crucial that the EU start to formulate a framework for expansion and investments in the transmission network. This will be central to securing energy efficiency and resilience in the entire region – it cannot be left to Member States to manage it independently.

Important research is done in this field, such as the proposed SuperSmart Grid by the European Climate Forum and the Potsdam Institute for Climate Impact Research.[6] The SuperSmart Grid would connect the EU with North Africa, the Middle East and Turkey through a comprehensive network based primarily on renewable resources, including DESERTEC.

6 A. Battaglini, J. Lilliestam, C. Bals, A. Haas (2008-06-18). The SuperSmart Grid. European Climate Forum; Potsdam Institute for Climate Impact Research.

APPENDIX 2.

At the Intersection of Climate Change and Energy Security: Why Action is Urgent

By Karl Hallding

It is proving difficult for supplies of the fossil fuels that have enabled the matchless expansion of the 20th century to keep up with the increasing demand. At the same time, continued use of remaining fossil deposits risks pushing the world towards catastrophic climate changes. These two fundamental issues – energy and climate – each constitute a formidable security challenge for global society. But the combination of the two may have consequences far beyond our imagination.

The International Climate Investment Community addresses climate change, but equally the growing energy security challenges that both the EU and the world are facing. Our proposal lays down a foundation for immediate action to transform energy systems by providing clear market signals about incentives for low-carbon and energy efficiency investments – policy-driven measures that are urgently needed to accelerate the early stages of the low-carbon transformation that is now underway.

Climate Change: Faster than Anticipated

IPCC 's Fourth Assessment Report (2007) showed that climate change is already having dramatic effects on ecosystems, water resources and coastal zones across the world, with far-reaching human security implications, including higher mortality during heat waves, increasingly insecure access to water and food, and changes in the spread of diseases carried by vectors such as ticks and mosquitoes. The Stern Review (2007) projected that in the long term, climate change could cut global gross domestic product each year by anything between 5 per cent and 20 per cent, perhaps even more, if it is not brought under control by cutting greenhouse gas emissions. Taking global action to combat climate change is thus the pro-growth strategy for the longer term. The earlier we act, the less costly action will be.

Recent reports from scientists in the field repeatedly indicate that climate change is happening considerably faster than was anticipated only a few years ago. Over the past decade, concentrations of atmospheric carbon dioxide have increased faster even than was projected by the most fossil fuel-intensive scenarios from the IPCC Special Report on Emission Scenarios (2000). Population growth and per capita income have been identified as the main drivers behind this unexpected growth,[1] but feedback-loops in the Earth system are believed to play an increasingly important role for the more rapid increase in atmospheric carbon dioxide concentrations compared to earlier projections. The Climate Change Science Compendium 2009[2] looked at 400 scientific reports released through peer-reviewed literature. It concludes that all major variables, including sea-level rise, temperature rise, sea acidification and glacier melting, are changing more rapidly than estimated in the earlier IPCC reports.

Insecurity of Energy Supply: Approaching the Peak

Insecurity in the sustainable supply of fossil resources has been on the agenda for a long time. During the last few years, the science and debate regarding *peak oil* has made great progress. Groundbreaking research from Uppsala University demonstrates that not only the oil supply but also the possible extraction of natural gas and coal have delimitations that will lead to peaking gas and coal production in the coming decades.

Although *peak oil* has been a controversial concept, different organisations are now converging in their predictions about when the peak will happen. The International Energy Agency officially predicts a peak in production to occur around 2020[3], although whistleblowers in the organisations claim that most data indicate an earlier peak.[4] Others are of the opinion that the peak is more immediate. The Global Energy Systems group at Uppsala University and the International Association for the Study of Peak Oil and Gas predict the peak to occur now.[5] [6] UK Industry Taskforce on Peak Oil and Energy Security predicts that the peak will oc-

1 Mobjörk, Eriksson, Carlsen, 2010, On Connecting Climate Change with Security and Armed Conflict, Stockholm: FOI, ISSN: 1650-1942

2 UNEP (2009), "The Climate Change Science Compendium", http://www.unep.org/COMPENDIUM2009/

3 http://bigthink.com/series/30?selected=%2019155#player

4 http://rawstory.com/2009/2009/11/we-entered-peak-oil-iea-source-reportedly-claims/

5 Aleklett et. al. 2010, "The Peak of the Oil Age – analyzing the world oil production Reference Scenario in World Energy Outlook 2008", Energy Policy, Volume 38, Issue 3, retrieved at http://www.tsl.uu.se/uhdsg/Publications/PeakOilAge.pdf

6 http://www.aspo-ireland.org/contentFiles/newsletterPDFs/newsletter100_200904.pdf

cur in 2013.[7] In April 2010, the US military authorities issued a warning that all oil surplus production may be gone by 2012 and a potential massive shortage of oil may result in 2015.[8]

The real drama, however, is that this stagnation and eventual decline in the global supply of conventional fossil energy is happening at the same time as the demand for oil will inevitably increase significantly, driven mostly by the same two factors that have been pushing atmospheric carbon dioxide concentrations much higher than expected – population growth and increasing per capita income. The main momentum is coming from the large, rapidly growing transitional economies, where huge population groups are now about to reach income levels where per capita use of oil (mainly driven by increased private car ownership) and other energy (mainly driven by urbanisation, industrialisation and the need for new infrastructure that requires huge energy-intensive investments) is adding demand that is virtually impossible to meet with conventional energy supplies.

