

# **NEFCO Carbon Finance and Funds Operational Review 2008**

*Carbon financing for sustainable energy investments*



The Carbon Finance and Funds (CFF) operations of the Nordic Environmental Finance Corporation (NEFCO) expanded significantly in 2008. A new global facility, the NEFCO Carbon Fund (NeCF), was launched in April and is currently capitalised at 76.6 million euros. NEFCO's pioneering Baltic Sea Region Testing Ground Facility (TGF), a 35-million-euro regional carbon finance facility, continued strengthening its portfolio of emission reduction projects in 2008. Both funds are structured as public-private partnerships with investments from both governments and private sector utilities and industrial companies in the Baltic Sea region. The funds are compliance vehicles that purchase Assigned Amount Units (AAUs), Certified Emission Reductions (CERs) and Emission Reduction Units (ERUs) on behalf of investors from energy-related and other projects that reduce greenhouse gas (GHG) emissions within the frameworks of Kyoto Protocol's Joint Implementation (JI) and Clean Development Mechanism (CDM). The NeCF and TGF are managed as trust funds by NEFCO, an international financial institution owned by the five Nordic Governments, based in Helsinki.

## 1. Review of operations by the Fund Manager

The Fund Manager's emphasis in 2008 has been the origination and procurement of high quality, emission reducing investment projects and the establishment of the NEFCO Carbon Fund (NeCF). By year end, a total of 12 Emission Reduction Purchase Agreements (ERPAs) were concluded and signed. Of these, three apiece are located in Estonia and Lithuania, four in Russia and two in China.



The Joint Implementation (JI) mechanism lags behind the Clean Development Mechanism (CDM) by most measures, not least of all in numbers of project registrations (or "final determination").

However, the Testing Ground Facility (TGF) was pleased to take the Lithuanian Benaiciai wind project through the JI cycle to achieve this status as the third JI project ever, highlighting its status as a pioneer in this segment of the market.

The TGF is fulfilling the founding objectives set for it by the Baltic Sea Regional Energy Cooperation (BASREC). It has evaluated over 160 well-developed projects ideas in the Baltic Sea Region and Ukraine, screened and presented 76 of these to the TGF Investors' Committee. Of these so-called Project Idea Notes (PINs), 84% are in the renewable energy and energy efficiency sectors. Almost two thirds of these projects were located in Russia. As of December 2008, around 94% of the fund capital was allocated in the form of Emission Reductions Purchase Agreements (ERPAs) and Option Agreements (OAs).

Carbon Finance and Funds (CFF) progress continues to be hampered by regulatory and procedural issues, affecting both funds. The evolution of the host country procedures has been slow, particularly in Russia, where CFF has the majority of its projects and volume. By contrast, the national approval procedures of China and India are effective and predictable. On the international scene, the progress of project preparation and registration has been slowed by constraints in the determination/validation process, which is becoming more complex and unpredictable, resulting in project backlogs and calling into question the overall credibility of the mechanisms. The need for reform and resourcing is strong. Globally, the contraction of bank financing and current tight credit conditions will make it increasingly difficult for project developers to raise debt financing for JI and CDM activities.

In April 2008, the NeCF was launched with DONG Energy and NEFCO as inaugural investors. Since then, other parties have joined, including Denmark, IFU, Kymppivoima and Norway, with discussions ongoing with several other potential investors.

Compared to the TGF, the NeCF is a more flexible procurement vehicle, investing in projects world-wide and allowing investors opt-outs on certain projects, territories and project categories. An important innovation has been that the NeCF will also purchase post-2012 CERs up to the maximum of the first crediting period of the project (7 or 10 years). In establishing the NeCF, the investors are looking to support future greenhouse gas mitigation projects by giving value to their post-2012 emission reductions at a time of policy uncertainty. By accepting the risks relating to the development of a post-Kyoto regime, the NeCF is committed to promoting the longer term development for reductions in greenhouse gas emissions through the deployment of low-carbon technologies.

