

Building bridges to the future

Climate financing for a low carbon tomorrow



Key points

This paper addresses some of the key issues around the global climate finance agenda, and in particular the transition to a low carbon future, from a Nordic perspective. It outlines an important role for public financing institutions and the benefits of small and medium sized projects in the low carbon economy in transitional economies and developing countries.

- **THE PARIS AGREEMENT**, secured in December 2015, provides a framework for climate action, but should be viewed as a starting point for securing progressively stronger climate commitments over time. It provides a clear focus on low carbon development for policy makers and businesses alike, but the real work lies ahead.
- **IN THE IMMEDIATE YEARS** following the Paris Agreement, there is a pressing need for testing and scaling up innovative financial instruments, including carbon markets, in line with the envisaged outcomes of the COP21. The Nordic countries and their public finance institutions have been forerunners in the development of the pre-Kyoto and post Kyoto carbon markets, and should seek to provide leadership.
- **DEMAND FOR AND INVESTMENT IN** clean technology will continue to grow, whilst the risks and costs associated with fossil fuel generation will increase. Likewise, for businesses, there are profitable, near term opportunities for clean growth, with associated technology and know-how transfer in multiple mitigation and adaptation sectors. Developing countries in particular offer leapfrogging possibilities to move directly to a lower carbon growth trajectory.
- **TECHNICAL ASSISTANCE** will continue to play an important role in international cooperation on climate change, principally to address knowledge, policy/regulatory risks and viability gaps which currently prevent low carbon and climate resilient investments.
- **THERE EXISTS** an important role for public financing institutions in the low carbon future, especially in facilitating and complementing private investments within the small and medium sized enterprise / project (SME/SMP) space. These organisations, both national and interna-

tional, need to be responsive to their owners and stakeholders, providing cost effective emission reductions and environmental outcomes, compared to and supplementary to investments at home. Such institutions are also an important conduit for getting access to available international climate finance, for example via the direct access modality of the Green Climate Fund.

- **SCALING UP** and replicating successful demonstration projects enables new sources of funding, broader private sector participation and ultimately provides larger mitigation and adaptation impacts. Additional emphasis is needed on adaptation activities which in many cases are combined with mitigation. In addition to environmental outcomes, evidence from Nordic programmes such as the Nordic Climate Facility and Nopef shows significant benefits in terms of local policy development, capacity building and technology transfer to the benefit of both developing and developed countries.
- **ALREADY FUNCTIONING** and cost effective mechanisms for aggregating small projects exist and have been demonstrated to good effect for example in industrial energy efficiency in Ukraine and China. The SME/SMP approach is built on the premise that the road to success is best travelled by small steps, the first of which are difficult but by demonstrating and disseminating success, scaling-up becomes possible. The catalytic effects and effective use of scarce public financing is critical in this journey.
- **THERE ARE SIGNIFICANT OPPORTUNITIES** for replicating Nordic success stories and business models in climate finance, using the identified bridges between public and private finance. Internationalisation of climate technology and knowhow is critical.

Building Bridges to the Future is one of two special papers prepared for NEFCO's 25th Anniversary event to be held in Oslo on 12 April 2016. The other is entitled "A Nordic Perspective on Green Growth".

COVER PHOTO: SHUTTERSTOCK



The Nordic Ministers of the Environment at the Nordic Pavilion at COP21 in Paris.

The world economy is moving toward a low carbon future

What was agreed at COP 21?

The Paris Agreement is a historic development which aims to hold global warming to “well below 2°C” relative to pre-industrial levels. Announced on 12 December 2015 after two weeks of intensive negotiations involving 195 countries in the French capital, it was the highest profile event of its kind, attracting the largest number of heads of state and government in history. These represented the culmination of six years of negotiation within the UNFCCC process, dating back to the ill-fated Copenhagen Accords in 2009, with a view to have a universal agreement covering ambitious mitigation and adaptation obligations on all Parties.

