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Nordic Climate Finance Opportunities
The NCF Case Study

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Nordic Climate Finance Opportunities – the NCF Case Study

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Executive Summary

The goal of reaching an ambitious globally binding climate agreement by 2015 is one of the key challenges that the international community needs to address. This report focuses on the current Nordic climate finance landscape, and uses the Nordic Climate Facility (NCF) as a case study, to offer examples of and lessons learned from practical Nordic climate actions that can be used in on-going and future climate negotiations.

Two big questions in current UN climate negotiations are the role of private finance, as well as clean technology development and transfer. Issues on how private finance can be linked to public funding structures to ensure sufficient funding for mitigation and adaptation activities, and how technology transfer could work as part of climate finance, continue to be key topics in the upcoming UN climate negotiations.

Nordic Climate Finance

This report begins with a general review of Nordic climate finance institutions and how they are framed within an international context, focusing on select key issues influencing climate finance. This section highlights the changing landscape of the international policy framework, which is moving towards results-based systems where quantitative or qualitative measurement, reporting and verification of results underpin capital flows. In addition, all parties in a new climate agreement would need to put forward actions to mitigate emissions. The Nordic countries manage their climate policies in this framework through formal UN channels, bilateral channels, informal networks and the Nordic Council of Ministers.

Emerging new funds and mechanisms under the UNFCCC, including the Green Climate Fund (GCF) and Climate Technology Centre and Network (CTCN), suggest that climate financing will increasingly move towards larger units - sectors, policies and programs – and focus technology transfer more holistically on solutions to specific climate mitigation and adaptation challenges rather than individual technologies.

The review of Nordic climate finance institutions concludes that Nordic institutions provide a wide range of support for climate projects and programs. Much of the support is, however, still built around thematic silos for development funding, export support and climate/carbon finance supporting specific climate change mitigation activities. This creates a barrier for providing a more holistic support scheme operating out of the needs of individual projects or programs. The report also finds that Nordic climate finance is currently not anchored to any formal Nordic governance structure that would dictate how new approaches in climate financing emerge in the region.

Climate finance offers a theme around which co-operation could naturally be built; e.g. between the Nordic Development Fund (through NCF) and private sector companies, between development programs and carbon finance specialists, or between clean technology export networks collaborating with development funds. There are only a few examples of such collaboration across the established silos between institutions.

NCF Case Study

The review of Nordic climate finance institutions is followed by a NCF specific case study that includes a selection of projects from the NCF project portfolio. The section highlights that NCF is an enabler of projects, mobilizing private sector finance, reducing the financial risk and helping to prove the viability of projects. NCF is successful in filling the funding gap that is a common challenge for early investments.

The facility allows for testing a project concept or technology in a specific geographical setting, ensuring the acceptance of the solution by the involved stakeholders, as well as creating an initial demand for a specific solution. This can be linked to higher-level national-, regional-, and international policies for replication and scaling up the solution. Once pilot projects have proven successful, it is also possible for stakeholders to look for other types of funding, including loans and equity investments.

NCF projects that combine grant funding with private sector investment show positive initial results, as the involvement of the private sector seems to increase the impact and

sustainability of the projects. The projects with strong private sector involvement show potential to become self-sustaining in the near future, with the possibility to expand without further grant financing. In order to attract private sector financing and knowledge, projects need to have a sound business case and the potential to become commercially viable.

Technology transfer is another key focus area in the analysis of the NCF projects. For some projects and development needs, innovative and new technological solutions can prove very successful, while other projects benefit from basic technologies that might have existed for a long time in other geographical locations.

Projects included in the analysis also have a strong development agenda with related co-benefits, highlighting the need not to separate development and climate programs into silos of their own, but rather try to integrate these two financing opportunities in developing countries. Development co-benefits range from e.g. reducing the amount of water-borne diseases in communities, which have a direct effect on household income levels and children's school attendance, to increased local level employment, and new types of income generating activities.

Analysis and Recommendations

The analysis in the report and the case studies clearly show that financial support to smaller projects can provide benefits above and beyond their immediate economic and environmental impacts. They can be leveraged as a platform to scale best practices and business models by vetting project design, testing alignment with local policy instruments and proving a specific technology. Importantly, they can also be used to build a knowledge base of project-level monitoring protocols for reporting environmental impacts.

As results-based finance is increasingly required by international policy frameworks, the ability to utilize established project-level monitoring, reporting and verification practices for verified emission reductions or other targeted impacts in broader mitigation and adaptation programs becomes very valuable. Many Nordic institutions identified in this paper have built a vast body of knowledge in emission reductions monitoring, reporting and verification through the Clean Development Mechanism under the Kyoto Protocol. This understanding should be integrated into future Nordic climate finance instruments and facilities.

The Nordic countries, furthermore, have a long history in bilateral development programs. In the changing landscape of climate financing this experience should be seen as an asset. It serves as a complementary way to engage with host countries outside of structurally heavier multilateral climate financing channels. This should enable Nordic countries to e.g. support projects to prepare sectors and segments to access climate funding in priority areas and sectors of the host country. These bilateral programs should focus on creating the structures in countries that enable private sector funding and make results-based finance possible; e.g. risk mitigation for private investors, integrating MRV into policy tools and supporting development of sector or national funding applications for the GCF or other large funding channels.

The importance of greater private sector involvement in developing and financing future solutions in climate mitigation and adaptation is also to be acknowledged. All parties involved, including existing Nordic technology export programs and clean technology networks, could benefit greatly from better access to new and emerging flows of climate finance. There has been little coordinated overlap between export promotion and development and climate financing. Given the natural fit between the promotion of clean technologies and the goals of climate financing, this is an underutilized opportunity in the Nordic countries.

A key challenge identified in the report is the need to scale and replicate smaller projects into larger programs. This need to create "bridges" between bottom-up, smaller scale projects on the one hand, and large-scale international top-down climate finance programs on the other, is an overarching theme in the report. Addressing this need should become a central theme for Nordic climate finance institutions. An emphasis on linking smaller projects to large-scale funding flows should be embedded into any development of follow-on financial instruments for successful early stage projects

as well as into building foundations for operational scalability, such as MRV systems.

Scaling and replicating successful projects enables new sources of funding, facilitates private sector participation and ultimately provides larger mitigation and adaptation impacts. In the end, benefits of small projects should be framed in the context of their collective ability to deliver the required levels of global greenhouse gas reductions. Scaling smaller projects to meaningful size also requires conducive political and regulatory frameworks. Small projects can facilitate the creation of workable local policy framework by ensuring that results are made available to regulators. Large-scale climate financing institutions can also promote knowledge sharing from smaller projects to regulators by requiring that practical project experiences are required in any policy framework development that they support.

The report concludes with eight targeted recommendations for the Nordic countries, and the international community alike. The recommendations highlight key points and lessons learned that can be used for replication and scaling Nordic climate actions, and in on-going and future climate negotiations.

Sammanfattning (SWE)

Målet att nå ett globalt bindande klimatavtal år 2015 är en av de viktigaste utmaningar som det internationella samfundet måste ta itu med. Denna rapport fokuserar på existerande nordiska klimatfinansieringsmekanismer. Nordic Climate Facility (NCF) används som en fallstudie för att lyfta fram exempel och konkreta erfarenheter från nordiska klimatåtgärder som kan användas i pågående och framtida klimatförhandlingsarbete.

Två viktiga frågor i de pågående klimatförhandlingarna är privat finansiering, samt cleantech och tekniköverföring. Frågor om hur privat finansiering kan kopplas till offentliga finansieringsstrukturer för att säkerställa tillräcklig finansiering för klimatåtgärder och hur tekniköverföring skulle kunna fungera som en del av klimatfinansieringen fortsätter att vara viktiga frågor i de aktuella klimatförhandlingarna under FN:s regi.

Nordisk klimatfinansiering

Rapporten inleds med en allmän överblick av nordiska institutioner och organisationer som är involverade i klimatfinansiering. Rapporten fokuserar på ett urval nyckelteman som berör klimatfinansiering. Denna del av rapporten belyser specifikt kommande förändringar i internationella policyramverk som går mot allt större krav på resultat och där kvantitativ eller kvalitativ mätning och rapportering av resultat ligger till grund för kapitalflöden. Dessutom skall alla parter i ett nytt klimatavtal lägga fram åtgärder för att begränsa de egna utsläppen. De nordiska länderna hanterar sin klimatpolitik i dessa frågor genom formella FN-kanaler, bilaterala kanaler, informella nätverk samt det nordiska ministerrådet.

Nya stödformer inom ramen för UNFCCC, däribland Green Climate Fund (GCF) och Climate Technology Centre and Network (CTCN), tyder på att klimatfinansiering i allt högre grad kommer att gå mot större enheter och fokusera tekniköverföring mer på övergripande lösningar för specifika problem relaterade till klimatförändring, än på enskilda tekniska lösningar.

Genomgången av nordiska institutioner och organisationer aktiva inom klimatfinansiering visar att nordiska institutioner tillhandahåller ett brett utbud av stöd och kunskap relaterat till klimatprojekt. En stor del av detta stöd är dock fortfarande uppbyggd kring specifika teman så som finansiering av utvecklingssamarbete, exportstöd eller klimatfinansiering, vilket skapar en naturlig gränsdragning och hindrar ett mer övergripande stödsystem. I rapporten konstateras också att nordisk klimatfinansiering för tillfället inte är förankrad i någon specifik nordisk förvaltningsstruktur som styr hur nya stöd inom klimatfinansiering beaktas och implementeras inom Norden som helhet.

Klimatfinansiering erbjuder ett tema kring vilket samarbetet naturligt skulle kunna byggas, t.ex. mellan Nordic Development Fund (genom NCF) och privata företag, mellan utvecklingsbistånd och klimatfinansierings-specialister, eller mellan exportnätverk för cleantech som samarbetar med organisationer inom ramen för utvecklingssamarbetet. Det finns bara ett fåtal exempel på sådant samarbete över de etablerade gränsdragningar som existerar mellan institutioner.

NCF Fallstudie

Genomgången av Nordiska institutioner och organisationer som är involverade i klimatfinansiering följs av en fallstudie av NCF. Fallstudien innehåller en närmare granskning av utvalda projekt från NCFs projektportfölj. Denna del av rapporten påvisar att NCF möjliggör att projekt genomförs, att projekten lockar till sig privat finansiering, minskar den finansiella risken och bidrar till att visa att projektet ifråga är livskraftigt. I och med att en stor utmaning vanligtvis är att hitta grundfinansiering för nya projekt, fyller NCF detta behov på ett föredömligt sätt.

NCF möjliggör att testa ett specifikt projekt eller teknologi i ett begränsat geografiskt område, säkerställa att konceptet accepteras av de involverade parterna, samt visa att lösningen fyller ett behov. Detta kan, då det visat sig att konceptet är fungerande, länkas till nationella, regionala, eller internationella strategier och överenskommelser, kopieras, expandera eller skalas upp. Då pilotprojekt har visat sig framgångsrika, är det även möjligt för parterna i projektet att söka andra former av finansiering, så som lån och aktieinvesteringar.

NCF projekt som kombinerar gåvofinansiering med investeringar från den privata sektorn visar positiva resultat. Involvering av den privata sektorn verkar öka effekten och livskraften av projekten. De projekt som har en stark medverkan från den privata sektorn är på god väg att kunna stå på egna ben inom en snar framtid, samt ha möjlighet att expandera utan ytterligare understöd. För att kunna locka till sig privat finansiering och expertis, måste projekt ha en livskraftig affärsplan som även visar på möjligheter att vara vinstbringande.

Tekniköverföring, vilket är ett av ett flertal urvalskriterier för NCF projekt, är ett annat tema för rapporten. För vissa projekt och vissa behov i utvecklingsländer, kan nya och innovativa teknologiska lösningar vara väldigt framgångsrika. För andra projekt är däremot existerande enkla teknologier, som redan använts i andra områden och länder, vara den bästa lösningen.

Alla projekt som är inkluderade i analysen har även en stark betoning på aspekter relaterade till utvecklingssamarbete. Detta betonar vikten av att inte separera utvecklingsbistånd och klimatprojekt från varandra, utan istället försöka kombinera dessa två finansieringskanaler i utvecklingsländer. Fördelar som inte är direkt relaterade till klimatförändring är t.ex. en minskning av sjukdomar som överförs via dricksvatten, vilket har en direkt effekt på inkomster och barns skolgång, nya arbetsmöjligheter på lokal nivå, m.m.

Analys och rekommendationer

Analysen och fallstudien i rapporten visar tydligt att finansiellt stöd till mindre projekt kan leda till fler fördelar än de direkta ekonomiska- och miljöeffekter projektet har. De kan t.ex. användas som bas för att kopiera framgångsrika projektkoncept och affärsmodeller, bidra till nationell policyutveckling, eller bevisa att en specifik teknik fungerar. Projekten kan även användas som exempel för projekt specifik uppföljning och rapportering av miljöeffekter.

Eftersom resultatbaserad finansiering i ökande grad är ett krav inom internationell policy, blir det allt viktigare att kunna använda sig av etablerade uppföljnings- och rapporteringsmetoder för fastställda utsläppsminskningar eller andra riktade effekter av projekt som leder till utsläppsbegränsningar och anpassning till klimatförändring. Ett flertal av de nordiska institutioner som lyfts fram i denna rapport har en stor samlad expertis relaterad till uppföljning och verifiering av utsläppsminskningar som en följd av arbete med Kyoto protokollets Clean Development Mechanism. Denna kunskap borde integreras i framtida nordiska klimatfinansierings-instrument och program.

De nordiska länderna har dessutom en lång och gedigen erfarenhet av bilaterala utvecklingssammanhang. Inom de föränderliga ramarna för klimatfinansiering skall detta ses som en tillgång. Framförallt borde det ses som ett kompletterande sätt att engagera sig i mottagarländer utanför de strukturellt tunga multilaterala klimatfinansieringskanalerna och stödja dem genom mer flexibla och skräddarsydda projekt. Dessa kan i sin tur förbereda vägen för tillgång till internationell klimatfinansiering inom sektorer och ämnesområden som prioriterats. Dylika bilaterala program borde fokusera på att skapa sådana strukturer i mottagarländer som möjliggör finansiering från den privata sektorn, så som riskminimering för privata investerare, integrering av uppföljning och rapportering i policyredskap samt stödja utvecklingen av nationella ansökningar för finansiering från GCF eller andra större finansieringskanaler.

Ett starkare engagemang från den privata sektorn som en del i en framtida lösning på problematiken kring klimatförändring är viktigt att lyfta fram. Existerande nordiska program för teknologiexport och cleantech nätverk representerar en viktig del av den privata sektorn som skulle ha mycket att vinna på ett bättre utnyttjande av de nya finansieringskanaler som utvecklas. Samtidigt finns det idag endast ett fåtal exempel på samarbeten mellan exportfrämjande, biståndssamarbete och klimatfinansiering. Ett undantag är t.ex. den danska klimatinvesteringsfonden. I och med det naturliga sambandet mellan cleantech och klimatfinansiering är detta en möjlighet som kunde utnyttjas i större utsträckning i de nordiska länderna.

En stor utmaning som lyfts fram i rapporten är behovet av att kunna kopiera och skala upp små projekt och utveckla dem till större

program. Detta kräver att ”broar” byggs mellan mindre projekt på gräsrotsnivå och stora internationella klimatfinansieringsprogram. Detta är även ett övergripande tema i rapporten. Denna utmaning föreslås bli ett centralt ämnesområde för nordiska institutioner som är engagerade i klimatfinansiering. Förslaget innehåller både ett behov av att utveckla uppföljningsmekanismer och finansiella instrument som skulle möjliggöra att framgångsrika mindre projekt kunde expandera och växa, samt etablera och utveckla system som möjliggör att flertalet mindre projekt kan utvecklas till större helheter. Kopiering och uppskalning av framgångsrika projekt möjliggör tillgång till nya finansieringsmöjligheter, främjar finansiering från den privata sektorn och leder sist och slutligen till större effekter av anpassning till klimatförändring och utsläppsbegränsningar. Fördelarna med mindre projekt borde även jämföras med storleken på de minskningar som krävs av globala utsläpp av växthusgaser för att påverka klimatförändring. Att expandera och skala upp mindre projekt kräver även att ramverk för policy och regelverk främjar och möjliggör detta. Goda exempel genom mindre projekt kan bidra till skapandet av fungerande nationella policys under förutsättning att sådana samband prioriteras i finansieringsprocessen. Samtidigt kan stora internationella klimatfinansieringsverktyg, så som GCF, effektivt påverka politiska beslutsprocesser och policy.

Rapporten avslutas med åtta riktade rekommendationer till de nordiska länderna och det internationella samfundet mer generellt. Rekommendationerna lyfter fram nyckelpunkter och lärdomar som kan användas för att vidareutveckla och skala upp nordiska åtaganden för att begränsa utsläpp och lindra effekterna av klimatförändring nu och i framtida klimatförhandlingsarbete.