NEFCO has moved into new territories with NeCF, and has been focussing its origination efforts principally in Asia, and to a lesser extent, Africa. The Fund has been invited to speak at international conferences in Mumbai, Beijing and Singapore in the latter half of 2008, and is evaluating projects throughout the region and in Africa. An important milestone in October 2008, was the signing of the Xiangshui Wind Energy Project, a 201 MW development in eastern China, together with the Yangtze Energy Development Co., one of China's largest energy companies, and in cooperation with the Chinese Ministry of Environmental Protection's Foreign Economic Cooperation



Signing Ceremony for Xiangshui Project in Beijing, October 2008

Office. The project will deliver carbon savings of 1.4 million tonnes of carbon dioxide equivalent (tCO<sub>2</sub>e).

The NeCF is conceptualised as a rolling Facility which will continue operating in the global markets to meet the needs of its investors in the post-Kyoto period. Additional developmental activities are being undertaken regarding the use of voluntary markets for social and community projects.

Looking forward into 2009, and the COP 15 conference to be held in Copenhagen at the end of this year, it is expected that the nature of JI and CDM will evolve in the post-2012 world with more programmatic, policy and sectoral approaches which can help meet policy demands for long-term investments and a rapid scaling up of mitigation efforts. There will also be additional focus on technology deployment which meets climate change mitigation goals as well as offering social, developmental and community benefits. NEFCO aims to be at the vanguard of these activities, finding new ways to meet the needs of its investors for high quality emission reductions.

*Ash Sharma, Head, Carbon Finance and Funds and Magnus Rystedt, Managing Director, NEFCO, December 2008*



## 2. Baltic Sea Region Testing Ground Facility (TGF)

The Facility has its origins in multilateral energy cooperation in the region. The energy ministers of the Baltic Sea region countries and the European Commission decided in 1999 to enhance the energy cooperation in the region with the creation of BASREC (Baltic Sea Region Energy Cooperation). The countries and institutions participating in BASREC are the Governments of Denmark, Estonia, Finland, Germany, Iceland, Latvia, Lithuania, Norway, Poland, Russia and Sweden. The European Commission is represented by the Directorate General for Transport and Energy (DG TREN). One area of BASREC's focus is the Kyoto Protocol, its implications for greenhouse gas emissions, and the opportunities it creates for project implementation.

In November 2002, the Energy Ministers of the BASREC countries decided to turn the Baltic Sea region into a Testing Ground for Joint Implementation (JI) projects. The Testing Ground Agreement for Flexible Mechanisms of the Kyoto Protocol was signed on 29 September 2003 by seven countries – Denmark, Finland, Germany, Iceland, Lithuania, Norway and Sweden. The Agreement came into force in February 2004. Since then, Estonia, Latvia and Poland have also signed or acceded to the agreement. Russia has yet to accede, and Ukraine was not a signatory.

### Objectives

The objectives of the Testing Ground were originally:

- to build capacity and competence to use the Kyoto mechanisms and promote common understanding of concepts, rules and guidelines for use of the flexible mechanisms of the Kyoto Protocol, to promote realization of high quality projects in the energy sector generating emissions reductions;
- to collaborate in addressing administrative and financial barriers and the level of transaction costs, especially regarding small-scale JI projects;
- to facilitate generation, ensure issuance and transfer of ERUs and AAUs related to or accruing from JI projects and Emissions Trading.

Since then, the TGF has developed into a commercially functioning carbon purchase fund based on the Public-Private Partnership principle. This has mirrored the significant development of a carbon market globally in which the private sector has assumed a dominant role.

The TGF invests in projects owned and operated by private enterprises, public utility companies, public-private partnerships and municipal, regional or governmental authorities.

