Enhancing Ambition through International Cooperative Initiatives

norden

Enhancing Ambition through International Cooperative Initiatives

Nicholas Harrison, Nicolette Bartlett, Niklas Höhne, Nadine Braun, Thomas Day, Yvonne Deng and Sandrine Dixson-Declève

TemaNord 2014:518

Enhancing Ambition through International Cooperative Initiatives

Nicholas Harrison, Nicolette Bartlett, Niklas Höhne, Nadine Braun, Thomas Day, Yvonne Deng and Sandrine Dixson-Declève

ISBN 978-92-893-2746-6
http://dx.doi.org/10.6027/TN2014-518

TemaNord 2014:518
ISSN 0908-6692

© Nordic Council of Ministers 2014

Layout: Hanne Lebech
Cover photo: ImageSelect

This publication has been published with financial support by the Nordic Council of Ministers. However, the contents of this publication do not necessarily reflect the views, policies or recommendations of the Nordic Council of Ministers.

www.norden.org/en/publications

Nordic co-operation
Nordic co-operation is one of the world's most extensive forms of regional collaboration, involving Denmark, Finland, Iceland, Norway, Sweden, and the Faroe Islands, Greenland, and Åland.

Nordic co-operation has firm traditions in politics, the economy, and culture. It plays an important role in European and international collaboration, and aims at creating a strong Nordic community in a strong Europe.

Nordic co-operation seeks to safeguard Nordic and regional interests and principles in the global community. Common Nordic values help the region solidify its position as one of the world's most innovative and competitive.

Nordic Council of Ministers
Ved Stranden 18
DK-1061 Copenhagen K
Phone (+45) 3396 0200

www.norden.org

Content

Preface 7

Summary 9

1. Introduction 13
   - 1.1 Background 13
   - 1.2 The role of ICIs in the international negotiation process under the UNFCCC 14
   - 1.3 Objectives of this study 15

2. Identification and assessment of ICIs in sector wedges 17
   - 2.1 Renewables: Boost solar photovoltaic and wind energy 21
   - 2.2 Energy efficiency: Building heating and cooling 26
   - 2.3 Energy efficiency: Ban of incandescent lamps 32
   - 2.4 Energy efficiency: Electric appliances 35
   - 2.5 Energy efficiency: Cars & trucks emission reduction 40
   - 2.6 Energy efficiency: Maritime transport 44
   - 2.7 Fossil fuels subsidy reform 49
   - 2.8 Fluorinated greenhouse gases 53
   - 2.9 Reduce deforestation 57
   - 2.10 Short-Lived Climate Forcers 64

3. Identification and preliminary assessment of ICIs in actor wedges 69
   - 3.1 Top 1,000 companies 69
   - 3.2 Supply chain emissions reductions 70
   - 3.3 Green Financial Institutions 71
   - 3.4 Major cities 72

4. ICI design 75
   - 4.1 Ensuring additional impact from ICIs 75
   - 4.2 ICIs as a climate financing channel 79
   - 4.3 Options for the role of the UNFCCC and other organisations 82

5. Summary and recommendations 87
   - 5.1 Additionality and double-counting 87
   - 5.2 International overview of, and support to, ICIs 88
   - 5.3 Promising channels for Nordic support 89

References 93

Sammendrag 95

Appendix: Full list of ICIs 99

Preface

There is wide recognition that the current global emissions pathway – with the reduction pledges on the table in the UNFCCC – is unsustainable and leads to some 3.5–4.0 °C average warming over preindustrial levels. According to the 2013 UNEP Emissions Gap Report, a gap of some 8–12 Gt CO2e in 2020 still exists between predicted emissions and the emissions level with a likely probability of being on track to stay below the 2 °C target. COP 18 in December 2012 decided "to identify and to explore in 2013 options for a range of actions that can close this pre-2020 ambition gap with a view to identifying further activities for its plan of work in 2014."

International Cooperative Initiatives (ICIs), where mitigation ambition is enhanced outside the UNFCCC framework as a complement to Party pledges for those Parties and / or other stakeholders that wish to do so, can be one possible option to help close the pre-2020 ambition gap. The number of ICIs is growing and they offer many possibilities to support, and go beyond, pledges. The Nordic countries have also been active in this regard – e.g. with REDD+, renewable energy, energy efficiency, in the Friends of the Fossil Fuel Reform (FFFSR) and in the Climate and Clean Air Coalition (CCAC). The Nordic Council of Ministers has laid emphasis on black carbon in the Arctic and on the reform of fossil fuel subsidies.

This report examines a selection of ICIs and their potential to raise ambition and to generate additional greenhouse gas mitigation. The study concentrates on ICIs in areas where Nordic countries are already active or which they find interesting. A wide range of actions have been identified for Nordic countries and others to pursue.

Ecofys and University of Cambridge Programme for Sustainability Leadership have carried out the study for NOAK, a working group under the Nordic Council of Ministers. The aim of NOAK is to contribute to a global and comprehensive agreement on climate change with ambitious emission reduction commitments. To this end, the group prepares reports and studies, conducts meetings and organizes conferences supporting the Nordic negotiators in the UN climate negotiations.

Helsinki February 2014

Harri Laurikka
Chair of the Nordic Working Group
for Global Climate Negotiations

Summary

The Nordic Working Group for Global Climate Negotiations (NOAK) has identified that the activities of International Cooperative Initiatives (ICIs) could hold significant promise for raising ambition and closing the global emissions gap. These initiatives range from global dialogues and formal multilateral processes which identify and support mitigation activities, to implementation initiatives engaged in direct emissions reduction efforts.

This study examines a selection of these ICIs to explore their potential for delivering additional greenhouse gas mitigation and for raising ambition at both the national and international levels. Focussing on ICIs which make a direct contribution to closing the emissions gap, the study reviews initiatives across key thematic areas including: renewable energy, energy efficiency, fossil fuel subsidy reform, mitigating fluorinated greenhouse gases, reducing deforestation and managing short-lived climate pollutants. It goes on to consider a number of technical and institutional issues such as how to ensure additionality from the impact of ICIs, what potential ICIs could present as a channel for climate finance and what role the United Nations Framework Convention on Climate Change (UNFCCC) and other organisations could play.

The study concludes that there are a wide range of ICIs already making an important contribution to emission reductions globally. Many have potential to scale-up their activities and could offer promising new channels for public climate finance with the potential to deliver substantial additional emission reductions and catalyse ambition-raising in national pledges.

Based on the analysis undertaken for this study we propose a range of possible channels which Nordic countries and others could pursue to further their international climate priorities. These range from channelling additional finance and political support, to researching and developing new initiatives where promising mitigation potential exists but is yet to be fully realised. These include:

1. *Renewables*: *Boost solar photovoltaic and wind energy*: Form a coalition of powerful industry, finance and NGO partners to set ambitious and implementable global targets for installed capacity by 2020.
2. *Energy efficiency*: *Building heating and cooling:* Catalyse an initiative working with an alliance of commercial real estate sector actors who agree to a code / target in terms of future property investments. Also, further research to identify other initiatives that could enact new actions and additionality.
3. *Energy efficiency: Ban of incandescent lamps*: Expand the number of countries engaged in the en.lighten programme and enable more in-depth, focused support to a larger group of countries to enable market transformation.
4. *Energy efficiency: Electric appliances*: Form a coalition with countries who pledge to transform markets around at least three key appliances. Pool the unique strengths of Super-efficient Equipment and Appliance Deployment Initiative (SEAD), Collaborative Labelling and Appliance Standards Program (CLASP) and en.lighten to phase in super-efficient appliances and phase out inefficient ones.
5. *Energy efficiency: Car & truck emission reductions*: Support further research to develop initiatives that could increase the scale of impact and action (e.g. enabling more stringent emissions and fuel quality legislation and city traffic management schemes).
6. *Energy efficiency: Maritime transport*: Develop an initiative which engages with governments and major shipping companies to increase the scale of action and impact (e.g. though the support of risk guarantee schemes for retrofitting ships with energy efficiency and engaging natio-nally owned port authorities to incentivise energy efficient shipping.).
7. *Fossil fuels subsidy reform*: Develop a new initiative to provide an enabling platform of public-private actors to support countries willing to pledge to phase out fossil fuel subsidies by 2020. For example, this could include increasing pressure on lending institutions to maintain their commitment to fossil fuel subsidy phase out and ensure integration in all lending criteria. Political support could be provided by relevant governments and IGOs with focussed policy and technical support provided by some of the ICIs highlighted in this study.
8. *Fluorinated greenhouse gases*: Strengthen support for utilising the Montreal Protocol to regulate phase out.

9. *Reduce deforestation*: More research is needed on how to scale up ICIs which are focused on decreasing the drivers for deforestation and enabling sustainable forest management. Widening the focus to an integrated land management approach is also key here, as well as the relatively untapped contribution that landscape and forest restoration could make.
10. *Short-Lived Climate Forcers*: Strengthen resources and support for the Climate and Clean Air Coalition (on condition that effective tracking and ambitious targets are set).

1. Introduction

1.1 Background

There is now wide recognition that the current global emissions pathway – with the reduction pledges on the table in the UNFCCC – is unsustainable and leads the world to an "emissions gap" of some 8–13 Gt CO_2e in 2020 (UNEP, 2012). The UNEP Emissions Gap report clearly stated the urgency and scale of this challenge as well as the potential still available to bridge the gap and return the world to a more secure 2-degree pathway by 2020.

In line with the decision at COP18 to identify and explore options for actions that can close this pre-2020 ambition gap, the Nordic Working Group for Global Climate Negotiations (NOAK) has identified that a promising way forward could be through the activities of the many International Cooperative Initiatives (ICIs) now working to support implementation of pledges and provide new and additional emission reductions around the world (Seppänen *et al*., 2013; Halonen *et al*., 2013).

International Cooperative Initiatives are broadly defined as one of three types of activity (UNEP, 2013):

- Global dialogues.
- Formal multilateral processes.
- Implementation initiatives.

For the purposes of this study, we restrict the definition further to those initiatives which are international in scope and make a direct contribution to closing the emissions gap.

As outlined in the 2012 Nature paper (Blok *et al*., 2012) articulating the "Wedging the Gap" approach, there are a myriad of ICIs now underway and in development. If their efforts are to be effectively leveraged to close the gap, a number of questions must now be addressed:

- How can we address the risk of double counting and assess the additionality of ICIs?
- What (if any) is the role of the UNFCCC and others in facilitating and / or recognising / tracking further action from ICIs?
- How effective are ICIs compared to other options for mitigation which parties may channel financial resources to?

1.2 The role of ICIs in the international negotiation process under the UNFCCC

The ad-hoc group on the Durban Platform (ADP) is negotiating, under its work stream 1, a future international agreement by 2015. Under its work stream 2 it explores ways to raise ambition before 2020 through more ambitious pledges, more financial resources and complementary initiatives.

International cooperative initiatives are enjoying growing support as potential vehicles of ambition-raising in this context. Analysis of submissions to work stream 2 of the ADP identifies ICIs are highlighted in 16 formal submissions from Parties and Observers and emphasised in three dedicated workshops during 2013. Clearly then, ICIs show signs of playing an increasingly important role in the overall climate negotiation process under the UNFCCC. One reason for this could be that emission reductions pledges and commitments by governments can only be truly ambitious if there is willingness for action from other plurilateral and non-state actors. For example, setting national targets together with businesses and sub-national actors (cities and regions) could to be more promising.

Another reason could be that for various domestic political or economic reasons, some countries are restricted in their ability to increase their pledge. For these countries a route to increasing ambition through stronger ICI involvement could be more attractive and politically viable.

However, it remains to be seen if ICIs will be more formally recognised under the UNFCCC and various technical and governance issues may first need to be resolved. For example, some Parties may see threats to sovereignty arising from a more direct role for ICIs, and others may oppose ICI resources being counted towards international climate financing pledges.

1.3 Objectives of this study

The objective of this study is to identify and review ICIs in order to assess their potential for greenhouse gas mitigation and ambition raising, specifically addressing the following questions:

- Which are the most promising and effective channels to deliver higher ambition and under which circumstances?
- How could the UNFCCC most effectively facilitate, be informed by and possibly recognise further action from ICIs?
- How can additionality and overlaps / double counting relative to pledges be effectively addressed?
- What kind of ICIs could the Nordic countries support taking into account their priorities in the negotiations?

2. Identification and assessment of ICIs in sector wedges

The full list of most promising, existing ICIs was collected (see Table 17) based on:

- ICIs identified in (Blok *et al*., 2012).
- Additional ICIs identified in 2013 submissions to the ADP (Ecofys currently reviewing for the UNFCCC) (Wouters, 2013).
- Additional ICIs proposed by NOAK members.

14 thematic areas, or "wedges", were chosen for further examination in terms of organisational feasibility and / or impact (see Table 1). 15 interviews of ICI representatives were undertaken to gather input across 10 of these thematic areas.

The 10 thematic areas for which we undertook interviews were all of sectoral nature. We present our findings for these in Section 2 per thematic area, or "wedge". Findings are informed by semi-structured interviews (undertaken over the phone during the period July–August 2013) unless clearly referenced to another source. In addition, we present preliminary desk research findings and analysis for four promising wedges which are of the "actor" type in Section 3.

For each thematic area we present estimates of emission reductions by 2020. We differentiate, where available, between the following:

- *Total technical mitigation potential*: Total, time-independent, technically possible mitigation potential per thematic area.
- *Total possible mitigation potential*: Total achievable mitigation potential for a sector per thematic area by a certain point in time.
- *Potential of an initiative*: Part of the total potential assumed to be possible through a specific initiative.
- *Possible full effect of agreed targets*: Expected effects of agreed targets for all initiatives in a thematic area, assuming their full implementation.
- *Expected effect of implementation of targets*: Expected effects of agreed targets for all initiatives in a thematic area, making assumptions on their likely implementation success.

- *Achieved mitigation to date*: measured historical effect of implementation of targets by initiatives in a thematic area.

We present our findings under the following headings per sectoral theme:

- Mitigation potential.
- Benefits of taking action beyond climate impacts.
- Barriers to taking action.
- Options for scaling up.
- Need for government support.
- Focus ICI: Leadership capability, capacity and scope.

Table 1 shows the long list of ICIs from which the focus ICIs were selected after agreement with NOAK. In addition, Table 17 shows the current full list of ICIs identified under the overall Wedging the Gap approach from which this long list was selected.

Table 1 Long list of ICIs considered in this report

Wedge / Thematic area	NOAK topic group	Name of initiative	Led by
Boost solar photovoltaic energy / Boost wind energy	Renewables	(IRENA) International Renewable Energy Agency (REEEP) Renewable Energy & Energy Efficiency Partnership 300 GW/a initiative	Intergovernmental organisation [REEEP] pv magazine
Building heating and cooling	Energy efficiency	(SBCI) Sustainable Buildings & Climate Initiative (GBPN) Global Building Performance Network's Energy efficiency in Buildings initiative Energy Efficiency in Buildings projects MEF action on buildings World Green Building Council	UNEP [GBPN] WBCSD MEF [World Green Building Council]
Ban of incandescent lamps		en.lighten	UNEP
Electric appliances		(CLASP) Collaborative Labelling and Appliance Standards Program	Alliance to Save Energy, International Institute for Energy Conservation, the Lawrence Berkeley National Laboratory
		(SEAD) Super-efficient Equipment and Appliance Deployment Initiative	Clean Energy Ministerial
Cars & trucks emission reduction		30 by 30 Initiative (PCFV) Partnership for Clean Fuels and Vehicles (GFEI) Global Fuel Economy Initiative (ICCT) International Council on Cars and transport	IRU UNEP FIA Foundation primarily Climate Works Foundation
Maritime transport		Sustainable Shipping Initiative Carbon War Room (IMO) International Maritime Organisation	[Sustainable Shipping Initiative] [Carbon War Room] UN
Fossil fuels subsidy reform	FF subsidy reform	[no initiatives yet with a clear focus and target]	
Fluorinated gases initiative	HFCs	(CCAC) Climate and Clean Air Coalition to reduce Short-Lived Climate Pollutants Refrigerants Naturally!	UNEP [Refrigerants Naturally!]
Reduce deforestation	Deforestation	REDD+ Partnership (FCPF) Forest Carbon Partnership Facility Forest Investment Program Global Bioenergy Partnership (GPFLR) Global Partnership on Forest and Landscape Restoration (CPF) Collaborative Partnership on Forests REDD Programme Rainforest Alliance Tropical Forest Alliance The Prince's Rainforest Partnership	[REDD+ Partnership] World Bank FAO IUCN CGIAR UNEP [Rainforest Alliance] USAID The Prince of Wales
SLCFs	SLCFs	(CCAC) Climate and Clean Air Coalition to Reduce Short-Lived Climate Pollutants Global Methane Initiative	UNEP [GMI]

Wedge / Thematic area	NOAK topic group	Name of initiative	Led by
Supply chain emissions reductions		(CGF) Consumer Goods Forum	[CGF]
		Clean By Design	Walmart
Top 1000 companies		Caring for Climate by UNEP & UN Global Compact	UNEP
		WWF Climate Savers	WWF
Green financial institutions		(UNEP-FI) UNEP Finance Initiative	UNEP
		(BEI) Banking Environment Initiative	CPSL (University of Cambridge Programme for Sustainability Leadership)
		(IIGCC) Institutional Investors Group for Climate Change	[IIGCC]
Major cities		(C40) C40 Cities Climate Leadership Group	[C40]
		(cCCR) carbonn Cities Climate Registry	ICLEI
		Mexico City Pact	[Mexico City Pact]
		International Council for Local Environmental Initiatives (ICLEI)	[ICLEI]
		Climate Alliance	[Climate Alliance]
Sub-national governments		R20 Regions of Climate Action	[R20]
		States and Regions Alliance	Climate Group
Access to energy		(SE4ALL) Sustainable Energy for All	UN Director general
		International Energy and Climate Initiative – Energy+	Govt. of Norway
Agriculture		Global Methane Initiative	[GMI]
		Global Research Alliance on Agricultural Greenhouse Gases	[Global Research Alliance on Agricultural Greenhouse Gases]
		Global Bioenergy Partnership	FAO
Efficient cook stoves		(CCAC) Climate and Clean Air Coalition to Reduce Short-Lived Climate Pollutants	UNEP
Voluntary offset companies		[none]	n/a
Voluntary offset consumers		[none]	n/a

2.1 Renewables: Boost solar photovoltaic and wind energy

The focus on renewables in this section will only cover wind and solar photovoltaic energy. There are three main global initiatives actively promoting solar and wind power rollout globally REEEP, IRENA, and the 300GW/a initiative.

Table 2 List of initiatives: Renewables

Name of Initiative	Description	Starting Year
Renewable Energy and Energy Efficiency Partnership (REEP)	REEEP is a non-profit organisation that has a primary focus on scaling up of clean energy business models. It helps to fund small-to-medium scale projects that address barriers to market development, provides internet based information resources and is connecting countries and stakeholder that have developed best practice policies. Website: REEP – http://www.reeep.org/	2002
International Renewable Energy Agency (IRENA)	IRENA – intergovernmental organisation dedicated to renewable energy. The IRENA is an intergovernmental organisation that supports countries in their transition to a sustainable energy future, and serves as the principal platform for international cooperation, a centre of excellence, and a repository of policy, technology, resource and financial knowledge on renewable energy. Website: IRENA – http://www.irena.org	2009
300 GW/a	The 300GW/a initiative aims at raising awareness of the possibilities for the global PV industry, which could form a key pillar of the global energy supply by 2025. pv magazine is engaging with experts from the industry, politics and academia to determine what can be done to achieve the goal of 300 GW installed capacity per year by 2025. Website: http://www.pv-magazine.com/archive/archive/kategorie/09-2012/#axzz2dAHwTCpj	–

2.1.1 Mitigation potential

The total possible mitigation potential by 2020 from wind and solar is estimated between 1 and 2.5 Gt CO_2e as follows: The IEA is conservative on the potential and stated in its World Energy Outlook 2012 that current policies on renewable energy could be enhanced to deliver emission reductions of up to 1 Gt CO_2e by 2020 (IEA, 2012). The UNEP emissions gap report 2011 (UNEP, 2011a) is more optimistic with 1.5–2.5 Gt CO_2e by 2020. The long-term total mitigation potential of renewables is much larger, of course, estimated at up to 30% of total cumulative emissions between 2010 and 2050 compared to baseline by (IPCC, 2011). Concrete

initiatives on wind and solar could deliver a reduction of up to 1.4 Gt CO_2e from solar power and 1.2 Gt CO_2 e from wind power in 2020 (Blok *et al*., 2012). This estimation was based on an assumption of 1,600 GW additional solar and 650 GW additional Wind installed capacity.