Abbreviations

ADB - Asian Development Bank
ADP – The Ad Hoc Working Group on the Durban Platform for Enhanced Action
AfDB - African Development Bank
ARTI Tanzania - Appropriate Rural Technology Institute Tanzania
CDM - The Clean Development Mechanism
CEDAT - College of Engineering, Design, Art and Technology
CERs - Certified Emission Reductions
Ci-Dev - Carbon Initiative for Development
CIF - Climate Investment Funds
CLEERE - Climate Change, Energy Efficiency and Renewable Energy
COP - Conference of the Parties on Climate Change
CTCN - The Climate Technology Centre and Network
DFIs - Development Finance Institutions
EBRD - European Bank for Reconstruction and Development
EEP - Energy and Environment Partnership
EIB - European Investment Bank
EKF – Eksport Kredit Fonden (the Danish Export Credit Agency)
EKN – Export Kredit Nämnden (the Swedish Export Credit Agency)
EU - European Union
GCF - Green Climate Fund
GHG emissions - Greenhouse Gas emissions
GIZ - Deutsche Gesellschaft für Internationale Zusammenarbeit
INDCs - Intended Nationally Determined Contributions
IDB - Inter-American Development Bank
IEW - Institute of Environment and Water
IFI - International Finance Institution
IFU - Investment Fund for Developing Countries
IIC - Inter-American Investment Corporation
IØT - Department of Industrial Economics and Technology Management
JI - Joint Implementation
LADEC - Lahti Region Development Ltd
LDCs - Least Developed countries
LFA - Logical Framework Approach
MIF - Multilateral Investment Fund
M-PESA - Mobile money transfer system
MRV - Monitor Reporting & Verification
NAMAs - Nationally Appropriate Mitigation Actions
NAPA – National Adaptation Programme of Action
NCF - Nordic Climate Facility
NDF - Nordic Development Fund
NGO - Non-governmental organization
NEFCO - Nordic Environment Finance Corporation
NHO - Confederation of Norwegian Enterprise
NIB - Nordic Investment Bank
NOAK - Nordic Working Group for Global Climate Negotiations
NOPEF - Nordic Project Fund
NORAD - Norwegian Agency for Development Cooperation
NorCap - Norwegian Carbon Procurement Facility

NPI - Nordic Partnership Initiative
NTNU - Norwegian University of Science and Technology
OECD - Organization for Economic Co-Operation and Development
OREEC - Oslo Renewable Energy and Environment Cluster
PoAs - Program of Activities
REDD - Reducing Emissions from Deforestation and Forest Degradation
RINCOD - Revitalization of Indigenous Initiatives for Community Development
SEA - Swedish Energy Agency
SEK – Swedish Export Credit Corporation
Sida - Swedish Development Cooperation Agency
SME - Small and medium-sized enterprises
UNEP - United Nations Environment Programme
UNFCCC - United Nations Framework Convention on Climate Change
WB - World Bank

1. Introduction

1.1. Background

Climate finance refers to the mobilization of finance from local, national and transnational sources to counter adverse effects of global climate change. *"Climate finance is critical to addressing climate change because large-scale investments are required to significantly reduce emissions, notably in sectors that emit large quantities of greenhouse gases. Climate finance is equally important for adaptation, for which significant financial resources will be similarly required to allow countries to adapt to the adverse effects and reduce the impacts of climate change."*[1]

The international effort to reach an ambitious globally binding climate agreement by 2015 is one of the key challenges that the international community needs to address. Reaching a global climate agreement with legally binding and ambitious goals is the overarching goal of the Nordic working group for global climate negotiations (NOAK). NOAK also acts as a conduit for joint Nordic perspectives on developing international climate policy. This report complements NOAK's existing body of work and offers a case-study based bottom-up view on key climate policy aspects.

The Nordic countries recognize that ambitious efforts in climate mitigation and adaptation solutions provide positive examples and highlight solutions that can be acceptable to the various stakeholder groups and nations involved. These types of actions serve as a positive conduit in climate negotiations by highlighting working and emerging solutions in carbon- and climate finance. Recent Nordic actions include e.g. continued support for existing carbon finance mechanisms under the Kyoto Protocol, and testing new future climate finance mechanisms.

NOAK plans to use the Nordic climate financing architecture, as well as previous and on-going Nordic Climate Facility (NCF) projects as examples of Nordic climate initiatives that contribute to effective climate change adaptation and mitigation in developing countries. This provides a potential platform for increased and scaled-up actions. NCF and a general analysis of Nordic climate finance institutions can provide examples of best practices and lessons learned that can be used as positive input into the on-going UN climate negotiations.

Grass-root projects, such as the ones developed under NCF, can be seen to have an important function in aligning national policies to emerging international climate policy frameworks. They can serve the dual purpose of providing examples of projects that should be targeted by local policy interventions while also meeting the expectations set by the international climate policy framework. On the local level, projects provide practical cases to evaluate the impact of alternative national policy tools (e.g. feedstock subsidies, off-take contracts etc). At the same time the projects could e.g. illustrate how to design monitoring and reporting procedures to meet the demands of international results-based climate finance. Importantly, projects such as the NCF serve as testing facilities for concepts that, can be scaled and replicated to the levels needed to address climate change mitigation and adaptation.

Indirect support for climate mitigation investments and projects has been a key focus area for other Nordic finance institutions that have made climate mitigation considerations a part of funding decisions. They have broadened the investment spectrum for Nordic climate-related funding generally. These institutions include in particular development finance institutions, such as e.g. Finnfund, Swedfund, Norfund and the Investment Fund for Developing Countries (IFU) from Denmark, and development cooperation agencies and programs such as e.g. the Swedish development cooperation Agency (Sida), Finnpartnership and the Energy and Environment Partnership. These initiatives support the overall image of the Nordic region as a provider of pragmatic solutions for adaptation and mitigation projects.

A central question in the current climate negotiations is the role of private finance and leveraged public funding structures can mobilize private funding for mitigation and adaptation activities. NCF provides a valuable example of a mechanism that complements and mobilizes private climate

[1] https://unfccc.int/focus/climate_finance/items/7001.php

financing. It works as an enabler of private carbon financing by bearing a part of the project development risk together with private entities, thus providing an important bridge to private climate finance.

Another key issue in the current international climate negotiations is that of clean technology development and transfer. Technology transfer could work as part of climate finance or as a separate mechanism to support dissemination of clean technologies. NCF projects have a clear link to grass-root community level technologies that are at the core of scaling mitigation and adaptation activities in developing countries. NCF, in particular, could provide a good model for a workable micro-scale solution for tech transfer for this all-important segment.

1.2. Objectives

The objectives of this report are fivefold.

1. Use NCF and lessons learned from selected NCF projects as an example of joint Nordic climate activity, analyze how these Nordic experiences could be utilized in the on-going negotiations on pre- and post-2020 climate finance under the Ad Hoc Working Group on the Durban Platform for Enhanced Action (ADP), including how a 2015 agreement could best encourage and promote technological innovations leveraging private sector participation in areas susceptible to climate change.
2. Explore through the Nordic experience how cost-effectiveness of climate finance instruments, low carbon development strategies or parties' contributions to the 2015 agreement could be improved in a manner that, in addition to the mitigation component, maximizes adaptation benefits and other co-benefits, or vice versa.
3. Explore possibilities and potential for further climate finance co-operation and partnerships between the Nordic countries and relevant developing countries as well as replication possibilities.
4. Explore the work of other institutions with a view to exploit synergies, complementarity and minimize duplication of efforts.
5. Propose how the lessons learnt and experiences can best be disseminated and scaled, and how they can promote the joint Nordic climate agenda.

1.3. Scope of Work

The report will consist of two parts. The first part (chapter 2) consists of a more general analysis of the Nordic climate finance architecture. The second part (chapter 3) of the assignment consists of a review and assessment of a number of selected, on-going and completed NCF projects.

The report focuses on the role of private finance, as well as technology transfer. These are two key challenges in the on-going climate negotiations, and areas where NCF and the Nordic experiences can serve as good examples. A third, overlapping issue, is that of co-benefits. Co-benefits are highlighted in the analysis because co-benefits are a highly valuable argument in discussing merits of various policy mechanisms. These include direct benefits such as social, economic or procedural synergies between mechanisms or funding instruments. Although policy mechanisms are not analyzed specifically in the paper it should be noted that the case studies (chapter 3) offer a grass-root level examination of what local policy mechanisms would be beneficial. The analysis in Chapter 4 then looks at how such local projects could, by aligning project design with international requirements, be used by local policy mechanisms to meet the emerging expectations and demands of international policy.

1.4. Methodology & Approach

The methodology for this project is structured around the Logical Framework Approach (LFA). The study includes desk studies, fieldwork and interviews. Interviews have been conducted with key experts, stakeholders and partners in the Nordic countries, as well as project implementers and beneficiaries at the field level.

To support the analysis and conclusions, the data has been triangulated. The use of this research technique, known as methodological triangulation, ensures that no conclusion can be drawn from a

single source without corroboration by others. Therefore, only when interviews with beneficiaries, accounts from project managers or government authorities, field observations and/or secondary data sources point in the same direction, will the assessment team draw conclusions on key issues, drivers and trends.

Key issues for the assignment include the effectiveness of climate finance instruments, climate finance co-operation and policy/instrument architecture, As to the ability to replicate projects, it is of interest to consider whether or not they are applicable elsewhere (including organizational structure needed etc.), and to consider whether the benefits are only to the specific organizations/companies taking part in the projects, or if they are felt more broadly. To be able to cover these issues, the team will put an emphasis on interviewing people involved in the implementation of the projects.

Synergies - mitigation and adaptation

Many smaller developing countries have not yet developed a diverse industrial base. This is particularly the case with least developed countries. In the absence of large industry, can reasonably be assumed that in these countries the emphasis of mitigation and adaptation activities will be on household and small-business energy efficiency, energy efficient agriculture, small-scale renewable energy and distributed energy, waste and water solutions. NCF projects are predominantly in these sectors and should provide several learning points. Cross-benefits between mitigation and adaptation are typically more tangible in smaller projects where the projects are more closely rooted to practical local actions. Energy efficiency projects such as efficient cookstove distribution, water purification or communal water services typically provide a parallel adaptation benefit through an increase in local climate resilience by maintaining or improving the natural habitat (tree cover, water resources and soil quality). Similarly, renewable energy projects improve local climate reliance through reduced exposure to imported energy and support sustainable local resource-management.

A further benefit of finding ways (through NCF experiences) to support the development of mitigation and adaptation activities in the above mentioned small-scale project categories is that auxiliary benefits of such projects are typically larger than for large scale industrial projects (social benefits, inclusion of women, health benefits, employment etc).

NCF projects could also support the development of Monitor Reporting & Verification (MRV) systems as they could be anchored to or use elements of the procedures of the Clean Development Mechanism Program of Activities (POA). Moving project/program level monitoring to a sector or national level to support the MRV requirements of policy frameworks is a key challenge for host countries. This will require concrete support and guidance from the host country, but grass-root projects, such as those under NCF, could clearly support national MRV capacity building by providing well-defined MRV cases from which to scale broader national MRV programs into specific sectors.

Interviews

The team interviewed persons from the following stakeholder groups:

- Government officials
- Relevant persons at NOAK, NDF and NEFCO
- Organisations and companies in the Nordic countries involved in climate financing
- Project and programme managers
- Final beneficiaries
- Regional and nationally based organizations and companies involved in the projects
- Selected specialists within specific subject matter areas in climate finance

1.5. Interpretation of Climate Finance

From the authors' discussions with stakeholders during the course of the project it is apparent that interpretations on climate finance differ markedly between institutions and interviewees. The same issue can also be identified in the broader international climate negotiations, where climate finance is directly linked to a broader discussion of development assistance; the level of funding, funding targets, changes in scope and size of funding etc. Domestic political realities and development funding

preferences in all Nordic countries have a direct impact on the actual availability and targets of climate funding.

This paper will not engage in a discussion about the balance between public and private capital in total flows of funding to developing countries, or more specifically about the role of climate finance in development funding and how various funding mechanisms may overlap with both development- and climate funding. Instead, the paper elects to take a practical approach and focus on Nordic sources of funding (or other forms of financial support) where the decision underlying the capital allocation does not take place without a direct mitigation or adaptation impact (primary) or where the decision underlying the capital allocation has a direct/clear indirect link to mitigation and adaptation results (secondary). This approach loosely follows the principles of the OECD (Organisation for Economic Co-Operation and Development) Development Assistance Committee's Rio Markers for climate mitigation and adaptation projects where the *objective* of an aid flow determines whether it is aligned with a marker[2]. This looser definition of climate finance should thus isolate the study from the more politically charged discussions on defining climate finance.

The UN climate negotiations currently discuss how to understand Intended Nationally Determined Contributions (INDC), in the context of climate finance; are INDCs mitigation targets and in need of MRV or independent of climate finance? This paper takes an, agnostic view of this political discussion, whereby any references to developing country programs seeking climate financing are made without any assumptions about the definition of INDCs.

The review in chapter 2 includes investment vehicles that are focused on the acquisition of Certified Emission Reductions, under the procedures of the Kyoto Protocol. To the extent that carbon credits are acquired for reasons other than meeting Kyoto Protocol obligations these mechanisms are here viewed as climate finance instruments more broadly.

1.6. Focus on Available Mechanisms

There are a number of sources from which financial support can be directed towards climate mitigation or adaptation projects. Ultimately these funds will be channeled to specific actions through a range of financial support mechanisms. These mechanisms range from grants and soft-loans to insurance products, guarantees as well as debt and equity funding. The focus of this paper is on NCF projects and using these as example cases of applied climate finance and use the review of other sources of climate finance to identify funding gaps or overlaps with these examples. This approach will limit the review of mechanisms to the ones that can be used for project investments in developing countries. Ultimately available support mechanisms and instruments for climate investments would create a continuous funnel where projects come out at through one mechanism ready and prepared for seeking financing or support instruments at the next phase of project development, as illustrated in the picture below.

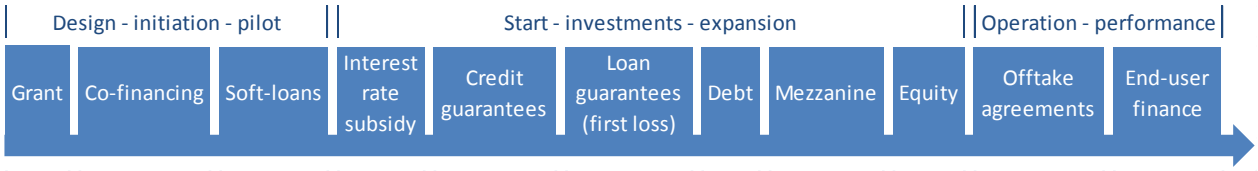

Figure 1. Various forms of financial support

The order of the flow of needed support forms depends very much on the characteristics of an individual project. In the context of this paper where NCF funding is focused purely on very early stage project funding for design, proof of concept and testing, the primary question is what forms of funding and support mechanisms are available or needed for projects that complete the first "phase" of the project development cycle. In other words, what forms of funding could be tagged onto NCF projects to ensure their continuation and long-term viability.

[2] http://www.oecd.org/dac/stats/48785310.pdf

1.7. Limitations

The scope of the project work cuts across several broad topics of the international climate negotiations. The authors have thus applied certain limitations in the analysis to simplify the structure of the paper and help deliver its core messages. Despite a strong focus on core elements (finance, technology transfer, new mechanisms) of the UN climate negotiations, the paper does not seek to provide a status update of these and related topics under the United Nations Framework Convention on Climate Change (UNFCCC).

Nordic countries have been at the forefront of developing new climate finance mechanisms since the pilot phase on project based emission reductions under Activities Implemented Jointly was launched at COP1 (Conference of the Parties on Climate Change) in 1995. However, this paper focuses solely on currently available funding mechanisms for climate mitigation and adaptation projects in *developing* countries.

The paper has a predominantly Nordic focus; it will review existing funding structures around climate finance in the region and it will, review synergies and overlaps between different instruments in light of the NCF case studies. A separate review of international climate finance mechanisms or institutions is not presented in this paper.

2. Nordic Climate Finance

2.1. International Context

This chapter outlines select overarching issues that influence the development of an international climate policy framework and provides a context for the case studies in Chapter 3

2.1.1 Shifting international climate policy

The process for negotiating a new international climate agreement was decided at the UN Climate Change Conference in Durban in 2011. The agreement is expected to be finalized and approved in the Paris Climate Conference in 2015 and come into effect by 2020. Although the final form and structure of the new climate agreement is under negotiation, it is clear that a fundamental principle of the new agreement will be a requirement on all parties to contribute to the overall mitigation target. The developing countries' GHG emissions now exceed those of developed countries and also show much higher growth levels. A fair and equitable approach to emission budgets should allow the developing countries to develop their economies and continue to increase their emissions, albeit under new rules and responsibilities.

In the new climate agreement the international rules seem likely to be combined with a requirement to define and act upon Intended Nationally Determined Contributions (INDCs). These are domestic actions that each country needs to submit as part of their contribution to a mitigation goal under the new international policy framework. These actions will include national policies, programs and rules, some of which would only be created with the political confidence given by a robust international agreement. This requirement on developing countries creates a direct link between international policy and local mitigation and adaptation projects, such as the NCF projects analyzed in this report.

Local projects that are developed unilaterally or through multilateral and bilateral programs can provide valuable contributions to policy design. First, know-how from projects can be used in designing the policy tools, but this requires that engagement with national regulators is part of the initial project scope and design. Second, monitoring and measuring the impacts of national contributions will likely be a pre-requisite for accessing international climate financing. If commitments cannot be measured there is a risk that confidence and support in the climate agreement will be undermined. Well-designed projects can support the development of local national procedures for monitoring, reporting and verifying emissions and thus support policy execution. Accountability and measurability will become key features in national policy mechanisms as they unlock emerging climate financing and technology transfer support provided by the new international policy framework.

2.1.2. Nordic governance structures

What is Nordic climate finance? Is it a set of independent country-specific actions and mechanisms on climate mitigation and adaptation united by a common Nordic generic agenda on climate policy and finance? Or is it a coordinated collective approach of different actions on climate policy and finance? Current governance structures suggest the former definition is closer to the truth, although informal channels of communication and exchange of information between Government officials in all aspects of climate policy also lends some truth to the latter definition.

The Nordic countries share a proactive and co-operative approach in international climate policy with an emphasis to facilitate support for a new international climate agreement. This approach is built on the trust earned from an active engagement in global climate policy frameworks and decades of active development aid without interfering geopolitical interests. As the negotiations for COP 21 gear up, the question is whether, and how, the Nordic countries should move to leverage more strongly this common Nordic approach for building bigger political influence on e.g. climate finance.