Due to the BASREC origins, energy-related projects are given priority, with a focus on:

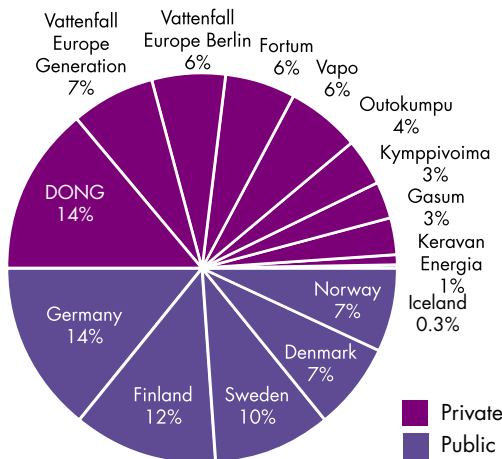
- renewable energy (biomass, small scale hydropower, wind power and geothermal)
- fuel switching
- energy efficiency
- energy conservation and fugitive emission reductions

However, also other sectors such as waste (e.g. waste to energy, recapturing and utilisation of methane from landfills) and projects related to reduction of other greenhouse gases are also eligible. Investments in these projects have been made where there is an energy component.

### Investors in the TGF

The TGF is a public-private partnership which has investors from six governments and nine heat and power and industrial companies. It is capitalised at 35 million euros, split equally between public and private sectors.

### Baltic Sea Region Testing Ground Facility Investors

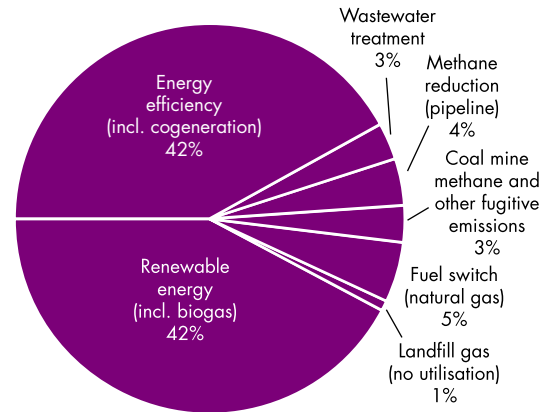


### TGF portfolio overview

The Fund Manager has sought to diversify portfolio risk across project types, with an emphasis on renewable energies and energy efficiency projects, and the TGF's countries of operation, taking into account the technical and realisable potential in those markets.

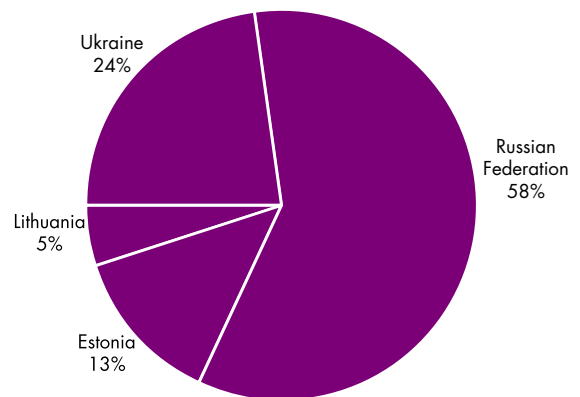
Since 2005, over 70 Project Idea Notes (PINs) have been screened by the Fund Manager and submitted as investment proposals to the TGF IC. Of these, only three have been rejected (none in 2008). The breakdown of these projects by project type and geography is presented in the following graphs:

### TGF Project Proposals by Project Type



The graph shows a strong emphasis on renewable energy and energy efficiency projects, with the distribution of the former between wind and biomass/biogas technologies. Similarly, the geographic distribution below shows the expected bias toward Russia, and good representation from the Baltic States. Latvia and Poland are notable exceptions due in part to constraints of EU membership on JI eligibility.

### TGF Project Proposals by Host Country



In total, TGF has committed in the form of Emission Reductions Purchase Agreements (ERPAs) 1.6 million tCO<sub>2</sub>e saved. In addition, there are further Option Agreements (conferring the rights to negotiate a final ERPA) for projects representing 2.4 million tCO<sub>2</sub>e saved.

### Regulatory and market overview

There have been significant developments in the regulatory environments in the host countries in 2008. All TGF host countries have become eligible to use national JI Track 1 procedures and to issue and transfer AAUs and ERUs. Preparation and operationalisation of national JI procedures and legislation is underway in all host countries.

The Lithuanian Benaiciai wind farm project became the third ever JI project to achieve final determination under Track 2 in July 2008.