IRENA and REEEP are prominent international organisations driving renewables deployment, but they do not formulate specific targets so their impact is difficult to forecast. Other initiatives exist at global and regional level with concrete targets for solar or wind deployment. At global level, the most notable individual initiative is the 300 GW initiative by the trade journal pv magazine, which aims to increase *annual* added PV capacity from currently ~30 GW/a to 300 GW/a resulting in a *total* installed capacity just short of 700 GW in year 2020.

Wouters (2013) estimated the 2020 impact of the 300 GW/a initiative at around 0.46 Gt CO_2e. For wind energy, several regional initiatives exist (e.g. in Europe and the US) which have been estimated by Wouters (2013) to have a potential of 0.37 Gt CO_2e by 2020. These results suggest that there is still space for scaling up this ambition.

Alongside desk research, a structured interview was conducted with a senior representative of IRENA, resulting in the findings below.

2.1.2 Benefits of taking action beyond climate impacts

It is IRENA's experience that, although climate policy may be a driver for renewables, it is not seen as the overriding one, especially given the low carbon price in many places. Instead, energy security and energy independence, as well as local value creation through technological development and employment, are often cited as main objectives for adoption of renewables given the volatility of oil and gas prices. Distributed renewable energy supply can also provide access to energy for communities where centralised infrastructure is lacking. Another motivation cited was the decrease of air pollution through increasing the share of renewable energy, thereby leading to improvements in public health.

In terms of enhancing local employment opportunities, the ILO estimates that employment in the wind energy sector could grow from 0.7 million jobs to 1.9 million globally by 2020 (ILO, 2012).

2.1.3 Barriers to taking action

Policy hurdles (e.g. planning procedures and priority grid access) and market distortions (such as subsidies for other energy technologies or fuels or the lack of a carbon price) are major barriers, as well as capital risk and high upfront capital costs. Barriers also encountered are of a financial, legal and institutional nature, as well as technology limitations in resource poor regions and a lack of existing infrastructure (UNFCCC, 2013).

This is a new and highly dynamic field with a diverse range of options and lack of capacity can be a real barrier. Most of the international lenders such as the World Bank, EBRD and EIB have pointed to the need for capacity building at the policy level to enable better regulatory development and hence investment opportunities in the renewables sector.

Scale or access to the necessary funding can also be a problem. Often, the size of a proposed renewables project is too small in comparison to the typical project financed by traditional project finance sources, including development banks. Similarly CPSL's own work in central and Eastern European countries around renewables finance has shown that either bundling small projects in the same country or bundling projects between countries in the same region enhances investor interest and project viability.

In this respect, IRENA is currently exploring a range of ways in which it could overcome this barrier, whether it be through bundling projects to create scale for the banks or supporting banks in adapting their policies to enable such projects to be financed.

Developing the necessary infrastructure can also involve decades of change, which means that fully understanding the implications of policy choices and investment opportunities is critical. The need for infrastructure development can be a major barrier to renewables, particularly for wind, where high potential wind areas are often located far from the power grid. The time and investment needed to ensure this access can significantly slow renewable deployment.

2.1.4 Options for scaling up

IRENA has a project facility, funded by and co-delivered with the Abu Dhabi Fund for Development (ADFD). It provides new and additional concessional funding of 50 USD million annually for 7 years to innovative renewable energy projects with important demonstration effects. Replicability and scalability are criteria for financing; approval for the first round of funding is the final decision stages at present. More countries could come forward with funding to co-create these facilities to help scale.

Clearly, providing the right policy framework to support renewable energy deployment will support scaling up renewables. Contrary to common perception, however, this is not necessarily about providing subsidies but more about creating the right framework for enabling renewable energy uptake. Such a framework includes the elimination of subsidies for fossil energy. Solar energy is becoming competitive in many countries and retail dynamics are supporting continuation of this trend. However, a clear tension is emerging with the established energy industry / utilities in these places in terms of business models: solar energy is clearly negatively impacting profits for some of them.

In terms of decreasing the perception of risk around scaling up renewable energy investments, in the longer-term, organisations such as IRENA may be able to help provide concrete data and case studies to support countries in making their cases for lending / investment. IRENA is also actively analysing options for finding practical solutions to the capital costs and risk – from potentially developing a risk guarantee fund to providing access for members on relevant funding sources.

As mentioned above, there is a critical need for investment in infrastructure to provide grid access for renewable electricity in order to scale it up. The need for land and the impact of noise can lead to planning and governance hurdles for wind energy – governments need to focus on streamlining these processes to enable scaling up.

2.1.5 Need for government support

Building on the above points, governments need to continue focusing and investing in this area, making the time available to foster public discourse and debate and actively participating in international discussions through fora such as IRENA. This will help overcome any lobbying disadvantages that renewables may face as a newly emerging industry.

IRENA believes that having a target for renewable energy is very important, even if not backed up by a subsidy programme. The target sends a clear market signal to enable investment decisions. IRENA and REEP believe that more renewables lobbying is necessary in order to ensure long term policy and market mechanisms are put into place to enhance renewable energy uptake. One key issue identified by CPSL in its renewables work has been the lack of strong national organisations promoting the entire renewables industry rather than specific sectoral interests e.g. wind, solar or biomass. This creates competitiveness between different renewable energy producers at the national level and means there is rarely a unified lobbying voice.

2.1.6 Focus ICI: IRENA

Aims and objectives

One of the roles IRENA fulfils is that of being the international agency for renewable energy. Renewables are a highly dynamic field and are new to many countries. Joining IRENA provides relatively low-cost access to advisory support for policymakers in member countries, providing a clear benefit in being involved. The international knowledge exchange platform provides a tangible benefit not only to developing countries but to founding members as well – having a link to global activities in the field and analysis of what has worked and what hasn't, benefits all member countries. In a highly dynamic field, policy needs to adapt accordingly – lessons learnt from other countries can be highly valuable in creating effective policy.

IRENA serves 3 main functions:

- Global unified voice for renewables.
- International hub for cooperation and debate in an unbiased setting.
- Advisory resource.

Leadership capability: track record, scope, capacity, & convening power

IRENA is an intergovernmental agency and was officially established in Bonn on 26 January 2009. The first session of the IRENA Assembly was held in April 2011.

It commands excellent convening power: at its most recent Assembly it had over 100 delegates from 137 countries with at least 30 Ministers present.

It is organised into 3 divisions:

- Knowledge, Policy and Finance.
- Innovation and Technology.
- Country support and partnerships.

As a relatively new agency, it is still developing its database of case studies in terms of impact. It believes that its "anchor approach" is an important part of its positive impact in enabling countries to deploy renewables. In this approach, which helps a country to conduct its Renewables Readiness Assessments, the work is not delivered by external consultants but is country led and delivered. IRENA moderates the process with the local government, creates the platform for engagement with the right stakeholders and provides credibility. This means that the developed capacity stays within the implementing country and speeds up the process by anticipating and overcoming potential barriers raised

by stakeholders. An example of where this is proving successful is Senegal which has already implemented two of the recommended decrees from its 2012 assessment report.

It is fully international in scope: It currently has 161 countries as members, 43 of these are in accession. Its headquarters are in Abu Dhabi (UAE), with an Innovation & Technology Centre in Bonn. With a lean approach to management, the intention is not to open many global offices, instead, it works through key partnerships on the ground to enable its global work.

2.2 Energy efficiency: Building heating and cooling

There are several global and regional initiatives aimed at decreasing energy waste in the built environment.

Table 3 List of initiatives: Energy efficiency: Building heating and cooling

Name of Initiative	Description	Starting Year
Sustainable Buildings & Climate Initiative (SBCI)	The SBCI was created by the UNEP in order to address GHGs emission and energy use reduction in the buildings sector in a global way. It is a partnership of governments, the private sector, research centres. The main goals of the initiative are to – provide buildings stakeholders with a platform for collaboration and collective actions – set performance assessment baselines for buildings energy use and GHGs emissions – elaborate strategies for policy measures acceptance – implement measures and changes. Website: –	2008
WBCSD, Energy Efficiency in Buildings projects	The second phase of this 4 year initiative (2013–2017) will analyse market's opportunities and barriers concerning energy efficiency in buildings and will procure recommendations to stakeholders involved in the building sector. Website: –	2006
MEF action on buildings	One of the subgroups of the MEF is focusing on energy efficiency in buildings. Website: –	–
World Green Building Council	The World Green Building Council is a network of national green building councils in more than ninety countries. They support new and emerging Green Building Councils by providing them with the tools and strategies to establish strong organisations and leadership positions in their countries. Website: http://www.worldgbc.org/index.php?cID=220	2002
Global Buildings Performance Network (GBPN)	The GBPN, by the Climate Works Foundation, GBPN carries out research and distributes the knowledge to diverse key stakeholders in energy performance in buildings to capture the economic, technical potential of energy performance in buildings (GBPN, 2013) Website: http://www.gbpn.org/	2011

2.2.1 Mitigation potential

Emissions from the building sector account for around a third of energy-related emissions. It is estimated that between 45%–70% of these are related to heating and cooling. UNEP (2011a) estimated the full global energy savings potential in 2020 in the built environment at around 1.8 Gt CO_2e. Based on this estimate, Blok *et al*. (2012) estimated an achievable reduction potential of up to 0.6 Gt CO_2e in 2020 which covers savings from highly efficient new builds, as well as existing buildings.

There is a range of global initiatives concerned with reducing emissions from the built environment, but few specify targets or agree on a baseline definition. One initiative with a target is the Global Buildings Performance Network (GBPN), which also contains the European BPIE initiative. It aims at a reduction in global emissions from buildings of 25% below baseline in 2020. Assuming that this reduction should be achieved equally from all emission sources in buildings, the commitment would be equivalent to around 1.6 Gt CO_2e savings in 2020, i.e. much higher than the estimate by Blok *et al*. (2012).

As well as desk research, semi-structured interviews took place with senior representatives from the UNEP SBCI and the Buildings Performance Institute Europe (BPIE), which is part of the Global Buildings Performance Network (GBPN), resulting in the findings below.

2.2.2 Benefits of taking action beyond climate impacts

Clearly there are strong economic drivers to enabling cost-effective energy efficiency options. The IEA estimates that this would increase global economic output through 2035 by 18 USD trillion (IEA, 2012). UNFCCC (2013) notes that it can support technological advancement, as well as potential increased employment benefits, reduced fuel bills of households and a reduced need for investment in the energy supply.

There are also clear links with adaptation. For example, improving building insulation to reduce energy consumption in winter can also reduce heat entering a building in the summer, thus reducing additional costs (and emissions) from air cooling.

2.2.3 Barriers to taking action

The building industry is highly fragmented and cuts across the remits of many government departments – social housing, construction, local government etc. This complicates the issue and without clear coordination across governments, change is difficult to implement. Traditionally the

UNEP, for example, has close relationships with the Environment Ministries and needs to develop relationships across governments in order to support effective action.

Data and information is critical for success in this area, again implying a need for coordination across government. The needed data is not always held by governments, it is often held by the private sector instead, which means that cross-sectoral collaboration is critical, further complicating effective action and potentially causing delays.

Ultimately, the UNEP believes that scale and finance, at both a country level and within initiatives such as the UNEP's SBCI, provide the major barrier. To enable investment, scale is needed and this can be difficult in a sector which develops in a project-by-project manner.

UNFCCC (2013) notes that energy efficiency faces broadly common barriers in all countries and summarises these barriers as:

A. "policy barriers, such as market organization and price distortions"
B. "high project development costs relative to energy savings, high upfront capital costs and perceived capital risk and high transaction costs"
C. "information barriers and lack of awareness of the financial benefits of financial institutions and of a large number of consumers to make informed consumer decisions"
D. "institutional bias towards supply-side investment and energy tariffs that discourage energy-efficiency investments"
E. "lack of affordable energy-efficiency technologies that are suitable to local conditions and capacity to maintain energy-efficiency investments"
F. "other legal, regulatory, institutional, financial and technological barriers."

2.2.4 Options for scaling up

Interviewees pointed to a need for a more integrated approach, clearly linking building and infrastructure energy efficiency with primary energy supply, broadening the goal to one of low or zero carbon buildings as opposed to only focusing on energy efficiency. Clearly doing this means one will encounter some of the same market / business model issues that renewables face in general (highlighted above) but moving towards this approach could enable emission reductions far more quickly.

Movements toward this approach can already be seen. An initiative which should be noted in this area is the "1 Billion m^2" initiative

launched by REEP and the Global Buildings Performance Network in May 2013. Its aim is to encourage the construction of 1 billion m^2 of net energy positive and affordable social housing by 2023.

The UNEP SBCI will also be taking a more integrated approach to this by working to ensure their energy efficiency and resource efficiency in buildings work streams reinforce each other, again supporting emission reductions by taking a holistic building sector approach.

Another option for scaling up action in this area would be to catalyse an initiative which brought together the commercial real estate sector to agree to a voluntary code / target in terms of their future property investments. Alliances which bring together major real estate players do already exist, for example, an organisation such as the Urban Land Institute's Greenprint Center for Building Performance, which represents major real estate investors, owners and other stakeholders, could lead on such an initiative, working in close collaboration with organisations such as the GBPN, the UNEP, SE4All and others.

2.2.5 Need for government support

To enable and speed up a more integrated building sector approach across all of the UNEP's work streams, governments could earmark any funding they send to the UNEP Trust Fund to the Sustainable Buildings and Construction (SBC) Programme of the 10-Year Framework of Programmes (10 YFP) on Sustainable Consumption and Production adopted at Rio+20 Conference.

Clearly, there is a major role for governments to play in terms of increasing action in this area, with the main policy tool being building code reform and setting mandatory energy efficiency targets. The cycle to revise these codes and get targets approved can take years and the process can be laborious. It is recommended that when the window of opportunity arises, governments take as integrated an approach as possible to sell the benefits of more sustainable building overall thus not focusing solely on energy efficiency, but also energy supply, water, waste etc.

Also, governments could exchange best practice and policy experience in bilateral / trilateral / multilateral discussions to keep the debate and discussion alive in this area and increase the appeal of energy efficiency / energy savings legislation, which to date is not receiving the attention it deserves in comparison with energy supply policy. These policy case studies should include policy costs and gains.

Governments could run pilots and provide case studies on successful pilots in this area or fund these demonstration projects in developing countries.

The need for data collection and sharing was continuously highlighted – this helps to establish baselines.

2.2.6 Focus ICI: the UNEP SBCI

Aims and objectives

According to its website, SCBI has a mission "to present a common voice for building sector stakeholders on sustainable buildings and climate change."

Goals:

1. "Provide a common platform for dialogue and collective action among building sector stakeholders to address sustainability issues of global significance, especially climate change."
2. "Develop tools and strategies for achieving greater acceptance and adoption of sustainable building practices throughout the world."
3. "Establish baselines, which are globally recognized and are based on a life cycle approach. Focus has initially been concentrated on establishing baselines for energy efficiency and Greenhouse Gas (GHG) emissions, but is now expanding to account for additional indicators such as materials and water."
4. "Demonstrate through pilot projects and inform policy developments of the important role buildings have to play in mitigation and adaptation to climate change at local, national and / or global levels."

Further details about its objectives to meet each of these goals can be found on its website.

Leadership capability: track record, scope, capacity, & convening power

The initiative was started in 2006. Part of the focus of the SBCI's work has been to develop a common metric for measuring and reporting GHG emissions in buildings – the Common Carbon Metric (CMC). One of its major programmes at the moment, the "NAMA Development for Building Sector in Asia" project, is assisting 4 Asian countries (Thailand, Indonesia, Vietnam and the Philippines) to assess Nationally Appropriate Mitigation Action (NAMA) opportunities in their respective building sectors and support them in embedding carbon metrics into their policy frameworks. The project has 3 observer countries, China, India, Malaysia, which provide significant opportunities for scaling these activities up in

the future. Because of the in depth country support that the UNEP provides in helping these countries, increasing their capacity and resources would enable this scaling up to occur. It is worth noting that the UNEP is able to draw on the platform for action already created by its en.lighten initiative to support this scaling up.

In terms of benefits for those involved with initiatives such as the UNEP's SBCI, countries are provided with policy advice and support, as well as support for developing their NAMAs, which provides a clear incentive to work with them.

The main project focus at present is its: "NAMA Development for Building Sector in Asia" project. This has 4 Asian countries involved with the scope to increase to across Asia.

The UNEP has numerous offices around the world and its scope to scale such activities is truly global.

2.2.7 Focus ICI: Global Buildings Performance Network (GBPN)

Aims and objectives

The GBPN is a globally organised and regionally focused network whose mission is to advance best practice policies that can significantly reduce energy consumption and associated CO_2 emissions from buildings. They promote what they phrase as the "Deep Path", a transformational change agenda, enabling a 80% global reduction of thermal energy demand from buildings by 2050, representing over 2.1 Gt of CO_2 avoided.

Leadership capability: track record, scope, capacity, & convening power

It was launched by the Climate Works Foundation in 2011, as a non-profit Best-Practice Network. It has a mandate to advance knowledge and expertise globally on building energy performance.

It has 4 regional hubs in what it sees as priority regions for this agenda: China, India, Europe, and the U.S. Its Global Centre in Paris coordinates its work.

They describe their role as advising and informing governments, national administrations and agencies, building designers & developers, financial institutions and multilaterals, and other key stakeholders involved in the energy performance of buildings. They distil and distribute local and regional best practices and lessons learnt and champion policy packages that can achieve the Deep Path.

Its four hubs / partners are:

- China Partner, Energy Foundation China.
- Europe Hub, Buildings Performance Institute Europe (BPIE).
- India Partner, Shakti Sustainable Energy Foundation (SHAKTI).
- U.S. Hub, Institute for Market Transformation (IMT).

2.3 Energy efficiency: Ban of incandescent lamps

The en.lighten initiative from the UNEP is the main global initiative attempting to drive a transformation in lighting at global scale.

Table 4 List of initiatives: Energy efficiency: Ban of incandescent lamps

Name of Initiative	Description	Starting Year
The UNEP / GEF en.lighten initiative	The en.lighten initiative has been established to accelerate global market transformation to environmentally sustainable lighting technologies by developing a coordinated global strategy and providing technical support for the phase-out of inefficient lighting. Website: http://www.enlighten-initiative.org	2009

2.3.1 Mitigation potential

Incandescent lamps are still the dominant lighting technology globally, although phase-out schedules exist in several countries and regions. The en.lighten initiative of the UNEP and the Global Environment Facility has set itself a target to achieve a transition to efficient lighting technologies globally by 2016 with an original estimated reduction impact of ~0.2 Gt CO_2e in 2016 already (En.lighten initiative, 2012). Given the scarcity of data in this area, Blok *et al*. (2012) used this commitment for a cautious estimate of the total reduction potential in 2020. A recent report by en.lighten assessed the 2016 impact of their efforts at ~0.5 Gt CO_2e (En.lighten initiative, 2013).

In addition to analysis and desk research, two semi-structured interviews were conducted, one with a senior representative from en.lighten at the UNEP and one with a representative from Philips who works closely on the platform as a member.

2.3.2 Benefits of taking action beyond climate impacts

As highlighted in previous sections, there are clear economic benefits for action in the area of energy efficiency. En.lighten believe that governments are keen to engage with the initiative as shifting from inefficient to efficient lighting systems has many co-benefits, including cost savings at both the householder and a national level and decreased peak electricity demand, thereby the potential to reduce blackouts. It is seen as a cost-effective way to increase energy efficiency and reduce carbon emissions – a "low hanging fruit".

It is also an area where gains can be made relatively quickly, interviewees noted that the entire transition can take between 2–3 years on average, taking much longer than this can actually create issues due to the confusion it can cause for consumers.