The interaction between Nordic governments and institutions over climate finance takes place through several different channels of communications and happens on several different levels in public- and semi-public institutions. Understanding the role and scope of operations of the bodies in different levels of the network is elemental for the recommendations provided in this report.

The fact that the five Nordic countries are currently in three different groups in the official UN climate negotiation process creates a somewhat misrepresentative picture of the coherence of the Nordic countries on the highest level of intergovernmental negotiations. On this level of negotiations, the countries views' and opinions' are represented by the European Union (Sweden, Finland and Denmark), the Umbrella Group (Norway) and Iceland[3]. A common Nordic view, or position, in the UN climate negotiations items must thus be discussed and channeled further through other bodies.

In light of this, informal discussion groups between ministries play an important role. The Nordic Working Group for Global Climate Negotiations (NOAK) under the Nordic Council of Ministers plays a central role in coordinating Nordic priorities through research projects and facilitating informal discussion between the Nordic countries and key parties in the climate negotiations. These discussions focus on exchanging views and understanding positions of negotiation with the purpose of positively influencing official negotiations, e.g. as input into Parties' submissions to the UNFCCC.

The Nordic countries have naturally pursued their own climate policy- and finance goals through unilateral actions and policies. Most recent such examples include e.g. the Swedish and Norwegian carbon credit procurement programs, the Danish Climate Investment Fund, the Copenhagen Climate Finance Meeting 2013, and Sweden and Norway recently taking the initiative to set-up and join the Global Commission on the Economy and Climate, an initiative focused on analyzing and communicating costs and benefits of acting on climate change. The reasons behind unilateral actions in climate finance can be tied to e.g. specific development goals, national emission reduction goals and technology export.

As described above it should be recognized that there is no harmonized or structured bottom-up procedure for the Nordic countries to push specific priorities within the climate policy- and finance agenda. The structure created by the different levels of interaction, relies on an informal and open dialogue between Ministries in different Nordic countries. The platforms created, such as NOAK, provide an opportunity for any Nordic country to put forward its own proposals to the work program and thus influence the joint Nordic agenda.

Finally, many of the core Nordic institutions involved in climate financing, such as e.g. NEFCO, NDF, and NIB, outlined in section 2.2. below, have their own statutes and strategies allowing them some degree of freedom to engage in various climate finance mechanisms of their own choice. This is exemplified e.g. by NEFCO's long-standing engagement in the carbon markets through its Carbon Finance and Funds department. These entities provide a further channel through which new approaches and collaborations on climate finance may emerge in the Nordic region.

[3] Iceland is currently not in any official negotiation block.

In light of the above it is clear that new mechanisms, collaborations or approaches on climate finance, based on positive experiences from NCF and other current Nordic channels of financing discussed below, can emerge through many different sub-structures in the overall landscape for climate finance. New approaches can be a coordinated effort through e.g. NOAK, it can be based on a looser informal Ministerial collaboration or through some of the joint-Nordic financing institutions. This shows that the review of the status and future development of Nordic climate finance is currently not anchored to any rigid cross-Nordic governance structure that would dictate how new approaches in climate financing emerge in the region.

2.1.3. Climate finance and technology transfer

The analysis in this paper concentrates on three themes that are deeply rooted in the agendas for COP 20 in Lima and COP 21 in Paris; private sector finance, technology transfer and co-benefits between adaptation and mitigation projects. Facilitation of private sector climate finance has been a central theme to the Standing Committee on Finance[4] under the COP. This was a key driver in the decisions leading to the establishment of the Green Climate Fund (GCF). As the discussions in the UNFCCC are now focusing on the mechanics of operationalizing the new finance and technology transfer mandates, they also provide an international context for the analysis. It is assumed that these two mandates will re-shape ways in which technology transfer and climate financing is done across multilateral, bilateral and private sector climate finance channels. This assumption is done with a full recognition that existing institutions, many of which have been designed or recently reformed for climate finance, will continue to play a meaningful role. Such institutions include, in particular the Global Environment Facility, but also e.g. the Adaptation Fund, the Climate Investment Funds, the various International Finance Institutions, including European Investment Bank (EIB), European Bank for Reconstruction and Development (EBRD), Inter-American Development Bank (IADB), Asian Development Bank (ADB), Nordic Investment Bank (NIB) etc. and Carbon Initiative for Development (Ci-Dev, World Bank).

The Green Climate Fund

The Green Climate Fund (GCF) is a new multilateral fund aimed to centralize finance for adaptation to climate change and mitigation of GHG emissions in developing countries. The mandate to establish the Green Climate Fund as an operating entity of the UNFCCC's Financial Mechanism has moved to a level where the GCF's investment and governance procedures are being set up. Under the Copenhagen Accords[5] the developed countries pledged to mobilize US$ 100 billion a year in climate finance by 2020. There is a wide-ranging expectation that GCF will gradually become one of the key global channels for allocating this funding for climate mitigation and adaptation.

Development finance institutions (multilateral- and national development banks, bilateral and regional financial institutions) account for roughly a third[6] of the global financial flows of $360 billion low carbon and climate resilient investments. The New Climate Economy report[7] identifies development finance institutions having a key role in significantly scaling up climate financing. This could be done directly or through e.g. GCF. The emerging operating procedures for the GCF provide a good example[8] of how an overall scaling of climate finance will ultimately also impose expectations on increasing underlying mitigation or adaptation actions. Large flows of funds will need to target larger project categories.

[4] See e.g. SCF 2013 Report to the COP: http://unfccc.int/resource/docs/2013/cop19/eng/08.pdf
[5] http://unfccc.int/files/meetings/cop_15/application/pdf/cop15_cph_auv.pdf
[6] http://static.newclimateeconomy.report/wp-content/uploads/2014/08/NCE_Chapter8_InternationalCooperation.pdf
[7] ibid
[8] http://www.gcfund.org/documents/in-session-documents.html

Finland, Sweden, Denmark and Norway have all committed funding for setting-up the GCF. The GCF currently seeks further financing pledges for capitalization, with some developing countries calling[9] for it to reach a capitalization target of $15 billion by November 2014. Following the UN Climate Summit in New York in September 2014 all Nordic countries pledged funding for capitalizing the GCF. At the Berlin pledging conference in November 2014, pledges of more than $9.3 billion were made by 21 Governments towards the initial capitalization of the GCF for the years 2015-2018.[10] [11]Of this sum, both Finland and Norway committed US$ 100 million, and Denmark US$ 71,6 million. Sweden has pledged the largest sum of all Nordic countries, with its pledge of US$580 million.[12] Following additional pledges that were made at COP20 in Lima, the GCF reached a capitalization level of USD 10.14 billion[13]

The GCF can provide direct access to funding through accredited national implementing entities, intermediaries such as multilateral-, national and regional development banks and also private sector institutions and non-governmental organizations among others. Funding could also be allocated directly to host country institutions as opposed to discrete projects approved by the GCF board.

The expectation is that the GCF will, initially – while building internal capacity and getting national implementing entities accredited, - rely on development banks as the main funding channels, thus utilizing their networks and know-how to implement projects. Funding requests would be initiated by host countries by them putting forward bankable project proposals and programs to the GCF (or to the multilateral banks). One current assumption is that the GCF's funding focus is on larger transformational, sector-wide and/or policy-led programs.

The Nordic region is represented on the inaugural GCF board, with Norway and Sweden being members (alternating with the Czech Republic and Belgium, respectively) and Denmark being an alternate member to the Netherlands. Combining this role of governance with the above front running financial pledges, it is fair to say that the GCF is politically strongly embedded into the Nordic countries and can thus reasonably be seen as a central future climate finance channel for them, alongside multilateral commitments and bilateral initiatives. This is supported by a recent Nordic Council recommendation[14] that endorsed an active Nordic participation in the build-up and funding of GCF as an effective approach to bridge differences between UNFCCC Members around the critical topic of funding.

The emergence of the GCF will likely impose shifts in the Nordic climate finance landscape, as funding will be increasingly directed through the fund. While the absolute level of climate funding should increase, and leave ample room for existing bilateral funding structures and unilateral funding through e.g. EU (European Union), the emergence of the GCF will raise a lot of new questions. The key question for this paper is how to tie smaller mitigation and adaptation programs such as the NCF and Nordic private sector capital and technology into larger financing programs in an environment where decisions on funding are increasingly distanced from Nordic governments. Overall, influence on how funds will be allocated will diminish.

The Climate Technology Centre and Network

The Climate Technology Centre and Network (CTCN) was made operational under COP 19 in Warsaw as the operational arm of the UNFCCC Technology Mechanism. It is based in Copenhagen and hosted and managed by the United Nations Environment Programme (UNEP). It works with 11 centers of excellence located in developing and developed countries to promote technologies for climate change mitigation and adaptation. The centre works out of requests from developing countries to deliver

[9] Ad Hoc Working Group for Enhanced Action under the Durban Platform (ADP): Call for $15 billion capitalization of the Green Climate Fund (www.twnside.org.sg)
[10] UN Secretary General press release, SG/SM/16355-ENV/DEV/1474, 20.11.2014.
[11] Ministry of Foreign Affairs of Finland, press release 262/2014, 20.11.2014.
[12] Subject to parliament approval.
[13] Press Release 9.12.2014. Green Climate Fund hits USD 10 billion threshold. Green Climate Fund.
[14] Rek. 4/2014. Norden som brobygger mellom i- og u-land i de globale klimaforhandlinger. Nordic Council of Ministers.

technological assistance, know-how and networks to support plans, projects, concepts and programs that ultimately lead to transfer of climate technologies. Participating Countries need to nominate National Designated Entities that serve as the national focal point for the development and transfer of technologies and interaction with the CTCN regarding technology requests.

The regional centers of excellence, most of which are established energy, agriculture and forestry research institutions, provide the core technical know-how for CTCN projects and therefore play an important part in project design. The funding provided by the CTCN is aimed at feasibility and preparatory studies, with the intention to develop projects to a stage where they can access multilateral and private funding e.g. through the GCF. Over time it is assumed that a wider network of experts and partners could also play a leading role in executing projects once funding becomes available. It will take time for the CTCN to deliver on this vision to become a hub for big structural reform projects and carry these projects from feasibility towards funding. However, the long-term model offered by the CTCN mirrors that of the GCF; large host-country initiated mitigation and adaptation projects for major structural reforms.

The technology transfer model developed by CTCN offers a departure from existing approaches under development- and export finance activities as well as trade promotion efforts. In the foreseen CTCN structure technology transfer will be host-country demand driven and centrally coordinated and it will increasingly be linked to climate finance, even results-based finance. This demands an emphasis on early stage involvement in project development and co-ordination efforts, a feature that is much less prominent in project-level bottom-up developer initiated technology transfer projects under bilateral efforts. This shift and alignment between technology and climate finance needs to be recognized in Nordic institutions. In large-scale technology transfer initiatives the emphasis moves away from the underlying projects to a more challenging environment involving implementing governments, expert networks and technology providers.

2.1.4. Leveraging Kyoto Protocol flexibility mechanisms

The flexibility mechanisms existing under the Kyoto Protocol of the UNFCCC include many features on e.g. project monitoring, emissions baseline definition and emission reduction calculations that will likely prove very useful for future climate finance mechanisms. The Clean Development Mechanism (CDM) and Joint Implementation (JI), as well as the scaled-up programmatic form of the CDM, will provide an important channel for transferring know-how on results-based climate finance to emerging climate finance structures. Nordic institutions have a well-founded position to leverage active existing and historical participation in UNFCCC mechanisms in future climate financing channels.

The Nordic countries have been forerunners in carbon finance historically, with Finland, Sweden and Norway all being founding participants of the World Bank's first carbon fund in 2000, the pioneering Finnish CDM/JI program set up in 2000 and Denmark setting up its the Danish Carbon Fund through the World Bank in 2005. Norway's International Climate and Forest Initiative established in 2008 was a key international milestone in developing the REDD+ (Reducing Emissions from Deforestation and Forest Degradation) mechanism. Similarly, current carbon credit procurement programs overseen by NEFCO and the Swedish Energy Agency (SEA) are providing unique demand for carbon credits in a very challenging market environment[15]. Both programs define their procurement strategy to service a specific project type, region or financing bottleneck.

Historically there has been no common Nordic strategy or body for co-operating work with UN flexibility mechanisms. However, there is an informal platform for exchange created through the long history of joint engagement in e.g. World Bank and NEFCO carbon funds between Nordic governments – and also with select Nordic companies participating in these funds. There is also a vast body of know-how and experience from unilateral actions in carbon finance in each country. This body of

[15] The value of international carbon credits, Certified Emission Reductions and Emission Reduction Units, has fallen over 90% since July 2011.

work from existing UNFCCC mechanisms presents a potential platform around which to strengthen Nordic collaboration on climate finance and technology transfer.

2.2. Status of Nordic climate financing

The review of Nordic institutions currently involved in climate finance in developing countries is divided into the following three financing channels:

1. Institutions, programs or investment vehicles where the climate impact (measured impact or an ex-ante estimate of climate impacts or benefits) is a primary determinant for investment or financial support.
2. Institutions, programs or investment vehicles where a climate impact is a clear secondary consideration in investment decisions. These include development- and export funding institutions.
3. Institutions and programs not related to climate finance but which are directly linked to the core themes and could thus play a role in the future climate financing channels or networks. These institutions include e.g. cleantech networks, and private sector companies.

The diagram below illustrates how climate finance becomes the main channel for capital flows towards developing countries. The international frameworks for funding will be consolidated, as key funding channels need to scale significantly while aid-driven development is decreasing. The arguments underpinning other related big drivers of capital flows – clean technology sales, sustainable development goals and export promotion - will be embedded as parts of larger flows of climate finance.

This will require a shift away from the current approach where different drivers for capital flows operate in separate "silos" defined by their targeted end-use. Larger flows of funding will aim to combine several targets at the same time - under broader projects and programs, combining development goals and clean technology promotion with results-based climate finance mechanisms suited for large scale funding programs.

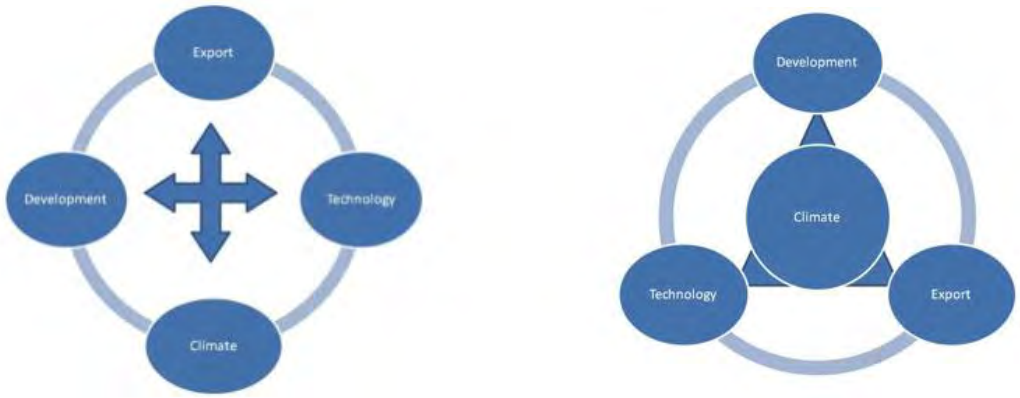

Figure 2. Current drivers of capital flows and the anticipated shift towards a mainstreamed climate-centric model of capital flows

It is important to note that to some extent the institutions included in the review below are overlapping as the source of funding or management capacity for the facility may come from other institutions. This is particularly the case with NEFCO that today administers NOPEF and also manages the Nordic Climate Facility and NorCap through its Carbon Finance and Funds Department. In the analysis below we've chosen to separate NEFCO's headline operations, financing environmental-related projects and investments in Ukraine, Russia and Belarus, from its Carbon Finance and Funds department.

2.2.1. Nordic climate finance institutions and facilities

There are currently only a handful of Nordic institutions or facilities solely focused on financing climate impacts. Institutions include the Nordic Development Fund (NDF) and the Nordic Climate Facility (NCF), the Swedish Energy Agency's (SEA) carbon credit procurement program, the NEFCO Norwegian Carbon Procurement Facility (NorCap) and the NEFCO Carbon Fund. The support currently offered by these institutions and facilities for projects and programs in developing countries falls broadly into two categories: grant funding and purchases of carbon credits through offtake agreements.

NDF is the only joint Nordic financing institution with a mandate to finance exclusively climate projects. NDF offers grants of typically above €2 million to projects or programs that are focused on mitigation or adaptation for the purposes of project preparation activities, such as pre-feasibility studies, project designs, marketing and commercialization studies etc. Financing is done on a co-financing basis, meaning that NDF only invests in programs with another sponsor, typically the IFI managing the project. In doing this the grants leverage additional funding in the project inception phase, and also at a later stage by focusing support on moving projects and programs closer to financial bankability. NDF largely relies on its local partner IFI's for project origination, implementation and follow-up.

The NCF, a facility financed by NDF, and administered by by NEFCO, offers grants of up to €0.5 million to concrete projects that are focused on mitigation or adaptation. All projects are identified, selected and monitored over their 2 ½ year lifetime by NCF. Financing is done on a co-financing basis, meaning that NCF grant recipients must provide at least 20% of own funding, but the average co-financing over four calls for proposals is approximately 50%. In doing this NCF leverages additional private funding in the project inception phase, and also at a later stage by focusing support on moving projects closer to financial bankability. Funding is conditional on achieving agreed results and milestones.

The financial support provided by SEA, the NEFCO Carbon Fund and NEFCO Norwegian Carbon Procurement Facility is through carbon credit procurement and is directed at projects and activities that reduce emissions, i.e. at the operational stage of projects. This type of financing is at the complete other end of the spectrum of financial support mechanisms compared to grant funding.