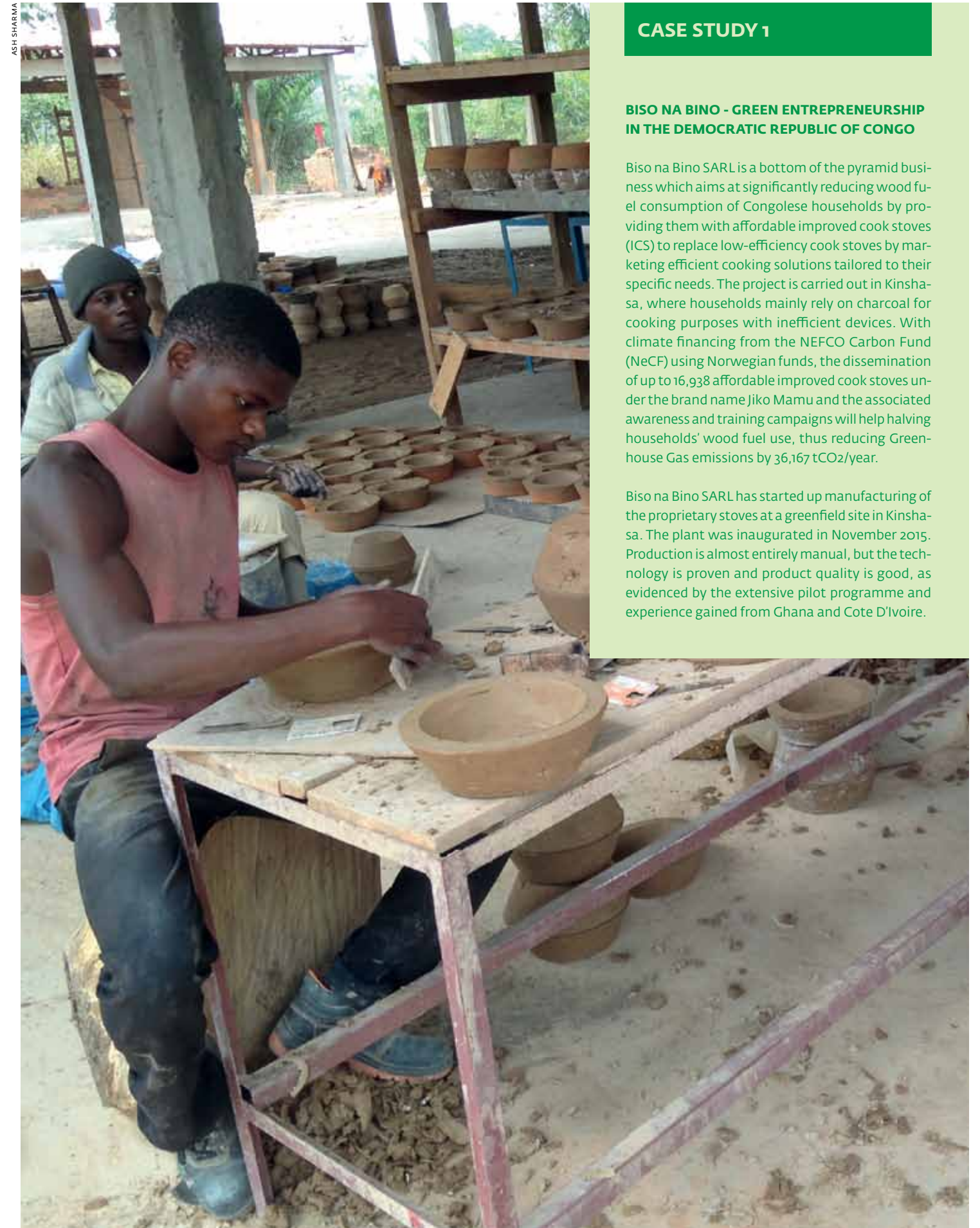
The Agreement sets out the obligation to effectively reach peak emissions as by the middle of this century, and move towards net zero emissions or carbon neutrality by 2100, including the effect of carbon sinks such as forests, oceans and soils. This is to be achieved by a series of bottom up “nationally determined contributions” (NDCs) which countries submitted in connection to the COP21 to demonstrate how they would achieve significant emission reductions in their economies. These NDCs are the building blocks of the ambition behind the Agreement, which establish the scope and sectoral coverage of the emission reduction plans. Given that current submissions will lead to warming of 2.7 - 3.5°C, these national targets will need to be ratcheted upwards and updated every five years in a series of “stocktakes” in order to achieve the required goals.

Richer countries have committed to provide financial assistance for poorer countries to finance low carbon growth in developing nations, with a target of mobilising USD 100 billion annually by 2020. In addition to finance, there are technology transfer and capacity building needs. The countries most vulnerable, such as small island states susceptible to extreme weather and sea level rise, will also be eligible for financial assistance for loss and damage.

Carbon markets firmly back on the agenda

A role for the market is enshrined in the Paris Agreement¹ as it makes provision for linkages between existing carbon markets, thereby offering the opportunity to develop a de facto international system of carbon pricing. Also the UNFCCC’s synthesis report on the aggregate effect of NDCs² states that over half of the NDCs submitted indicate that Parties plan to use or are considering the use of market-based instruments from international, regional or domestic schemes, at least for part of their targets.

Article 6 describes, albeit in the broadest possible terms, that some Parties may choose to pursue “voluntary cooperation” in the implementation of their NDCs that may involve the use of “internationally transferred mitigation outcomes” (ITMOs) or loosely speaking, tradeable carbon credits, subject to robust accounting. Also, Article 6.4 establishes a mechanism for use by the Parties on a voluntary basis, in accordance with rules to be developed. The next few years will see intense activity in the international negotiations, to further define this new mechanism, its nature and scope and develop its modalities and procedures. The building blocks such as project methodologies are in place and the post-Paris momentum is strong. Established principles that will underpin the new markets are referred to in the decision as well as the Agreement and include inter alia environmental integrity, transparency, additionality, avoidance of double counting, verification and certification of designated operational entities and supervision by a body similar to the Clean Development Mechanism (CDM) Executive Board. It can therefore be expected that much of the body of modalities and procedures to be developed in the next few years will build on the experiences of the CDM and other instruments. Nordic negotiators, representing nations that have been early and enthusiastic supporters of carbon pricing³, are likely to play a leading role in these discussions.



CASE STUDY 1

BISO NA BINO - GREEN ENTREPRENEURSHIP IN THE DEMOCRATIC REPUBLIC OF CONGO

Biso na Bino SARL is a bottom of the pyramid business which aims at significantly reducing wood fuel consumption of Congolese households by providing them with affordable improved cook stoves (ICS) to replace low-efficiency cook stoves by marketing efficient cooking solutions tailored to their specific needs. The project is carried out in Kinshasa, where households mainly rely on charcoal for cooking purposes with inefficient devices. With climate financing from the NEFCO Carbon Fund (NeCF) using Norwegian funds, the dissemination of up to 16,938 affordable improved cook stoves under the brand name Jiko Mamu and the associated awareness and training campaigns will help halving households' wood fuel use, thus reducing Greenhouse Gas emissions by 36,167 tCO₂/year.