Simple back-of-the-envelope calculations illustrate the dilemma: in a decade China's and India's combined net oil imports would be roughly equivalent to the combined net oil exports from Saudi Arabia, Russia, Norway, Iran and the Emirates, if their current rate of increase in net imports were to continue. In fact, China alone may shock world oil markets. If China were to follow the same development pattern of per capita use of oil as South Korea, then Chinese consumers alone would need over 70 per cent of world oil production by the mid-2020s. It goes without saying that in reality this could not happen. But even a "modest" figure such as a doubling of China's share of global oil consumption over the coming decade – from its current 10 per cent – implies an annual increase of global oil production by well over 10 per cent, which should be compared to the average annual 1 per cent growth in global oil output of the past 25 years.[9]

The Geopolitics of Energy Supply: A Major Risk Factor

Dramatically intensifying competition for conventional fossil energy will have fundamental impacts on our economies and societies already within the course of this decade.[10] Oil is the most convenient and multi-purpose fossil fuels, accounting for about 43 per cent of the world's total energy consumption, and 95 per cent of fuels used globally for transportation. Oil and gas are feedstock for plastics, paints, fabrics, pharmaceuticals, fertilisers, electronic components, tyres and much more. The Hirsch Report[11], commissioned by the U.S. Department of Energy and published in 2005, warns that "as peaking is approached, liquid fuel prices and price volatility will increase dramatically, and, without timely mitigation, the economic, social, and political costs will be unprecedented. Viable mitigation options exist on both the supply and demand sides, but to have substantial impact, they must be initiated more than a decade in advance of peaking."

With limited time to re-orient the energy system, this development is likely to produce significant price increases and price volatility.[12] An oil price approaching USD 150 per barrel in the summer of 2008 certainly played a role in the build-up to the financial crisis. With demand outstripping supply the world is bound to see repeated oil price hikes with far-reaching negative implications for global growth and high risks for regional or global economic meltdowns.

Another increasing global dilemma is that diminishing oil resources and the prospect of higher oil prices drive industry and governments towards exploration of energy resources located in environmentally sensitive areas and with higher negative impact on, and risks to, the environment. The recent oil leak in the Gulf of Mexico is a dramatic example of this development. These developments risk leading to severe environmental impacts, higher costs and dramatically changing public opinion. People will react to these large-scale impacts in unforeseeable ways, but we know that these reactions can rapidly impact on policymaking and business if they are strong enough.

Keener competition for the limited energy resources will have the most dramatic impact on the countries most dependent on imported energy. A majority of the most oil-dependent economies are found among the least developed countries on the African continent. These are the countries that will be the first to be cut off from their oil supply sheerly because they do not have the finances to compete on a market with higher prices. The possible consequences of this scenario are problematic with considerable impacts on agriculture and security of food supplies.

Our Conclusion: Change is Urgent due to Climate Change and Security of Supply

With more than 50 per cent of its gross energy consumption relying on fossil fuel imports, the EU is highly dependent on imported energy. The figures for oil and gas are even starker, with 80 per cent oil and 60 per cent gas import dependency.[13] As European oil and gas fields have already peaked and are likely to show a rapid decline over this dec-

7 UK Industry Taskforceon Peak Oil and Energy Security. "The Oil Crunch: Securing the UK's energy future"

8 The US Army report, http://www.jfcom.mil/newslink/storyarchive/2010/JOE_2010_o.pdf and a commentary in the Guardian http://www.guardian.co.uk/business/2010/apr/11/peak-oil-production-supply

9 http://blogs.cfr.org/geographics/2010/08/23/chinasoilconsumption/

10 Klare, Michael T. 2010, "China: the 21st century energy superpower" in European Energy Review, Sep 30, retreievd at http://www.europeanenergyreview.eu/index.php?id=2396&zoek=china

11 http://en.wikipedia.org/wiki/Hirsch_report

12 http://www.energypolicyblog.com/2010/03/12/oil-price-volatility-causes-and-recommendations-to-the-eu/

13 http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/Energy_production_and_imports

ade, these dependencies are bound to increase significantly, making the European economy exceedingly vulnerable to increasing energy competition.

Energy security, therefore, ought to be a major issue in the Union, also in a perspective of climate change. This becomes particularly evident when the EU approach to climate negotiations is compared to those of China and the U.S., where energy security is an overriding argument in favour of climate policy, although these two giants are both less import-dependent that the EU.

The International Climate Investment Framework is as important as a hedge against negative climate impacts as it is to building energy security for the European Union. In the short run the energy security argument may actually be more important, as it urgent for the EU to develop its own sources of energy to fill the gap left by declining oil and gas production in the Union.

From a climate-policy perspective there is every reason also for the EU to focus on the confluence between climate and energy security. A Climate Investment Framework to build real energy security, reduce greenhouse gas emissions and boost productivity and competitiveness would make the EU more credible as a world leader, and would put real strength behind the call for other countries to do their share.

This report launches the idea of an International Climate Investment Community as a complementary approach to the stalled UN negotiations. The EU is the global leader in clean tech export, but other parts of the world, mainly Asian countries are determined to win "the green race".

The EU has a comprehensive and ambitious climate strategy and should use this position to take an initiative to give new momentum to energy investments and thus turn climate mitigation policies into a strategy for growth.

Global Utmaning (Global Challenge) is an independent Swedish think tank. It is a network of people from business, politics and academia focusing on the challenges posed by a new world order regarding economics, environment and democracy.

GLOBAL UTMANING

Birger Jarlsgatan 27
111 45 Stockholm
Sweden
+46-8-787 21 50

WWW.GLOBALUTMANING.SE