2.3.3 Barriers to taking action

In addition to policy hurdles, lack of technical expertise, experience and capacity can be a real barrier to successfully implementing policy in this area. The process involves not only ensuring the most efficient lighting systems are made available and are taken up in the market, but also that the inefficient lighting systems are no longer available – i.e. it is about market transformation. Governments need to take all the implications into account when implementing a framework – not doing this well can result in competiveness issues for local suppliers and a stakeholder backlash.

Interviewees cited a lack of awareness by governments and the international community of donors, development banks, investors and bilateral agencies, of the efficacy of this policy option, how effective it can be and how quickly it can be successfully rolled out.

2.3.4 Options for scaling up

In terms of scaling up the en.lighten initiative, interviewees clearly see increased funding in this area as being the main opportunity and current barrier for scalability. A proper funding mechanism would allow more countries / regions to be provided with in-depth ("fast lane") support.

Increased impact would also be achieved through expanding the initiative to include industrial and commercial lighting systems. The focus is currently on residential / domestic lighting as this is the source of up to 2/3 lighting emissions in countries. Expanding the country commitments to include more products and appliances, such as air conditioners / fans could vastly reduce energy consumption further.

Another option identified is to expand private sector involvement. It is worth noting that this sector is currently evolving very quickly, with LED lighting being potentially easier to manufacture than the older lighting systems. Also, the initiative takes an integrated approach looking at the entire supply cycle and expanding the private sector base is critical for the integrated recycling systems to be successfully implemented in developing countries; consequently the companies involved invest in these countries. The private sector partners often provide funding in country and the in-kind technical expertise and data is critical to the initiative's success. It also lends credibility and weight to the initiative when inviting a country to come on board if certain companies have manufacturing or distribution facilities in that country.

2.3.5 Need for government support

Apart from the clear funding needs laid out above, governments can support this through adoption of the initiative nationally and encouraging other countries to undergo the same transition from old to new efficient lighting systems and share best practice in bilateral / multilateral fora.

2.3.6 Focus ICI: the UNEP en.lighten

Aims and objectives

The initiative has the aim of accelerating a "global market transformation to environmentally sustainable, energy efficient lighting technologies, as well as to develop strategies to phase-out inefficient incandescent lamps to reduce CO_2 emissions and the release of mercury from fossil fuel combustion."

Leadership capability: track record, scope, capacity, & convening power

It was established in 2009. 50 countries spanning Africa, Asia, Europe, Latin America, the Caribbean and the Middle East, have joined the en.lighten Global Efficient Lighting Partnership Programme and agreed to the phase-out of inefficient incandescent lamps by the end of 2016.

The initiative is a public / private partnership between the United Nations Environment Programme, OSRAM, Philips Lighting and the National Lighting Test Centre of China with the support of the Global Environment Facility. The most recent partner is the Australian Agency for International Development (AusAID).

The initiative has taken a clear regional approach, this allows for market efficiencies and scale, as well as supporting the creation of a full light-

ing value chain system being created, including recycling facilities and quality control. Activities have been focused on West Africa (15 countries) and Central America (8) through a regional approach, as well as on support the remainder of the 50 member countries through their local UNEP offices, regional seminars and offsite advice. Plans are currently being developed for the next phase of expanding the initiative into the ASEAN countries, for which funding has been secured.

This is an area where strong examples exist of how countries have successfully made this transition, which can create confidence in the process and outcome

Having the private sector as partners is cited as an important part of the initiative's success; having their experience of what does and doesn't work in terms of successful market transformation policy is cited as one of the reasons the initiative is successful.

There is a strong governance system in place to manage the initiative.

Interviewees noted that most participating countries were successfully undergoing the journey, with countries such as Chile and Jordan highlighted as particular success stories, having the highest-level of support from both the Ministry of Environments and Energy, delivering to both of their objectives. By the end of the current project, half of the 50 participating countries will have clear plans in place with the transition well under way, while the other half will still need capacity and funding support to enable this.

A real tension was noted between the desire to be able to scale up this initiative, supporting an increasing number of countries successfully undertaking this transition, and the limitations the initiative experiences in terms of capacity and resources.

2.4 Energy efficiency: Electric appliances

Two key initiatives, CLASP and SEAD, are calling for adoption of the most efficient appliances worldwide.

Table 5 List of initiatives: Energy efficiency: Electric appliances

Name of Initiative	Description	Starting Year
The Collaborative Labeling & Appliance Standards Program (CLASP)	CLASP is an international organisation with a mission to "serve as the primary resource and voice for appliance, lighting and equipment energy efficiency worldwide". The initiative provides technical and policy support to governments worldwide working to implement energy efficiency standards and labels (S&L) for appliances, lighting, and equipment, and specialises in publishing studies and analyses with relevance to S&L practitioners. It serves as the SEAD's operating agent (see below) Website: CLASP – http://www.clasponline.org/	1999
Super-efficient Equipment and Appliance Deployment (SEAD) Initiative	The Super-efficient Equipment and Appliance Deployment (SEAD) initiative seeks to transform the global market for efficient equipment and appliances. Through its activities and projects, SEAD is engaging governments and the private sector to measure the potential of appliance and equipment efficiency. Website: SEAD – http://www.superefficient.org	–

2.4.1 Mitigation potential

Our analysis and desk research has shown that, there is an increasing number of international labelling schemes and standards for energy efficiency of appliances, as efficient appliances usually give net savings in the long term. The global savings potential from appliances could be as much as 0.6 Gt CO_2e in 2020, according to Blok *et al*. (2012). UNEP (2011a) estimated a potential of 0.3 Gt CO_2e.

Several initiatives with quantified targets exist, such as the Collaborative Labelling and Appliance Standards Program or the Super-efficient Equipment and Appliance Deployment Initiative. SEAD has reported commitments which, if successful, could lead to emission reductions of 0.7 Gt CO_2e for appliances and lighting combined (Jaquot 2013). The share of reductions in appliances in this target was estimated by Jaquot (2013) at ~0.5 Gt CO_2e.

As well as desk research and outreach, a structured interview took place with a senior representative of CLASP, which serves as the operating agent for SEAD, resulting in the findings below.

2.4.2 Benefits of taking action beyond climate impacts

The drivers for reducing GHG emissions and increasing efficiency from appliances are similar to inefficient lighting, with the primary driver being the reduction of energy consumption, whether at the national or individual scale. In countries like India, which is one of the 4 main focus countries for the current work programme of CLASP, daily load shedding

and blackouts are a reality. The governments involved are under clear pressure to solve this.

With a continuously growing consumer class across the globe, there is an increasing uptake of appliances and thus demand for energy, placing more pressure on energy systems. It is therefore, not seen as viable to simply focus on growing supply. Demand-side measures are also critical, with countries such as China committing to decrease the energy intensity of their economy (defined as energy consumption per unit of GDP).

2.4.3 Barriers to taking action

Policy change takes time in particular in the area of products and labelling – it takes time to design successfully and can be subject to delays via political barriers being encountered. Designing and implementing a successful framework is also different per country, i.e. it is highly bespoke due to the nature of labelling. Many countries do not have the necessary robust human and physical infrastructure to enable this.

Testing facilities are an example of the physical infrastructure needed to enable this transition. In order to properly certify energy efficient appliances testing facilities are needed – this can be a real barrier as these facilities are often not in place. They are expensive to create and run and while manufacturers may have them, governments need independent expertise and are also often not willing to use another country's results.

This lack of expertise and infrastructure means that lack of funding is a major barrier for many countries and unless developing countries have a clear donor commitment to support this process, it is often not possible to implement.

2.4.4 Options for scaling up

CLASP notes that there are many opportunities for energy demand reduction, even in countries with mature energy efficient appliance programmes, such as with clothes dryers in the US. In immature markets, it would be of real benefit to focus in 3 key areas: Air Conditioning, hot water heaters and fridges. Echoing feedback from en.lighten, there has been an explosion of air conditioning units being used globally, focusing on this one appliance alone could reap major reduction benefits.

Utilising SEAD's excellent platform with senior government engagement, en.lighten's experience of successful market transformation programmes and CLASP's in-depth technical expertise, an initiative could be co-created between these organisations, with a global pledge by partici-

pating countries to phase in super-efficient appliances and products while phasing out inefficient appliances and products, starting with air conditioning, refrigeration and water heaters.

Consensus has already begun to be generated around this notion with interested parties and it is estimated that broad agreement could be achieved as early as 2014 with a core group of countries and organisations. This approach could also support overcoming barriers with regards to national testing facilities. For example, a new approach has been suggested where countries would agree to a process of having products tested in at least three different countries' laboratories elsewhere, should they not have facilities themselves.

2.4.5 Need for government support

Countries could support through funding an initiative along the lines of the one outlined above. CLASP believes funding in the region of 100 USD million would allow for the rapid scaling up that closing the pre-2020 emissions gap would entail. In the absence of a dedicated programme such as this, progress will be incremental.

An alternative approach would be to catalyse an "anti-dumping" initiative – bringing together manufacturers and governments in a common goal of ensuring inefficient appliances are not shifted to markets which do not have the standards in place to ensure such products are unable to be sold. This can be seen as an equity issue – locking poorer consumers into high operating costs and less efficient appliances. Raising awareness of the benefits of strong appliance efficiency standards should be made a priority by countries. Putting the financial resources aside to do this and prioritising such action during bilateral conversations in order to promote better practices and ban such behaviour would send the right signal for market transformation.

2.4.6 Focus ICIs: CLASP (and SEAD)

Aims and objectives
Operating since 1999, it seeks to be as the primary resource and voice for appliance, lighting and equipment energy efficiency worldwide.

Leadership capability: track record, scope, capacity, & convening power
Operating since 1999. With its relatively long track record and focus on staying a neutral and independent voice, it can play an important role in

this area. In 2009, CLASP partnered with the Climate Works Foundation's network of organisations as a Best Practice Network (BPN).

CLASP has been serving as SEAD's operating agent since 2011. SEAD was launched at the first Clean Energy Ministerial (CEM) in Washington, D.C. in July 2010. The initiative includes the member governments of Australia, Brazil, Canada, the European Commission, France, Germany, India, Japan, Korea, Mexico, Russia, South Africa, Sweden, the United Arab Emirates, the United Kingdom, and the United States. CLASP provides strategic advice to guide SEAD's activities, as well as facilitating five government working groups that promote market transformation through coordinated efforts on public procurement, technical analysis, standards and labelling policy, awards, and financial incentives for energy efficient products.

CLASP's primary audience / "clients" are policymakers and they choose not to work with manufacturers directly, although they obviously do engage actively with them as part of the process. They believe it is important that they are able to remain an impartial voice at the table, there are times when their analysis might directly contradict that of manufacturing and their associations, it is important that policymakers are able to hear utilise CLASP's alternative findings and recommendations in their decision making processes.

As a high-level political platform, SEAD is able to convene and engage Energy Ministers through the Clean Energy Ministerial. Engaging with the members of this platform would provide a strong basis to deliver on the ambitious initiative as laid out above. It is worth noting that SEAD is currently implementing a programme to incentivise development of super-efficient appliances through their "Global efficiency awards". Taking a clear partnership approach is part of their delivery approach.

While they provide support to a broader range of countries, currently their main focus regions are the United States, China, India and the European Union – the decision to focus here is based on the fact that these regions / countries are seen as being able to deliver the most impact in terms of scale of emissions reduction. Increasing funding to CLASP would allow their focus areas to expand to countries such as Brazil, South Africa, Mexico, Indonesia and Nigeria, where opportunities exist for major energy demand reductions.

As a result of the lack of capacity and infrastructure in many developing countries, CLASP experiences a high number of requests for support, far more than they are able to service inside the confines of their current budget.

2.5 Energy efficiency: Cars & trucks emission reduction

Around three quarters of GHG emissions in the transport sector still originate from road transport, primarily from cars and trucks. Several global initiatives attempt to effect a transformation in the road transport space.

Table 6 List of initiatives: Energy efficiency: Cars & trucks emission reduction

Name of Initiative	Description	Starting Year
"30 by 30" Resolution	The IRU "30 by 30" Resolution is a voluntary commitment of the road transport industry to reduce CO_2 emissions by 30% by 2030 through means such as investments in innovative engine and vehicle technology, driver training and innovative logistic concepts. Website: www.iru.org/en_policy_co2_home	2009
Global Fuel Economy Initiative (GFEI)	GFEI is a partnership between 6 organisations that promote further research, discussion and action to improve fuel economy worldwide. GFEI's core activities are data development and analysis of fuel economy potentials, support for national and regional policy-making efforts and outreach and awareness raising to stakeholders (e.g. vehicle manufacturers). Website: www.globalfueleconomy.org	2009
Partnership for Clean Fuels and Vehicles (PCFV)	The PCFV is a global initiative to promote cleaner fuels and vehicles in developing and transition countries. The PCFV helps developing countries to eliminate the use of leaded gasoline and to phase down sulphur in diesel and gasoline fuels and supports the development and adoption of cleaner fuel standards and cleaner vehicle requirements by providing a platform for exchange of experiences and successful practices in developed and developing countries as well as technical assistance. Website: http://www.unep.org/transport/pcfv/index.asp	2002
International Council on Clean Transportation (ICCT)	The International Council on Clean Transportation is an independent not-for-profit organisation founded to provide first-rate, unbiased research and technical and scientific analysis to environmental regulators. The mission is to improve the environmental performance and energy efficiency of road, marine, and air transportation, in order to benefit public health and mitigate climate change. Website: http://www.theicct.org/	–

2.5.1 Mitigation potential

There is considerable scope for emissions reductions in transport through improvements in fuel economy. In Europe, emissions from new cars have been falling considerably in recent decades, due to the efforts of both car and truck manufacturers to develop more efficient vehicles. The UNEP emissions gap report 2011 (UNEP, 2011a) estimates a mitigation potential of ~1.7 Gt CO_2e from cars and trucks and ~2.1 Gt CO_2e from transport as a whole in 2020, based on work by the ICCT.

Blok *et al*. (2012) showed that an initiative that would agree to save one additional litre per 100 km globally by 2020 for cars, and equivalent reductions for trucks, this could result in a global emissions reduction of up to 0.7 Gt CO_2e.

Wouters (2013) analysed existing commitments of two initiatives with clear, quantifiable targets: the Global Fuel Economy Initiative which focusses on cars globally and the IRU's 30x30 initiative which focusses on trucks in certain regions only. Wouters (2013) calculated the total impact of both bottom-up initiatives to be 0.43 Gt CO_2e (range 0.20–0.55 Gt CO_2e). These targets fall short of the potential estimated by Blok *et al*. (2012) mainly due to the fact that the GFEI's commitment is actually less ambitious than existing regulations in some regions.

As well as desk research, a semi-structured interview took place with a senior representative of the International Road Transport Union, resulting in the findings below.

2.5.2 Benefits of taking action beyond climate impacts

There are clear economic drivers for increasing energy efficiency in terms of bus, taxi, trucking and coaching operators as fuel costs form a large part of their operating costs. High replacement rate in terms of vehicles enhances continuous technological innovation thus potentially resulting in a major impact. There are further co-benefits in terms of these innovations, such as quieter vehicles – e.g. a reduction in noise pollution. In comparison to many of the other initiatives and clean technology uptake it is true that cleaner vehicles do receive preferential tax treatment in some markets enabling the uptake of such vehicles.

The IRU believes that the above benefits from the promotion and scalability of efficient vehicle uptake underpin its reasoning in its "30-by-30" resolution, which was unanimously adopted by its General Assembly.

Further benefits for implementing action in this area also include decreasing local pollutants, reductions in traffic congestion and general mobility improvements. The UNEP notes that the introduction of a bus rapid transit (BRT) system has substantially reduced vehicle traffic overall thus improving air quality, creating jobs, promoting social equity, has had a positive impact on public health, and has reduced the number of road traffic accident fatalities (UNEP, 2012).

ILO (2012) has estimated that major gains can be made in employment by a shift to mass transportation and to more energy-efficient vehicles.

2.5.3 Barriers to taking action

While real opportunities exist to reduce emission reductions in the road transport sector, fundamental barriers are prevalent in terms of financing, administration and the technologies available for heavy duty vehicles. Effective policy development can be hampered due to economic and safety considerations taking precedence over emissions. In addition, governments are often confused as to the real role of vehicles versus fuel substitution or electrification on emissions. In particular, in the area of heavy duty vehicles, efficiency is often traded in for torque and security considerations. This is why it is essential for all manufacturers to work with governments and civil society to find the right policy solutions that take efficiency seriously, yet don't undermine important safety issues.

One of the areas often overlooked and yet extremely effective in impacting emissions is land and mobility management. In terms of trucking, for example, around 85% of journeys are within or between cities, with distances covered being less than 150 km – in this respect, the most effective action would be in the area of city logistics management and traffic flow. Each time a truck has to slow down or come to a complete stop, fuel consumption is dramatically impacted.

This means that investment in infrastructure and city planning is critical, and that technology is not the only solution. Hence an integrated approach needs local authority buy-in, funding, and proper planning capacity which is often lacking. That said, new technology development is also a barrier. Bringing cost effective options to market which can serve both the longer and short distance journeys is tricky. In terms of long distance journeys, currently hybrid technologies are showing real promise but more support is needed for research and demonstration in this area. IRU is focusing on this area and will be facilitating what it calls "lighthouse projects" to support technological advancement and new fuel sources being utilised successfully.

2.5.4 Options for scaling up

The UNEP notes a range of incentives to scale up mitigation potential in transport. For transit development, these include: identifying and assessing the co-benefits; implementing the highest standards from the outset; improving accessibility through integrated transport systems; and ensuring strong institutional support and industry engagement.

In terms of vehicle performance, this includes ensuring standards are technology neutral, so that markets find the most cost-effective solution; dynamic standards that become more stringent year on year; including

all vehicle classes; being footprint-based not weight-based; improving the accuracy of testing procedures; and combining standards with fiscal mechanisms and scrappage schemes to increase the turnover of the existing fleet (UNEP, 2012).

IRU highlights the fact that providing real business incentives for lower emission transport options, such as preferential tax rates or priority road access, can really drive change. The new modular concept, with larger truck designs are also highlighted as a potential avenue to exploit.

2.5.5 Focus ICI: International Road Transport Union (IRU)'s "30 by 30" Resolution

Aims and objectives

IRU "30-BY-30" RESOLUTION was adopted unanimously by the IRU General Assembly in Geneva on 6 November 2009.

IRU Resolution is a voluntary commitment by the road transport industry, on the basis of innovative technologies and practices, to reduce CO_2 emissions by 30% by 2030 – calculated as transport performance in tkm and pkm and related to the base year 2007 – through means such as:

- Investments in innovative engine and latest vehicle technology, which can contribute to a reduction in fuel consumption and consequently CO_2 emissions of more than 10%.
- Driver training, as provided by the IRU Academy and others, which can reduce fuel consumption and consequently CO_2 emissions by up to 10%.
- Innovative logistic concepts, such as ITS and optimised weights and dimensions of heavy commercial vehicles, which can equally reduce fuel consumption and CO_2 emissions of more than 10%.

Leadership capability: track record, scope, capacity, & convening power

The International Road Transport Union (IRU) was founded in Geneva on 23 March 1948. It has 170 Members in 74 countries. Its "Active Members" are the most representative road transport associations at national level. The IRU's Associate Members are drawn from industries that have close ties with road transport, including the manufacturers of vehicles, fuels, tyres and information systems. It covers the majority of service providers in the area of truck, bus, coach and taxi operators.

It has a track record in delivering effective change programmes related to energy efficiency, having a focused work stream in this area since 2004, for which they have been officially recognised by the UNEP.

Employees: 130 in total at the IRU (80 of which are delivering the UN Custom's system). It has offices in Moscow, Geneva, Brussels and New York.

2.6 Energy efficiency: Maritime transport

Emissions from shipping represent a small but growing share of GHG emissions. International intergovernmental organisations exist which could drive efficiency gains in this sector.