Biso na Bino SARL has started up manufacturing of the proprietary stoves at a greenfield site in Kinshasa. The plant was inaugurated in November 2015. Production is almost entirely manual, but the technology is proven and product quality is good, as evidenced by the extensive pilot programme and experience gained from Ghana and Cote D'Ivoire.

Whilst the mechanism and the modalities are being developed, countries will continue to design, test, implement and link market-based domestic carbon pricing programmes, such as the multi-donor Transformative Carbon Asset Facility⁴ announced by the Norwegian Prime Minister, Erna Solberg and the World Bank President, Jim Yong Kim in Paris. In particular, there is scope for road-testing sectoral crediting mechanisms as part of Nationally Appropriate Mitigation Actions (NAMAs) or “learning by doing” type activities under broader NDCs, possibly developing verified ITMOs which can later be used for compliance. The Nordic of Council of Ministers and NEFCO, as founding members of the Nordic Partnership Initiative on Up-scaled Mitigation Action, have been working with the development of such NAMAs in Peru and Vietnam since 2011⁵ and are well positioned to take part in the work of developing the new mechanism. More generally, Nordic funding is contributing to a broader international community of practice in NAMAs.

A clear signal to policy makers and businesses

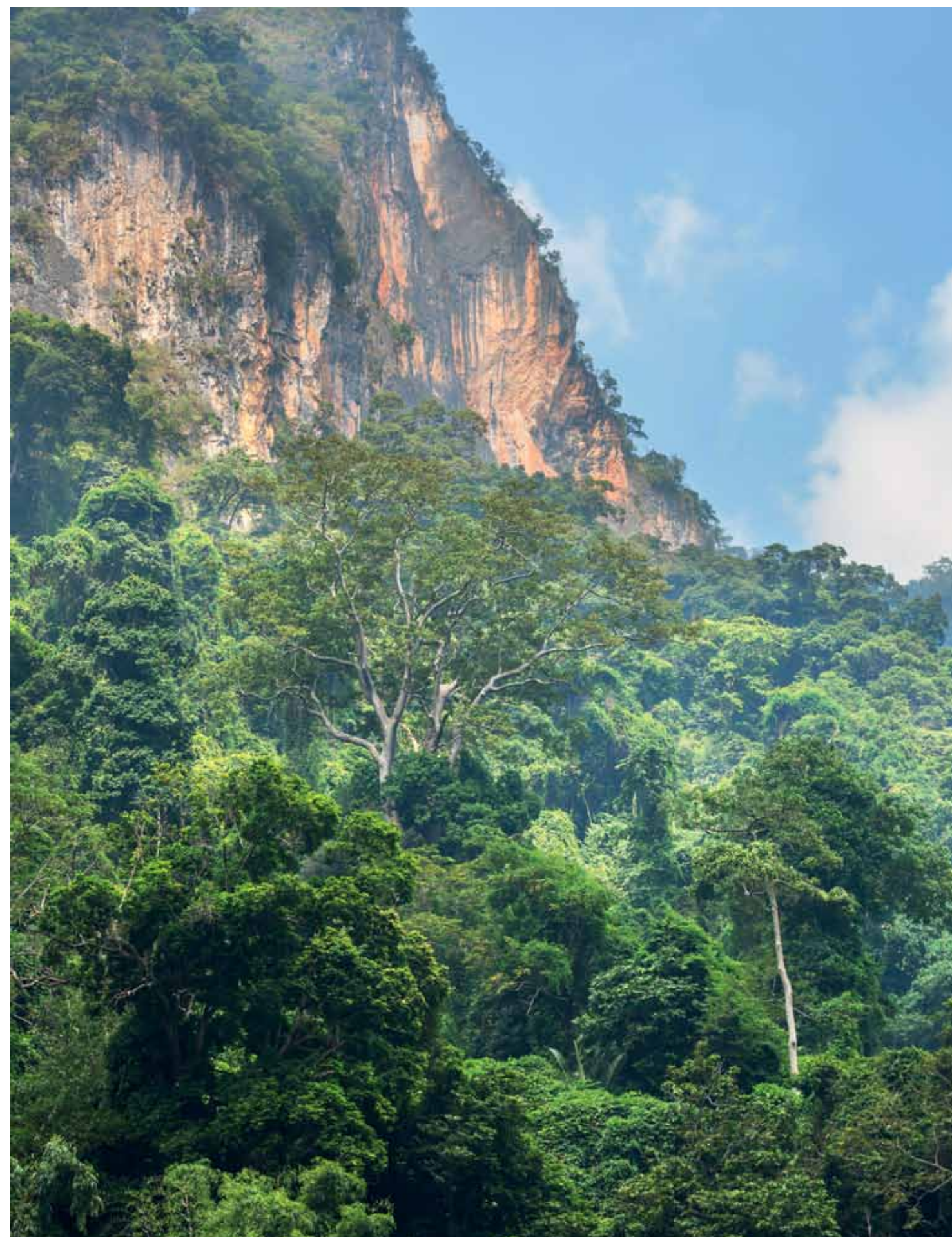
Politicians and governments increasingly recognise that climate action is required in the national interest. Also the business community sees the potential climate change represent in terms of both sales of solutions and cost savings in the long run. Whilst there is a lot of work to be done in operationalising the Agreement, in developing the mechanisms, and their modalities and procedures, the optimistic Paris momentum and the broadly shared goals behind the Paris Agreement provide guidance for policy makers at national, regional and city levels to move towards a carbon constrained future.

Moreover, the Agreement sends a clear signal to business and industry to set in motion carbon reduction strategies in line with these international goals. An ever expanding system of international carbon pricing will offer businesses more certainty in which to reduce greenhouse emissions. Internal carbon pricing provides a means to identify and value cost savings and revenue generation opportunities. Externally, investors, shareholders and other stakeholders will look more closely at climate related risk, already evident across much of the economy, and particularly salient in the energy sector where the threat of stranded assets⁶ is very real.