In October 2008, Lithuania became the first TGF host country to finalise legislation regarding issuance and transfer of ERUs. Since Lithuania is relying on international (Track 2) procedures for the assessment of JI projects, the final remaining bottleneck for the creation of ERUs is the accreditation of Independent Entities for determination and verification.

Thus far, all investor country Letters of Approval have been requested and received from Sweden. Lithuania and Estonia have already issued Letters of Approval to TGF projects, while the first Russian and Ukrainian approvals are still pending. One TGF project is already in the Russian JI approval application process.

#### Strezhevoy district heating rehabilitation project

The Strezhevoy District Heating Rehabilitation Project reduces greenhouse gas emissions in western Siberia with the support of carbon finance from the Baltic Sea Region Testing Ground Facility (TGF). The project is developed as a Joint Implementation (JI) project under the Kyoto Protocol in cooperation with Norsk Energi and it will generate Emission Reduction Units (ERUs) from 2008 until 2012.

The project consists of energy efficiency improvements in the district heating system in the town of Strezhevoy in western Siberia, Russia. The renovation of seven heating sub-centrals will result in a reduction of their energy consumption by up to 25% and thus, significant fossil fuel savings. Construction began in July 2007 and phased implementation started in January 2008.

Through more efficient fuel use, the project reduces greenhouse gas emissions by almost 90,000 tonnes of carbon dioxide equivalent (tCO<sub>2</sub>e) during 2008-2012. TGF has agreed to purchase the first 81,000 tonnes as ERUs on behalf of its investors. These ERUs can be used for compliance by governments under the Kyoto Protocol and by companies under the EU Emissions Trading Scheme.

Besides global climate benefits, the project offers also local sustainable development benefits by reducing air pollution and improving the quality of domestic hot water and the comfort level of the apartments in the district heating systems.

The project is operated by OOO "Strezhevoy Teploenergostabzhenie" (STES) which is the sole provider of heat, hot water and steam in Strezhevoy.

### 3. NEFCO Carbon Fund (NeCF)

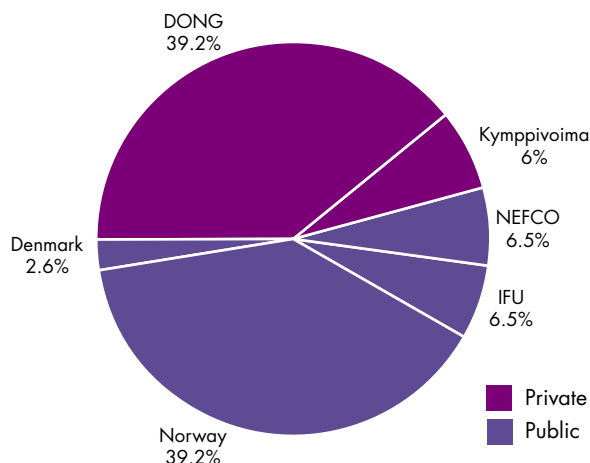
The NEFCO Carbon Fund (NeCF) is a global carbon fund based on a public-private partnership model, launched in March 2008 for the purchasing of greenhouse gas emission reductions under Joint Implementation (JI) and the Clean Development Mechanism (CDM).

The NeCF will invest in a wide typology of projects by providing carbon finance to renewable energy, energy efficiency, fuel switching and other investments. The principal target markets are the Russian Federation, Ukraine, People's Republic of China, India and Southeast Asia, although other developing countries will also be considered.

### Investors in NeCF

The new fund is directed towards private investors (corporate entities with compliance obligations under the EU Emissions Trading Scheme, or EU ETS) and sovereign investors, including those who are currently investors in the TGF.

NEFCO Carbon Fund Investors



The NeCF had an initial target capitalisation of EUR 50 million. As of December 2008, EUR 76.6 million had been raised, from the Danish Energy Agency, DONG Energy (DK), Industrialiseringsfonden for Udviklingslandene (IFU) or the Industrialisation Fund for Developing Countries (DK), Kymppivoima (FI), the Norwegian Ministry of Finance and NEFCO itself.