Table 7 List of initiatives: Energy efficiency: Maritime transport

Name of Initiative	Description	Starting Year
International Maritime Organisation (IMO)	The IMO was established in 1948 with the purpose to develop and maintain a comprehensive regulatory framework for shipping and its remit today includes safety, environmental concerns, legal matters, technical co-operation, maritime security and the efficiency of shipping. IMO is governed by an Assembly of members and is financially administered by a Council of members elected from the Assembly. Website: –	1958
Sustainable Shipping Initiative	The SSI is a four-stage initiative designed to help the industry make long-term plans for future success. Its members are leading companies from around the world and NGOs Forum for the Future and WWF. The cross-industry group represents ship owners and charterers, shipbuilders, engineers and service providers, banking, insurance, and classification societies. Website: http://ssi2040.org/what-we-do/work-streams/	2012
Carbon War Room's Operation Shipping Efficiency	A not-for-profit organisation which states as its mission to "accelerate the adoption of business solutions that reduce carbon emissions at gigaton scale and advance the low-carbon economy". Website: http://www.carbonwarroom.com/	–

2.6.1 Mitigation potential

The UNEP 2011 Bridging the Gap report (UNEP, 2011a) estimated reduction potential for maritime transport at around 0.2–0.4 Gt CO_2e in 2020.

Blok *et al*. (2012) came to the conclusion that, when including efficiency measures and biofuels, aircraft and ship manufacturers could agree to design their vessels to capture at least half of this mitigation potential. The total impact in 2020 could therefore be up to 0.2 Gt CO_2e.

We focused on maritime transport for the purposes of this report and conducted semi-structured interviews with a senior representative of the Carbon War Room and a contact close to the IMO secretariat, resulting in the findings below.

2.6.2 Benefits of taking action beyond climate impacts

In terms of shipping, it was noted that there is a major economic benefit, in reducing fuel consumption and thereby costs, with the Carbon War Room (CWR) highlighting the fact that with current fuel costs being so high, fuel costs can represent up to 60–70% of ship charters / owners operating costs. This incentive can clearly be demonstrated through the significant savings that companies like Maersk, who have the capital to invest in the necessary retrofitting of their shipping line, have managed to achieve. Recent decisions by companies such as Cargill, UNIPEC UK and Huntsman, alongside others, who have committed to transport 1 billion tons of goods annually on more energy efficient ships, is not only driven by sustainability commitments, but very much by the fuel cost savings they will achieve.

Maintaining a "license to operate" also drives action. Shipping is an energy intensive industry that underpins much of global trade. International law and norms are important in this area, with "Innocent Passage" forming a cornerstone to the law of the sea, stating that: "Passage is innocent so long as it is not prejudicial to the peace, good order or security of the coastal State."

To date issues of peace, good order and security have not been linked to climate change. Maintaining a license from society to operate should include concerns around air pollution and climate change and efforts should be made by governments to start including such concerns in international and national negotiations.

2.6.3 Barriers to taking action

Split incentives, particularly in terms of short term charters, can be a barrier to unlocking the investments necessary to retrofit existing ships; the charterer pays for the fuel, and there is no standard in the industry to price fuel-efficiency into day rates (the price paid to the owner by the charter for the hire of the vessel). Therefore, increased efficiency does not provide enough of an incentive for the ship owner to invest in efficiency retrofitting.

Even with financing options becoming available, mistrust in the industry as to the claims of energy efficiency retrofit technology impacts exist – ship owners doubt the results published by experts consulted by new technology companies as they are not seen as independent. At the same time, because it can become a competitiveness issue, owners are not always keen for independent testing to be carried out and made public on new technologies they many invest in. There is also sensitivity

when it comes to existing ships as their value could be perceived to be devalued through new standards and norms being applied. Most importantly the ownership structure of shipping companies and the sailing under different national flags complicates matters substantially as the operators of ships are not necessarily the owners. Moreover, a further complication is that up to 70% of the fuel bill is paid for not by the owner or operator, but by owners of the cargo (charterers).

There are also huge variances in the data associated with these retrofit technologies, due to the significant impacts that weather and high seas can have on a ship's fuel consumption. This can make it extremely difficult to reliably quantify fuel savings, which is critical for the investment financing models to work.

It should be noted that no common standard exists for measuring fuel consumption in ships, which is also a barrier for driving change. There are efforts to create standards for measurement, such as the International Organization for Standardization initiative to develop a common industry standard for measurement of changes in hull and propeller performance. Furthermore, the development of technologies to accurately measure fuel consumption emissions in real time will introduce new opportunities to accurately measure fuel consumption, but are costly.

Shipping is a global industry and as such, similar issues and political hurdles need to be traversed as those that emerge in the UNFCCC process.

Potential trade-offs may arise between CO_2 versus nitrous oxides (NOx) and sulphurous oxides (SOx) both from engines but also from fuel substitution in shipping. The indirect emissions related to possible fuel substitution from biofuels, for example, in terms of land use change, food security concerns, but also in terms of quality and hence security concerns, further hamper the development of other options for these sectors (UNEP, 2011a).

2.6.4 Options for scaling up

Measures which facilitate and incentivise the retrofitting of existing ships to enhance energy efficiency needs to continue to be a focus area, as well as defining common standards for measuring, reporting and verification of fuel consumption.

Emerging practices and trends, such as "virtual arrival" which can dramatically reduce bunker fuel consumption and emissions by tankers, while easing congestion and enhancing safety, should be encouraged. New technology, such as recent advancements with gas hybrid engines, should also be encouraged.

Increasing awareness of the benefits of energy efficiency is also critical. Companies can also help support the "demand pull through" effect of energy efficient shipping by pledging to charter only the most efficient ships via the CWR and RightShip's GHG Emissions rating system.

Currently, CWR is in the "proof of concept stage" of demonstrating viable financing models for retrofitting ships with energy efficiency technologies and features. Similar to ESCOs, governments and financial institutions could build on the successful demonstration by providing guarantees to back third party financing, to bring this to scale.

Building on this, focus could be given to exploring the positive impact that energy efficiency improvements could have to the asset value of a ship, in terms of the banking and insurance industry. The CWR is aware of more than one large shipping bank currently using GHG ratings in assessing its lending and asset management criteria.

2.6.5 Need for government support

More support could be given to developing countries and the IMO, to enable capacity building and awareness raising of the benefits of action in this area. Clear support of an international enforcement regime of the Energy Efficiency Design Index (EEDI), for new ships, and the Ship Energy Efficiency Management Plan (SEEMP), for all ships, is important.

CWR notes that, similar to what a small group of ports have implemented with regards to the Environmental Ship Index, government transport authorities could incentivise ships improving their efficiency by having ports give reduced port fees, priority areas and tax breaks to the most efficient ships (e.g. rate A–C ships) based on RightShips methodology.

2.6.6 Focus ICI: International Maritime Organisation's EEDI and SEEMP

Aims and objectives

The amendments to MARPOL Annex VI Regulations for the prevention of air pollution from ships, entered into force on 1 January 2013, added a new chapter 4 to Annex VI on Regulations on energy efficiency for ships to make mandatory the Energy Efficiency Design Index (EEDI), for new ships, and the Ship Energy Efficiency Management Plan (SEEMP) for all ships. The regulations apply to all ships of 400 gross tonnage and above and are expected to enter into force on 1 January 2013.

Being a non-prescriptive, performance-based mechanism, EEDI leaves the choice of technologies to use in a specific ship design to the

industry. The aim is to meet the required energy-efficiency level – ship designers and builders would be free to use the most cost-efficient solutions for the ship to comply with the regulations. The EEDI requires a minimum energy efficiency level per capacity mile (e.g. tonne mile) for different ship type and size segments. Following an initial two year phase zero when new ship design will need to meet the reference level for their ship type, the level is to be tightened incrementally every five years. It is expected that this will stimulate continued innovation and technical development of all the components influencing the fuel efficiency of a ship from its design phase. It provides a specific figure for an individual ship design, expressed in grams of carbon dioxide per ship's capacity-mile and is calculated by a formula based on the technical design parameters for a given ship.

The SEEMP establishes a mechanism for operators to improve the energy efficiency of ships.

Leadership capability: track record, scope, capacity, & convening power

The International Maritime Organizations is the United Nations' specialised agency with responsibility for the safety and security of shipping and the prevention of marine pollution by ships. It was established in Geneva in 1948 and came into force ten years later, meeting for the first time in 1959. Its Headquarters are in the United Kingdom.

It currently has 170 Member States and three Associate Members. Its governing body, the Assembly, meets once every two years. Between sessions, the Council consisting of 40 Member Governments elected by the Assembly, acts as IMO's governing body.

Recognising that more additional measures would be need to reduce the amount of GHG emissions from international shipping, discussions are currently under way to introduce market based measures to incentivise action further.

2.6.7 Focus ICI: Carbon War Room's Operation: Shipping Efficiency

Aims and objectives

The Carbon War Room is an independent non-profit organisation focused on accelerating the adoption of business solutions that reduce carbon emissions at gigaton scale and advance the low-carbon economy. It comprises of three groups: Research and Intelligence; Network Engagement; Active Operations.

Operation Shipping Efficiency aims to reduce carbon emissions by bridging gaps in market information related to environmental efficiency, encouraging key stakeholders to embed efficiency into decision making, and unlocking capital flow for technology retrofits.

Leadership capability: track record, scope, capacity, & convening power
In terms of bridging information gaps and encouraging transparency, CWR have worked with RightShip to create the world's first eco-labelling for the shipping industry, with a global online platform that provides information on 60,000 ships in operation today, including the majority of the world's container ships, tankers, bulk carriers, cargo ships, cruise ships and ferries.

The search tool, powered by RightShip's EVDI methodology, provides a systematic and transparent means of comparing the relative theoretical efficiency and sustainability of the existing fleet by measuring a ship's theoretical CO_2 emissions per nautical mile travelled. It uses a dynamic rating system of A to G to rate ships.

Currently, CWR is in the "proof of concept stage" of demonstrating viable financing models for retrofitting ships with energy efficiency technologies and features.

CWR's ethos is to specifically focus in emission reduction areas which could have a clear link to profitability in the private sector – shipping efficiency is an area where this is clearly visible.

CWR was established in 2009. It sees its convening power as a key strength as it is able to draw on a high profile group of leaders and entrepreneurs to do so. The operational leads for each of its "operations" are leaders and practitioners within the private sector.

It has offices in Washington D.C., New York and London, as well as operational leads in a range of other cities.

It is funded by financial contributions from its "Founders Circle" of entrepreneurs and has a partnership model to enable and support delivery of its "operations" (projects).

2.7 Fossil fuels subsidy reform

The vast majority of our GHG emissions stem from the burning of fossil fuels, primarily for energy use. In a bid to ensure affordable access to energy for their populations, governments have built extensive fossil fuel subsidies in particular in developing countries where fossil fuel companies tend to be state run and consumer purchasing power is low. In line with a goal of reducing GHG emissions, these subsidies would

have to be directed to future energy generation options in a socially acceptable manner.

At the time of writing this report, we were not aware of an ICI, as defined above, in this area. There are, however, several initiatives to note in this area and whose work has contributed some of the findings below:

- *G20's Subsidy Reform subgroup* of finance ministers and central bank governors from 20 countries who meet biannually at G20 summits, to discuss several topics around finance including fossil fuel subsidies. The discussion has been running within the G20 since 1999.
- *The International Monetary Fund's* (IMF) research and recommendations into fossil fuel subsidies. In response to the G20's call for a phase out of inefficient fossil fuel subsidies in all countries, the IMF has an active area of research in this area and released a paper in March 2013, "*Energy Subsidy Reform – Lessons and Implications"* urging policymakers to reform subsidies for products from coal to gasoline, arguing that this could translate into major gains both for economic growth and the environment.
- *Global Subsidies Initiative* (GSI), which is an initiative of The International Institute for Sustainable Development's (iisd) devoted to analysing subsidies and how they support or undermine progress towards sustainable development. It works to encourage governments to undertake reforms on subsidy policy where these would deliver clear economic, environmental and social benefits. It also works to generate a consensus in the World Trade Organization and in other forums on this issue. The GSI has received funding from governments, United Nations agencies, and foundations. It was established in 2005. The initiative has staff working on it from Geneva, as well as local staff in India and Indonesia, working with a variety of part-time consultants and local consistent partners in these places, as well as in Bangladesh and Nigeria.
- *The Nordic countries (Denmark, Finland, Iceland, Norway, and Sweden) and the United States' declaration* to no longer provide public financing for new coal-fired power plants overseas, except in rare circumstances, as well as continuing to focus on fossil fuel subsidy reforms. They have announced they will undertake peer reviews of their domestic fossil fuel subsidies, as part of the Nordic countries' work within the *Friends of Fossil Fuel Subsidy Reform* group.
- *The Friends of Fossil Fuel Subsidy Reform* are a group of non-G20 countries including: Costa Rica, Denmark, Ethiopia, Finland, New Zealand, Norway, Sweden and Switzerland, who aim to build political

consensus on the importance of fossil-fuel subsidy reform within international forums.

- *The Extractive Industries Transparency Initiative* (EITI), which is a global group of governments, companies and civil society focused on improving openness and accountable management of revenues from natural resources. Established in 2002, with a World Bank-administered Multi-Donor Trust Fund (MDTF) established for it. The MDTF has disbursed almost 60 USD million in technical and financial assistance to EITI programmes in 37 countries.

2.7.1 Mitigation potential

The IMF (2013) estimated the reduction potential from phasing out fossil fuel subsidies to be as much as 4.5 Gt CO_2e by 2020 by energy prices to levels that would eliminate tax-inclusive subsidies for petroleum products, natural gas, and coal. This represents a 13% decrease in global energy related CO_2 emissions. Earlier analysis by the OECD suggests mitigation potential of between 8–10% by 2050 (Burniaux, Chateau, 2011).

Blok *et al*. (2012) estimate the full reduction potential at ~1.8 Gt CO_2e and suggests international efforts could capture at least 50% of these by 2020, resulting in an emissions reduction of 0.9 Gt CO_2e.

The large range in the full potential estimate is a result of the underlying assumptions and the general uncertainty of future energy market developments.

As well as desk research, a semi-structured interview took place with a representative of the Global Subsidies Initiative (GSI).

2.7.2 Benefits of taking action beyond climate impacts

There are numerous social and economic benefits to phasing out fossil fuel subsidies. Finance Ministries are keen to ensure fiscal stability which these subsidies can undermine through creating unmanageably large budget deficits.

Reducing or eliminating them altogether offer a variety of benefits, apart from carbon emission reductions, including reducing local air pollution, traffic congestion, accidents and road damage, as well as through encouraging investment in energy efficiency and zero-carbon energy and increasing the longer-term competitiveness of the private sector.

The IMF (2013) notes that "pre-tax", subsidies for petroleum products, electricity, natural gas, and coal reached 480 USD billion in 2011 (0.7% of global GDP or 2 percent of total government revenues). The OECD estimates

that welfare gains of 0.3–4% internationally and an increase of real income of 0.3–0.5% in 2050 relative to the baseline, could be achieved by unilateral phase-out of fossil fuel subsidies (Burniaux, Chateau, 2011).

2.7.3 Barriers to taking action

Undertaking reform in this area faces many political and social barriers. IMF research, based on country experiences of undertaking such reform, concludes the following six main barriers (IMF, 2013):

- "lack of information regarding the magnitude and shortcomings of subsidies"
- "lack of government credibility and administrative capacity"
- "concerns regarding adverse impacts on the poor"
- "concerns regarding adverse impacts on inflation, international competitiveness and volatility of domestic energy prices"
- "opposition from specific interest groups benefiting from the status quo"
- "weak macroeconomic conditions."

2.7.4 Options for scaling up

There are a variety of organisations and international agencies working to support action in this space, this work could be better coordinated to ensure maximum impact. For example, the World Bank, International Energy Agency and the Global Subsidies Initiative could be encouraged to ensure strategic coordination on this issue in country – the World Bank contributing with its technical expertise and capacity for detailed economic modelling, the database that the IEA is able to draw on and the experience of supporting governments with the social and political aspects, that the GSI is able to bring. Playing the role of a lender, the World Bank's involvement clearly also incentivises activity in this area, while the GSI's capacity for flexibility and planning strategic public communication programmes with governments, could create a powerful partnership. While this coordination is already happening, donor countries could request it happens more systemically.

2.7.5 Need for government support

As noted above, governments could encourage systematic collaboration between organisations focused in this area.

A voluntary peer-to-peer review mechanism could be set up by the Group of 20 countries, who in 2009 agreed to fossil fuel subsidy phase out in the medium term. A mechanism which tracks subsidies, facilitates exchange on reform activities and provides a common platform for identification and rating, would support action in the group.

GSI notes that supporting a country to successfully implement this reform is time consuming and requires resources. Capacity is needed to build the right network of stakeholders in a country, design a communication strategy, catalyse public debate and discussion about the issue and the benefits of reform, designing the strategy to ensure minimal negative economic and social impacts, and supporting local research and analysis in country to better embed knowledge and know how so as to increase the viability and success of subsidy phase-out programmes. Governments could provide funding to initiatives such as the GSI, to allow them to scale their work.

2.8 Fluorinated greenhouse gases

Fluorinated greenhouse gases are potent greenhouse gases, some with very long lifetimes. Hydrofluorocarbons have seen a rapid increase in use due to their ozone-friendly properties following adoption of the Montreal Protocol, they have become a significant contributor to the radiative forcing responsible for anthropogenic climate change. Three global initiatives aim at curbing their use.

Table 8 List of initiatives: Fluorinated greenhouse gases

Name of Initiative	Description	Starting Year
Climate and Clean Air Coalition to Reduce Short-Lived Climate Pollutants (CCAC)	The initiative was launched in 2012 by the UNEP with the aim to raise awareness of short lived climate pollutant impacts and mitigation strategies; Enhancing and developing new national and regional actions, including by identifying and overcoming barriers, enhancing capacity, and mobilising support and promoting best practices and showcasing successful efforts. Website: http://www.unep.org/ccac/	2012
Refrigerants, Naturally!	Global initiative of companies committed to substituting harmful fluorinated gases ("F-gases", such as CFCs, HCFCs and HFCs) with natural refrigerants. Supported by the UNEP and Greenpeace. Website: http://www.refrigerantsnaturally.com/	2008

2.8.1 Mitigation potential

Fluorinated greenhouse gases originate from refrigeration, air-conditioning and industrial processes. Although their total use and atmospheric concentration is small compared to other GHG, their detrimental effect is significant due to their high warming potential and long lifetimes. Blok *et al*. (2012) estimated a possible reduction at 0.3 Gt CO_2e by 2020, which would represent half of the technical mitigation potential.

Desk research and semi-structured interviews were carried out with senior representatives of Refrigerants Naturally! and Climate and Clean Air Coalition to reduce Short-Lived Climate Pollutants (CCAC).

2.8.2 Benefits of taking action beyond climate impacts

Increased energy efficiency is a co-benefit in this area. The UNEP refers to recent studies which indicate that refrigeration and air-conditioning systems using low global warming potential (GWP) substances have equal or better energy efficiency than systems using high GWP (UNEP, 2011b). This increased efficiency may also play an important role in adaptation – increased warming could increase the use of refrigeration and air conditioning equipment, increasing demand for energy globally.
In terms of the companies involved in Refrigerants Naturally (RN!), these companies have primarily been driven by social and environmental concerns, supporting their suppliers and contractors in reducing energy costs and working to decrease the global warming potential of their supply chain.

2.8.3 Barriers to taking action

A number of barriers prevent changes in technology to avoid the use of high GWP HFCs. They include the need for technical developments, flammability and toxicity risks, regulations and standards that inhibit the use of alternatives, insufficient supply of components, investment costs and lack of relevant skills among technicians.

In many countries, there is a need for new regulations and standards to be developed, as well as infrastructure adapted, as low GWP refrigerants can pose flammability and toxicity risks. Lack of technical skills to maintain this equipment and insufficient supply chains for the necessary components of this equipment, can also be a barrier (UNEP, 2011b). Political pressure placed on governments by high GWP equipment manufacturers, as well as a lack of understanding of the co-benefits, can also hold governments back from taking action.

Governments may also be concerned that their action in this could be construed as avoiding action on CO_2 by focusing on the short-lived climate pollutants.

2.8.4 Options for scaling up

Utilising the existing mechanisms for capacity building and incentives under the Montreal Protocol could support this transition. This could include facilitating technology transfer to developing countries, support to reorganise production processes and catalysing product redesign.

More companies could be encouraged to focus on eliminating high GWP equipment in their value chains, such as those involved in the RN! initiative.