The demands are growing on companies in many sectors to be more transparent about the financial, environmental and social risks to their operations and business models that they face from climate change. Already pressure is building within institutional investment circles on carbon risk disclosure and decarbonisation of portfolios. Danish and Swedish pension funds⁷ and the Norwegian sovereign fund⁸ for instance are at the vanguard of this movement.

On the opportunity side, there are a myriad of commercial possibilities for low carbon innovation, investment and employment growth - often referred to as “green growth” but likely to be the only type of economic growth in a future carbon constrained world. Important sectors include renewable energy, energy efficiency, sustainable transport, low carbon technologies, transmission and distribution systems and waste and wastewater technologies. The Nordic countries with their history of low carbon development and multiplicity of cleantech companies, stand at the forefront of this ongoing (r)evolution.

→ Reducing Emissions from Deforestation and Forest Degradation (REDD) is an effort to create a financial value for the carbon stored in forests. REDD+ includes the role of conservation, sustainable management of forests and enhancement of forest carbon stocks.



The global economy is already moving towards a low carbon and climate resilient model

Emissions from energy use account for two-thirds of global GHG emissions. Hence this sector is of critical importance in limiting global warming. Investment in clean energy technology has been growing and there are signs that growth in the global economy and energy related emissions are starting to decouple⁹ (with regional variations, such as the Nordic region where decoupling has already taken place in the power sector¹⁰). The International Energy Agency (IEA) reports that the energy intensity of the global economy dropped by 2.3% in 2014, more than double rate of reduction over the last decade, due to improved energy efficiency and structural change in some economies.

Reducing emissions from deforestation and forest degradation in developing countries, and the role of conservation, sustainable management of forests and enhancement of forest carbon stocks in developing countries (REDD+) are important elements of the response to international climate change. UNEP states the theoretical potential of forest-related mitigation activities in developing countries is estimated to be up to 9 GtCO₂ in 2030¹¹. Forest mitigation actions are being undertaken by many countries, but there is significant scope for expansion, with REDD+ offering a special opportunity for developing countries. Nordic countries, notably Norway's International Climate and Forest Initiative (NICFI)¹², have recognised the opportunity to create financial value for the carbon stored in forests, offering incentives for developing countries to reduce emissions from forested lands and thereby incentivise investment in these low-carbon paths.

As the climate changes, with impacts range from more frequent and severe storms, floods, droughts and other natural disasters to sea level rise, crop failures, and water shortages, so the business case for adaptation pressing. The annual Global Risks Report series¹³, published by the World Economic Forum describes how climate change remains one of the most pressing contributing factors to global geopolitical and other risks. The consequences of climate change are causing growing concern among global leaders as they intersect with a large number of interconnected global risks. For instance, climate change and water risks are intricately linked to food security concerns. However, experience¹⁴ shows that best practices and novel technologies can play an important role in enhancing capacity to deal with the impacts of climate change.

→ Solar power is currently one of the fastest growing industries in the global energy market.

Financing for climate change action

Climate finance has been a key issue in the international negotiations. Developing countries and civil society actors are tracking progress towards the commitments made by developed countries to mobilise USD 100 billion for climate actions in developing countries per annum. Already public actors and bilateral and multilateral intermediaries committed USD 148 billion¹⁵ in 2014. The bulk of these contributions have been through concessional loans (47%) and grants (10%). The regional multilateral banks have increasingly integrated climate change into their lending operations. The European Bank for Reconstruction and Development reported investments in renewables exceeding thermal power investments for the first time in 2014¹⁶. Bilateral institutions such as Finnfund and the Danish Industrialisation Fund for Developing Countries (IFU) have stepped up their climate related activities¹⁷.

The Climate Policy Initiative (CPI) estimates global climate related finance flows reached at least USD 391 billion in 2014, driven by increasing public financing and record private sector investment, primarily in the deployment renewable energy technologies. Whilst there is uncertainty around the

numbers¹⁸, set against the identified investment needs of USD 840 billion¹⁹, it is evident that, whilst there is still a need for scaling up, we are at least in the same order of magnitude.

On a per capita basis, the Nordic countries have been generous benefactors on climate finance. Nordic climate flows have been reported²⁰ as USD 2.77 billion in 2013, of which 51% were earmarked for mitigation, 21% for adaptation and the balance on cross-cutting measures.

The main determinant of overall growth in climate finance in 2014 was renewables, notably the record 98GW of solar PV and onshore wind installed. Fully a third of all renewables investment was in one country, China. A key driver is the decreasing costs, with some technologies becoming fully competitive with fossil fuels in many jurisdictions. For example, utility scale solar photovoltaic costs²¹ have fallen by half in the past five years and solar PV module prices decreased by three quarters in the period 2009-2014. The picture is much the same in another maturing technology, wind power.



SHUTTERSTOCK

Public finance can play a role in catalysing transformational actions and mitigating investment risk

Public finance can play a key, catalytic role in climate finance, but it is recognised that much of the heavy lifting must be undertaken by private sector capital. The Nordic countries²² believe that the role of public climate finance is to promote market based solutions, address identified investment barriers (such as investor risks) and leverage/scale up private sector equity investments. For example, an estimated USD 1.5 billion of public funds are channelled through climate related risk management instruments such as credit guarantees, political risk insurance and contingency recovery grants. This excludes officially supported export credit risk guarantees to renewable energy estimated by the OECD at USD 2.6 billion globally in 2013²³. The use of innovative financing instruments is likely to be an important area of development for the Green Climate Fund (GCF), in particular through its Private Sector Facility.