While not an investment facility, the Nordic Partnership Initiative on Scaled-Up Mitigation (NPI) currently provides a good example on forward-looking Nordic collaboration on future climate finance mechanisms. The NPI focuses on scaled-up mitigation action in Vietnam and Peru by helping build capacity to evaluate, structure and implement Nationally Appropriate Mitigation Actions (NAMAs). The initiative is anchored with all five Governments having come through from NOAKs strategy work to ministerial approval. It also extends collaboration to NEFCO and NDF who provided funding and guidance for the program.

The NPI focuses on the waste management sector in Peru and in Vietnam on the cement industry. For both cases the primary aim was to set up a sector specific data collection and a monitoring, reporting and verification system and design support instruments for mitigation actions. In doing this the NPI prepares both sectors for accessing international funding and new market mechanisms, should these become available. The NPI thus represents a potential platform around which to build further Nordic collaboration on climate finance.

Table 1. Examples of Nordic climate finance institutions and facilities

Nordic climate finance institutions		
Joint	Nordic Development Fund	A joint-Nordic development finance institution with a mandate to facilitate climate change investments in low-income countries with an annual funding volume of EUR 35 million. Grant funding solely through co-financing, target size EUR 2-5 million aimed mainly at technical assistance (consulting services), and for investments (goods, works, services). The Small Grant Facility (EUR 9 million) can fund smaller grants e.g. project preparatory activities.
Sweden	Swedish Energy Agency	The agency procures carbon credits for Sweden's 2020 voluntary emission reduction target in addition to credits for its target under the Kyoto Protocol. Direct purchase of Certified Emission reductions on a forward contract basis under an Emission Reduction Purchase Agreement.
Joint	NEFCO	NEFCO, manages three carbon facilities. Through its Carbon Finance and Funds department it has a dedicated focus on climate finance.
Nordic climate finance facilities		
Joint	Nordic Climate Facility	The Nordic Climate Facility is a grant co-financing facility under NDF and managed by NEFCO. It provides grant co-financing between EUR 0,25-0,5 million into projects with a Nordic interest/stakeholder. Investment scope and appraisal includes mitigation or adaptation impact. Milestone-based payments and monitoring requirements.
Joint	NEFCO Carbon Fund	NEFCO Carbon Fund purchases carbon credits from new projects from least developed countries (LDCs), including not yet commissioned and/or registered CDM projects. Forward contract basis under an Emission Reduction Purchase Agreement.
Norway	Norwegian Carbon Procurement Facility (NorCap)	The Norwegian Carbon Procurement Facility managed by NEFCO purchases CERs from registered and commissioned CDM projects and PoAs that are vulnerable to the current low carbon market prices. Direct purchase of credits on a forward contract basis under an Emission Reduction Purchase Agreement. Payment on delivery.

Annex 2 provides further details of the institutions and facilities above.

2.2.2. Nordic finance institutions with an export, development or environmental agenda

This sub-chapter looks at Nordic institutions that finance projects with a focus on promoting Nordic export-, development- or environmental agendas. These institutions differ from institutions in the previous chapter by having a broader investment mandate. The chapter includes a brief overview of the following institutions: Danish Climate Investment Fund, Finnfund, Swedfund, Norfund, Sida, Norad, Eksport Kredit Fonden (EKF), IFU, NIB, as well as the Energy and Environment Partnership (EEP) programme. These institutions can emphasize several different issues; e.g. financial-, social-environmental-, export- and climate-issues. Climate mitigation or adaptation impacts are thus not a primary investment consideration for these institutions.

There is currently fairly little overlap with the institutions covered in this chapter, although there would exist possibilities for complementarity. The EEP programme is, for example, financing one of the projects that also have received NCF funding, while export promoting agencies could find a role to take in promoting the expansion of projects and involvement of Nordic cleantech solutions once NCF

financed pilot projects are reaching a more mature stage. This will also be discussed in more detail in chapter 4 of this report.

The Danish Climate Investment Fund represents a new approach in climate finance by combining public and private funding in an investment fund that seeks to combine climate mitigation projects with Danish clean technology and clean technology know-how promotion. It is managed by the Investment Fund for Developing Countries (IFU), and can thus utilize the manager's experience with development funding in the new funding mechanism. Its funding targets more mature project concepts and is thus clearly directed at the more commercial end of project development. It has a mandate to finance climate projects, but climate impacts have a secondary influence on capital allocation decisions.

The Nordic Investment Bank is the largest joint financial institution of the Nordic countries. Its climate financing facility already includes a portfolio of appr. EUR 4 billion. NIB's Climate Change, Energy Efficiency and Renewable Energy (CLEERE) lending facility supports actions for combating and adapting to climate change in several geographical areas around the world. Projects mainly focus on renewable energy, energy efficiency, cleaner industrial production technologies that reduce greenhouse gas emissions, as well as dealing with the adaptation of power networks and infrastructure to climate change, such as extreme weather conditions.

Table 2. Nordic finance institutions with an export, development or environmental agenda

Nordic finance institutions and programs with an export, development and/or environmental agenda		
DK	Danish Climate Investment Fund	The Danish Climate Investment Fund promotes climate investments in developing countries and emerging markets. Capitalization is US$ 200 million, of which 60% is private capital from pension funds. The fund is managed by IFU and it provides co-investments using equity into projects that use Danish technology or have other Danish involvement and that directly or indirectly reduce greenhouse gas (GHG) emissions.
Nordic & Baltic	Nordic Investment Bank (NIB)	NIB is an International Finance Institution (IFI) owned by the Nordic and Baltic countries. It offers long-term loans and guarantees to clients in both the private and public sectors. The Bank's Climate Change, Energy Efficiency and Renewable Energy (CLEERE) lending facility supports actions for combating and adapting to climate change in selected countries.[16]
FIN	Finnfund	Finnfund is Finland's development finance company. The organization provides long-term risk capital for business projects in developing countries that involve a Finnish interest.[17]
SWE	Swedfund	Swedfund is a Swedish development finance company owned by the Swedish government. It provides risk capital, expertise and financial support for investments in emerging markets (Africa, Asia, Latin America and Eastern Europe).[18]

[16] www.nib.int
[17] http://www.finnfund.fi/en_GB/
[18] http://www.swedfund.se/en/about-swedfund/

NO	Norfund	The Norwegian Investment Fund for Developing Countries (Norfund) is Norway's main instrument for combating poverty through private sector development. Its objective is to contribute to sustainable commercial businesses in developing countries. The organization provides equity, other risk capital, and loans to companies.[19]
DK, FIN, SWE	EKF. Finnvera, SEK/EKN	EKF, Finnvera and SEK/EKN are Denmark's, Finland's and Sweden's respective Export Credit Agencies. The objective of these organisations is to help companies in their respective countries to expand into new markets. They are tasked to assist companies to raise financing and by insuring companies and banks against the potential financial and political risks of trading with other countries.[20]
SWE	Sida	The overall goal of Swedish development cooperation is to contribute to making it possible for poor people to improve their living conditions. Sida works with actors from both civil society as well as the private sector.
NO	Norad	The Norwegian Agency for Development Cooperation (Norad) administers the majority of Norway's development assistance and is a major player in international development aid.
DK	IFU, Investment Fund for Developing Countries	Danish IFU provides risk capital, as well as advisory services to Danish companies wishing to set up operations in developing countries.[21] The organization invests in projects and companies by committing equity capital or by providing loans or guarantees, with the purpose to promote development in host countries.
FIN, UK, AT, EU[22],	Energy and Environment Partnership Program (EEP)	The Energy and Environment Partnership Program (EEP) promotes renewable energy, energy efficiency, and clean technology investments. It focuses combating climate change, while focusing on sustainable energy services to the poor. EEP Programs currently exist in the Andean region in Latin America, Southern and Eastern Africa, the Mekong region, as well as in Indonesia.[23]
Joint	Norsad Finance	Norsad Finance is a Southern-African funding agency set up by the four Nordic development funds and local financial institutions. It is focused on provision of debt instruments and equity to established (post-revenue) private companies. No specific climate mandate.
Joint	NOPEF	Nopef finances feasibility studies within the fields of the environment, climate and green growth in connection with a international business set-up. The funding is provided as conditional loans of up to 40% against proven costs. Nopef is administered by NEFCO.

The institutions above offer a broader selection of support mechanisms than the directly climate oriented mechanisms in section 2.2.1. The development funds have the broadest mandate for supporting investment projects. Their investment mandates are development impact driven but also have a clear link to technology transfer and climate impacts. The type of support is also broad as the institutions provide debt-, equity- and mezzanine funding. Development funds also co-invest in private equity funds, most of which have a climate/clean energy mandate. Many of these are managed by non-Nordic fund managers, but nevertheless provide a network of investment funds that can provide private capital into development projects. Examples include funds, e.g. the Adenia SME (Small

[19] http://www.norfund.no/about-norfund/category296.html
[20] http://www.ekf.dk/en/about-ekf/Pages/EKF-and-export-credits-in-2-minutes.aspx
[21] http://www.ifu.dk/en/about-ifu
[22] The UK and Austria also co-financiers
[23] http://eepglobal.org/etusivu/

and medium-sized enterprises) Fund III in Africa (Swedfund) and Voxtra East Africa Agribusiness Fund (Norfund) and Althelia Climate Fund (Finnfund).

Funding solutions by National Development Cooperation Agencies (Sida, NORAD, EEP) target the promotion of economic and social development, without specific solutions for climate investments. The solutions provided also cover development loans that can be used to complement a market loan facility. Guarantee arrangements, such as the African Risk Capacity of Sida, do not cover individual projects, but mainly banks and lenders.

2.2.3. Nordic private sector initiatives and green technology clusters

The Nordic countries have for years promoted a green technology agenda and in the process become a hub for cleantech innovation and technologies. Denmark, Sweden and Finland have consistently ranked in the top5 in the Cleantech Group and WWF's Cleantech Innovation Index[24]. In recent times of lackluster economic growth, the promise of sustained growth in cleantech segments in a range of industries has been met with wide political and institutional support. Nordic countries have built up a range of business and innovation networks for c venture development and international promotion of cleantech solutions. These include e.g. Cleantech Finland and TEKES[25] Green Growth, Groove and BEAM Business with Impact -programs in Finland and Tillväxtverket's[26] Cleantech program in Sweden.

Green technologies and solutions can be found in all traditional industries, so the networks that have emerged are, as opposed to more traditional industry networks, largely cross-industrial platforms, focused on networking, marketing and cleantech brand-awareness. Sector or solution- oriented groups are much rarer, with the Danish CLEAN cluster's thematic focus on specific environmental challenges an exception.

Venture funding is a core element of the Nordic cleantech environment. Several venture networks and associations have created new or separate programs for cleantech. However, these networks have a small role in cleantech exports to developing countries and are excluded from the review below.

Table 3. Nordic private sector initiatives and green technology clusters.

Examples of Nordic green technology promotion networks		
DK	State of Green	The official green brand for Denmark. It gathers all leading players in the fields of energy, climate, water and environment to build relationships with international stakeholders. It presents information about and examples on sectors, solutions and companies.
DK	CLEAN cluster	The national cluster organization for cleantech. Provides support for demonstration, marketing and branding and matchmaking services. Strong focus on integrated sector solutions in e.g. biofuels, smart grid and smart cities. Complex Cleantech Solutions program offers a platform to co-create solutions to customers' challenges in international urban projects.
NO	OREEC	OREEC (Oslo Renewable Energy and Environment Cluster) is a regional network for cleantech companies, research institutes, educational institutions and local authorities in the greater Oslo region. It is focused on local collaboration and matchmaking.

[24] http://awsassets.panda.org/downloads/cleantechrepsm.pdf

NO	Sector clusters	Norway has several regional clusters within Energy and Environment: NCE Smart Energy Markets, Electric Mobility Norway, Clean Water Norway, Smart Water Communities Cluster, Wind Cluster Mid-Norway. These are focused on local development, testing and commercialization products and services.
IS	Clean Tech Iceland	CleanTech Iceland accelerates the growth of Icelandic companies with environmentally friendly technologies and green enterprises to promote a sustainable planet.
FIN	Cleantech Finland	Cleantech Finland is the main network of Finnish cleantech companies. It is the hub for information about companies and also provides marketing outreach and communications support.
FIN	Cleantech Lahti (LADEC)	LADEC leads the national skill cluster of environmental technology. It operates a business centre and coordinates networking among companies. Main international connections to China, Russia and India.
SE	Swedish Cleantech	Swedish Cleantech is the official business-to-business platform for Swedish companies developed by the Swedish Agency for Economic and Regional Growth, Tillväxtverket . It is a part of the Government's environmental technology strategy by contributing to the development, commercialization and export of Swedish environmental technology.

The importance of cleantech networks for climate funding remains to be seen. These are predominantly networking and promotion platforms for exports and for attracting inbound venture- and private equity funding for cleantech start-up companies. Promotion and coordination of established funding channels, e.g. through national development funds or IFIs is not a current priority. These networks could prove an important channel for private finance because of the involvement of many of the biggest industrial companies in the Nordic countries. There is very little established collaboration from the cleantech clusters towards climate finance, mainly because the clusters' scope of operations is not focused on funding. The role of these technology networks could change, however. Climate mitigation and adaptation problems, especially in infrastructure and utilities, require solutions to whole systems rather than individual problems. These clusters could provide an important component in scaling up mitigation solutions.

Nordic private sector companies that are directly linked to project development and knowledge management of projects with a climate agenda is an important part of any future solution, with a potential that is largely unexploited to date. Some companies venture into this arena because they see direct business opportunities in developing countries as well as the untapped market potential among the large numbers of urban and rural poor most in need of new solutions to adapt to climate change. Another objective is secondary business benefits related to companies' sustainability agendas and the brand-building potential and positive goodwill such projects can provide companies. There are also independent think-tanks that combine private sector ideas and policy insights to promote private sector solutions in climate finance. One such example is the Nordic Action Group on Climate and Energy run by Global Utmaning[27].

2.2.4. Overview of support mechanisms

The illustration below provides an overview of currently available support mechanisms by Nordic institutions for climate investments.

[27] http://en.globalutmaning.se/?cat=9

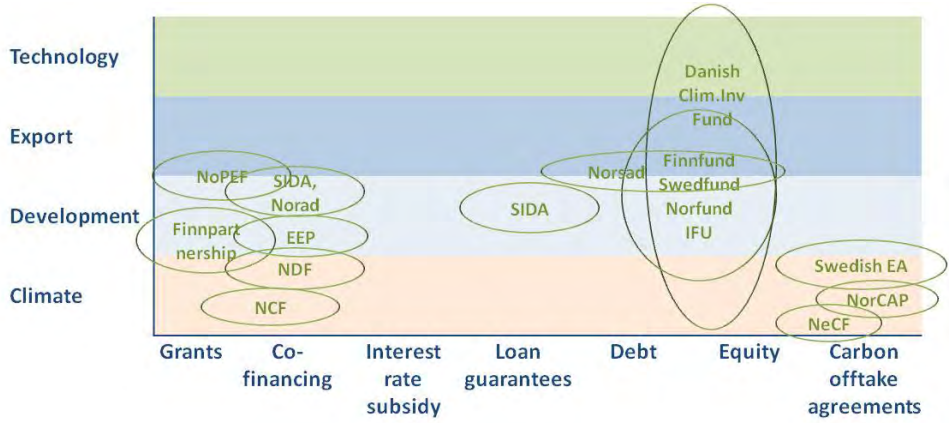

Figure 3. Overview of currently available Nordic finance support mechanisms.

Non-governmental- (NGOs) and development aid organizations, and the humanitarian community form an important foundation for many projects. These organizations often serve as implementing bodies of projects on the ground in development countries, and provide much needed "soft" capital to projects, such as knowledge, local level contacts and capacity building, to name a few. They also fund projects through their own funding channels that consist of a mixture of grants and privately collected funds. Privately collected funds include both funds received from private individuals, as well as larger sums distributed through private sector foundations. Some examples of Nordic organizations in this sector include Nordic sections of the Red Cross, World Vision, Norwegian Refugee Council, Church Aid of the various Nordic countries, Africa Groups of Sweden, Diakonia, the Swedish Society for Nature Conservation, Save the Children, and the World Wildlife Fund for Nature. Some of these organizations collaborate with private companies in addressing local development needs, including GHG mitigation and adaptation. The "Weconomy Start" program[28] developed by World Vision serves as one example; it leverages World Visions local presence in developing countries for the benefit of start-up companies creating solutions for bottom-of-the-pyramid markets.

There are no Nordic institutions whose support covers the entire project development cycle from design, inception to full-scale commercial operation. Grant funding is available, as is some early commercial debt and equity from development funds and operationally tied financial support through carbon credit purchases. Project-specific guarantees or first-loss products are not available for individual projects, which is an obvious shortfall. For the further analysis in this paper the key question is what type of funding and instruments would best complement NCF projects and/or an expansion of NCF projects.

3. NCF Case Study

The Nordic Climate Facility (NCF) is a Nordic climate finance instrument that "*finances projects that have a potential to combat climate change and reduce poverty in low-income countries*".[29] NCF is administered by the Nordic Environment Finance Corporation (NEFCO) and financed by the Nordic Development Fund (NDF).

The facility finances projects in selected developing countries on various themes related to climate change. Since the inception of NCF in 2009, it has had four calls for proposal, covering both mitigation and/or adaptation of climate change. Today there are 39 active or finalized projects in 18 countries in Africa, Latin America and Asia that cover themes such as renewable energy, transport, water and sanitation, health, agriculture, and forestry.

[28] http://www.weconomy.fi/html/index.html
[29] http://www.ndf.fi/project/nordic-climate-facility-ncf

This chapter will look at climate and development benefits of selected NCF projects – including mitigation and adaptation, as well as technology transfer. It also looks at the financing, partnerships and modes of co-operation between various stakeholders in NCF projects, with a special focus on the role of private sector finance.