2.8.5 Need for government support

Governments should focus on streamlining their regulatory processes in this area to accelerate the take-up of low-GWP refrigeration equipment. Also, governments could actively engage in initiatives such as the CCAC.

Already active countries could support this trajectory by highlighting gains in high-level bilateral / regional conversations and offer support to developing countries to undertake this transition, particularly encouraging the transition from ozone depleting CFCs directly to low GWP refrigerants.

2.8.6 Focus ICI: Refrigerants Naturally!

Aims and objectives

It is global not-for-profit initiative of companies focused on combatting climate change and depletion of the ozone layer by replacing environmentally harmful fluorinated gases ("F-gases" such as CFCs, HCFCs and HFCs) with natural refrigerants. The main aim of the initiative is to promote a shift in point-of-sale cooling technologies (beverage coolers / vendors and ice-cream freezers) towards natural refrigerants. This sector represents a significant portion of F-gas refrigerant use. Point-of-sale cooling includes the entire retail infrastructure, e.g. HVAC, but excludes manufacturing and distribution.

Its goals are listed as:

- "To promote a shift in the point-of-sale cooling technology towards natural refrigerants with a low-or non-Global Warming Potential and a zero Ozone Depletion Potential, that is safe, reliable and cost effective."

- "To do this whilst improving or (at least) equalling energy efficiency compared to existing fluorocarbon based technology."
- "To provide a platform and a critical mass in communicating with the refrigeration technology supply chain, with other users, governments and civil society."

Leadership capability: track record, scope, capacity, & convening power
It was launched in 2004 by The Coca Cola Company, Unilever and McDonald's.

Current members are PepsiCo, Red Bull, The Coca-Cola Company and Unilever. The initiative is supported by Greenpeace and by the United Nations Environment Programme.

Members have committed to:

- "Publicly commit to the objectives of the initiative."
- "Develop prospective timetables to move their operation towards these goals and periodically share their progress with members."
- "Make a substantial effort or investment to progressively replace fluorocarbons with natural refrigerants. This may include R&D, testing, financial investment, staff time or public engagement."
- "Share technical information about alternative refrigeration between the partners of the initiative via regular meetings, special events / workshops and bilateral exchanges."
- "Share data and results with external stakeholders, such as their wider supply chain, their industry peer groups, government decision makers and the public."

It notes that by the end of 2012, it has achieved the following:

- The Coca-Cola Company has placed 800,000 units using natural refrigerants and is committed to phasing out HFCs in all new equipment by 2015.
- Unilever has placed over 1 million units – reaching into every country that they operate in. Red Bull has 313,000 units of its efficient ECO cooler, which represents more than one third of Red Bull units worldwide, use natural refrigerants.
- PepsiCo has reached over 200,000 HFC-free units.

Its secretariat is housed in HEAT International in Germany.

2.9 Reduce deforestation

Deforestation is another major source for greenhouse gas emissions and many initiatives have set themselves the primary or secondary goal of decreasing annual forest loss.

Table 9 List of initiatives: Reduce deforestation

Name of Initiative	Description	Starting Year
REDD+ Partnership	The REDD+ Partnership serves as an interim platform for its partner countries to scale up actions and finance for initiatives to reduce emissions from deforestation and forest degradation (REDD+) in developing countries. Website: http://reddpluspartnership.org/en	2010
Forest Carbon Partnership Facility (FCPF)	FCPF is a global partnership of governments, businesses, civil society, and Indigenous Peoples aimed at REDD+, including 37 tropical and sub-tropical developing countries. The objectives of the FCPF are to assist countries in their REDD+ efforts by providing them with financial and technical assistance, to pilot a performance-based payment system for REDD+ activities, to test ways to sustain or improve livelihoods of local communities and to conserve biodiversity within the approach to REDD+, and to disseminate the knowledge gained in the process. To achieve these objectives the FCPF has two separate complementary funding mechanisms, the Readiness Fund and the Carbon Fund. Website: www.forestcarbonpartnership.org	2008
Forest Investment Program	The Forest Investment Program (FIP) is a targeted program of the Strategic Climate Fund (SCF), which is one of two funds within the framework of the Climate Investment Funds (CIF). The FIP supports developing country efforts to reduce deforestation and forest degradation and promote sustainable forest management that leads to emissions reductions and enhancement of forest carbon stocks (REDD+). Website: https://www.climateinvestmentfunds.org/cif/node/5	–
Global Partnership on Forest and Landscape Restoration (GPFLR)	GPFLR is a proactive network that brings together governments, organisations, communities and individuals with a shared goal. The priorities of the GPFRL are to catalyse support for forest and landscape restoration, to map and analyse restoration potential, and to enhance knowledge and networks on forest landscape restoration. Through active engagement, collaboration and the sharing of ideas and information GPRFL promotes an integrated approach that aims to ensure that forests and the functions they provide are effectively restored and conserved to help secure sustainable livelihoods and ecological integrity for the future. Website: http://www.ideastransformlandscapes.org/	2003
Collaborative Partnership on Forests (CPF)	The CPF is an interagency partnership on forests comprising 14 international organisations, institutions and secretariats with have substantial programmes on forests. The CPF was created to support the work of the UNFF and its member states and to improve cooperation and coordination among CPF member organisations. CPF's objective is to promote the management, conservation and sustainable development of all types of forests and to enhance long-term political commitment. Website: http://www.cpfweb.org/en/	2001

Name of Initiative	Description	Starting Year
UN-REDD Programme	The UN-REDD Programme is the UN's collaborative initiative on REDD+ in developing countries. The programme's mission is to support countries' efforts to reduce emissions from deforestation and forest degradation. The programme supports nationally-led REDD+ processes and promotes the involvement of all stakeholders in REDD+ implementation. The UN-REDD Programme has 46 partner countries. Website: www.un-redd.org	2008
Prince of Wales International Sustainability Unit (PCFISU)	The Prince's Rainforests Project was set up by The Prince of Wales in order to find practical solutions to slow tropical deforestation and combat climate change. The project aims to help the world community recognise the true value of forests by identifying ways to value and then pay for the ecosystem services rainforests provide. The Prince's Rainforests Project is part of the International Sustainability Unit. Website: www.pcfisu.org/the-princes-rainforests-project	2007
Global Bioenergy Partnership	The purpose of the Global Bioenergy Partnership is to provide a mechanism for Partners to organise, coordinate and implement targeted international research, development, demonstration and commercial activities related to production, delivery, conversion and use of biomass for energy, with a focus on developing countries. It should promote global high-level policy dialogue on bioenergy and international cooperation. Website: –	2007
Rainforest Alliance	The Rainforest Alliance works to conserve biodiversity and ensure sustainable livelihoods by transforming land-use practices, business practices and consumer behaviour. Website: http://www.rainforest-alliance.de/de	1986
Tropical Forest Alliance	"TFA 2020 is a public-private partnership in which partners take voluntary actions, individually and in combination, to reduce the tropical deforestation associated with the sourcing of commodities such as palm oil, soy, beef, and paper and pulp." The consumer goods forum that created this initiative has the goal of "zero net deforestation by 2020" Website: http://www.usaid.gov/climate/tfa2020	–

2.9.1 Mitigation potential

Reducing or avoiding deforestation decreases not only emissions but also has benefits for local air pollution and biodiversity, and can support the local population. There is a large uncertainty attached to any estimate of potential impact in this area, as sparse and diverse data hinders the definition of a reliable business-as-usual scenario for this sector. UNEP (2011a) reported reduction potentials for 2030 of 1.3–4.2 Gt CO_2e based on work by the IPCC in 2007 (Nabuurs *et al*., 2007).

Blok *et al*. (2012) suggested learning from successful national programmes and rolling them out to major deforestation regions globally. Assuming that this could lead to a halving of global deforestation by

2020, the study estimates a potential reduction of up to 1.8 Gt CO_2e. Wouters (2013) reports that Greenpeace, WWF and the consumer goods forum have goals of zero net deforestation by 2020 which would result in 2 to 5 Gt CO_2e.

Semi-structured interviews took place with representatives of CPF, GNFLR and FIP, resulting in the findings below.

2.9.2 Benefits of taking action beyond climate impacts

Forests contribute to the economic development of a country in many ways. These contributions range from both the traditional cash-based transactions (forest products etc.) to non-cash based. Data is not readily available to quantify the latter in many countries but where it does exist, "the non-cash economic contributions of forests to household and national economies range between 3 and 5 times the formally recognised, cash contributions." (Agrawal *et al*., 2012).

Forests also supply a high number of jobs globally – more than 13 million formally and the UNFFF estimates that a further 40 to 60 million may be employed in small and medium sized enterprises related to forests, in the informal sector (Agrawal *et al*., 2012). ILO notes that an annual investment of 30 USD billion into reduced deforestation and degradation of forests could sustain up to 8 million additional full-time workers in developing countries (ILO, 2012). Sustainably managing forests can also help bind the soil, prevent the leaching of vital nutrients, reduce extreme flooding risks, as well as numerous other benefits, all which support local climate adaptation (UNFCCC, 2013).

Sustainably managing forests and forest restoration so that they continue to supply these economic benefits motivates countries such as Ghana, Mexico, Brazil and Rwanda to work with organisations such as IUCN and WRI (through the GPLFR) and the World Bank (through the Forest Investment Program) to undertake substantial forest and landscape restoration projects.

Carbon markets fluctuate and projects based on this income alone are exposed to tremendous risks. It is this understanding which has driven governments such as Mexico, supported by the FIP, to strategically invest in community forest management and restoration projects in degraded forest land. The communities are able to increase their incomes through the sales of wood and forest products, including some creating small processing businesses to supplement household income. Combining the sustainable management of forests with agriculture (through agroforestry) supports food security, livelihoods, as well as carbon sequestration.

2.9.3 Barriers to taking action

One of the barriers to increasing REDD-plus activities is the lack of clear collaboration with the private sector in many places. The reputational and political risks of investing in this sector can be perceived as being too high – this has also been noted by institutions such as the World Bank. Being able to scale up investment through leveraging private sector finance for this is critical, but enabling frameworks to ensure investment risks are managed, would need to be created first. Development Banks and strategic funding sources, such as the FIP, should be utilised to do this.

UNFCCC (2013) notes the following as barriers to further implementing REDD-plus activities:

- "an incomplete methodological guidance package (e.g. reference levels, national forest monitoring systems, and monitoring, reporting and verification)"
- "poor data on forest inventories and estimated CO2 emissions and removals"
- "drivers of deforestation (e.g. private-sector activities and international markets)"
- "poor institutional framework (e.g. national forest governance and soil legislation, land-use policy, land tenure structure)"
- "lack of sufficient financial resources."

Land use management is a very complex issue and is not managed by governments in an integrated way. Institutional silos and cross-departmental competition can undermine effective action in this area, while local capacity to manage these challenges can be severely lacking. Political pressure and institutional corruption can also have major negative impact in this area.

2.9.4 Options for scaling up

A regional approach could be taken, particularly with funding mechanisms such as the Global Environment Facility. This would enable efficiencies in turn being able to develop the necessary institutional capacity to affect change.

Pre-2020, it is unlikely that carbon payments will provide enough incentives for change. Another recommendation would be to incentivise the implementation of Readiness reforms through substantiating funding for investments at scale, according to FIP – this could have a great

potential to "pull" Readiness processes behind. The FIP cites numerous successes in being able to support sustainable forest practices being implemented and forest restoration achieved, through strategic investments, enabling local economic growth to occur at the same time. Links could be made between the FIP and FCPF and UN-REDD, thereby allocating additional funding for the FIP in support of on-going Readiness processes in FCPF and UN-REDD pilot countries.

Governments and organisations could pledge to restore forests by joining the "Bonn Challenge" – a movement initiated by the partners of the GPFLR and IUCN to restore 150 million hectares of degraded and deforested land by 2020. In Doha, it was announced that the pledges had nearly reached 50 million hectares. IUCN and WRI are currently carrying out national assessments for restoration potential in 15 countries. Increasing their resources would allow new assessments, including the economic benefits that could be gained, further incentivising action in this area. IUCN estimates that restoring 150 million hectares would be worth 85 USD billion per year to national and global economies.

2.9.5 Need for government support

Donor countries could support a regional approach being taken by facilities such as the GEF, as well as supporting mechanisms for further incentivising REDD Readiness processes, as outlined above. Supporting a more integrated approach to land use change will also be important going forward.

2.9.6 Focus ICI: Forest Investment Program (FIP)

Aims and objectives
FIP financing aims to:

- promote forest mitigation efforts, including protection of forest ecosystem services
- provide support outside the forest sector to reduce pressure on forests
- help countries strengthen institutional capacity, forest governance, and forest-related knowledge mainstream climate resilience considerations and contribute to biodiversity conservation, protection of the rights of indigenous peoples and local communities, and poverty reduction through rural livelihoods enhancements.

Leadership capability: track record, scope, capacity, & convening power
The FIP is a targeted program of the Strategic Climate Fund (SCF), which is one of two funds within the framework of the Climate Investment Funds (CIF). The FIP is operational in eight pilot countries: Brazil, Burkina Faso, Democratic Republic of Congo, Ghana, Lao People's Democratic Republic, Mexico and Peru. 639 USD million has been pledged to the Program to date.

It has been designed to be collaborative and FIP resources complement other REDD+ finance mechanisms including Forest Carbon Partnership Facility (FCPF), the Global Environment Fund (GEF), and the UN-REDD Programme. Country level collaboration by these institutions is vital and will help leverage further opportunities to address REDD+ priorities effectively and efficiently in the context of sustainable forest management and protection.

An additional 50 USD million resource has been created to support indigenous people and local communities in the Program's pilot countries. This finance aims to meaningfully engage in REDD+ at the local level by providing the resources to support participatory governance, transparency, and accountability.

Work is also currently underway to unlock additional investment by incentivising private sector investment in the pilot countries.

2.9.7 Focus ICI: Global Partnership on Forest and Landscape Restoration (GPFLR)

Aims and objectives
The GPFLR's mission is to unite governments, organisations and individuals with the common goal of restoring the world's lost forests.

The objectives of the partnership are to catalyse and share a network of examples of forest and degraded land restoration that also deliver benefits to local communities and to nature, and fulfil international commitments on forests. The partnership promotes an integrated approach based on active engagement, collaboration and ideas and information sharing. It aims to ensure that forests, trees and the functions that they provide are effectively restored, conserved and employed to help secure sustainable livelihoods and ecological integrity for the future.

Leadership capability: track record, scope, capacity, & convening power
The GPFLR was launched in 2003 by IUCN, WWF and the Forestry Commission of Great Britain. Since then more than 25 governments and international and non-governmental organisations have joined. These

governments are China, El Salvador, Finland, Ghana, Italy, Japan, Kenya, Lebanon, the Netherlands, South Africa, Switzerland, United Kingdom, United States. NGOs are: ARC; CARE International; CBD; Global Mechanism for the UN Convention to Combat Desertification; ICRAF; IMFN – International Model Forest Network; IUCN; IUFRO; ITTO; PROFOR; Tropenbos International; UNFFF; the UNEP World Conservation Monitoring Centre; World Bank; WRI; Wageningen University; WWF. IUCN hosts the secretariat.

The partnership seeks to link existing activities, projects, processes and institutions and to reinforce and encourage the positive role and contribution they each make. The partnership does not seek to establish a parallel policy process or duplicate the efforts of others. The partnership provides case studies, tools and shares research methods. It has a dedicated online learning zone which provides case studies from across 15 different countries and four continents which represent a variety of stakeholder groups, socio-economic conditions and restoration strategies.

2.9.8 Focus ICI: Collaborative Partnership on Forests (CPF)

Aims and objectives

The CPF's mission is to promote sustainable management of all types of forests and to strengthen long-term political commitment to this end. The Partnership's objectives are to support the work of UNFF and its member countries and to enhance cooperation and coordination on forest issues.

Leadership capability: track record, scope, capacity, & convening power

The UN Economic and Social Council (ECOSOC) invited the heads of relevant UN, international and regional bodies to form a collaborative partnership on forests in 2000. The CPF was established in April 2001. It is chaired by FAO and is serviced by the UNFF Secretariat.

The CPF is a voluntary membership agreement arrangement between 14 international organisations and secretariats which have a substantial forest program:

Center for International Forestry Research, Convention on Biological Diversity, Food and Agriculture Organization of the United Nations, Global Environment Facility, International Tropical Timber Organisation, International Union for Conservation of Nature, International Union of Forest Research Organizations, United Nations Convention to Combat Desertification, United Nations Development Programme, United Nations Environment Programme, United Nations Forum on Forests, Unit-

ed Nations Framework Convention on Climate Change, World Agroforestry Centre, World Bank.

These agencies share their experiences and build on them, they collaborate to rationalise and align their work and to find ways of improving forest management and conservation and the production and trade of forest products. Members also form valuable strategic partnerships with one another, benefiting from shared expertise and pooled resources.

The Collaborative Partnership on Forests Framework, produced annually, represents the Partnership's work plan and its progress report.

2.10 Short-Lived Climate Forcers

Short-lived climate forcers such as methane, black carbon and short-lived HFCs fall outside the definition of the "emissions gap" but do have an impact on short-term warming.[1] They are being addressed by two key initiatives globally.

Table 10 List of initiatives: Short-Lived Climate Forcers

Name of Initiative	Description	Starting Year
Climate and Clean Air Coalition To Reduce Short-Lived Climate Pollutants (CCAC)	The initiative was launched in 2012 by the UNEP with the aim to raise awareness of short lived climate pollutant impacts and mitigation strategies; Enhancing and developing new national and regional actions, including by identifying and overcoming barriers, enhancing capacity, and mobilising support and promoting best practices and showcasing successful efforts. Website: www.unep.org/ccac/	2012
Global Methane Initiative (GMI)	GMI is a multilateral initiative that unites public- and private-sector interests to advance the recovery and use of methane as a clean energy source. GMI builds on the existing structure and success of the Methane to Markets Partnership. Website www.globalmethane.org/gmi	2010

[1] Although it can be said that the climate forcing effects of black carbon and other aerosols carry larger uncertainties than those of CO2, methane and HFCs.

2.10.1 Mitigation potential

Based on UNEP (2011a) and UNEP, WMO (2011), UNFCCC (2013) reported that if measures to reduce short-lived climate pollutants which have a warming effect on the climate, such as black carbon, methane and HFCs, were fully implemented by 2030, they could reduce global warming by around 0.4–0.5 °C by 2050.

Although this represents a sizeable contribution to slowing down the rate of climate change over coming decades, this abatement of SLCFs is unlikely to make a significant contribution to longer-term climate goals. Assuming full implementation of measures by 2020, the influence of the emission reductions on global temperature change over a 100 year time horizon would be equivalent to a reduction of around 1.1 Gt CO_2e. Therefore, reduction efforts must be viewed as a strategy that complements, but does not replace, carbon dioxide emission reductions (UNEP, 2011c).

A semi-structured interview took place with a senior representative of the CCAC.

2.10.2 Benefits of taking action beyond climate impacts

UNFCCC (2013) identifies benefits including national and local health improvements and air quality, thus supporting development, and improved agriculture and ecosystems. Successful mitigation activities could prevent the premature deaths of around 2.4 million people annually (from indoor and outdoor air pollution) by 2030 and a reduction in annual crop losses of approximately 32 million tonnes (UNEP, 2011c).

CCAC highlights that some of these areas are very much in the domestic domain, specifically impacting females – note that improvements will contribute to development. Also, the technologies and knowledge are already available to implement, countries actively participating in the CCAC note that it is a practical way to take meaningful action that enhances development while also taking action on mitigating climate change.

2.10.3 Barriers to taking action

In addition to the barriers noted in the previous section, CCAC also notes that a lack of awareness of the co-benefits and resistance by the industry to change industrial processes could also be seen as a barrier to action in this area.

Numerous barriers have been identified by the UNEP, including high fuel and technology costs; limited fuel supplies; lack of relevant regulations and standards, as well as weak enforcement; low stakeholder

awareness; limited access to finance and skilled personnel; limited community awareness; high upfront investment costs; technical constraints; lack of infrastructure, unavailability of ultra-low sulphur; low prices for methane; complex permitting schemes and liability issues (UNEP, 2011c).

UNFCCC (2013) notes that there is also a lack of reliable data in this area, with no requirements for measurement and reporting under the UNFCCC process of aerosols such as black carbon.