The Nordic countries see the GCF as a key climate finance mechanism, alongside other bilateral and multilateral channels for distributing climate finance assistance. In the initial resource mobilisation period, the Nordic countries have been fore-runners, making pledges exceeding USD 1 billion, or 10% of the global commitment.

Concessional loans, the most common form of public support, offer more than cheap and longer term financing. When blended with technical assistance, they can play a catalytic role in the establishment of policy frameworks, strengthening of institutional capacity, lowering investment costs and reducing investment risks for first mover projects.

The overwhelming majority of climate finance is directed to mitigation activities (93% of the total in 2014) compared to adaptation and climate resilience²⁴. An estimated USD 25 billion was directed to adaptation financing in 2014. This was primarily water and wastewater management related, but other important categories include agriculture, forestry and land use and infrastructure, energy and other built environment and disaster risk management. Whilst tracking adaptation investments is difficult as they are often integrated into mainstream development programmes such as those related agriculture or water, these volumes and proportions are set to grow. For instance, the GCF seeks to aim for 50:50 balance between mitigation and adaptation investments over time, of which 50 percent will be directed to the most vulnerable countries, including small island developing states, least developed countries and African States.

Public finance is particularly important for vulnerable countries with limited institutional capacity such as least developed countries and small island states.

→ The landfill site in Bogotá, Colombia handles approx. 2 million tonnes of household waste per year.



CASE STUDY 2

LEVERAGING CLIMATE FINANCE TO CATALYSE RENEWABLE ENERGY GENERATION IN COLOMBIA

The Doña Juana Landfill is the biggest sanitary landfill in Colombia and one of the biggest in Latin America. The landfill has been operating since November 1988, for the disposal of the municipal solid waste generated by almost 8 million inhabitants of Bogotá, handling an average of more than 2 million tonnes of household waste per year.

The project's objective is to capture and utilise fugitive emissions of landfill gas, a potent greenhouse gas which contributes significantly to climate change. The project had undergone financial restructuring as a result of financial stress due to a collapse of carbon prices and was at risk of discontinuation. A financial intervention by the Norwegian Carbon Procurement Facility (NorCaP) allowed the project to continue, and provided the security for new loans to invest in power generation at the site. The project expects to reduce GHGs in the order of 0.8m tCO₂e annually.

More emphasis on effectiveness and cost efficiency in use of public funds

Accounting for and the accountability of emissions is a key theme in determining the effectiveness of climate policy. Measuring and reporting the reductions of GHGs from renewable energy and energy efficiency initiatives are critical for determining the global climate trajectory. The 1 Gigaton Coalition is an initiative of the Norwegian Ministry of Foreign Affairs and UNEP in the energy sector seeking to quantify the contribution of sustainable energy projects in developing countries towards the narrowing of the emissions gap. It reported for the first time in 2015²⁵, recognising that mitigation achievements in climate programmes largely go unmeasured²⁶ and under-reported and described the work required to improve reporting of such projects. Improved measurement, reporting and understanding of climate impacts is essential, and can also build the case for continued and increased contributions of climate finance.

Increasingly, governments have been moving towards results based financing for Official Development Assistance (ODA). This “payment for performance” approach has been much utilised in the carbon markets, but has applications in broader climate finance, many of which are yet to be tested at scale, with the exception of REDD+. This is likely to be an area for further development in the emerging climate finance architecture²⁷.

Small and Medium Sized Projects as engines of growth

There are significant gaps in the investment portfolio required for climate mitigation. For instance, over the years, NEFCO has witnessed insufficient focus on SMEs/SMPs by commercial financiers and larger development institutions alike. In response, since the early 1990s, it has developed and implemented financial products²⁸ aimed at serving this sector in Eastern Europe. SMEs/SMPs may be regarded as the “engines of green growth”, offering innovation and job creation. Public financing organisations, both at the national and international level, are required which possess the flexibility and ability to efficiently identify, develop, finance and implement bankable SMPs which can move towards a low carbon trajectory. Experience with the Nordic Climate Facility (NCF)²⁹ in 20 developing countries shows that there is merit in advancing smaller scale projects which enable field testing and development of concepts, technology and implementation of concrete small scale projects, with a view of replication of business models and ultimately, scale-up.

In order to remain relevant, such institutions must be financially sustainable and cost effective, even if operating at smaller scale. National development institutions will play a key role in domestic investment³⁰, through local knowledge and networks by accessing national credit markets. Such institutions will benefit from direct access modalities to the GCF.

Nopef : PROMOTING GREEN GROWTH AND INTERNATIONALISATION

The Nordic Project Fund (Nopef) provides funding for Nordic small and medium sized enterprises for projects aiming at internationalisation within green growth and the environmental sector. The fund is financed by the Nordic Council of Ministers. Since the fund’s inception in 1982, Nopef has co-financed some 3000 projects with a total value of EUR 100 million. The majority of funded project have targeted growth markets in Asia, South America, Eastern Europe and Africa.

Nopef’s financing has shown to contribute to positive economic effects in both the Nordic region as well as in projects target countries through increased employment and sales. Client surveys indicate an average of 2 new jobs being created in the Nordic countries and 12 jobs in the target countries through each successfully completed project. With current levels of funding and an estimated 35 realised projects each year, the fund annually expects to contribute to an estimated 70 new jobs in the Nordic countries and some 420 jobs in the project countries. Nopef’s focus on early stage internationalisation projects, gives a remarkable impact and added value for Nordic SME’s that are in the process of evaluating business operations on new growth markets.