3.1. General

The NCF facility is financed by the Nordic Development Fund (NDF), which is the joint development finance institution of the five Nordic countries. The general objective of NDF is to facilitate climate change investments in low-income countries. This includes 1) facilitating the exchange of technology, knowledge, know-how and innovative ideas between the Nordic countries and low-income countries in the field of climate change, 2) increasing the capacity of low income countries to mitigate and adapt to climate change, and 3) contributing to sustainable development and the reduction of poverty.

The NDF funded NCF is used as a case study in this report, as it is a fairly innovative approach to finance climate adaptation and/or mitigation projects on a local level in developing countries. This includes the promotion of the involvement of both private sector finance and cooperation between stakeholders in the Nordic and recipient countries.[30] What makes NCF of particular interest when looking at Nordic examples suitable for future climate finance is its objective to encourage the testing of real concepts relating to climate change, thus providing a testing facility for project concepts that, if proven successful, could be replicated and scaled up.

NCF supports both technological innovation, as well as private sector involvement in various sectors susceptible to climate change. This includes energy, transport, water and sanitation, health, agriculture, forestry or other areas related to natural resource management. Projects are by default different, as the design of NCF includes multiple selection criteria, such as climate effect, development aspects, technology transfer, and/or innovativeness. Of the four calls for proposal launched under NCF, each one has focused on a specific theme. Over the years, the facility has moved more and more from financing specific development topics towards engaging the private sector and financing business ideas linked to development and green growth. NCF 1 focused on water resources and energy efficiency, NCF2 on renewable energy and urban adaptation, NCF3 on innovative low-cost climate solutions with focus on local business development, while NCF4 will focus on inclusive green growth[31].

A key design feature of the NCF is to implement pilot projects that pave the way for replication. NCF is intended to be engaged in a specific project in its early phases, and help to prove a specific project concept on a fairly small scale. This is also visible from the fact that the implementation period for NCF projects is limited to two years (having been extended to 2.5 years starting from the fourth call for proposals). Following the end of NCF financing, projects need to either be self-sustaining or to find follow-up funding elsewhere. Some examples of this can already be seen, although no large-scale replications have yet taken place. The lack of facilities or follow-up funding for replication of successful pilots is also one of the key elements that create uncertainty about the sustainability of the financed projects.

NCF underwent a thorough evaluation in 2013.[32] The evaluation did not identify any international financial mechanism that is identical to NCF, although there are programs with similar characteristics. The evaluation notes that NCF has an added value on an international level, as a mechanism that combines "*innovation, leverage and partnership*". The evaluation further notes that NCF can be considered as cost effective, with lower, or similar levels of administrative costs, when compared to other similar financing facilities and programs.

The evaluation concludes with both short- and long-term recommendations, many of which resonate well with observations made during site visits as part of this project. The NCF evaluation in 2013 also

[30] NEFCO & NDF (2014). Nordic Climate Facility (NCF) Annual Review 2013.
[31] A fifth call for proposals was lanched in December 2014
[32] Nordic Consulting Group (2013). Evaluation of Nordic Climate Facility.

notes that many of the projects evaluated are innovative in the geographic area where they operate, although they may have been utilized in other parts of the world before. The fact that many projects utilize existing technology that has been proven to work and that is adapted to the development country context in question, rather than developing a whole new set of technologies, can often be seen as an advantage for the projects in question.

The evaluation also notes that the element of partnership between Nordic and development country stakeholders generally is on a good level. It was, further, noted that it is too early to make final conclusions about the long-term impact and sustainability of the financed projects, but that many projects have a reasonably good chance of becoming self-sustaining. Observations made during the field visits of this study support this, with evidence that some NCF funded projects already are moving towards becoming fully self-sustaining. Updates on NCF can be found in NCF's Annual Reviews, available at http://www.ndf.fi/newsroom/publications.

For more information about the analysis and conclusions of strengths and lessons learned derived from this project, please refer to chapters 3.2. and 4.1.

3.2. Selected NCF projects for in-depth case study

Projects for the in-depth case study were selected by the consultants based on a number of selection criteria, with inputs received from the programme managers at NDF and NEFCO. Selection criteria included the projects' focus on either technology transfer or the role of private sector funding. Special attention was also given to projects that combine mitigation and adaptation activities. Additionally, the projects where selected with the view to give as broad a spectrum as possible of various themes covered by NCF, as well as to include projects from different countries. The projects chosen were also to be situated in relative proximity to each other, as a result of budgetary- and time constraints. Finally, projects were chosen that are regarded as good examples and successful in their implementation. The following four projects where chosen and visited in Eastern Africa:

1. Uganda - Sustainable Renewable Energy Businesses in Uganda [NDF C3 C10]
2. Kenya - Community Based Adaptation to Climate Change through Environmentally Sustainable Water Resources Management in Isiolo District [NDF C3 B8]
3. Kenya - Enhancing Capacity for Adaptation to, and Mitigation of, Climate Change in Kibera, Nairobi [NDF C3 B11]
4. Tanzania - Sustainable Charcoal Business Development in Tanzania [NDF C3 D15]

Interviews were also conducted with the programme manager of the The Bukaleba Charcoal Project [NDF C3 B14] in Uganda.

Desk reviews were conducted based on available project reports and documentation. Following this, interviews were held with the Nordic partners by means of telephone interviews or face-to-face meetings. Each of the four projects was then visited in the target countries, with interviews with the local implementing partner(s), site visits and interviews with final beneficiaries. Please refer to Annex 1 for a list of persons interviewed.

Looking at the achieved (for completed NCF projects) and expected (for on-going NCF projects) climate benefits in numbers is not included in this report, as this can be found in the individual project descriptions on the NCF web pages. The project focuses on projects and concepts that have potential for replication, scale up, benchmark, etc., rather than their realized achieved climate benefits to date. As noted by one of the persons interviewed in Uganda "*In order to get large scale positive effects in the long term, we need to start with micro-level projects, show that pilot projects work, get communities to accept new technologies, create the demand, and only then multiply and scale up*".

The following matrix (Table 4.) lists project names, partners involved and sources of finance for the projects, including NCF's stake in the various projects.

Table 4. Projects, partners and sources of financing.

Project name	Partners	Source of Financing
Sustainable renewable energy businesses in Uganda	1) The Royal Norwegian Society for Development, 2) The Department of Electrical and Computer Engineering, College of Engineering, Design, Art and Technology (CEDAT), Makerere University, 3) Husk Power Systems Private Limited (India), 4) Private sector program Uganda, Confederation of Norwegian Enterprise (NHO), 5) Department of Industrial Economics and Technology Management (IØT), The Norwegian University of Science and Technology (NTNU), 6) Local SME's	NCF (77% of project cost), Norges Vel, Local contractors and SME's, Makerere University
Community Based Adaptation to Climate Change through Environmentally Sustainable Water Resources Management in Isiolo District, Kenya	1) Danish Red Cross, 2) Kenyan Red Cross Society, 3) Grundfos LIFELINK (part of Grundfos A/S), 4) Local communities	NCF (60% of project cost), Red Cross, Grundfos A/S
Enhancing Capacity for Adaptation to, and Mitigation of, Climate Change in Kibera, Nairobi, Kenya	1) Solvatten AB, 2) Institute of Environment and Water (IEW), 3) Revitalization of Indigenous Initiatives for Community Development (RINCOD)	NCF (87% of project cost), Solvatten AB
Sustainable Charcoal Business Development in Tanzania	1) Appropriate Rural Technology Institute - Tanzania (ARTI Tanzania), 2) Gaia Consulting Oy	NCF (50% of project cost), ARTI Tanzania, Gaia Consulting Oy
The Bukaleba Charcoal Project, Uganda	1) Green Resources AS, 2) Busoga Forest Company Limited	NCF (48% of project cost), Green Resources AS, Busoga Forest Company

Projects visited include the first four projects of the table above. The projects are further elaborated in the following sections. For more information on the fifth project in figure 1, The Bukaleba Charcoal Project (that was not visited on the ground), please look at http://www.ndf.fi/project/ncf-bukaleba-charcoal-project-ndf-c3-b14.

3.2.1. Project 1 - Sustainable Renewable Energy Businesses in Uganda

The objective of the Sustainable Renewable Energy Businesses in Uganda [NDF C3 C10] is to support the development of local Renewable Energy companies that will utilize renewable energy in a sustainable and financial beneficial manner.[33] The project has been implemented through a business incubator, situated within the College of Engineering, Design, Art and Technology at Makerere University in Kampala, Uganda. The final beneficiaries of the project are local entrepreneurs and SMEs within the renewable energy sector in various locations in Uganda. Entrepreneurs and SME's receive assistance from the incubator to set up their businesses, focus their business plans and develop projects for implementation. Projects may also receive part-financing for initial investments from the incubator, as well as participate in networking events and workshops, to ensure that knowledge gained and lessons learned are shared. Projects that these SME's are involved in benefit the local population, by providing them with various types of off-grid energy solutions.

[33] The Royal Norwegian Society for Development (2013). Progress and financial reporting, Sustainable Renewable Energy Businesses in Uganda.

Picture 1. This gasification unit is used to produce off-grid electricity to up to 200 households, as well as char for the production of charcoal briquettes in a rural setting in Uganda.

The business incubator's role is to assist local entrepreneurs and SME's in testing their business idea, assisting in the necessary paperwork required to set up a business, provide technical assistance through the technical incubator staff, as well as financial assistance to investments needed for setting up the business in question and provide financial facilitation to students undertaking research in renewable energy. The incubator does not take an active role in the actual business, but provides know-how and grant financing to the various projects as they are setting up their operations. In the same way as NCF is regarded by the incubator to be an enabler of the project at large, the support from the incubator is seen as the enabler for the various local entrepreneurs and SME's starting their various businesses.

In respect to follow-up financing of the various pilot projects initiated through the incubator, a general remark was that once the pilot has been proven successful, the SME's can turn to commercial banks and private funding sources to secure possibilities for up-scaling their operations.

The work and projects of the incubator is in line with The Renewable Energy Policy for Uganda, implemented by the Ugandan ministry of Energy.[34] The policy states that renewable energy is to become a substantial part of the national energy consumption, with an overall goal to increase the use of renewable energy from 4% to 61% of the total energy consumption by 2017. The implementation of this policy is, however, lagging behind, and projects such as the business incubator only cover a fraction of the total actions needed in the country. Another initiative that could provide possibilities for up-scaling is for the incubator to be able to engage with a much larger existing joint project between Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) and the Ugandan government on "Clean Cooking".

The business incubator is the first of its kind in Uganda, and shows the demand for such a set-up in the country. For more information about this project, please refer to http://www.ndf.fi/project/ncf-sustainable-renewable-energy-businesses-uganda-ndf-c3-c10.

[34] Ugandan Ministry og Energy (2007). The Renewable Energy Policy for Uganda.

Good examples and lessons learned from this project include the fact that all projects are driven by the needs identified by local entrepreneurs, who all take an individual financial risk in the projects stemming from the incubator. It is thus a very bottom-up approach. One example includes a local SME setting up a business to provide off-grid electricity within a community in rural Uganda (picture 1). NCF financing through the incubator allowed for the purchase and installation of a gasification unit that produce off-grid electricity to up to 200 households. The raw material used is agricultural waste purchased from local farmers. Following the initial investment of the machinery, the SME is able to generate revenues from both the selling of electricity, as well as the production of charcoal briquettes, which is a waste product from the gasification process. Secondary development benefits include reduced demand for wood-based charcoal, thus decreasing deforestation, job creation as well as new sources for income generating activities.

Another example includes the generation of off-grid electricity using micro-level hydroelectric solutions. Other projects include biogas production or the production of charcoal briquettes. Common to all projects is that they use locally available resources, often agricultural waste, to create sustainable energy solutions in areas without access to the national electricity grid. None of the projects, however, use Nordic technologies, nor are there any direct links created with organisations promoting the export of Nordic cleantech solutions. Nordic cleantech solutions could, however, use the incubator to access markets on renewable energy solutions in Uganda. A positive aspect of the project is that it combines both climate change mitigation (reduced deforestation and CO2 emissions) and adaptation. Some initial contacts have also been established, through a joint product development project, between the Incubator and students from Makerere University and staff from the Norwegian University of Science and Technology.

Key challenges and unresolved questions include the long-term sustainability of the project, as the incubator itself is fully dependant on donor funding at the moment. Following the finalization of the NCF financed initial phase of the project, the incubator has managed to secure follow-up funding for the next couple of years from NORAD. This will allow the incubator to continue operations and build on the good experiences and successful projects it has engaged in so far. It needs, however, to think about alternative sources of funding or revenue generation, to ensure its long-term viability. Another challenge that was raised was the need for stronger uptake, support and enforcement of climate mitigation and adaptation related policies by the government. This would create a better operational environment for local businesses engaging in renewable energy projects across the country. The required changes also need to include capacity building and improving the knowledge and changing the attitudes among the population at large. Currently, a major challenge is that a large knowledge gap exists and that available existing easy-to-implement solutions are not adopted by people in cities and the countryside alike.

3.2.2. Project 2 - Community Based Adaptation to Climate Change through Environmentally Sustainable Water Resources Management in Isiolo District

The project "Community Based Adaptation to Climate Change through Environmentally Sustainable Water Resources Management in Isiolo District [NDF C3 B8]" in Kenya is a joint project between the Danish Red Cross, the Kenya Red Cross Society and Grundfos A/S (a Danish private company).[35] The pilot project is implemented in 9 communities in the arid and semi-arid Isiolo district in Kenya. The aim of the project is to increase capacity to adapt to the effects of climate change by enhancing access to safe water resources, while at the same time piloting innovative environmentally sustainable water systems.

[35] Danish Red Cross (2014). NCF Project Summary Completion Report. Community Based Adaptation to Climate Change through Environmentally Sustainable Water Resources Management in Isiolo District.

Picture 2. Access to clean drinking water is a rare commodity in Isiolo district, Kenya. The solar driven pump uses technology developed by Grundfos in Denmark to allow access to safe drinking water to the local population.

The Isiolo district is very prone to droughts, with recent weather patterns resulting in high levels of food insecurity, as well as water-borne diseases. The project is focused on climate change adaptation and has already succeeded to increase access to safe water and to promote hygiene awareness, while at the same time reducing the emission of greenhouse gases, through the use of modern and innovative technology created by the Danish company Grundfos AS (LIFELINK). The project received the MDG7 award for its achievements to provide safe drinking water to water scarce communities. The project, its concept and the cooperation arrangement between various stakeholders, were also regarded as very successful by all the stakeholders involved (NGO, company and local communities).

More information about this project can be found at http://www.ndf.fi/project/ncf-community-based-adaptation-climate-change-through-environmentally-sustainable-water.

The cooperation between organisations and the private sector provide an example for replication. Traditionally, there have been very little joint projects between the NGO community and private sector companies. In the collaboration between the humanitarian organizations (Danish and Kenyan Red Cross) and the private sector entity Grundfos A/S, this project shows the benefits such cooperation can have. The Danish and Kenyan Red Cross brings its vast expertise in development aid, community engagement and capacity building in a development country context, while Grundfos brings the technology, technological know-how, as well as business thinking to the project, that can ensure its sustainability over time. The project also involves the local communities from the outset, in order to ensure that they take ownership of the project and adopts the new technology.

The project has a strong component of technology transfer. A new and innovative idea developed in a Nordic country is adapted to the local context in a developing country, providing solutions with a possibility for replication and up-scaling. At the same time the project is able to generate revenue to ensure the sustainability of the project in the long run. It includes hardware developed and manufactured in Denmark, with local software applications (the mobile money transfer system M-PESA). Moving into a second phase, when the NCF funding phase comes to an end, the project is

almost self-sustaining at the moment. The NCF financed project was also seen as a pilot project by the organizations involved, with Grundfos moving onwards to multiply the project in other areas with similar needs. Grundfos estimate that they will install 250 similar water stations in various locations in Kenya in next year alone. It was also noted that engaging in projects with a good cause may not only be a good business idea, but that it is also very beneficial for private companies in providing goodwill and brand building in a way that is not possible to achieve by marketing campaigns alone.

The project has decreased conflicts in the area over scarce water resources, improved health among the local population, as well as increased attendance by children in schools (as a result of improved health). By getting access to safe drinking water, one school reported an increase from 100 to 260 students.

Key challenges and unresolved questions include following up with communities in respect to proper management of the infrastructure (solar pumps and storage tanks) and keeping the water clean between the pump house and the home. The issue about the management of the pumps has largely been resolved by Grundfos committing to a 10 year service contract, with part of the proceeds going to Grundfos to cover service charges. Another challenge is striking the right balance in respect to the pricing of water. Although the general sentiment was that the price of water (0,10 Kenyan shilling / liter) was a fair price to pay for clean water, as it also is accessible much closer to home, some communities noted that in periods of droughts and crop failure, people may not have the money available to buy the water, and then resort to the traditional way of travelling long distances to fetch water that often is contaminated. As a third point, it can be mentioned that community engagement and capacity building is an important component to ensure the sustainability of projects like this one, something that for the most part requires some sort of grant financing to organisations involved.

3.2.3. Project 3 - Enhancing Capacity for Adaptation to, and Mitigation of, Climate Change in Kibera, Nairobi

The project "Enhancing Capacity for Adaptation to, and Mitigation of, Climate Change in Kibera, Nairobi [NDF C3 B11]" focus on enhancing capacity for adaptation to-, and mitigation of climate change by piloting technology transfer for secure access to safe drinking water while reducing greenhouse gas emissions.

The location for the project was originally the Kibera slum in Nairobi, Kenya, where there is a great need for better provisions of safe water. Later, the project was expanded to three additional locations in the Eastern province of Kenya (Meru, Mutomo and Mwingi). These locations turned out to be even better suited for the project than Kibera, as a result of less cloud cover and more hours of sunshine.

The project's primary goal was to enhance the capacity for households to adapt to the impacts of climate change by providing them with a more sustainable and effective way to secure good water quality. The primary objective was thus to promote adaptation to climate change by securing access to safe drinking water, while a secondary objective was to reduce emissions of greenhouse gases per household.