2.10.4 Options for scaling up

More countries could join the CCAC, actively participate in the forum and / or contribute to its funding, of which 80% goes to funding projects and initiatives in its 10 work streams.

Another catalyst for change and for scaling up investment in this area would be to ensure reducing SLCFs is mainstreamed across other funds, such as the World Bank, GEF, regional development banks, Nordic Environment Finance Corporation (NEFCO), etc. This idea is already beginning to gain momentum, for example in 2012, the G8 commissioned the World Bank to investigate ways to integrate reduction of short-lived climate pollutants into its activities and asked the Bank to convene experts to evaluate new approaches to financing projects to reduce methane.

It should also be noted that the Gothenburg Protocol under the Convention on Long-range Transboundary Air Pollution from the United Nations Economic Commission for Europe (UNECE) has agreed to adopt 2020 reduction targets of fine particulate matter, to include black carbon. It will also issue standard guidelines for estimating and reporting black carbon emissions, a step toward creating an international inventory for the pollutant.

2.10.5 Need for government support

Governments are encouraged to undergo a similar screening process in their donor funding, utilise the "paid for performance" funding principle to support cuts and identify projects that can be funded which address this.

Political will to enact meaningful policy is critical in this area, as well as taking a sector by sector approach. Governments are encouraged to undergo their own national assessments in this area and exchange information on baselines, benefits, successful strategies, etc. Leaders are encouraged to raise the profile and benefits in this area by raising it in high-level dialogues.

2.10.6 Focus ICI: CCAC

Aims and objectives
Established in February 2012, by 6 governments and the UNEP "to catalyse major reductions in short-lived climate pollutants (SLCPs) with an initial focus on black carbon, methane and some hydrofluorocarbons (HFCs)." The Coalition's objectives are to address short lived climate pollutants by:

- raising awareness of short lived climate pollutant impacts and mitigation strategies
- enhancing and developing new national and regional actions, including by identifying and overcoming barriers, enhancing capacity, and mobilising support
- promoting best practices and showcasing successful efforts
- improving scientific understanding of short lived climate pollutant impacts and mitigation strategies.

Leadership capability: track record, scope, capacity, & convening power
Its work streams are divided into 10 work streams:

- Reducing Black Carbon Emissions from Heavy Duty Diesel Vehicles and Engines.
- Mitigating SLCPs and Other Pollutants from Brick Production.
- Mitigating SLCPs from Municipal Solid Waste.
- Promoting HFC Alternative Technology and Standards.
- Accelerating Methane and Black Carbon Reductions from Oil and Natural Gas Production.
- Supporting National Planning for Action on SLCPs Initiative (SNAP).
- Financing Mitigation of SLCPs.
- Reducing SLCPs from Household Cooking and Domestic Heating.
- Regional Assessments of SLCPs.
- Addressing SLCPs from Agriculture.

It has grown exponentially since its inception and is currently able to convene high-level political engagement at the highest levels, with over 15 Ministers attending one of its latest Assemblies, as well as high-level engagement with partner organisations, such as the World Bank and the World Health Organisation. It currently has over 70 members / partners, including over 30 countries.

3. Identification and preliminary assessment of ICIs in actor wedges

3.1 Top 1,000 companies

Assessing emission reduction potentials from a cross-sectoral viewpoint suggests the existence of a large potential in the corporate sector. Many initiatives already exist from the world's largest companies trying to catalyse emissions reductions.

Table 11 List of initiatives: Top 1,000 companies

Name of Initiative	Description	Starting Year
Caring for Climate	Caring for Climate is an initiative aimed at advancing the role of business in addressing climate change. The initiative helps companies to advance practical solutions, share experiences and shape public policy as well as public attitudes. Website: www.caringforclimate.org	2007
WWF Climate Savers	WWF Climate Savers is a global leadership platform which positions multinational corporations at the forefront of the low-carbon economy. The programme acts as a sounding board, providing guidance for companies seeking to substantially reduce their carbon footprints. The member companies work with other companies, suppliers and partners to implement innovative solutions for a low carbon economy. Website: www.panda.org/climatesavers	1999

3.1.1 Mitigation potential

The emissions of the top 1,000 largest greenhouse gas emitting companies amounted to 10.2 Gt CO_2e in 2008 (Jong, 2011). This points to a remarkable reduction potential in the business sector. Since many of the 1,000 largest greenhouse gas emitting companies already have GHG-reduction goals to decrease their energy use and increase their long-term competitiveness there is a high likelihood that this potential may be realised. Blok *et al*. (2012) estimated that if 30% of the top 1,000 companies were to reduce energy-related emissions 10% below business as usual by 2020 and all companies to reduce their

non-carbon dioxide greenhouse gas emissions by 50%, the total estimated potential impact of such initiatives would be up to 0.7 Gt CO_2e in 2020.

Wouters (2013) found that around 218 out of the 1,000 companies already participating in one or more initiatives account for around 39% of the emissions of the 1,000 companies. The commitments of a sample of 25 of these 218 companies yielded an average reduction target of 16% compared to business-as-usual emissions in 2020. Applying this average reduction to all 218 participating companies and an estimate of their total BAU emissions in 2020 results in an estimated reduction commitment of 0.73 Gt CO_2e in 2020.

No interviews were conducted for this study on the organisational feasibility of attaining the proposed reductions. However, given that several initiatives already exist and that tracking of performance has begun, this wedge may have a high chance of reduction achievements.

3.2 Supply chain emissions reductions

Beyond reductions from own emissions, companies could drive emissions reductions in their supply chain through a variety of approaches. A few initiatives exist globally to drive progress in this area.

Table 12 List of initiatives: Supply chain emissions reductions

Name of Initiative	Description	Starting Year
Consumer Goods Forum (CGF)	Industry network bringing together CEOs and senior management of over 650 retailers, manufacturers, service providers and other stakeholders across 70 countries with a combined staff of 10m+ and combined sales of EUR2.5 trillion Website: http://www.theconsumergoodsforum.com/	2009
Clean by Design	[No information found– further investigation needed] Website: http://www.cleanbydesign.org/	–

3.2.1 Mitigation potential

Reductions from supply chains depend on the level of implementation of social and environmental requirements for company suppliers, which are driven by increased competitiveness, corporate social responsibility and the ability to be a front-runner. Ecofys modelling shows that if 30% of companies were to require their supply chains to reduce emissions 10% below business as usual by 2020, the potential reduction would amount to 0.2 Gt CO_2e in 2020 (Blok *et al.*, 2012).

No interviews were conducted for this study on the organisational feasibility of attaining the proposed reductions.

3.3 Green Financial Institutions

Financial institutions could drive change in organisations which bank with them and change their own investment choices, effecting emission reductions beyond their own footprint.

Table 13 List of initiatives: Green Financial Institutions

Name of Initiative	Description	Starting Year
The UNEP Finance Initiative (UNEP-FI)	Established partnership between the UNEP and 200+ financial institution members to promote SD principles at all levels of financial institution operations. Has a dedicated climate change working group. Website: http://www.unepfi.org	2003
Banking Environment Initiative (BEI)	The Banking Environment Initiative (BEI) was initiated in 2010 with the support of The Prince of Wales to identify new ways in which banks can collectively stimulate the direction of capital towards environmental sustainable economic growth. It is facilitated by the University of Cambridge Programme for Sustainability Leadership (CPSL). Website: www.cpsl.cam.ac.uk/bei	2010
Institutional Investors Group for Climate Change (IIGCC)	The Investor Group on Climate Change (IGCC) is a collaboration of Australian and New Zealand investors focusing on the impact that climate change has on the financial value of investments. Website: http://www.igcc.org.au/	–

3.3.1 Mitigation potential

More than 200 financial organisations are already members of the finance initiative of the United Nations Environment Programme (UNEP-FI). They are committed to environmental goals owing to corporate social responsibility, to gain investor certainty and to be placed well in emerging markets. According to Blok *et al*. (2012), a reduction potential in 2020 of up to 0.4 Gt CO_2e could be achieved if the 20 largest banks were to reduce the carbon footprint of 10% of their assets by 80%.

No interviews were conducted for this study but we present findings from desk research below.

3.3.2 Barriers to taking action

A major barrier to undertaking an initiative such as the one mentioned above would the lack of data – the carbon footprint across a bank's entire lending or investment portfolio is not systematically tracked. The UNEP-FI is currently working to create common Monitoring Reporting and Verification (MRV) standards to support banks to do this.

Leakage and additionality issues also emerge when setting targets such as that suggested above. Any such initiative is likely to encounter reluctance from banks to participate due to competitiveness concerns.

3.3.3 Options for scaling up

Unlocking increased investment in clean energy could be achieved through an evolution of traditional valuation practices, which the BEI claim fail to value clean energy investments properly, undermining investment (BEI, 2012). They conclude that valuation models that explicitly value the fact that clean energy investments give energy companies the option to adapt to changing market or policy conditions may be more appropriate – thus creating an options type valuation approach. The group believe that making greater use of this thinking appropriately into standard investment decision-making would unlock further investment in clean energy today, given the nature of uncertainties in the energy sector.

Another option would be for a group of long-term investors to commit to investing in a certain percentage of low-carbon infrastructure.

3.4 Major cities

Another cross sectoral set of actors with great potential for driving emissions reductions are cities, where densely populated areas result in high emissions. There are already many valuable initiatives underway to use this avenue for change.

Table 14 List of initiatives: Major cities

Name of Initiative	Description	Starting Year
carbonn Cities Climate Registry (cCCR)	Cities can report on their GHG emissions and reduction targets through cCCR and cCCR is now the world's largest global database of local climate action. cCCR has been developed under the auspices of the WMCCC and with support of among others ICLEI. The cCCR will be operated by the Bonn Center for Local Climate Action and Reporting – carbonn®. Cities reporting to the cCCR include ICLEI member cities, Mexico City Pact signatories and WWF Earth Hour City Challenge candidates. Website: www.citiesclimateregistry.org	2010
C40 Cities Climate Leadership Group (C40)	C40 is a global network of large cities taking action to reduce GHG emissions. The C40 Group provides its members with direct support, peer-to-peer exchange and research & communication. The Clinton Climate Initiative (CCI) is the implementing partner of the C40 Group. The CCI works with participating cities on large-scale projects for reducing GHG emissions and improving energy efficiency. Website: www.c40cities.org	2005
Climate Alliance	The Climate Alliance of European Cities with Indigenous Rainforest People is a European network of local authorities committed to the protection of the world's climate. The member cities and municipalities aim to reduce GHG emissions, therefore local climate strategies are developed and implemented. There are also measures taken to raise the public's awareness for the protection of the rainforest and to refrain from the use of tropical timber derived from destructive logging. Climate Alliance is related to the Covenant of Mayors. Climate Alliance runs the Covenant of Mayors Office and acts as a Covenant Supporter for Climate Alliance Members. Website: www.climatealliance.org	1990
ICLEI	ICLEI – Local Governments for Sustainability is an association of cities and local governments promoting local action for sustainable development. Through the GreenClimateCities Initiative, replacing the Cities for Climate Protection (CCP) program, cities can receive guidance and technical support for setting up their GHG emissions inventory, identifying opportunities for emission reductions, developing a climate action plan and measuring and reporting their progress to the cCCR. Website: www.iclei.org	1990
Mexico City Pact	The Global Cities Covenant on Climate "the Mexico City Pact" was launched on the World Mayors Summit on Climate (WMSC) in 2010. The Mexico City Pact establishes a set of voluntary commitments to promote strategies and actions aimed at mitigation of GHG emissions as well as adaptation to the impacts of climate change. The Mexico City Pact was the result of an alliance between among others WMCCC and ICLEI. Website: www.mexicocitypact.org	2010

3.4.1 Mitigation potential

Blok *et al*. (2012) identified major cities as a large source of greenhouse gases emissions with many cities having set voluntary targets already. If the C40 or an equivalent sample of cities, would reduce their emissions

20% below business as usual by 2020 (estimated at ~3–4 Gt CO_2e) this could result in emission reductions of up to ~0.7 Gt CO_2e in 2020.

Wouters (2013) analysed the expected impacts of existing commitments of three city-based initiatives: C40, cCCr and Convent of Mayors. Given the current commitments of on average ~17% in 2020, compared to 2010, for the C40, she estimated their emission savings by 2020 to be around 0.22 Gt CO_2e. Additional emission reduction by cities who have joined the other two initiatives adds an expected 0.55 Gt CO_2e reduction, bringing the total estimated reduction in 2020 from current commitments of the cities in all three initiatives to 0.8 Gt CO_2e (range 0.5–1.0 Gt CO_2e).

The potential for cities to reduce emissions is likely to be higher than 0.8 Gt CO_2e, because:

- There are many cities that do not participate in these initiatives but are still taking action to mitigate climate change.
- A "race to the top" could encourage more cities to adopt the targets of the most ambitious cities, increasing the overall commitment (current targets span almost the entire range from 1%–100% reduction).

A current study by Jaquot (2013) is analysing achievements of emission reductions to date by the initiatives above and the implication for reaching their stated targets for 2020. Preliminary results suggest that the three initiatives are mostly on track with some cities lagging behind, and that target achievements are more likely when targets are set in the short term rather than too far in the future.

No interviews were conducted for this study on the organisation feasibility of attaining the proposed reductions. However, given that several initiatives already exist for cities and that tracking of performance has begun, this wedge may have a high chance of reduction achievements.

4. ICI design

4.1 Ensuring additional impact from ICIs

International cooperative initiatives (ICIs) can serve a dual role of supporting the delivery of current or planned mitigation efforts (as pledged by governments through the UNFCCC) and catalysing or delivering new and additional emission reductions. When working to ensure ICI activities lead to additional impact, a number of challenges must be overcome, including:

- ICIs claim to achieve additional reductions, but in reality it is a continuation of business as usual.
- ICI reductions are attributed to more than one initiative or country and double-counted when aggregating them to the global level.

These challenges can be addressed by ensuring that actions taken by ICIs are truly additional to what would happen otherwise and by establishing mechanisms to ensure effective attribution of impact at national and international level. We discuss these problems further here and present some possible solutions for consideration.

4.1.1 Ensuring action is additional to what would have happened otherwise

Actions taken by ICIs rarely take place in isolation, some will create synergies with government mitigation policies and interventions, while others may duplicate, or even counteract them. ICIs might influence different stakeholder groups, instruments or processes, and on different time scales and the legislative, fiscal or regulatory conditions controlled by governments may support or inhibit such activities. Therefore ensuring the overall impact of ICIs is additional to what would have happened otherwise is not straightforward. Comparison is always counterfactual and it is therefore important to have a clear framework for aggregating the impact of different activities taking place at the same time (Woerlen, 2013). A number of different design options exist to ensure that the actions by an ICI are additional to what would have happened otherwise:

ICIs demonstrate their ambition beyond Business As Usual

An ICI could demonstrate it is really ambitious and additional to what would have happened otherwise, (e.g. a reference case or business as usual, taking into account existing pledges). This is facilitated by the setting of quantitative targets which can then be monitored and verified. This is the standard approach applied for example in Clean Development Mechanism (CDM) projects or country pledges. However, setting the reference level is a critical and often disputed step. To overcome this, transparency on the assumptions and an external review and verification of the baseline can help to ensure commitments are truly ambitious.

ICIs demonstrate their ambition is in line with a benchmark

An ICI could demonstrate it is on a low-emission pathway relative to a benchmark of "best possible options" or in line with a common low carbon vision. For example, global 2 °C scenarios have in common that they all assume a full decarbonisation of the electricity system by the middle of the century. An ICI related to electricity supply that matches or exceeds such a goal would therefore be considered as ambitious. A prerequisite for this approach would be agreed global benchmarks / goals covering all relevant sectors. As no fully accepted global benchmarks currently exist, these would have to be developed and agreed by ICIs and / or the international community at levels ensuring ambition. Similar benchmark approaches have been developed for country-level assessment (e.g. by Ecofys in their Climate Action Tracker and EU Climate Policy Tracker tools (Höhne *et al*., 2010; Climate Analytics *et al*.)), however, global benchmarks would have to take into account other issues such as allowing for variation in country context.

4.1.2 Attributing the impact of initiatives and / or country pledges at national level

A number of problems are presented around the attribution of the impact of initiatives on emission reductions at the national level. For example, if different initiatives use different intervention types that jointly lead to emission reductions, is this impact always attributable to the investment, or also to the policy framework or the capacity building programs? (Woerlen, 2013). Two key problems are the risk of double counting (where ICI activities overlap with other activities) or when governments relax their ambition raising efforts when the impact of ICIs promises to fulfil their national pledges under the UNFCCC.

Double counting

ICIs activities often cover similar sectors or areas and as a result the impacts of different ICIs are likely to overlap with each other. When it comes to attributing emission reductions to the impact of these ICIs, this presents a potential for double-counting and consequent inflation of emission reduction estimates at the national level. For example, a City ICI with a programme supporting the installation of roof-mounted solar-panels may attribute emission reductions from new installations in the city to its actions. At the same time, a Renewable Energy ICI focused on promoting renewable energy nationally may attribute the emission reductions from the same new installations to its own efforts. Furthermore, the National government (or other domestic actors) involved in the installation may also claim the impact as a result of its activities (resulting in triple counting!). Therefore, if not well coordinated when aggregating the impact of different ICIs activities at national level, then a strong risk of double–counting exists. This problem is avoided by ensuring emissions reductions are only counted once when aggregating impacts of initiatives with the national inventory.

Transparency

ICIs have the potential to help catalyse increased emissions reductions at the necessary scale and pace to close the pre-2020 emissions gap. Their success in a given country could support or encourage national governments to raise their policy ambitions and enable them to implement or increase their emission reduction pledges to the UNFCCC. However, there is also the risk that if an ICI increases its ambition and activities in a given country, instead of acting as a catalyst to further action (and increased pledge) by the government, it could have the opposite effect, relaxing government ambition by sending a signal that it is no longer urgent for them to focus on policy development in this area. If ICIs are to support the ratcheting up of pledges within the UNFCCC, then it is important that such effects are avoided. If increased efforts of ICIs are to lead to increased ambition through the UNFCCC and ultimately to real emissions reductions then ensuring greater transparency around who is responsible for impact could help.

Tracking of ICIs could serve as very powerful mechanism to support this transparency and to help "ratchet up" targets by countries through the UNFCCC. For example a country makes a proposal for a target for 2030. This is then agreed as a "floor" of ambition. The country has to review it every two years to see if it can be ratcheted up. Later, an ICI pledges to e.g. install 1,000 GW wind globally, which would mean an additional 200 GW in that country. A technical review of the target would check if the

new ICIs are taken into account in setting the target and if there is scope to ratchet up the target of the country further for 2030.

4.1.3 Aggregating and tracking impacts at international level

If ICIs are clearly included within national inventories and projections in a "country-based accounting" approach, this will help avoid double-counting when aggregating globally to enable tracking of impacts at international level.

However, this approach cannot provide detail about the additionality made by individual ICIs at an international level. Therefore, in addition, an "ICI-based accounting" approach could also be adopted, where the impact of each ICI is identified and tracked at an international level. A central analysis body would then be required to aggregate these, identifying overlaps between other ICIs and estimating additionality to existing pledges.

4.1.4 How can future ICIs be designed for additionality?

If they are to effectively strengthen global ambition in a meaningful way resulting in new emission reductions, future ICIs that are interested in catalysing additional reductions will have to be designed to take account of the various challenges discussed above. Firstly, from a technical point of view, some degree of due-diligence will be required to mitigate concerns that initiatives might over-estimate or over-state their impact. To achieve this, ICI activities will need to be effectively quantified in some way, to demonstrate impact over and above current "pledged BAU" (business as usual including existing pledges) or to agreed global targets or benchmarks of what is considered ambitious. However, whilst due-diligence is important, so is motivation and the capacity to act, and the benefits of quantification must be balanced against the risk of disincentivising ICIs who are not motivated by, or cannot see the value of, engagement in overly-bureaucratic processes which this could entail. Secondly the combined impact of ICIs will need to be aggregated at the global level in a way which is both transparent, avoids double counting and enables the additionality of ICIs to be identified over and above existing pledges to the UNFCCC.