Supported companies report that their foreign business establishments have created an average of EUR 1 million in direct investments and resulted in approximately EUR 3 million in project related sales a three year period after the initial start-up. This translates to expected annual investments of EUR 35 million and EUR 95 million in sales. In addition, the majority of Nopef clients state that their completed foreign establishment has created positive effects through improved competitiveness, opportunities for technology and knowledge transfer, and through new export opportunities for subcontractors.

Areas of opportunity

The Intergovernmental Panel on Climate Change (IPCC) in its fifth assessment report concluded that to limit global warming to below 2 °C, the remaining cumulative CO₂ emissions (or the “carbon budget”) are in the order of 1 000 GtCO₂. This remaining budget can be utilized in different ways, but given the most recent assessment of current trends, net global carbon emissions will eventually need to be reduced to zero between 2060 and 2075³¹. The emissions gap between what the full implementation of the unconditional pledges (as expressed in the NDCs) contribute and the least-cost emission level for a pathway to stay below 2 °C, is estimated to be 14 GtCO₂e (range: 12-17) in 2030 and 7 GtCO₂e (range: 5-10) in 2025³². The current efforts are however consistent with an average global increase exceeding 3°C by the end of the century.

Existing technologies and solutions offer a pathway to meet the 2°C target. Key opportunity areas include enhanced energy efficiency with a particular emphasis on industry, buildings and transport, expanded use of renewable energy technologies for power production combined with increased efficiency of fossil fuel-based power production as well as measures in forestry, agriculture and waste sectors. UNEP in the 2015 Emissions Gap report focuses on the role of international cooperative initiatives including cities and regions and global sectoral programmes (e.g. cement sector, addressed in the aforementioned Vietnam NAMA).

Some specific areas of opportunity are outlined in this section.

→ 2015 was the warmest year since modern record-keeping began in 1880, according to an analysis by NASA's Goddard Institute for Space Studies.



CASE STUDY 3

ENERGY SAVINGS CREDITS PROGRAMME IN UKRAINE

The Energy Savings Credits Programme is a small loan programme which has been operational in Ukraine since 2011. The ESC focuses on energy efficiency measures such as insulation and temperature controls in municipal buildings including schools and hospitals, and offer loans up to EUR 400.000, including local currency.

The programme has been implemented in 27 cities, benefiting over 142.000 people. In terms of environmental achievements, the investments have reduced electricity consumption by 7,150 megawatt-hours and heat energy by nearly 15,000 gigacalories. The ESC is a good example of aggregating small scale, replicable interventions in demand side energy efficiency.



PATRIK RASTENBERGER

The importance of technology

Technology transfer is a key element of climate support as highlighted in the Paris Agreement. Among other things, Article 10 establishes a technology framework to support the transfer, diffusion and implementation of low carbon technologies in developing countries. According to the text, the framework should facilitate, inter alia the enhancement of enabling environments for and the addressing of barriers to the development and transfer of socially and environmentally sound technologies. The Copenhagen-based UNFCCC Climate Technology Centre and Network, is the main body which promotes the accelerated transfer of environmentally sound technologies for low carbon and climate resilient development at the request of developing countries.

Enhancing energy efficiency, particularly in the industrial, buildings and transport sectors will be critical to reducing GHGs, but will also support economic development and create jobs. The Nordic countries represent an important hub for the development, deployment and sharing of such cleantech innovation, technologies and know how. Key strengths including wind power, biofuels, cogeneration, geothermal energy and energy efficient buildings and industrial processes.

← School number two
in Chernihiv, Ukraine.
Replacing draughty
and ageing windows
can reduce energy
consumption by 8-15
per cent.

CASE STUDY 4

RISK CAPITAL INVESTMENT IN ENERGY EFFICIENCY : DEPLOYING NORDIC TECHNOLOGIES IN CHINA

NEFCO is a substantial shareholder in Green-Stream Network Ltd to support new investments in energy-efficiency projects in China. Green-Stream is a leading Nordic energy management company operating in China, where Nordic tailored cleantech solutions are offered to Chinese companies on the basis of the Energy Service Company (ESCO) business model. Eight energy-efficiency projects have been signed in the steel, chemical and paper industries.

NEFCO provides debt and equity financing from its Investment Fund, which has an overall value of EUR 113.4 million. Before the investment in Green-Stream, NEFCO had investment assets and holdings in eleven different companies valued at EUR 15.4 million.



GREENSTREAM

An enhanced role for carbon pricing and markets

The growth of carbon pricing through emissions trading or carbon taxes around the world has been significant. Since 2012, the number of instruments implemented and planned has doubled, with coverage of emissions increasing commensurately. Currently around 40 national jurisdictions, and over 20 cities, states and regions are taking part in some form of carbon pricing - accounting for 12% of global emissions³³. The G7 leaders committed in 2015 to strengthen climate related policies and actions, including carbon market based and regulatory instruments. A Carbon Market Platform has been established under the German G7 Presidency. Together with international initiatives such as the Partnership for Market Readiness and the Carbon Pricing Leadership Coalition, there is post Paris Agreement momentum behind an enhanced role for markets and the linking thereof.

The implications for business and public policy are clear. Setting a price signal will encourage investment in low carbon projects and investments. Public policy will increasingly be supportive towards these goals, through policy setting and market enabling and in many cases, fossil fuel subsidy reform.

Technical assistance can mobilise additional public and private finance

Technical assistance is typically grant based international development assistance used to address knowledge, policy/regulatory risks and viability gaps which currently prevent low carbon and climate resilient investments, but also address risk and viability gaps³⁴. This support directly attracts co-financing through donors, developing country governments and the private sector. There is also an indirect mobilisation of resources by supporting the creation of conducive policy and investment environments that underpin the deployment of low carbon technologies. For example, Nordic knowhow and experience with climate policies and measures could be directed towards working with developing countries to plan and achieve their NDCs.