Picture 3. Solvatten's product in use in the slums of Meru town, Kenya. The product reduces the need for charcoal and wood to cook the water and make it safe to drink, also reducing the amount of water-borne diseases.

More information about the project can be found at http://www.ndf.fi/project/ncf-enhancing-capacity-adaptation-and-mitigation-climate-change-kibera-nairobi-ndf-c3-b11.

The project involved the selling, for a subsidized cost, Solvatten's solution to provide safe drinking water on a household level. Solvatten's invention uses solar energy to heat water in a portable solar water heater. Similar to the joint project between the Red Cross and Grundfos, this project also had a strong component in building the capacity of the project beneficiaries to successfully adopt the new technology. This is one important aspect to bear in mind - the final beneficiaries are to be trained and prepared to adopt the suggested new technology, in order to take ownership of the project in question, if a project is to succeed and be sustainable in the long run.

By using solar energy to heat and clean the water, this results in a significant reduction of carbon dioxide emission per household, as it replaces the need for charcoal, paraffin or firewood that traditionally has been used to heat and clean water. Solvatten reports a 48% decrease in fuel use per household following the introduction of their products, something that was supported by observations and interviews on the field level as part of the fieldwork for this specific report.

Important secondary effects reported by project beneficiaries is an increased resilience of households towards changes in the climate, improved health among family members, increased school attendance by children, as well as increased savings per household as there are less running expenses for traditional fuels as well as medical costs. The decreased use of traditional fuels also leads to less deforestation, one of the major environmental challenges in many parts of Kenya, and East Africa as a whole. The project also has a strong link to the empowerment of women, as women mostly are responsible for fetching drinking water and taking care of sick family members. As part of the project's capacity building component, various women groups are also created that includes aspects that helps women to become economically more independent, and to use the money saved from for example decreased fuel expenses for savings, local level micro-level credit schemes and the creation of micro-scale businesses.

NCF funding was seen as the enabler that got the project off the ground. The project has been a successful pilot project, field testing it, showcasing the usability of the technology in question and proving its effectiveness among local communities. This has made it possible for Solvatten to expand its operations and secure funding and partners for new similar projects in other parts of Kenya. This type of funding, focused on piloting small innovative projects that can lead to replication, is at the heart of the design of NCF.

On the downside, the project concept still very much relies on external grants and "soft" funding, in order to subsidize the prize of the product and make it affordable to the people that need it the most. This resulted, for example, that the project site visited in Meru, is not distributing more products despite an existing demand, as there are no more grant funding available, and as there was no planned strategy on how to continue the project following the end of NCF funding. This, in spite of the fact that there exists a local project infrastructure with a local community based organization that is able to train and distribute the technology. A potential to expand the existing project is thus being missed by the project implementers, and strategies to secure the sustainability of successful projects after the exit of NCF should be considered.

Some links were mentioned to government authorities, such as ad-hoc cooperation with local level authorities. Prior to project implementation, the project was also presented to the Ministry of Environment and Mineral Resources, the Ministry of Water and Irrigation, as well as the Nairobi City Water and Sewerage Company, in order to ensure acceptance of the project by the authorities. However, no direct link or concrete forms of cooperation with national level schemes that aim towards climate change mitigation and/or adaptation exist at the time being.

3.2.4. Project 4 - Sustainable Charcoal Business Development in Tanzania

The project "Sustainable Charcoal Business Development in Tanzania [NDF C3 D15]" aims to contribute to the reduction of deforestation and greenhouse gas emissions in Tanzania. This is done by decreasing the need for unsustainable wood in energy production, and to support local livelihoods in creating environmentally, socially and economically sustainable energy businesses.

The main component of the project is to develop and introduce a business model that is sustainable from both an economic and environmental perspective, for the production of charcoal briquettes, using agricultural waste as the main raw material.

The project idea originates from the Appropriate Rural Technology Institute - Tanzania (ARTI TZ) and the business model has been developed together with the Finnish company, Gaia Consulting Oy. ARTI TZ is a not for profit organization founded in 2007, with the goal of developing technologies for rural development. One such technology is the production of sustainable charcoal briquettes from agricultural waste, substituting the use of traditional, wood-based charcoal, which is one of the key drivers of deforestation in Tanzania, as well as many other developing countries. In Dar es Salaam alone, it is estimated that 500,000 tons of charcoal is used every year, making this the largest charcoal market in Tanzania, and a huge driver of deforestation in the regions surrounding the city.

Picture 4. Tapping into the charcoal market with briquettes made from agricultural waste have a large business potential in many countries, while decreasing the rate of deforestation by reducing the demand for traditional charcoal.

More information about the project can be found at http://www.ndf.fi/project/ncf-sustainable-charcoal-business-development-tanzania-ndf-c3-d15.

The project strives to improve energy security in Tanzania, while also replacing a part of the huge amounts of traditional charcoal used today, by sustainably produced charcoal briquettes. This in turn will lead to reduced levels of deforestation, reduced amounts of greenhouses gases emitted and increased resilience to changes in the climate by providing improved energy security. The project is also a very good example of technology transfer between different parts of the world. The technology used is developed, tested and produced in India, with some modifications to suit the specific demands set by the project.

Grants, including the NCF project, enabled further cooperation between ARTI-TZ and Gaia Consulting, and laid the foundations for establishing a joint venture private company, Charcoal Briquette Tanzania Ltd (CBTL) in 2014. The overall business objective of the joint venture is to enable a fuel switch from traditional unsustainable charcoal to sustainable charcoal briquettes in Tanzania by establishing a profitable and sustainable business that grows nationally while expanding locally. Target markets include small businesses, institutions and households.

A central component in this project is to provide training and capacity building to rural communities, in order for them to produce the charpowder from their agricultural waste that is needed for the production of the briquettes. This also results in a new stream of incomes to the rural communities in question. Secondary effects, such as job creation throughout the supply- and production chain, poverty alleviation and improved health (as the briquettes do not emit smoke in the same way as traditional charcoal), are thus also to be regarded as positive results of this project.

NCF financing was seen as an enabler, providing much needed funding for the initiation phase of the project and reducing the financial risk of the private companies involved to an acceptable level. In addition to NCF funding, the project had already previously received grant funding from the World

Bank's Biomass energy initiative for Africa, as well as the Energy and Environment Partnership (EEP), spearheaded by Finland.

This project is on the verge of becoming self-sustaining, with a strong business case that can provide revenues that would secure the continuation of the project. With funds provided by NCF and some other grants, the project has been able to purchase the initial machinery and proved its concept to work. For future funding needs and up-scaling, the project will already be able to look towards other funding sources, mainly commercial bank loans and/or equity investments.

This project is very much in line with national policies looking to increase the use of renewable energy resources etc, but without having any official tie to these. For this project, however, it was noted that the management of CBTL has good connections with the Ministry of Natural Resources in Tanzania, and that some sort of cooperation is envisaged in the future. Contacts also exist with the Ministry of Energy and its focus to increase the level of national renewable energy, as well as with Tanzania's forest service. Linking the project and cooperating on some level with national level programs would be one interesting possibility to follow-up on that might help the facilitation of up-scaling the project within Tanzania.

Good examples and lessons learned from this project include the possibility to replace unsustainable use of traditional charcoal with a sustainable alternative that uses agricultural waste as its raw material, without having to charge a premium for the product. In this case, the charcoal briquettes are sold at a lower price than traditional charcoal. The project concept is also built in such a way that it is possible to rapidly become self-sufficient, with a large potential for replication and up-scaling to a much higher level than what is the situation today. This highlights an important point, which is to show the business potential of projects that have a positive impact on reducing the effects of climate change, and in that way attract private sector funding to climate related projects. In this respect, NCF plays an important role as an "incubator" of projects with the potential to reduce the effects or increase the adaptation capacity towards climate change. Once the projects have been proven to work on such a relatively small scale, they could be replicated and scaled up to much larger scale and to other geographical areas.

A key challenge for the project has been to cover operational/running costs, or bridge financing, as this was not included in the project budget by the project implementers. This has caused challenges and has slowed down the progress of the project. In respect to carbon certification schemes, the project would also have the potential to try to get its operations certified. However, considering the current state of carbon financing, and the early state of briquette production, combined with the fairly cumbersome process to receive the necessary certifications, carbon financing has not been seen as an efficient way of financing at this stage.

4. Analysis of Results

4.1. NCF Case Specific Analysis

This chapter combines the various lessons learned from the projects visited in the field. It includes an analysis of main points raised in the various projects, including aspects related to co-operation partnerships such as knowledge exchange, technology transfer, business development etc, as well as challenges and financing sources of the selected projects. It is divided into three sub-chapters, in line with the main themes of this report (private sector funding, technology transfer and mitigation & adaptation). A fourth sub-chapter highlights aspects of a more general nature related to NCF.

4.1.1. General

NCF is an enabler of projects, reducing the financial risk and helping to prove the viability of projects. In the life-cycle of a specific project or business idea, NCF funding allows to set up and test projects on a pilot level. Once pilot projects have proven successful, it is possible for stakeholders to look for other

type of funding, including loans and equity investments. The challenge is usually to find funding for the necessary initial investments, which is a gap that NCF successfully fills today.

Funding pilot projects is a core feature of the design of NCF, and a project's potential to become self-sufficient or find others sources of funding following the pilot stage is analyzed as part of the selection process. However, a clear strategy from the donors' side does not exist on how to ensure the viability or expansion of successful pilot projects once the NCF funding runs out. Although part of the NCF evaluation process, it would, however, also be of interest for the Nordic financing institutions to look into this question in more detail, in order to ensure the sustainability of the investments it has made. The various players involved in climate finance could develop a more coherent approach on how to be able to ensure financing at the various stages of a project's lifecycle.

All projects also have a strong development agenda, highlighting the need not to separate development and climate projects into silos of their own, but rather merge these two financing opportunities in developing countries. Development co-benefits range from reducing the amount of water-borne diseases in communities, which have a direct effect on household income levels and children's school attendance. The projects also result in increased local level employment and new types of income generating activities, to name a few.

In general it can be noted that the NCF fills an important niche, in order to be able to achieve larger scale climate benefits in the long run. To achieve this, there is a need to start with small-scale pilot projects that showcase that a specific concept works. This allows for testing of the technology in the specific geographical setting, ensuring the acceptance of the solution by the communities involved, as well as creating an initial demand for a specific solution. All of this can then be multiplied and scaled up. Annex 3 contains a map depicting the various projects and geographical areas where NCF projects exist. Further information, such as NCF Annual Reviews that analyze the climate and development benefits of the completed projects, can be found through the link http://www.ndf.fi/newsroom/news.

4.1.2. Private Sector Finance

Projects that combine development / grant funding with private sector investment, show positive initial results and received positive comments from the various stakeholders. NCF has gradually been able to increase the share of co-financing e.g. via the scoring process (higher amount of co-financing will increase the score). Today, the average co-financing in the four calls is appr. 50% of project costs. Private sector involvement is considered a positive aspect, as this seems to increase the impact and sustainability of the projects. All but one of the visited projects highlight that the role of private sector funding is very important. The projects with strong private sector involvement show potential to become self-sustaining in the near future, meaning not dependent on grants or development funds to continue or expand. The projects indicate that projects with a sound business case and the potential for profit attract private sector investments and know-how.

It was noted that by combining the expertise of organisations that work with development issues with private sector players, it enables the project to draw on the expertise of the involved stakeholders. This results in a stronger project outcome, than if the different organisations would work on such a project alone. A NGO knows very well the topics of how to engage with the local communities, ensure capacity building etc, while the private sector company can come up with solutions on how to ensure the sustainability (profitability) of a project, has the necessary technological know-how etc.

A funding gap for the projects was considered to be the low price for carbon credits, as this could be a good additional revenue stream for the projects. The very cumbersome, heavy and expensive process of receiving certifications allowing for the sale of carbon credits stemming from the various projects is also a challenge for small-scale projects, such as the once financed by NCF. Relating to NCF funding, a general remark was, furthermore, that reporting requirements were cumbersome and difficult for NCF projects, compared to other funding sources.

4.1.3. Technology Transfer

The question of technology transfer from Nordic countries to the developing world is very case specific. Projects are by default different by design, and technology transfer is but one criteria used to select projects for funding under the NCF. There is no technology transfer requirement as such for NCF projects, but all projects need to have a "Nordic component". The transfer of know-how, Nordic management and expertise (such as health and safety) are other key inputs Nordic partners have brought to projects.

NCF projects with a technology transfer component show both a North-South as well as a South-South movement. North-South technology transfer is exemplified by the Grundfos and Solvatten technologies, while South-South technology transfer is exemplified in the projects utilizing technologies developed and tested in other developing economies. The role of technology transfer was highlighted in many projects. However, only two projects actually involved technology transfer of a completely new technology from the Nordic countries to the developing country in question. Other projects use technologies, often imported from India, that are well adapted to the local environment and fairly basic needs required to run an operation at sites with no, or limited access to electricity or other reliable infrastructure.

Currently no cooperation seems to exist between the various NCF projects visited and Nordic clean technology export promotion organisations. This has, however, been specifically promoted during the marketing of NCF's fourth call for proposals (NCF4). This is an interesting opportunity that could benefit all parties involved, and also provide much needed funding for the expansion of successfully proven pilot projects.

For some projects and development needs, innovative, completely new technological solutions can prove successful, such as the export of the Grundfos or Solvatten technologies highlighted in this report. For other projects, basic technologies that might have existed for a long time in other geographical locations can be the most useful. It is often more a question of finding the initial investments needed for transferring existing technologies and training local people in their use, as well as supporting national dissemination of technologies.

4.1.4. Mitigation and Adaptation

The distinction between mitigation and adaptation is not apparent in the field. Instead, projects stem from specific needs such as energy-, food-, or water insecurity or a specific environmental problem, such as deforestation. Climate change adaptation aspects, were, however found in all of the projects visited, and often go hand in hand with the development aspects of the projects in question. This is probably a result of the projects, also the ones that are mainly focusing on climate mitigation activities, all deriving from specific development needs identified on the local level.

The lines between development financing and climate financing are also blurred out more and more when it comes to actual project implementation on the field level. Most projects cover aspects that include both traditional development cooperation, as well as climate change related issues. The two sources of financing are, however, very different to date, with some funding agencies focusing purely on development aid, some purely on climate financing, and some on a mix between the two. This follows that the funding landscape is very dispersed and with a number of different requirements, objectives and purposes, making it difficult to provide a holistic approach to the thematic areas deemed most important to address the major challenges posed by a changing climate.

In order to be selected for NCF funding, projects need to show that they are in line with the relevant national policies, including NAMAs and NAPAs as relevant. Once the projects have proven successful, it would be of interest to develop more direct links and utilize the strong potential to be part of related programs on a national level and with identified overlaps with national policies on topics such as renewable energy, or sustainable business. One challenge in anchoring pilot projects more strongly to national policies is probably the general sentiment that national policies are not effectively

implemented or enforced. The emerging international policy framework underpinning NAMAs and NAPAs is also yet to be established, leading to hesitation on linking national policy to such mechanisms. Small-scale projects can provide examples on project designs that could be utilized under NAMAs or NAPAs and thus link project to the international policy framework. However, it is imperative that, upon NCF project completion, a plan exists on how to practically anchor project experiences and follow-up to national policy development.

In order for a future climate agreement to be effective it could also aim at making it easier for smaller projects to participate in carbon credit certification schemes. This would require a lighter and less time-consuming and expensive approach. An important aspect highlighted was also that there is a need to assist governments to implement existing rules and regulations and through that assist businesses and organisations with a sustainability agenda to reduce the impacts of climate change. For this to be successful, there is also a need for donors and funding agencies to be more coherent and long-term in their funding decisions.

4.2. General analysis on Nordic climate finance institutions

As a starting point, the information in Section 2 clearly points out that Nordic institutions provide a wide range of support for climate projects. Much of this support is, however, still built around thematic silos for development funding-, export support and climate/carbon finance, which creates a natural barrier for providing a more holistic support scheme operating out of the needs of individual projects. Ultimately, project developers and local partners are quite agnostic about whether funding is development-, export- or climate "branded". There are some examples of institutions or programs where support mechanisms cuts across several thematic silos, such as e.g. the Danish Climate Fund, some investments made by Nordic development finance institutions and to some extent NCF.

This suggests that a key area for the analysis of results and findings is to identify how different institutions interact. The table below summarizes the best examples of interaction and highlights some limitations found in our analysis.

Summary of interaction between Nordic climate finance institutions and instruments		
Theme	Technology transfer	Private sector funding
Modes of co-operation	Limited co-operation. E.g. NCF require Nordic involvement, but no requirement on used technology. Cleantech networks are nationally oriented and are primarily tied to export finance mechanisms.	Public/private co-operation in NEFCO Carbon Funds, development funds co-invest with private sector, Danish Climate Fund capitalized largely by private sector.
Overlap between instruments	National Development Finance Institutions have national agendas and prefer the use of local technologies in their projects. Most cleantech transfer initiatives towards developing countries are largely promotional without links to funding entities.	Early-stage grant funding cuts through development technology and climate agendas enabling private sector involvement. Many instruments operate short-term, in silos, and offer limited continued support for the private sector that looks at lifetime of a project.
Sharing of information	Largely national or regional promotion efforts.	No formal system of "handing over" a project to a potential subsequent funding mechanism (e.g. after NCF project completed). No private sector co-operation or networks on climate finance.
Opportunities to exploit synergies	Private sector well engaged in technology networks. Links to funding solutions would increase synergies.	There is an overlap between NCF and national development finance institutions to be used for leveraging private sector funding.

The Nordic private sector is underrepresented in the analysis. There are currently few private sector entities that are engaged in development-, climate or carbon finance in developing countries. In marketing of especially NCF4, all key Nordic Cleantech networks and organization were contacted. Nordic Cleantech companies may still consider it too difficult or risky to engage in these markets. As private carbon funds have exited the market, the main channels of private sector capital are a few development focused investments. Private equity/debt would seem the most "natural" type of private capital to be pooled with e.g. some of the example cases above.