A good model could be the approach adopted at regional level by the Covenant of Mayors in the EU where individual cities and local authorities work to exceed voluntarily agreed benchmarks which raises ambi-

tion across Europe. Each city quantifies and reports progress by submitting regular reports which are then aggregated by a central analytical body (the EU-Joint Research Centre) enabling effective tracking of progress across the region.

4.2 ICIs as a climate financing channel

Recent analysis of the global climate finance landscape indicates that public finance deployed in 2010/11 (16–23 USD billion) played a crucial role in catalysing substantially greater volumes of private investment (217–243 USD billion) over the same period (Buchner *et al*., 2012). Established channels of public climate finance (largely from developed country governments) are facilitating the flow of increasing volumes of investment, but progress is slow and their mitigation efficacy is not always clear. Originally, developed countries agreed to provide 30 USD billion in fast-track financing between 2010 and 2012 and to mobilise 100 USD billion of additional climate support per year by 2020. However, with the fast-track period now over and no substantial agreement on large-scale climate finance from developed countries, the issue is becoming increasingly urgent for those trying to implement interventions through established channels such as Nationally Appropriate Mitigation Actions (NAMAs). In the case of NAMAs, despite at least 67 currently in development or implementation and a further 34 feasibility studies underway (Ecofys, 2013) there is an acknowledged finance gap limiting implementation progress. Finance vehicles such as the Green Climate Fund, although being established, are not yet operational and others such as the UK/German NAMA Facility remain of relatively modest size to achieve the impact required at sufficient scale globally.

Other channels of finance through new (and existing) market mechanisms, Reducing Emissions from Deforestation and forest Degradation (REDD+) and Sectoral Crediting Mechanisms (SCM), continue to be explored and developed under the expectation that they will create additional avenues for market based financing (Kawamura, Utsunomua, 2012). However, as is the case for Reducing Emissions from Deforestation and forest Degradation (REDD+) – where most finance is mobilised by the public sector – issues such as slow, fragmented disbursement, scarce investment opportunities and the absence of a predictable long-term finance strategy (Angelsen *et al*., 2012) suggest that further channels for public finance may be needed to mobilise at the scale and pace now required.

Even with sufficient finance volume and flow, the estimated impact of mitigation actions such as individual NAMAs varies considerably. Furthermore, as with other established channels of public climate finance and ODA, verifiable impacts on emission reductions are not easy to quantify. Despite a recognised need for effectiveness, reporting and monitoring processes have been considered largely inadequate and patchy (Chaum *et al*., 2011). Consequently, this presents a problem to the public financier in prioritising the most favourable channels to use. Given the challenging economic climate since 2008/09 and increased emphasis among donors to demonstrate development aid effectiveness (OECD, 2005), consideration of how scarce public resources are best spent on tackling climate change are now perhaps more important than ever. Do current public climate finance channels represent good value for money? What will achieve most impact at the greatest scale and pace? What other alternatives might be more effective or efficient?

4.2.1 Could ICIs offer an effective channel for public climate finance?

This is where ICIs may present a viable alternative for channelling public climate finance. As our analysis for this study has revealed, ICIs often develop innovative new approaches for reducing emissions which, with further support, can be scaled to make a significant contribution to global emissions reduction. Some ICIs may have limited impact or fail, while others identify new, more efficient ways to reduce emissions faster and more effectively (e.g. by leveraging private investment) and as such offer a promising prospect for public climate finance.

A direct cost-benefit comparison between ICIs and established finance channels is challenging (and beyond the scope of this current study) due largely to the lack of evidence about the impact of ICIs and persistent challenges in measuring the effectiveness of established climate finance channels (Chaum *et al*., 2011). A number of effectiveness criteria have been agreed for the Green Climate Fund (GCF) and the new German-UK NAMA Finance facility which offer a useful guide. However, the broader principles for development aid effectiveness set out in the Paris and Acra Agreements (OECD, 2005) should also be taken into account. They emphasise the importance of: Increasing country ownership; Aligning interventions with national and community priorities; Harmonising donor practices; and Ensuring mutual accountability and management for results. Additionally, based on our current understanding of how the climate finance "market" is operating, public finance ap-

pears to play a potentially crucial role in catalysing private investments (Buchner *et al*., 2012) and therefore another criteria could be ICI's effectiveness in leveraging further private finance. A number of ICIs we analysed for this study satisfy many of these criteria and would appear to offer promising prospective channels for public climate finance. One such example is the UNEP/GEF en.lighten initiative, the leading ICI driving a global transition to energy efficient lighting (see box).

Channeling climate finance through an intiative which scales up energy efficiency in lighting and appliances led by en.lighten, CLASP and SEAD

With regards to lighting, the en.lighten initiative offers an inspiring example of a partnership between public and private sectors which is exhibiting targeted, fast, effective impact. Its approach employs many of the key principles for aid effectiveness (OECD, 2005) and it provides a good demonstration of how public climate finance can be used to leverage the private finance necessary to deliver at scale. Through the initiative, private sector partners provide investment, in-kind technical expertise and data, critical to ensuring government buy-in and achieving the high scale and pace of impact demonstrated to date. Lack of access to finance for the core ICI activities is cited by the initiative as its major barrier to scaling up. Additional finance could extend the scale and pace of en.lighten's work enabling more countries and regions to be provided with in-depth support.

Initial financing of 5 USD million has led to the support of 23 countries across West Africa and Central America (roughly 220 USD thousand per country). Further support of this magnitude could extend the initiative to additional countries (excluding ASEAN region where funding is already secured). Compared to other channels of finance, the impact (in terms of emissions reduction) can be expected to be relatively fast with experience to date suggesting that countries typically take just 2–3 years to make a full transition to energy efficient lighting. The current focus of the initiative is on domestic, residential lighting which typically represents around two thirds of emissions from lighting. Additional finance could also be targeted at further mitigation potential by extending their work to include industrial and commercial lighting.

Dispersing finance through ring-fenced contributions to the UNEP Trust Fund for extending the number of countries, or through developing existing country plans into NAMAs to increase the scope to industrial/commercial lighting or other appliances are two routes which could be explored.

An opportunity exists to scale up energy efficiency in appliances globally through an initiative which combines the demonstrated strengths of the en.lighten initiative, CLASP and SEAD. Utilising SEAD's established platform with senior government engagement, En.lighten's experience of successful public/private partnership for market transformation and CLASP's in-depth technical expertise, an initiative could be co-created between these organisations, with a global pledge by participating countries to phase in super-efficient appliances and products while phasing out inefficient appliances and products, starting with air conditioning, refrigeration and water heaters.

Consensus has already begun to be generated around this concept and it is estimated that broad agreement could be achieved as early as 2014 with a core group of countries and organisations. CLASP believes funding in the region of 100 USD million would allow for the rapid scaling up that closing the pre-2020 emissions gap would entail. In the absence of a dedicated programme such as this, progress will be incremental.

4.3 Options for the role of the UNFCCC and other organisations

If ICIs are to make a more significant and scaled-up contribution to emissions reductions with the support of public climate finance, then some degree of international coordination, facilitation or overview will be required to ensure efficiency, effectiveness and a good fit with existing intergovernmental processes.

The UNFCCC could naturally have a role to play here. However, the scale and type of involvement it should have is worth consideration as different options could present different pros and cons. For example, one option could be a process completely independent of the UNFCCC, which offers the advantage of attracting ICIs who are traditionally less keen to engage with the UN process. However, the disadvantage of such an approach is that this would not easily enable a comprehensive global overview and integration with the UN process resulting in high risk of duplication and gaps in identifying and realising mitigation potential. A second option could be a process lightly facilitated by the UNFCCC which offers the advantage that it enables a more integrated overview of activity without putting off ICIs who may not want direct involvement with the UN process. The disadvantage of this approach is that it may not allow for fully integrated monitoring and tracking of ICI activities. A third approach could be a process fully coordinated by the UNFCCC

which would offer the advantage of full tracking, strong global overview and enabling identification of gaps while avoiding the risk of duplication. The disadvantages of this option are that it could be off-putting to some ICIs who are not willing to engage with the UN process and would likely require additional administrative resources to be delivered.

It is perhaps more useful to consider that this process will require a number of key functions to be performed by various existing (or new) global institutions alongside the UNFCCC. These functions should support three main objectives: (1) Tracking; (2) Supporting; and (3) Strengthening; which we discuss in more detail below. No one single organisation / institution is likely to be ideally suited to delivering all of these functions and when considering which are best suited to each, a number of issues should be taken into account. Firstly, it will be important that the organisation is seen as credible both by ICIs and the international community and is provided with some kind of mandate to perform the function. For example, as mentioned earlier, some ICIs are not keen supporters of the UN process and may be reluctant to engage with the UNFCCC in this role (for example, if the exercise is seen as unnecessarily bureaucratic for what the ICI is trying to achieve). Secondly, it will also be important that the organisation is capable of performing the function well. Has it previously demonstrated effective leadership relating to the proposed function? Would it be able to effectively convene and motivate key players? Does it have the necessary resources (e.g. skilled staff) and organisational capacity to deliver efficiently and effectively?

4.3.1 Tracking

If ICIs are to play a significant global role in reducing emissions (and be recipients of further climate finance) it will be important that their activities and impact (both estimated and observed) are effectively tracked to enable a global overview. For effective tracking to take place, we identify three main functions which will need to be performed and suggest an organisation best suited to performing them (summarised in Table 15):

- *Provide an overview* of initiatives, their actions and overlaps. This is a key strategic function of mapping the landscape and is required to enable a global overview of ICI activities and how they interact (both with each other and with country pledges to the UNFCCC). This function is likely to be best performed by the UNFCCC Secretariat given its existing work in this area (e.g. the ICI web portal currently in development) and familiarity with collating and verifying

mitigation pledges from parties to the UNFCCC. The United Nations Environment Programme (UNEP) could also play an important role here given its experience in producing the Emissions Gap reports, its familiarity with ICIs and its high global visibility, particularly with non-government actors.

- *Aggregate the impact* of ICI activities. This will be important to enable a clear understanding of the overall global contribution and impact of ICIs to closing the emissions gap. It will be important that this fits with the current process of tracking and reporting from country pledges undertaken by the UNFCCC Secretariat (particularly to avoid overlaps). As with (a) this function is likely to be best performed or coordinated by the UNFCCC Secretariat, the UNEP or a combination of the two.
- *Provide analysis* to enable prioritisation for finance or support. Further analysis will be important to identify where potential gaps or unrealised mitigation potential exists which should then be further supported or strengthened. This function therefore provides important information to guide the other two objectives (Supporting and Strengthening). This could also be coordinated by the UNFCCC Secretariat or the UNEP.

Clearly, it is also possible that a credible independent third party builds the foundation for this tracking function before it is transferred to an international body to administer and develop further.

4.3.2 Supporting

As our analysis has shown, ICIs are at various different stages of development and share various common challenges when scaling up their activities and impact (e.g. need for resources or government support). There are a number of important functions which could be performed to help support them in this which we identify below and suggest organisations best suited to performing them (summarised in Table 15):

- *Facilitate knowledge sharing and learning* between initiatives. Providing a platform (or range of platforms) which enable ICIs to exchange good practices and learning from each other's successes and failures could play an important developmental role, particularly for ICIs in early stages of development. This could be facilitated by the UNFCCC or the UNEP, potentially in collaboration with existing platforms such as the Low Emissions Development Global Partnership (LEDS-GP) or an independent organisation.

- *Facilitate collaboration* between ICI and government leaders to ensure efficiency and avoid duplication of effort. This is an important function to ensure efficiency and prevent duplicated effort at the global level by facilitating dialogue and collaboration both between ICIs (e.g. avoid duplicated effort and encourage "co-opetition") and between ICIs and governments (e.g. unblock obstacles). Again, this could be facilitated by the UNFCCC or the UNEP, potentially in collaboration with existing platforms such as the Low Emissions Development Global Partnership (LEDS-GP) or an independent organisation.
- *Encourage ambition-raising of existing ICIs* – Supporting and encouraging ICIs to raise their own ambition level and enabling them to achieve this is a critical function to be performed if ICIs are to effectively drive new and additional emission reductions at the global level. This function draws upon analysis undertaken through the first objective (Tracking) and links closely to the third object (Strengthening). It is likely to be best performed by the UNFCCC, the UNEP or an independent organisation provided with a strong mandate.

4.3.3 Strengthening

- *Seeding new ICIs* where gaps are identified. Analysis undertaken under the first objective (Tracking) is likely to identify areas with mitigation potential where there is no ICI effectively operating. In such cases an important function may be to work with other ICIs and stakeholders to develop activities or ICIs to address this. This function could be performed by the same organisation(s) involved in object two (Supporting). Organisations, such as UNEP, which have demonstrated a strong track record in identifying and seeding new ICIs would probably be best placed.
- *Incubation or brokerage to increase existing ICIs impact*. Another important function to enable ICIs to achieve their mitigation potential is to connect them to sources of finance and further capacity building support. Public and private financiers are not always aware of ICIs and their activities, or how they may fit their investment criteria and mandate. An important function here would be to connect ICIs to appropriate sources of finance and support to help them grow and scale up their impact. For public climate finance, this function could be potentially coordinated or facilitated by the World Bank, or a collaboration of regional development banks and other organisations currently engaged in the dispersement of fast-start climate finance.

For private finance the role may be better suited to a collaboration of private financiers (e.g. those involved in the UNEP Finance Initiative) or existing facilitators of Public-Private Partnerships (PPP) such as the World Economic Forum (WEF) or the Global Green Growth Forum (3GF). It may also be worth considering bringing this together under a special global initiative of the UN Secretary General (UN-SG) to provide a high enough profile to ensure effective buy-in.

- *Develop ICIs as channel for public and / or private climate finance*. A further function which may be required would be to operate a process for developing ICIs into more formal channels for climate finance. This would need to involve some processes for managing risk and verifying impacts and would be best suited to an organisation such as the World Bank, or a collaboration of regional development banks.

Table 15 Functions and potential organisations suited to perform them

Objective	Function	Potential lead organisation
1.Tracking	Provide overview of ICI's actions and overlaps Aggregate global impact of ICI activities Provide analysis to enable prioritisation for support and or finance	*UNFCCC* *UNEP* *Foundation could be laid by a credible independent third party*
2. Supporting	Facilitate knowledge sharing and learning between ICIs. Facilitate ICI and government leaders to collaborate and avoid duplication of effort Encourage ambition-raising of existing ICIs.	*UNFCCC* *UNEP* *LEDS-GP or similar* *An independent organisation*
3. Strengthening	Seeding new ICIs where gaps are identified. Incubation / brokerage to increase existing ICIs impact. Develop ICIs as channel for public and / or private climate finance support.	*UNFCCC / UNEP* *World Bank and / or collaboration of regional development banks + others* *Organisations such as UNEP-FI, WEF, 3GF or similar* *UN-SG*

5. Summary and recommendations

Through our analysis for this study we have identified and reviewed a selection of ICIs and assessed their potential for greenhouse gas mitigation and ambition-raising. From this analysis we can conclude that there are a wide range of ICIs which:

- are already making an important contribution to emission reductions globally
- have potential to scale-up their activities to achieve greater emission reductions
- offer new possible channels for public climate finance with the potential to deliver substantial new emission reductions and catalyse ambition-raising in national pledges.

If ICI activities are to be scaled-up to provide new and additional emissions reductions sufficient to make a meaningful contribution at the global level, a number of issues must be addressed both in their design and in the way in which they fit with the current UNFCCC process. We summarise below a number of recommendations for how these issues could be addressed, specifically in relation to ensuring additionality of impact and proposing options for ensuring effective international overview and support. We conclude with recommendations for a range of possible channels which Nordic countries could pursue to further their international climate priorities.

5.1 Additionality and double-counting

To demonstrate that they are providing new and additional emissions reductions, ICIs should be encouraged to monitor their impact and commit to a level of ambition through setting targets. To ensure they were truly ambitious, ICIs targets should be in line with (or exceed) agreed benchmarks of good practice relevant for the sectors and contexts in which they are operating. As no fully accepted global bench-

marks currently exist, these would have to be developed and agreed by ICIs, donors and the wider international community at levels which ensure sufficient ambition. Tracking of ICIs could also serve as very powerful mechanism to "ratchet up" targets by countries through the UNFCCC. A good model to follow could be the approach adopted at regional level by the Covenant of Mayors in the EU where individual cities and local authorities work to exceed agreed benchmarks, providing regular reports on progress which raises ambition across the region.

To avoid double-counting (i.e. with country pledges) at country and international level, accounting processes must be put in place to ensure that emission reductions from ICIs are only counted once when aggregating them in the country's national inventory. Any tracking of the expected impact of an ICIs actions must take into account not only existing national pledges but also all expected actions by other ICIs which operate in the same sector. This is especially important for the cross-sectoral thematic areas. Ensuring verifiable tracking of ICI impacts at country level together with transparency around the inventory methodology (e.g. for clear attribution of impacts) would enable "country-based accounting" of ICI impacts which could then be included in country inventory communications to the UNFCCC.

5.2 International overview of, and support to, ICIs

If ICI activities are to be effectively integrated into existing international efforts and contribute to ambition raising and providing new and additional emission reductions, then some degree of strategic overview will be required. To achieve this, we identify nine key functions to be performed by a range of international organisations (including the UNFCCC) in order to achieve three key objectives of tracking, supporting and strengthening ICI impact:

1. Tracking, possibly led by the UNFCCC and / or the UNEP.
    a) Provide overview of ICI's actions and overlaps.
    b) Aggregate global impact of ICI activities.
    c) Provide analysis for prioritisation of support and / or finance.
2. Supporting, possibly led by the UNFCCC and / or the UNEP and others.
    a) Facilitate knowledge sharing and learning between ICIs.
    b) Facilitate ICI and government leaders to collaborate and avoid duplication of effort.
    c) Encourage ambition-raising of existing ICIs.

3. Strengthening, possibly led by a wide range of organisations in collaboration with the UNFCCC, the UNEP.
   a) Seeding new ICIs where gaps are identified.
   b) Incubation / brokerage to increase existing ICIs impact.
   c) Develop ICIs as channel for public and / or private climate finance support.

5.3 Promising channels for Nordic support

Based on our analysis for this study, we have identified a number of promising channels where Nordic countries could support ICIs to further their international climate change negotiation priorities. This may include providing political, technical or financial support to: convene new coalitions of ICIs or to strengthen existing ICIs (or groups of ICIs) to increase their ambition, scale-up their activities and increase their impact. We summarise in Table 16 below a range of actions which provide some initial suggestions for how this could be achieved and what mitigation potential this could offer.

Table 16 Potential channels for Nordic support

Thematic area	Mitigation potential in 2020	Level and stringency of current activity	Possible action to scale up
Renewables: Boost solar photovoltaic and wind energy	Total potential 1 to 2.5 Gt CO_2e Existing commitments almost 1 Gt CO_2e, but implementation unclear	Significant and diverse. Concrete targets currently only by minor players	Form a coalition of powerful industry, finance and NGO partners to set ambitious and implementable global targets for installed capacity by 2020
Energy efficiency: Building heating and cooling	Total implementation potential in 2020 0.6 Gt CO_2e Expected impacts of existing commitments unclear	Fast growing and diverse activity. Some larger goals, but limited concrete targets of initiatives	Catalyse an initiative working with an alliance of commercial real estate sector actors who agree to a code / target in terms of future property investments. Also, further research to identify other initiatives that could enact new actions and additionality.
Energy efficiency: Ban of incandescent lamps	Total potential ~0.5 Gt CO_2e Existing commitments ~0.5 Gt CO_2e	One major, growing initiative with clear target and phase out plans	Expand the number of countries engaged in the en.lighten programme and enable more in-depth, focused support to a larger group of countries to enable market transformation.
Energy efficiency: Electric appliances	Total potential ~0.3–0.7 Gt CO_2e Existing commitments ~0.3–0.7 Gt CO_2e	Limited but ambitious initiatives	Form a coalition with countries who pledge to transform markets around at least three key appliances. Pool the unique strengths of SEAD, CLASP and en.lighten to phase in super-efficient appliances and phase out inefficient ones.
Energy efficiency: Cars & trucks emission reduction	Total potential 1.7 Gt CO_2e Existing commitments ~0.4 Gt CO_2e	Several partnerships with goals of mixed stringency	Support further research to develop initiatives that could increase the scale of impact and action (e.g. enabling more stringent emissions and fuel quality legislation and cities up traffic management schemes).
Energy efficiency: Maritime transport	Total potential ~0.2 Gt CO_2e No firm commitments at global level, mostly voluntary targets	On-going, long-term international processes now supported by new initiative	Develop an initiative which engages with governments and major shipping companies to increase the scale of action and impact (e.g. though the support of risk guarantee schemes for retrofitting ships with energy efficiency and engaging nationally owned port authorities to incentivise energy efficient shipping.)
Fossil fuels subsidy reform	Total potential 1–4.5 Gt CO_2e No firm commitments at global level	Initial commitments but limited action so far	Develop a new initiative to provide an enabling platform of public-private actors to support countries willing to pledge to phase out fossil fuel subsidies by 2020. For example, this could include increasing pressure on lending institutions to maintain their commitment to fossil fuel subsidy phase out and ensure integration in all lending criteria. Political support could be provided by relevant governments and IGOs with focussed policy and technical support provided by some of the ICIs highlighted in this study.
Fluorinated greenhouse gases	Total potential 0.3 Gt CO_2e No clear commitments at global level yet	Significant, high level activities. Ambitious if agreed and implemented	Strengthen support for utilising the Montreal Protocol to regulate phase out.