←GreenStream has experience from providing cleantech solutions for the steel, chemical and paper industries in China.

Short-lived climate pollutants and the Arctic region

Short-lived climate pollutants (SLCPs) are agents that have relatively short lifetime in the atmosphere - a few days to a few decades - but exert a significant warming influence on climate³⁵. These short-lived climate pollutants are also dangerous air pollutants, with various detrimental impacts on human health, agriculture and ecosystems.

The Climate and Clean Air Coalition³⁶ is a global initiative that unites governments, civil society and private sector, committed to improving air quality and protecting the climate in next few decades by reducing short-lived climate pollutants across a number of sectors. These include brick kilns, clean cooking stoves, heavy duty diesel vehicles, waste management, oil and gas, livestock management and HFCs.

An area of particular interest to the Nordic countries is the Arctic region where vulnerability to climate change is at its greatest due to the greater impact from black carbon emissions over the highly reflective surface of ice and snow³⁷. Here NEFCO is working with the Arctic Council's Project Support Instrument (PSI), financing projects in the Arctic. The PSI mechanism provides financing for pollution prevention, abatement and elimination, including climate change mitigation as well as abatement and elimination of the release of hazardous substances such as persistent organic pollutants (POPs) and mercury. Focus areas are for example the sectors of short-lived climate pollutants including black carbon, hazardous waste management and destruction of polychlorinated biphenyls (PCB) and pesticides.



SHUTTERSTOCK

Conclusion

This paper has sought to outline the important role for public financing institutions in building bridges to the future of a low carbon economy in transitional and developing countries. Mobilisation of private finance is the critical success factor. Public finance can catalyse ever larger flows of private investment through inter alia improving the investment climate (through targeted technical assistance in areas such as fossil fuel subsidy reform and renewable energy policy), de-risking scaled-up financial interventions and by encouraging behavioural change such as decarbonisation of portfolios. The role of carbon pricing, either through carbon taxes, emission trading or related market based mechanisms, will continue to play a critical role going forward. In all of these areas, the Nordic governments are leading by example, through their financial and technical support, channelled through both multilateral and bilateral means. Evidence from Nordic programmes such as the Nordic Climate Facility and NOPEF shows significant benefits in terms of local policy development, capacity building and technology transfer.

NEFCO's experience of the past 25 years has also illustrated the benefits of small and medium sized projects in achieving favourable and cost effective environmental and climatic outcomes, but also as "engines of growth", driving innovation, investment and job creation. Benefits accrue to developed and developing countries alike. However, SMPs face specific financing challenges of scale diseconomies, and require cost effective solutions, often overlooked by local commercial financial institutions. NEFCO's experience in Eastern Europe has demonstrated here the beneficial deployment of public finance to build project pipelines and aggregate small projects, buy down risks and support private and public investment projects in areas such as energy efficiency and cleaner production. This community of practice has been supported by Nordic solutions in terms of cutting-edge technology and know how. In the journey to a low carbon tomorrow, there are significant opportunities for replicating these success stories and business models in the developing and industrialising world, and enhancing Nordic cooperation in their dissemination.

←The emissions of black carbon and other short-lived climate pollutants contribute to Arctic warming.

Endnotes

¹ For a fuller discussion, read <http://climate-l.iisd.org/guest-articles/carbon-markets-firmly-back-on-the-agenda/>

² See <http://unfccc.int/resource/docs/2015/cop21/eng/o7.pdf>

³ Through early introduction of CO₂ taxes (early 1990s) and bilateral procurement programmes for Kyoto Mechanisms in the late 1990s/early 2000s established by Finland (2001), Denmark (2000), Sweden (1999) and Norway (2007) and participation in multilateral initiatives such as the Prototype Carbon Fund (2000) and Baltic Sea Region Testing Ground Facility (2004). Nordic funders also support the Partnership for Market Readiness.

⁴ <http://www.worldbank.org/en/news/press-release/2015/11/30/new-500-million-initiative-to-boost-large-scale-climate-action-in-developing-countries>

⁵ See <http://www.nefco.org/work-us/our-services/climate-funds/nordic-partnership-initiative-and-nama>

⁶ See <http://www.carbontracker.org/report/wasted-capital-and-stranded-assets/>

⁷ Swedish pension fund AP4 was a founder of the Portfolio Decarbonisation Coalition. See also <http://www.ipe.com/pensions/pensions-in/nordic-region/pensions-in-nordic-region-time-for-action-on-carbon/10004145.fullarticle>

⁸ Norway's sovereign wealth fund exited 27 firms with links to coal, see <http://mobile.reuters.com/article/idUSL5N16H455>

⁹ Energy and Climate Change - World Energy Outlook Special Report, International Energy Agency, 2015 <https://www.iea.org/publications/freepublications/publication/WEO2015SpecialReportonEnergyandClimateChange.pdf>

¹⁰ The carbon intensity of Nordic electricity production has been reduced to 100g CO₂ per KWh, equivalent to one-fifth of the global average in 2015. Source : <http://www.norden.org/en/news-and-events/news/nordic-countries-mark-long-history-of-decoupling-the-link-between-climate-emissions-and-economic-growth-at-cop21-in-paris>

¹¹ The UNEP Emissions Gap Report 2015 http://uneplive.unep.org/media/docs/theme/13/EGR_2015_ES_English_Embargoed.pdf The realization of this 9Gt theoretical potential will be constrained by economic and land-use factors.