The analysis also suggests that there is a very wide base of know-how across institutions on central issues related to the procedures of climate finance. This include e.g. know-how on emissions monitoring, verification and management of programs with several small projects, new market mechanisms (e.g. NAMAs), familiarity in working with local stakeholders and in IFIs' funding procedures. These are all elements that are needed for successfully arranging climate finance for projects. The challenge is how this information, scattered across numerous institutions can be made collectively useful. And whether there is a political incentive and the political will to do so. A concrete example of this is the growing body of knowledge on scaling up climate mitigation initiatives and measuring impacts through NPI - NOAK/NEFCO's work on NAMAs and SEA's work on supporting PoAs. Results-based finance will also require this know-how. How can this type of information be made collectively useful?

4.3. Combining results from sections 2 and 3

This chapter builds on the previous chapters and the contents of chapters 2 & 3 above, based on lessons learned from selected NCF projects and linked to the overall Nordic climate finance landscape discussed. There are some key lessons learned and examples of best practices that can be drawn from the case studies made in chapter 3, in respect to the overarching questions raised in chapter 2. Overall, the case studies provide a project-level starting point for examining investments in the current system. This is done by comparing project level execution and the institutional set-up.

General observations – scaling up initiatives
The change in the international climate finance architecture suggests a push towards larger funding entities, bigger projects, and concrete links to government programs for both top-down and bottom-up programs. Top heavy architecture, such as Climate Investment Funds (CIF) that rely on host country programs going through potentially multiple levels of governance (at the level of International Finance Institutions and GCF) is a justifiable approach when seeking to maximize impact of investment flows and solidly embed finance to national policy. But this approach has limitations – as exemplified by the CIF's slow mobilization of funds (9% invested after 6 years)[36], the administrative requirements on host countries, or the ability to address specific local challenges. NCF again, takes the opposite approach, with small-scale funding to a variety of projects on the grassroots level, typically implemented within 2-3 years. This report suggests that both types are needed, and that a bridge is to exist that can link successful smaller scale grassroots projects to larger funding entities.

There could be a risk of polarization in climate finance – where bilateral development projects under the "aid-for-trade" banner focus on small-scale high-impact projects and at the other end large GCF and IFI's mandate shifts to larger project concepts. The broader climate funding structures risk the connection to the underlying projects. The Nordic countries should recognize the limitation in the emerging funding environment generally, and specifically when considering a potential increasing future funding emphasis on the GCF structure. This would entail continuing to support smaller bilateral (or multilateral) engagements in support of smaller, nimbler and more locally driven projects. Recipient countries will, furthermore, likely have direct access to climate financing through accredited national implementing entities.[37] Work could also be directed through intermediaries

[36] CIF (2014). CIF evaluation report. www.cifevaluation.org
[37] www.climatefundsupdate.org

(consultants, project developers, investors) to access projects. In order for the big climate funding structures to work there needs to be a balancing mechanism that seeds smaller projects, groups these for scaling up and matching with the larger funding flows.

In addition to the benefit of scaling smaller projects to larger bankable programs, the bottom-up process is also important for accessing important sources of emissions. The project types supported by e.g. SEA carbon credit procurement program and NCF target areas of the economy, such as household and SME emissions, that are not priority areas for large national structural reform programs like energy, transport or waste. In this respect, funding programs that enable project development, up-scaling and private investment in sectors that run the risk of being underserved by large funding channels could be a natural area of priority for Nordic climate finance institutions.

A number of lessons learned and good examples can be drawn from the analysis of existing NCF projects (please refer to chapter 4.2.) that, hopefully, can be used to improve the future impacts of Nordic climate financing as a whole. The fact that NCF is a fairly small climate financing facility has allowed it to test various project concepts on a local level, where impacts, project design and results are fairly easy to monitor and measure.

Creating a platform for results-based finance

All the NCF projects in chapter 3 provide good examples of successful small grass-root projects that enabled the projects to develop to a stage where the private sector could carry a majority of the project risk. However, in light of the fact that future climate finance puts emphasis on size, how do these projects scale in order to match larger tracts of funding? Access to funding will be increasingly tied to monitoring and reporting of results, highlighting the need for impact measurement and results monitoring, but without making the process too complicated.

Chapter 2 highlighted some Nordic initiatives that tie in with new market mechanisms, e.g. SEA's view on using CDM POA experiences on measurement and monitoring as building blocks for results-based finance (sectors, programs) or NAMAs. This know-how on using results-based finance in the context of smaller mitigation and adaptation projects (households, SMEs, public services) will become very valuable for scaling up e.g. NCF projects. Host country proposals for accessing GCF or other multilateral climate funding, will in the longer run be tied to measuring of results or at least an approved monitoring system.

As an example, in order for the NCF project "Ugandan Sustainable Renewable Energy Businesses" to be part of a hypothetical Ugandan Government country GCF funding application for increasing renewable energy use, it would need to scale significantly and also develop a program wide monitoring system. NCF provides a valuable incubation role, but the up-scaling phase needs new funding partners and project development experience in preparing the mitigation program for the national government.

Based on Chapter 2, NCF could find such partners in one of the National Development Finance Institutions and the institutions with experience in results-based finance (SEA, NIP, NEFCO). These would provide the project owner a "seamless" service by putting in place expansion funding for e.g. hundreds of gasifiers and ensuring that the overall emission reductions of the project are accurately measured and reported to the Ugandan Government. In doing this, NCF projects could become platforms for replication, scaling-up and ultimately part of larger national climate funding programs.

Collaboration

It can be noted that NCF projects largely operate independently from other Nordic initiatives, as well as target country overarching climate related policies working on related topics (policy alignment and country approvals is, however, ensured during the application evaluation). This is part of the design of the NCF, being a facility that allows for testing project concepts, means of collaboration between public and private sector finance, as well as new technological solutions in a development country context on a small scale. Setting up such pilot projects, for example testing a new type of water pump or small-scale renewable energy solutions are not big investments. This stage is, however critical in

order to be able to select successful concepts that can be scaled up, multiplied and rolled out on a much larger scale, in order to have a real impact in the solutions required to both mitigate and adapt to climate change.

This is where a consideration on how to better link "testing facilities", such as NCF to larger scale climate finance facilities (GCF, Development Banks etc.) should be considered. As highlighted above, there are potential combinations of Nordic climate finance, capacity and know-how that could support the scaling up of NCF-, development cooperation agencies' or NGO's projects to larger programs. There is at least one example where a NCF project is scaled up in another country with other NDF financing. Here, the experiences and lessons learnt have been utilized to improve the sustainability of the concept. Collaboration, knowledge-sharing and strategic co-ordination between institutions becomes essential for enabling such scale-up to take place. The existing channels of co-operation between Nordic institutions and Governments provide a good ground for this.

There are no Nordic institutions whose support covers the entire project development cycle from design, inception to full-scale operation. For the NCF, the collaboration with early commercial debt and equity providers, mainly development funds, is important. In the absence of project-specific guarantees, interest rate subsidies or first-loss cover (though some of which are available through Sida, mainly for banks or funds) this is an area where Nordic as well as international collaboration could prove beneficial for ensuring long-term viability of NCF seeded projects.

Once the pilot projects funded by NCF have proven successful, it is important to develop direct and concrete links to host country policies, NAMA's and NAPA's. Creating such links and anchoring projects to higher level policies, would result in a better chance to be included in financing for follow-up, replication and up-scaling of the projects.

Technology Transfer and Private Sector Funding

The field studies clearly highlighted the importance of private sector involvement already in the early stages of NCF projects. The main reason for this is that the private sector's interest goes way beyond the 2-year NCF period. Private investors provide longevity and much needed focus to become self-sustained. Importantly, private sector co-investors also bring a range of important soft-skills to project management and execution already at the start phase of the project.

The role of Nordic technology networks was not brought up by the field studies and the technologies used in two of the projects were from other developing countries. However, this could change, and all key Nordic cleantech networks were, for example contacted for the NCF 4 call for proposals. Climate mitigation and adaptation problems, especially in infrastructure and utilities, require solutions to whole systems rather than individual problems. The same shift in focus to collaborative solutions is also endorsed by the CTCN that looks at technology solutions for big structural change projects. The broad membership base of these cleantech networks provides a good platform for co-creation and collaboration between companies. In order for cleantech companies to be able to respond to project requests coming through larger IFI funding channels or the GCF, they must take a systematic view on these problems and provide solutions that embed several technologies. At the same time the technology solutions offered through these networks must be scalable to match the size and reporting requirements of climate finance channels. By conforming to reporting and monitoring expectations, and providing broader technology solutions, cleantech promotion programs will be able to move closer to climate funding platforms.

The importance of a greater involvement of the private sector in any future solution to the problems of climate change cannot be overlooked. Existing Nordic technology export programs and clean technology networks represent an important part of the private sector that could benefit greatly from better access to new and emerging flows of climate finance. However, these networks currently operate without any concrete goals to align them with or promote themselves towards climate finance platforms.

5. Conclusions and Recommendations

This report concludes by highlighting key points and lessons learned that can be used by NOAK for replication and scaling up of Nordic climate actions (including gaps and opportunities), and in on-going and future climate negotiations. It includes strategic and operational recommendations using NCF as a case study. Recommendations that focus on concrete evidence from NCF projects (please also refer to chapter 4), including points relating to technology transfer and private financing, can be used in negotiations as examples of best practices, and can further specific agenda items as part of the negotiations.

Much of the key know-how to follow-up on the recommendations below already exists in Nordic institutions and the report illustrates a wide ranging competence in scaling-up mitigation activities, developing MRV systems, use of carbon finance and commercializing early-stage sustainable businesses in developing countries. Much of this competence is scattered across many organizations and finding a way to collate this know-how for strengthening the effectiveness of future Nordic climate finance mechanisms should be a priority for Nordic co-operation in this field.

5.1. Recommendations

1. Emphasize scale-up

NCF should continue to be used as a facility that can test various new ideas and projects on a pilot level and thus improve the project's bankability and chances for commercial success. The primary recommendation from this report is that scale-up potential and planning should be a core feature of any Nordic climate finance project or program and that collaboration between Nordic countries and different Nordic climate financing sources should be developed with this in mind. There are three main reasons for this.

First, scaling up needs to be seen as a measure in response to a systematic need for more sizeable funding targets as a result of an increase in climate finance flows. As larger and more rapid emission reductions are needed, climate finance flows will need to, other things being equal, prioritize reduction size. As an indirect consequence, smaller-projects need to be combined into larger groups in order to create large enough bankable programs for funding.

Second, scale-up of projects to larger programs is not a means to an end in itself but up-scaling needs to be anchored to local policy demands in order to improve access to climate finance resources. National policy that meets the demands of the global policy framework enables funding. Smaller-projects provide concrete examples of what policy interventions are required and can thus support policy development.

Third, the bottom-up process is important for accessing significant sources of emissions. The project types supported by the NCF target areas of the economy, such as household and SME emissions, are not priority areas for typical large national structural reform programs (e.g. in energy, transport or waste). In this respect, funding programs that enable project development, up-scaling and private investment in sectors that run the risk of being underserved by large funding channels should be an area of priority for Nordic climate finance institutions.

2. Create enabling mechanisms for scale-up and replication

Mitigation and adaptation projects should be supported by targeted actions that enable up-scaling and replication to take place, thus creating bridges between bottom-up smaller scale pilot projects and top-down large international climate finance channels.

The study shows that NCF projects, by design, mainly operate independently from other financing initiatives and host-country national programs. Once such independent pilot projects have proven successful, Nordic governments should foster and encourage collaboration between public and private

projects to build a knowledge-sharing process from which to scale up mitigation and adaptation initiatives on a country- and regional level, focusing on specific clusters and technologies. These could, for example, be country-, or region specific sites for exchange of information that create collaboration opportunities between private and public institutions to support the creation of larger projects.

Once pilot projects–, and concepts have proved successful, there is a clear need to anchor NCF projects to policy development procedures in the host country. Emphasizing such feedback systems in the design of NCF projects enables influence on policies to be more conductive to small-projects. A result is an improved chance to create polices that support follow-up financing, replication and up-scaling of the projects.

NDF's mandate, as the financier of NCF, could be expanded and include sources for follow-up funding for successful projects, while working to ensure uptake by international climate finance mechanisms. It could also provide advice on further project development, linking to policies, NAMAs or NAPAs. This would ensure that successful NCF projects are anchored into policy and thus have a better chance to be included in international climate financing. For this, overlaps that exist between NCF projects and existing national-level policies that already exist should be utilized.

3. Access to follow-up funding - involve National Development Finance Institutions

There is a lack of follow-up funding for small-scale climate projects that would support commercial scaling, through e.g. credit guarantees or loan guarantees – support that would naturally take off from where NCF support ends. This would cover the gap for follow-up and ensure the viability or expansion of successful pilot projects once the NCF funding runs out. NCF should explore partnering with National Development Finance Institutions to offer project owners "next step" expansion funding using debt, equity or mezzanine financing. This could lead to NCF projects becoming platforms for replication, scaling-up and ultimately part of larger national climate funding programs. It would simultaneously increase the deal-flow towards DFIs, involve organizations that so far have not been actively involved in climate financing in developing countries, and potentially open up opportunities for collaboration between Nordic DFIs.

4. Use bilateral funding to increase co-operation with international climate finance

Use bilateral funding sources to ensure that successful smaller-scale project concepts get approval and uptake that lead to international climate financing. Such increased cooperation with international climate finance initiatives would further facilitate up-scaling and replication of successful pilot projects.

Top-heavy funding architecture (e.g. CIF funds) that relies on host country programs going through multiple levels of governance (e.g. first at the IFI level and then GCF) is a justifiable approach when seeking to maximize impact of investment flows and solidly embed finance to national policy. This approach, however, has limitations – as exemplified by the CIF's slow mobilization of funds (9% invested after 6 years). The analysis points to an increasing concentration of funding through multilateral development banks, as well as the GCF.

The Nordic countries should recognize the limitation in these structures and seek to actively use smaller bilateral engagements, as a complementary funding channel, to support host countries to develop bottom-up mitigation and adaptation programs that are quicker and easier to finance than e.g. through the CIF or GCF structures. Bilateral funding could, for instance, focus on supporting the design and development of funding requests for larger funding channels in sectors with national expertise and interest (e.g. urban planning, off-grid electrification, biomass utilization, waste management, renewable energy). This could include policy tools, technology options, or the organization of local implementing bodies. Small-scale case studies, such as NCF, could be used as the starting point for sector programs.

For the NCF, collaboration with early commercial debt and equity providers, mainly development funds, is also important. In the absence of project-specific guarantees, interest rate subsidies or first-loss cover (though some are available through Sida mainly for banks or funds) this is an area where

international collaboration could prove beneficial for ensuring long-term viability of NCF seeded projects.

Although it is clear that a typical NCF project operates on a scale that is at the complete opposite of large climate finance channels – one should not overlook the facts that Nordic countries have a long history of practical development aid and bilateral programs that could serve as a platform for using a collection of smaller projects (in chosen sectors) to build scale and policy readiness for GCF.

5. Encourage the involvement and reduce risks for private sector financing

Private sector financing provides much needed know-how and long-term engagement, increasing the probability for projects to become self-sustaining. In order to improve the attractiveness of climate related projects among the private sector, sound business cases are needed with the possibility for profit making.

The importance of a greater involvement of the private sector in any future solution to the problems of climate change is not to be overlooked. The technological know-how, capital, innovative solutions and the basic assumption of businesses that projects need to become self-sustaining, are all aspects that support a stronger inclusion of direct private sector involvement.

NCF works as a good example of a facility that enables private sector entities to establish and develop new business ideas in low-income countries by taking on a part of the financial risk involved during the early phase of a project. Nordic institutions seeking to engage the private sector in climate financing need to focus on addressing risks that cannot be covered with private sector financial products. Seed-money financing should also be allowed to cover operational costs.

Risks for private sector involvement could be reduced by partnering with, and using the expertise of organisations that work with development issues. This enables the project to draw on the expertise of all involved stakeholders, resulting in a stronger project outcome. NGOs know well how to engage with the local communities, ensure capacity building etc., while the private sector company can come up with solutions on how to ensure the sustainability (profitability) of a project, has the necessary technological know-how etc.

Finally, the international community and bilateral financers should assist governments to implement already existing rules and regulations and through that assist businesses with a sustainability agenda to establish themselves, which in turn would help governments to reach set targets and reduce the impacts of climate change. For this to be successful, there is also a need for donors and funding agencies to be more coherent and long-term in their funding decisions.

6. Leverage know-how of Kyoto Protocol mechanisms in monitoring and reporting

The importance of monitoring, reporting, and verification (MRV) of mitigation and adaptation projects will grow in significance under the new international climate agreement. The impacts of climate finance need to be monitored to safeguard the credibility of mitigation and adaptation actions and thus enable climate finance. Know-how of results-based finance in the context of smaller mitigation and adaptation projects (households, SMEs, public services) will become very valuable for scaling up e.g. NCF projects. Host country proposals for accessing GCF or other multilateral climate funding, will in the longer run be tied to measuring of results, or at least an approved monitoring system.

There is a vast body of knowledge in scaling up climate mitigation initiatives and measuring impacts through, for example, the Swedish Energy Agency's long-standing interest in and support of CDM Programs of Activities and NEFCO's carbon credit procurement programs. This understanding of procedures to identify, calculate, monitor and report emission reductions using procedures created under the Kyoto Protocol should not be discarded. NCF and future Nordic climate finance programs or investment vehicles should embed this know how into their funding processes.

7. **Cut barriers to carbon credit certification schemes and access to basic technology**

In order for a future climate agreement to be effective it should aim at making it easier for smaller projects to participate in carbon credit certification schemes. This would require a lighter, less time-consuming and less expensive approach.