Thematic area	Mitigation potential in 2020	Level and stringency of current activity	Possible action to scale up
Reduce deforestation	Total potential 1–4 Gt CO_2e Expected impacts of existing commitments unclear	Very significant and diverse activity. Very ambitious goals	More research is needed on how to scale up ICIs which are focused on decreasing the drivers for deforestation and enabling sustainable forest management. One option could be to provide further support to increase the scope of and resources available to the Forest Investment Program to enable it to scale up its strategic investments in this area. Widening the focus to an integrated land management approach is also key here, as well as the relatively untapped potential contribution that landscape and forest restoration could make. For example, GPFLR's "Bonn Challenge" to restore 150 Million hectares of degraded and deforested land by 2020 could be supported through an ICI which brought together countries, ICIs and organisations highlighted to increase pledges to reach the target and then systematically support their achievement through a programme of research, capacity building, knowledge exchange, monitoring and reporting on its successes.
Short-Lived Climate Forcers	Total potential equivalent to ~1 Gt CO_2e No clear commitments at global level yet	Significant, high level activities. Level of ambition undefined	Strengthen resources and support for the Climate and Clean Air Coalition (on condition that effective tracking and ambitious targets are set).

References

Agrawal, A., Cashore, B., Rebecca, H., Shepherd, G., Benson, C., Miller, D., 2012, Background paper 1: economic contributions of forests. Draft: Background paper prepared for the United Nations Forum on Forests.

Angelsen, A., Brockhaus, M., Sunderlin, W.D., Verchot, L.V. (eds), 2012, *Analysing REDD+: Challenges and choices*, Center for International Forestry Research (CIFOR), Bogor, Indonesia.

BEI, 2012, An options approach to unlocking investment in clean energy, Banking Environment Initiative (BEI).

Blok, K., Höhne, N., van der Leun, K., Harrison, N., 2012, "Bridging the greenhouse-gas emissions gap". *Nature Climate Change* [online], 2, 471–474 [available at http://www.nature.com/nclimate/journal/v2/n7/full/nclimate1602.html].

Buchner, B., Falconer, A., Hervé-Mignucci, M., Trabacchi, C., 2012, *The Landscape of Climate Finance 2012*, San Francisco, Climate Policy Initiative [available at http://climatepolicyinitiative.org/wp-content/uploads/2012/12/The-Landscape-of-Climate-Finance-2012.pdf].

Burniaux, J.-M. and Chateau, J., 2011, Mitigation Potential of Removing Fossil Fuel Subsidies: A General Equilibrium Assessment. OECD Economics Department Working Papers 853.

Chaum, M., Faris, C., Wagner, G., Buchner, B., Falconer, A., Trabacchi, C., Brown, J., Sierra, K., 2011, Improving the Effectiveness of Climate Finance: Key Lessons, Environmental Defense Fund; Climate Policy Initiative; Overseas Development Institute; Brookings.

Climate Analytics, Ecofys, PIK, *Climate Action Tracker: Bangkok climate talks did not narrow the gap,* Climate Analytics; Ecofys; PIK.

Ecofys, 2013, *The NAMA Database* [available at http://www.nama-database.org/].

En.lighten initiative, 2012, The rapid transition to energy efficient lighting: an integrated policy approach, United Nations Environment Programme (UNEP); Global Environment Facility (GEF).

En.lighten initiative, 2013, The rapid transition to energy efficient lighting: an integrated policy approach. en.lighten initiative, United Nations Environment Programme (UNEP); Global Environment Facility (GEF).

GBPN, 2013, Activities Global, Global Buildings Performance Network (GBPN), Building Policies for a Better World.

Halonen, M., Ryynänen, E., Sorasahi, H., Vihma, A., Kanninen, M., 2013, Global emission reduction potential of additional mitigation measures, Gaia Consulting Oy, The Finnish Institute of International Affairs and Helsinki University.

Höhne, N., Vieweg, M., Blok, K., Becker, D., 2010, Climate policy tracker for the European Union, Ecofys for World Wide Fund For Nature.

IEA, 2012, *World Energy Outlook 2012*, Paris, International Energy Agency (IEA) [available at http://www.worldenergyoutlook.org/publications/weo-2012/].

ILO, 2012, Working towards sustainable development: opportunities for decent work and social inclusion in a green economy, ILO, Geneva, Switzerland.

IMF, 2013, Energy Subsidy Reform: Lessons and Implications. Executive Summary, International Monetary Fund (IMF).

IPCC, 2011, IPPC Special Report on on Renewable Energy Sources and Climate Change Mitigation.: Summary for Policymakers, Cambridge, England.

Jaquot, P., 2013, *Contribution of four "wedging the gap" initiatives to achieve Copenhagen climate change mitigation targets*. Master Thesis, Wageningen University; Ecofys.

Jong, B. de, 2011, Carbon impact large companies – an insight in the greenhouse gas emissions, energy use, and energy costs of the world's largest companies. Appendix carbon impact large companies. Internship Report, Ecofys, Utrecht.

Kawamura, M. and Utsunomua, K., 2012, NAMA Finance Study: Examples for the UNEP Bilateral Finance Institutions Climate Change Working Group, United Nations Environment Programme (UNEP), Nairobi, Kenya.

Nabuurs, G.J., Masera, O., Andrasko, K., Benitez-Ponce, P., Boer, R., Dutschke, M., Elsiddig, E., Ford-Robertson, J., Frumhoff, P., Karjalainen, T., Krankina, O., Kurz, W.A., Matsumoto, M., Oyhantcabal, W., Ravindranath, N.H., Sanz Sanchez, M. J., Zhang, X., 2007, "Forestry", in: Metz, B., Davidson, O. R., Bosch, P. R., Dave, R. & Meyer, L. A. (ed), *Climate Change 2007: Mitigation. Contribution of Working Group III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*, Cambridge University Press., Cambridge, UK and New York, NY.

OECD, 2005, The Paris Declaration on Aid Effectiveness and the Accra Agenda for Action, Organisation for Economic Co-operation and Development (OECD), Paris.

Seppänen, S., Ahonen, H.-M., Ollikainen, J., Viljaranta, S., Hoogzaad, J., Huber, S., Conway, D., Chagas, T., Fernandez, M., 2013, Demand in a Fragmented Global Carbon Market: Outlook and Policy Options.

UNEP, 2011a, *Bridging the Emissions Gap: A UNEP Synthesis Report,* United Nations Environment Programme (UNEP) [available at http://www.unep.org/pdf/UNEP_bridging_gap.pdf].

UNEP, 2011b, HFCs: A Critical Link in Protecting Climate and the Ozone Layer: A UNEP Synthesis Report, UNEP.

UNEP, 2011c, Near-term Climate Protection and Clean Air Benefits: Actions for Controlling Short-Lived Climate Forcers: A UNEP Synthesis Report, United Nations Environment Programme (UNEP), Nairobi, Kenya.

UNEP, 2012, *The Emissions Gap Report 2012: A UNEP Synthesis Report*, Nairobi, United Nations Environment Programme [available at http://www.unep.org/pdf/2012gapreport.pdf].

UNEP, 2013, *The Emissions Gap Report 2013: A UNEP Synthesis Report*, Nairobi, United Nations Environment Programme (UNEP) [available at http://www.unep.org/pdf/UNEPEmissionsGapReport2013.pdf].

UNEP and WMO, 2011, *Integrated assessment of black carbon and tropospheric ozone*, Nairobi, Kenya.

UNFCCC, 2013, Compilation of information on mitigation benefits of actions, initiatives and options to enhance mitigation ambition: Technical paper FCCC/TP/2013/4, United Nations Framework Convention on Climate Change (UNFCCC).

Woerlen, C., 2013, Meta-evaluation of climate mitigation evaluations. Climate Change Evaluation Community of Practice, GEF Evaluation Office., Washington D.C.

Wouters, K., 2013, *Wedging the gap – an analysis of the impact of existing large-scale bottom-up initiatives for greenhouse gas emission mitigation in 2020*. Master Thesis, Utrecht University; Ecofys.

Sammendrag

Den nordiske arbeidsgruppen for globale klimaforhandlinger (NOAK) finner at tiltak gjennom internasjonale samarbeidsinitiativer (ISIer) kan bidra signifikant til å øke globale ambisjoner og å redusere det globale utslippsgapet. Disse initiativene er mangfoldige, fra globale dialoger og formelle multilaterale prosesser for å identifisere og støtte opp om mitigerende tiltak, til implementeringsinitiativer direkte fokusert på utslippsreduserende arbeid.

Denne studien tar for seg et utvalg ISIer og vurderer deres potensiale til å levere ytterligere mitigering av drivhusgasser og til å øke ambisjoner både på nasjonalt og internasjonalt nivå. Studien fokuserer på ISIer som bidrar direkte til å redusere utslippsgapet, og vurderer initiativer langs sentrale temaområder som: fornybar energi, energieffektivitet, reform av subsidier til fossilt brennstoff, mitigering av fluorbaserte drivhusgasser, reduksjon av avskoging og arbeid mot kortlivede klimaforurensere. Den tar så for seg en rekke tekniske og institusjonelle spørsmål, slik som hvordan sikre addisjonalitet fra effekten av ISIer, hvilket potensiale ISIer kan representere som klima-finansieringskanaler og hvilken rolle FNs rammekonvensjon om klimaendring (UNFCCC) og andre organisasjoner kan spille.

Studien konkluderer med at finnes et stort utvalg ISIer som allerede står for sentrale bidrag til globale utslippsreduksjoner. Mange har potensiale til å oppskalere sine aktiviteter og kan være lovende nye kanaler for offentlig klimafinansiering, med potensiale til å levere betydelig addisjonalitet i utslippsreduksjoner og å være katalysatorer for ambisjonsøkning i nasjonale forpliktelser.

Basert på analysearbeidet i denne studien foreslår vi en rekke mulige kanaler nordiske og andre land kan benytte til å fremme sine internasjonale klimaprioriteringer. Dette spenner fra kanalisering av ytterligere finansiering og politisk støtte, til forskning og utvikling av nye initiativer der hvor lovende mitigeringspotensiale eksisterer men enda ikke er fullt ut utnyttet. Disse inkluderer:

- *Fornybar: Støtt opp om solcelleenergi og vindenergi*: Dann en koalisjon av ressurssterke industri-, finans- og NGO-partnere for å sette ambisiøse og implementerbare globale mål for installert kapasitet innen 2020.
- *Energieffektivitet: Oppvarming og nedkjøling av bygninger*: Iverksett et initiativ i samarbeid med en allianse av kommersielle aktører i eiendomsbransjen som samtykker til en forskrift / målsetning for framtidige eiendomsinvesteringer. Støtt samtidig videre forskning for å identifisere andre initiativer som kan bidra til ytterligere tiltak og addisjonalitet.
- *Energieffektivitet: Forby glødepærer*: Øk antall land engasjert i en lighten-programmet og legg til rette for mer gjennomgripende, fokusert støtte til en større gruppe land for å bidra til markedsomlegging.
- *Energieffektivitet: Elektriske produkter*: Dann en koalisjon av land som forplikter seg til markedsomlegging for minst tre sentrale produkter. Kombiner Super-efficient Equipment and Appliance Deployment Initiative (SEAD), Collaborative Labelling and Appliance Standards Program (CLASP) og en.lighten sine unike styrker til å fase inn supereffektive produkter og fase ut ineffektive versjoner.
- *Energieffektivitet: Utslippsreduksjoner fra biler & lastebiler*: Støtt ytterligere forskning for å utvikle initiativer som kan øke effekten og omfanget av tiltak (f.eks. gjennom strengere lovgivning for utslipp og drivstoffkvalitet og bedre systemer for trafikkstyring i byer).
- *Energieffektivitet: Maritim transport*: Utvikle et initiativ hvor nasjonale myndigheter og større rederier involveres i å øke effekten og omfanget av tiltak (f.eks. gjennom støtte til garantiordninger for ombygging av skip med fokus på energieffektivitet, og samarbeid med nasjonale havnemyndigheter for å insentivere energieffektiv skipsfart).
- *Reform av subsidier til fossilt brennstoff*: Utvikle et nytt initiativ hvor en felles plattform av offentlige og private aktører tilrettelegger støtte til land som er villige til å forplikte seg til å fase ut subsidier til fossilt brennstoff innen 2020. Dette kan for eksempel inkludere økt press på utlånsinstitusjoner for fortsatt oppslutning om utfasing av subsidier til fossil brennstoff, og å sikre at dette integreres i alle utlånskriterier. Dette kan gis politisk støtte fra nasjonale myndigheter og IGOer gjennom fokusert politisk styring, og teknisk støtte kan besørges av noen av ISIene som trekkes fram i denne studien.

- *Fluorbaserte drivhusgasser*: Styrke støtten til utfasing regulert gjennom Montreal-protokollen.
  Begrens avskoging: Det behøves mer forskning på hvordan oppskalere ISIer fokusert på å redusere driverne for avskoging og legge til rette for bærekraftig forvaltning av skogsområder. Å utvide fokus til en integrert landforvaltning er også sentralt her, så vel som det relativt uutnyttede bidraget skogfornyelse kan stå for.
- *Kortlivede klimadrivere*: Øk ressurser og støtte til det globale partnerskapet for klima og ren luft (CCAC) (på den betingelse at det settes ambisiøse mål og følges opp med pålitelig overvåking).

Appendix:
Full list of ICIs

Table 17 Full list of ICIs on which the long list was based

Thematic area	Global or regional initiatives in thematic area
Boost solar photovoltaic energy	300GW/a Asia Solar Energy Initiative (ASEI) Global Solar Alliance (GSA) Global Solar Council (GSC) Solar Europe Industry Initiative (SEII) SunShot Initiative Vote Solar Initiative European Wind Initiative (EWI) Renewable Energy and Energy Efficiency Partnership (REEP) International Renewable Energy Agency (IRENA) International Renewable Energy Alliance (IREA) Major Economies Forum Clean Energy Ministerial (CEM) International Partnership on Mitigation and MRV Clean Energy Solutions Centre International Energy and Climate Initiative – Energy+
Boost wind energy	Wind Program Wind Energy Initiative (WEI) Renewable Energy and Energy Efficiency Partnership (REEP) Global Wind Energy Council (GWEC) Major Economies Forum Clean Energy Ministerial (CEM) International Partnership on Mitigation and MRV Clean Energy Solutions Centre International Energy and Climate Initiative – Energy+ International Renewable Energy Agency (IRENA)
Building heating and cooling	UNEP / GEF en.lighten initiative UNEP Sustainable Buildings & Climate Initiative (SBCI) Global Building Performance Network's (GBPN) Energy efficiency in Buildings initiative WBCSD, Energy Efficiency in Buildings projects MEF action on buildings World Green Building Council
Ban of incandescent lamps	UNEP enlighten initiative
Electric appliances	The Collaborative Labeling & Appliance Standards Program (CLASP) Super-efficient Equipment and Appliance Deployment (SEAD) Initiative The International Partnership for Energy Efficiency Cooperation (IPEEC)

Thematic area	Global or regional initiatives in thematic area
Cars & trucks emission reduction	"30 by 30" Resolution 21st Century Truck Partnership Fleets for Change Global Fuel Economy Initiative (GFEI) Green Freight Asia Network (GFAN) Green Freight Europe (GFE) Green Truck Partnership (GTP) Lean and Green Logistics Carbon Reduction Scheme (LCRS) Low Carbon Vehicle Partnership (LowCVP) Partnership for Clean Fuels and Vehicles (PCFV) Partnership on Sustainable, Low Carbon Transport (SLoCat) SmartWay U.S Drive Renewable Energy and Energy Efficiency Partnership (REEP) UNEP Partnership for Clean Fuels and Vehicles (PCFV) International Organisations of Motor Vehicle Manufacturers (OICA)
Maritime transport	International Maritime Organisation (IMO) Sustainable Shipping Initiative Carbon War Room
Fossil fuels subsidy reform	Earth Track Global Subsidies Initiative (GSI) Oil Change International International Energy Agency (IEA) G8 G20 Major Economies Forum
Fluorinated gases initiative	Refrigerants, Naturally! Clean Air Coalition To Reduce Short-Lived Climate Pollutants
Reduce deforestation	Collaborative Partnership on Forests (CPF) Cool Earth FERN Forest & Climate Initiative Forest Carbon Partnership Facility (FCPF) Forest Stewardship Council Forest Trends Global Partnership on Forest and Landscape Restoration (GPFLR) Greenpeace The Prince's Rainforest Project UN-REDD Programme REDD+ Partnership Prince of Wales International Sustainability Unit (PCFISU) Carbon Sequestration Leadership Forum (CSLF) Global Bioenergy Partnership Forest Investment Program Rainforest Alliance Tropical Forest Alliance
SLCFs	Climate and Clean Air Coalition To Reduce Short-Lived Climate Pollutants UNEP Climate Montreal Protocol Global Methane Initiative (GMI)
Supply chain emissions reductions	Consumer goods forum Clean by Design

Thematic area	Global or regional initiatives in thematic area
Top 1,000 companies	Association of Climate Change Officers (ACCO) Caring for Climate Cement Sustainability Initiative (CSI) Business Environmental Leadership Council (BELC) Haga Initiative Responsible Care The Clean Revolution Ultra-Low CO_2 Steelmaking (ULCOS) [World Business Council for Sustainable Development (WBCSD)] WWF Climate Savers Carbon Disclosure Project (WBCSD)
Green Financial Institutions	UNEP Finance Initiative (UNEP-FI) Banking Environment Initiative (BEI) Institutional Investors Group for Climate Change ((IIGCC) I) (ILG) New Investment Leaders Group
Major cities	carbonn Cities Climate Registry (cCCR) C40 Cities Climate Leadership Group (C40) Climate Alliance Mexico City Pact The Clean Revolution U.S. Conference of Mayors' Climate Protection Agreement (MCPA) World Mayors Council on Climate Change (WMCCC) WWF Earth Hour City Challenge (EHCC) International Council for Local Environmental Initiatives / Local Governments for Sustainability (ICLEI) WBCSD Urban Infrastructure Initiative

Sources: UNFCCC, 2013, UNEP, 2011a, UNEP, 2012, Blok *et al*., 2012, Wouters, 2013, Jaquot, 2013.

Nordic Council of Ministers

Ved Stranden 18
DK-1061 Copenhagen K
www.norden.org

TemaNord 2014:518

Enhancing Ambition through International Cooperative Initiatives

International Cooperative Initiatives (ICIs) could hold significant promise for closing the global emissions gap between a pathway to a 2°C warming limit and current national emission reduction pledges.

This report examines a selection of these ICIs to explore their potential for delivering additional greenhouse gas mitigation and for raising ambition at national and international levels. It concludes that there are a range of ICIs already making an important contribution. Many have potential to scale-up their activities and could offer promising new channels for public climate finance.

TemaNord 2014:518
ISBN 978-92-893-2746-6
ISBN 978-92-893-2747-3 (EPUB)
ISSN 0908-6692