### Projects

The NeCF will invest in projects owned and operated by private enterprises, public utility companies, public-private partnerships and municipal, regional or governmental authorities.

The NeCF will invest in a wide range of greenhouse gas mitigation projects including, but not limited to, renewable energy projects (e.g. biomass, small-scale hydropower, wind, geothermal), energy efficiency and fuel switching, methane capture from landfill gas and coal mine/beds, and reduction of N<sub>2</sub>O and industrial greenhouse gas emissions.

Projects should be in line with the requirements of the Kyoto Protocol, in particular the fulfilment of the requirements of the JI Supervisory Committee and CDM Executive Board and the second trading period of the EU ETS (and subsequent periods).

As of December 2008, the NeCF had signed two contracts for the purchase of 1.6 million Certified Emission Reductions from two renewable energy projects in China. During 2008, the NeCF had considered around 15 project ideas in five different host countries.

### Jiangsu Xiangshui wind power project in eastern China

The Jiangsu Xiangshui wind power project reduces greenhouse gas emissions in China with the support of carbon financing from the NEFCO Carbon Fund (NeCF). The project is developed as a Clean Development Mechanism (CDM) project under the Kyoto Protocol and it will generate Certified Emission Reductions (CERs) from 2009 until 2015.

The project consists of the installation and operation of 134 wind turbines, with a total capacity of 201 MW, in Jiangsu province in the eastern coast of China. The project will deliver to the East China Power Grid over 400 GWh of emission-free electricity annually, which would otherwise be generated with fossil fuels.

By displacing fossil fuel-based electricity generation, the project reduces greenhouse gas emissions by around 400,000 tonnes of carbon dioxide equivalent (tCO<sub>2</sub>e) per year, or by more than 2.4 million tonnes over its ten-year crediting period (2009-2015). The NeCF has agreed to buy the first 1.4 million tonnes as CERs which the NeCF investors may use for compliance under the Kyoto Protocol or the EU Emissions Trading Scheme. Such carbon financing helps to boost the economic viability of clean energy investments.

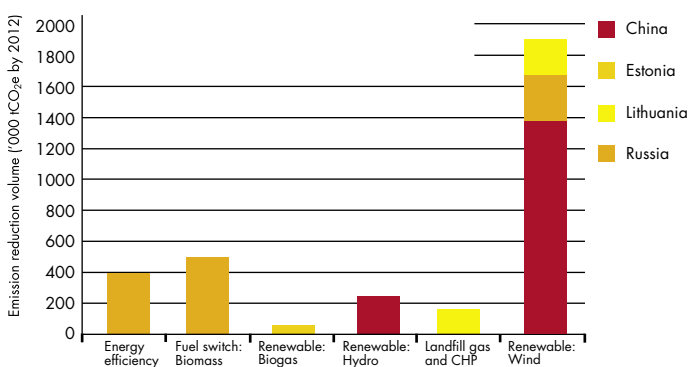
Besides global climate benefits, the project offers also local sustainable development benefits by reducing air pollution, creating employment opportunities and strengthening know-how in wind energy in China. The project enjoys strong local support, confirmed by the findings of a stakeholder consultation process. The project's Environmental Impact Assessment (EIA), which has been prepared and reviewed in accordance with host country legislation, identified no significant negative environmental impacts.

The project is owned and operated by Yangtze New Energies Development Co. Ltd., one of China's largest energy companies, and it has been developed as a CDM project in cooperation with the Foreign Economic Cooperation Office at the Chinese Ministry of Environmental Protection.

## 4. Carbon Finance and Funds (CFF) portfolio overview

The Fund Manager has sought to diversify portfolio risk across project types, with an emphasis on renewable energies and energy efficiency projects, taking into account the technical and realisable potential in the carbon markets of different host countries.

### Emission reductions from contracted CFF projects



The breakdown of emission reductions by technology demonstrates CFF's continuing emphasis on catalysing sustainable energy investments, notably renewable energy, particularly wind, solid biomass and biogas and energy efficiency.

As with any portfolio activity, it should be noted, however, that some of the projects could ultimately fail to deliver emission reductions for investment-related or approval reasons. During 2008, a number of projects have been withdrawn from the portfolio and replaced with new ones.