On a local-level in most low-income countries, the technological solutions needed are often of a very basic type that can be operated and repaired in remote areas by fairly low-skilled labour. Examples include simple means of purifying water without the need of firewood/charcoal, micro-scale hydropower or using agricultural waste as a source for energy. There is thus a need to support the roll-out of low-spec technologies that have been tested in other parts of the world, and adapted to the local environments. This focus on workable practical technologies above latest high-technology should be recognized on all levels of project development and climate finance in Nordic organizations.

In developing countries, there is also a need to try and merge climate- and development financing opportunities, rather than to keep them in silos of their own. Today, it is difficult to provide a holistic approach to the thematic areas deemed most important to address the major challenges posed by a changing climate, while the lines between development financing and climate financing are blurred when it comes to actual project implementation on the field level.

8. **Support large scale technological solutions through the Clean Technology Network Centre**

UNFCCC efforts to speed up the diffusion of cleaner technologies are spearheaded by the newly established Clean Technology and Network Centre in Copenhagen. The CTNC promotes the idea of collaborating solution development through its expert hubs, thus potentially becoming an important channel of project ideas. Nordic (research) institutions should recognize this and establish formal links to the CTNC. The emphasis is on system solutions rather than stand-alone technologies. The Nordic governments should see this as a permanent change in the technology promotion landscape; technology promotion networks should move away from supporting “menus” of technologies and focus more on providing “recipes” for solving problems in specific sectors. The same logic should apply for clean technology export activities; by focusing on solutions they create a natural contact point with climate finance. Emphasize broader involvement by govt.

5.2. Conclusion

Nordic Climate Finance has provided and is well shaped to provide several valuable contributions to the emerging global agenda of climate finance.

An overarching theme in this report is the need to create ”bridges” between bottom-up smaller scale projects that enable field testing and development of successful concepts on the one hand, and large-scale international top-down climate finance programs on the other. Scaling-up and replicating successful projects enables new sources of funding, facilitates private sector participation and ultimately provides larger mitigation and adaptation impacts. Scaling smaller projects to a meaningful size requires conductive political and regulatory frameworks, while large scale international climate financing, such as the GCF, have the scale to effectively influence such frameworks.

NCF is seen as an enabler of projects, reducing the financial risk and helping to prove the viability of projects. In the life-cycle of a specific project or business idea, the NCF funding allows to set up and test projects on a pilot level. Once pilot projects have proven successful, it is possible for stakeholders to look for other type of funding, including loans and equity investments. The challenge is usually to find funding for the necessary initial investments, which is a gap that NCF fills successfully today.

The analysis in the report and the case studies clearly show that financial support to smaller projects can provide benefits above and beyond their immediate economic and environmental impacts. They can be leveraged as a scale-up platform using best practices from project design e.g. for targeting local policy instruments, replication of business models, providing capacity building, proving technology,

fuel supply models etc. Importantly, they can also be used as examples of project-level monitoring and reporting of environmental impacts. As results-based finance is increasingly required by international policy frameworks, the ability to copy project-level monitoring and reporting practices to broader mitigation and adaptation programs (e.g. on a sector level) becomes very valuable. NCF and other Nordic Climate Finance channels should emphasize this in their monitoring practices.

The active participation by Nordic institutions in carbon markets and in the development of new market mechanisms (e.g. NAMA, REDD) means that there is an accumulated body of knowledge of processes for identifying, measuring, verifying and reporting on mitigation projects. This know-how, which sits in largely Government funded or managed institutions such as SEA and NEFCO, should be used more broadly. This information, despite being specific to carbon markets, is useful and relevant for any mitigation or adaptation project for instance for Nordic national development finance institutions, private investors or development agencies who want to make sure the emission reductions from their investments or projects are aligned with best practices. This, in turn, could unlock new sources of follow-up, or co-funding from climate finance sources.

The Nordic countries have a long successful history in bilateral development programs and in the changing landscape for climate financing this should be seen as an asset. In particular, it should be seen as a way to engage with host countries outside of structurally heavy multilateral climate financing channels and supporting them through more nimble and targeted projects to prepare sectors and segments to access climate funding. These bilateral programs should focus on creating the structures in countries that enable private sector funding and make results based finance possible; e.g. risk mitigation for private investors, integrating monitoring and reporting into policy tools and supporting development of sectoral or national climate finance applications for the GCF.

Clean technology exports are an integral part of current Nordic technology export promotion activities and also attract much political attention. Much effort has been put into building export networks and hubs for start-up activities, as well as national clean-tech brands. At the same time there has been little structured overlap from export promotion, with a few exceptions such as the Danish Climate Investment Fund, into development and climate financing.

Given the natural fit between clean technologies and climate financing, this is an underutilized opportunity in the Nordics. There is clearly room for a more systematic approach where technology exports are packaged into concrete sector solutions, under development programs, to be part of country programs to access climate funding. The CTCN in Copenhagen represents a step towards developing collaborative solutions to mitigation and adaptation problems brought forward by developing countries.

The need to scale small projects into larger programs is the obvious challenge and meeting this challenge should become a central theme for Nordic climate finance institutions. This applies both to developing the follow-up on financial instruments to enable early stage projects to increase in scale as well as putting in place the foundations for operational scalability, i.e. growing a project to a program. Growing the project size enables new sources of funding, facilitates private sector participation and ultimately provides a bigger mitigation or adaptation impact.

In brief, findings presented in this report suggest that there are a number of positive lessons learned and good examples within Nordic climate finance mechanisms that can be utilized in supporting a future international climate agreement. The key issues and recommendations highlighted in this report is believed to provide additional guidance on how to better facilitate private sector financing, technology transfer and mitigation and adaptation activities in field-level projects, as well as in national-, regional- and international climate policies and agreements.

Annex 1 – Interviews

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Jukka Uosukainen, UNDP, Climate Technology Centre and Network (CTCN), Denmark

Petra Wadström, Solvatten, Sweden

Annex 2 – Nordic Climate Finance Institutions and Facilities

Nordic Development Fund	
Synopsis	A joint-Nordic development finance institution with a mandate to facilitate climate change investments in low-income countries.
Investment tools	Grant funding solely through co-financing, target size EUR 2-5 million aimed mainly at at technical assistance (consulting services), and for investments (goods, works, services). The Small Grant Facility (EUR 9 million) can fund smaller grants e.g. project preparatory activities.
Source of capital	Nordic governments. NDF's total assets are around EUR 880 million (85% are tied to concessional credits made before 89-09 with long maturities). The reflow from these assets (+ liquid assets) form the basis for NDF's current grant funding.
Geographical focus	27 eligible countries in which NDF has made a concessional loan prior to 2009.
Sector focus	Broad. 1) Infrastructure (energy, transport, urban development and water management, climate vulnerability/resilience), 2) Natural resources (water resources management, sustainable land use and forestry, coastal zone management) and 3) Climate change related capacity building
Funding channels	Predominantly in cooperation with IFI's. Channels also funding through the Nordic Climate Facility (through NEFCO). No direct funding.
Climate/carbon finance mechanisms	No direct link, NDF applies shadow pricing for emission reductions in project eligibility screening (+10% of investment costs) and a 50% cost threshold for adaptation projects.
Adaptation or mitigation	Dual focus, mandate covers both.
Links to Nordic institutions	Strong links to sister-institutions NEFCO and NIB, and bilateral Government funding agencies (Ministries)
Priorities	The operations mirror the Nordic countries' priorities in the areas of climate change and development. NDF's capital is provided from the development cooperation budgets of the five Nordic countries.
International links	IFI's: African Development Bank (AfDB), ADB, Inter-American Development Bank (IDB), Inter-American Investment Corporation (IIC), Multilateral Investment Fund (MIF) and World Bank (WB)

Swedish Energy Agency (carbon credit procurement program)	
Synopsis	The agency procures carbon credits for Sweden's 2020 voluntary emission reduction target in addition to credits for its target under the Kyoto Protocol.
Investment tools	Direct purchase of Certified Emission reductions on a forward contract basis under an Emission Reduction Purchase Agreement. Payment on delivery.
Source of capital	Swedish government
Geographical focus	Sub-Saharan Africa and South East Asia with a focus on LDCs.
Sector focus	Renewable energy, energy efficiency and waste management.
Funding channels	Direct purchases, no external channels.
Climate/carbon finance mechanisms	Pure carbon finance with added focus on emission reduction projects from CDM projects and PoAs (Programmes of Activities) that have not yet been commissioned and/or may be discontinued and commissioned projects in LDCs.
Adaptation or mitigation	Mitigation
Links to Nordic institutions	Actual procurement program has no formal links to other institutions or technology providers. Several informal channels through SEA to other governments and NEFCO. No

Priorities	The program has a mandate to develop flexible mechanisms with a view to utilize know-how from these mechanisms to help lay the foundation for continued and expanded international climate finance.
International links	No direct international partners

NEFCO Carbon Finance and Funds	
Synopsis	NEFCO Carbon Finance and Funds is an NEFCO department solely focused on climate finance. It has a global investment focus in projects that generate CERs and Emission Reduction Units.
Investment tools	NEFCO Carbon Fund purchases (up to 3 million tons) CERs from new projects from LDCs, including not yet commissioned and/or registered CDM projects. Forward contract basis under an Emission Reduction Purchase Agreement. Payment on delivery.
Source of capital	*NeCF investors*: DONG Energy (Dk), Danish Energy Agency, EPV Energy (Fi), the Finnish government, Kymppivoima (Fi), Vapo (Fi), Industrialisation Fund for Developing Countries (IFU), the Norwegian government, GDF Suez, Eesti Energia and NEFCO itself.
Geographical focus	Global, only projects in LDCs.
Sector focus	No sector focus
Funding channels	Direct purchases, no external channels.
Climate/carbon finance mechanisms	Pure carbon finance with procurement focus on vulnerable projects. NEFCO CFF is also an active stakeholder, through the Nordic Partnership Initiative (NPI), in the development of new market mechanisms and climate financing for the post Kyoto policy environment.
Adaptation or mitigation	Mitigation
Links to Nordic institutions	Several informal channels through NEFCO to other governments. Marketing towards cleantech groups and providers, no formal links. Partner with NOAK and NDF in the NPI on scaled-up mitigation. No links under programmes to technology providers.
Priorities	Current NeCF program has a direct mandate to support new emission reduction projects in LDCs that risk never starting because of current low-price market conditions.
International links	No direct international partners

NorCap/NEFCO Carbon Credit and Funds	
Synopsis	The Norwegian Carbon Procurement Facility (NorCaP) managed by NEFCO purchases Certified Emission Reductions (CERs) from registered and commissioned CDM projects and PoAs that are vulnerable to the current low carbon market prices.
Investment tools	Direct purchase of Certified Emission reductions on a forward contract basis under an Emission Reduction Purchase Agreement. Payment on delivery.
Source of capital	Norwegian government (Ministry of Climate and Environment)
Geographical focus	Global, with separate funding tranche set aside for projects in LDCs.
Sector focus	No sector focus
Funding channels	Direct purchases, no external channels.
Climate/carbon	Pure carbon finance with procurement focus on vulnerable projects.

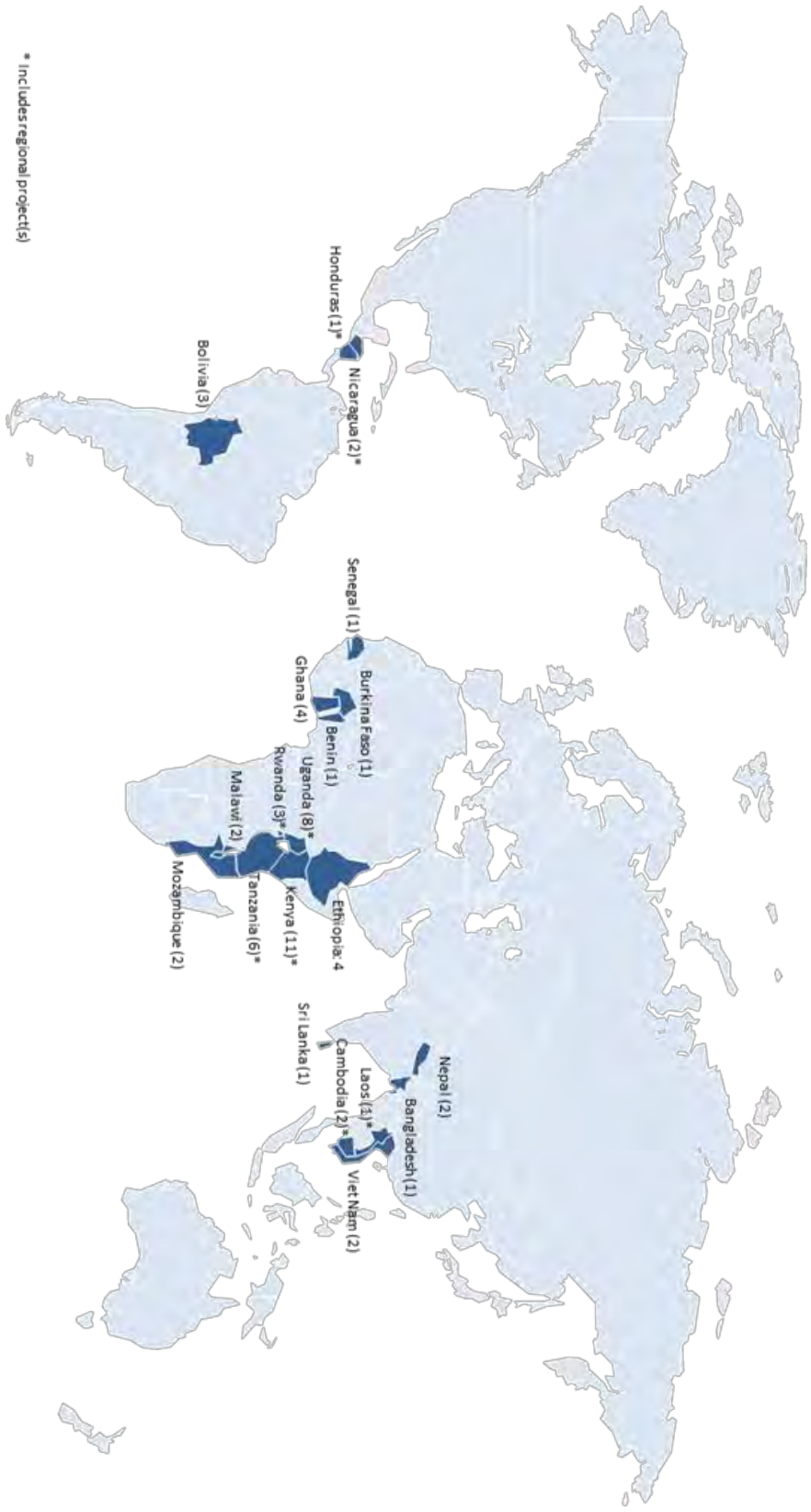
finance mechanisms	
Adaptation or mitigation	Mitigation
Links to Nordic institutions	Norwegian government procurement program. No formal links to other institutions. Several informal channels through NEFCO to other governments. Marketing towards cleantech groups and providers, no formal links.
Priorities	The program has a direct mandate to prevent decommissioning of vulnerable emission reduction projects that risk survival because of current low-price market conditions.
International links	No direct international partners

Nordic Climate Facility	
Synopsis	The Nordic Climate Facility is a grant co-financing facility financed by NDF and administered by NEFCO Carbon Finance and Funds department.
Investment tools	Grant co-financing between EUR 0,25-0,5 million into projects.
Source of capital	The Nordic Development Fund
Geographical focus	14 eligible countries in Africa, 10 in Asia and 3 in South America
Sector focus	Varies between calls for proposals; energy, transport, water and sanitation, health, agriculture, and forestry and natural resource management.
Funding channels	Direct funding to projects or local partners
Climate/carbon finance mechanisms	Climate finance, investment scope and appraisal includes mitigation or adaptation impact . No results-based payments or systematic monitoring of achieved impacts.
Adaptation or mitigation	Both
Links to Nordic institutions	Nordic participation is required in funded projects. The main applicant must be registered in a Nordic country. Marketing outreach also to cleantech networks and technology providers. No formal links to other institutions. Several informal channels through NDF and NEFCO to other governments. No links to technology providers.
Priorities	Thematic focus changes with calls. Overall priorities: exchange of technology, knowledge and know-how between the Nordic countries and low-income countries, increase host countries' capacity to mitigate and adapt to climate change and contribute to sustainable development and poverty reduction. Emphasis on testing of scalable and real concepts relating to climate change mitigation and adaptation. All projects have defined required development impacts.
International links	No formal international partners

The Danish Climate Fund	
Synopsis	The Danish Climate Fund promotes investments in developing countries and emerging markets, with Danish climate technology or other Danish interests. Current capitalization is DKK 1,2 billion. The fund is managed by IFU.
Investment tools	Equity into projects that directly or indirectly reduce greenhouse gas emissions with Danish technology. Co-invest
Source of capital	Danish government (DKK 275 million, development funds), IFU (DKK 250million), Danish institutional investors (DKK 675 million).

Geographical focus	Geographically the fund covers almost all countries in Latin America and Africa, the majority of the countries in Asia and a few countries in Europe.
Sector focus	Broad: including e.g. renewable energy, energy efficiency projects, transport projects and material and equipment, e.g. insulation material and district heating systems
Funding channels	IFU's own channels
Climate/carbon finance mechanisms	Investment decision based on projected emission reduction. No results based payments or carbon finance.
Adaptation or mitigation	Both
Links to Nordic institutions	Largely a Danish initiative
Priorities	The Fund has a dual purpose: reduce greenhouse gas emissions and promote the transfer of Danish technology into developing countries and emerging markets.
International links	No direct international partners

Annex 3 – NCF Projects and Geographical Location



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