¹² See <http://www.climatefundsupdate.org/listing/norway-s-international-climate-and-forest-initiative> for further information

¹³ <http://reports.weforum.org/global-risks-2016/>

¹⁴ For example, community based adaptation projects in Isiolo and Kibera, Kenya, financed by the Nordic Climate Facility, described as case studies in Nordic Climate Finance Opportunities: The NCF Case Study, Nordic Council of Ministers Working Paper, <http://norden.diva-portal.org/smash/record.jsf?pid=diva2%3A807275&dswid=-9176> (NCF, 2015)

¹⁵ Global Landscape of Climate Finance 2015, Climate Policy Initiative, November 2015 (CPI, 2015). Note that the study found that 74% of total climate finance flows and 92% of private investments were raised and spent in the same country, i.e. not transfers from developed countries to developing countries, and these are not directly comparable to the USD 100 billion.

¹⁶ <http://www.bloomberg.com/news/articles/2015-09-10/renewable-power-investment-beats-thermal-for-first-time-at-ebrd>

¹⁷ Examples are found at http://www.finnfund.fi/yritys/toimintastrategia/en_GB/strategy/ and <http://www.ifu.dk/en/services/the-danish-climate-investment-fund>

¹⁸ According to the OECD study Climate Finance in 2013-14 and USD 100 Billion Goal, climate finance flows increased from US\$52.2 billion in 2013 to \$61.8 billion in 2014. There is an acknowledged need in the climate finance community to contribute to improve the tracking and reporting of funds.

¹⁹ The International Energy Agency in its World Energy Outlook, October 2015 stated the global energy industry needs to invest \$13.5 trillion through to 2030 in efficiency measures and low-carbon technologies in order to meet climate-protection pledges i.e. an average \$840 billion every year from 2015.

²⁰ As reported under the EU Monitoring Mechanism Regulation, from Nordic Action on Climate Support, Fact Sheet produced by Nordic Council of Ministers for COP21. http://www.ndf.fi/sites/ndf.fi/files/nordic_action_on_climate_support.pdf

²¹ On a levelised cost of electricity (LCOE) basis, source : CPI (2015). LCOE is a measure of a power source which attempts to compare different methods of electricity generation on a comparable basis. It is an economic assessment of the average total cost to build and operate a power-generating asset over its lifetime divided by the total energy output of the asset over that lifetime. The LCOE can also be regarded as the minimum cost at which electricity must be sold in order to break-even over the lifetime of the project

²² New Nordic Finance : Nordic Statement on Innovative Climate Finance, <http://www.norden.org/en/news-and-events/news/nordic-statement-on-innovative-climate-finance-launched-at-cop21>

²³ Ibid (CPI, 2015)

²⁴ Ibid (CPI, 2015)

²⁵ <http://www.1gigatoncoalition.org/wp-content/uploads/2015/12/1-gigaton-coalition-key-findings-and-executive-summary.pdf>

²⁶ <http://reports.weforum.org/global-risks-2016/> For a summary of climate change impacts visit <http://reports.weforum.org/global-risks-2016/coping-with-climate-change/>

²⁷ Climate Finance : Is it Making a Difference? A Review of the Effectiveness of Multilateral Climate Funds, Overseas Development Institute, December 2014

²⁸ Examples include the Cleaner Production Credits and Energy Savings Credits under the Nordic Environmental Development Fund

²⁹ Ibid NCF, 2015

³⁰ <http://climatepolicyinitiative.org/publication/the-role-of-national-development-banks-in-catalyzing-international-climate-finance/>

³¹ Ibid (UNEP, 2015)

³² When conditional INDCs are included as fully implemented, the emissions gap in 2030 is estimated to be 12 GtCO₂e (range: 10-15) and 5 GtCO₂e (range: 4-8) in 2025.

³³ State and Trends of Carbon Pricing 2015, World Bank Group Climate Change, September 2015

³⁴ The Role of Technical Assistance in Mobilising Climate Finance - Insights from the GIZ Programmes, Climate Policy Initiative, October 2015

³⁵ The main short lived climate pollutants are black carbon, methane and tropospheric ozone, which are the most important contributors to the human enhancement of the global greenhouse effect after CO₂.

³⁶ Visit <http://www.ccacoalition.org/en> Denmark, Finland, Norway and Sweden are members. NEFCO is a Lead Partner in the Finance Initiative.

³⁷ Visit <http://iccinet.org/programs/cryosphere-action-plan>

Suggested citation : Sharma, A. (2016), Building Bridges to the Future - Climate Financing for a Low Carbon Tomorrow, Nordic Environment Finance Corporation

About NEFCO

The Nordic Environment Finance Corporation (NEFCO) is a financial institution established in 1990 by the Nordic governments to address environmental priorities and projects initially in Eastern Europe. Since then, the governments have given NEFCO further assignments that address environmental priorities and projects globally.

Towards 2020, NEFCO's vision is to further deepen and broaden its role as a visible and potent investment partner and fund manager for small and medium-sized projects relevant for the environmental priorities set by the Nordic governments, and to continue to contribute to the generation of positive environmental impacts in the Nordic regions and globally.

The mission for NEFCO as an IFI is to generate added value for the Nordic governments and the countries where it operates through its positive environmental impacts, based on NEFCO's competitive advantages as a financier owned by the highly rated Nordic states.



The Nordic Environment
Finance Corporation

info@nefco.fi
www.nefco.org
twitter.com/NefcoNordic

Editors:
Ash Sharma, Chief Editor
Helle Lindegaard
Lia Oker-Blom
Mikael Sjövall

Graphic design: Lemonworks



4041 0017
Printed matter



SHUTTERSTOCK