## Sustainable development benefits

CFF projects offer significant broader environmental, and sustainability benefits as well as climate change mitigation. These include, for energy sector projects:

- cost savings through improved efficiency and reduced fuel consumption and energy losses;
- providing an additional financial impetus for the transition to a lower carbon economy, reducing reliance on increasingly expensive fossil fuels;
- reduced levels of local air pollution through elimination of coal and mazut (heavy fuel oil), with benefits for human health;
- reduced groundwater pollution through reduced release of nutrients (primarily for animal waste treatment systems);
- improved operational reliability and comfort levels for communities, (for example district heating rehabilitations) especially important in colder environments;
- employment related benefits through job creation and retention, also training and development of new skills, and
- capital investment, technology transfer and introduction of best practices through international cooperation.

## Capacity building, dissemination and communication

NEFCO undertakes dissemination of all public project-related information. Such information can be found at <http://www.nefco.org/cff>, including project profiles in Russian.

During 2008, there has been participation by NEFCO staff in a variety of international events both to promote CFF funds and disseminate knowledge. NEFCO was represented at the COP 14 meeting, held in Poznan, Poland and the UNFCCC Technical Workshop on JI in Bonn.

In addition, there is an active programme of engagement in capacity building seminars and workshops in the current and new countries of operation, as well as ongoing project missions and outreach activities.

## Stakeholders & partnerships

CFF engages with a wide range of stakeholders in the course of its business.

- As regards emission reduction purchases, the Facility often co-finances projects with other institutions in order to diversify risk and to extend its project reach.
- For project identification and preparation, CFF works with a wide range of institutions and consultants. For example, TGF engages with a number of government organisations, institutes, consultants and project developers within the NEFCO network to source projects. In 2008, NeCF signed Framework Agreements with developers in Malaysia and India.
- In terms of capital equipment and engineering work, the projects supported by CFF have employed a wide range of international suppliers and contractors, including significant local content, particularly in China. Technology transfer has been an important element of the emission reduction projects.
- CFF also commissions consultancy work as part of its technical assistance programme to support its investments including project design documents, business plans/risk assessments and determination studies. By the end of 2008, it had committed over EUR 800,000 in total to such procurement.

Current TGF portfolio as of December 2008

Project and location	Category	Emission Reductions (tCO <sub>2</sub> e)	Status
Estonia: Saaremaa animal waste management project	Renewable energy, waste treatment, CHP	80,000	Contracted
Estonia: Viru Nigula 24 MW wind power development project*	Renewable energy	171,000	Contracted
Estonia: Kunda 7 MW wind power project	Renewable energy	74,000	Option Agreement
Estonia: Vanaküla 9MW wind power project	Renewable energy	114,000	Contracted
Lithuania: Lapes landfill gas utilisation project, Kaunas	Waste management, energy generation	160,000	Contracted
Lithuania: Benaiciai 16MW wind project	Renewable energy	129,000	Contracted
Lithuania: Sudenai/Lendimai wind projects	Renewable energy	75,000	Contracted
Russia: Murmansk district heating rehabilitation project*	Energy efficiency (supply side)	134,000	Under contracting
Russia: Khimprom waste coke oven gas utilisation project, Kemerovo	Energy efficiency (supply side)	318,000	Contracted
Russia: Vodokanal methane reduction and cogeneration, St. Petersburg*	Wastewater treatment, biogas CHP	210,000	Under contracting
Russia: Zhesart biomass fuel switch, Komi Republic	Renewable energy, fuel switch	63,000	Under contracting
Russia: Strezhevoi energy efficiency, Tomsk oblast	Energy efficiency	80,000	Contracted
Russia: Priezorsk fuel switch /energy efficiency, Leningrad oblast*	Renewable energy, fuel switch	81,000	Contracted
Russia: Kirov oblast biomass and natural gas fuel switch*	Renewable energy, fuel switch	430,000	Contracted
Russia: Chelyabinsk landfill gas utilisation	Waste management, energy generation	324,000	Under contracting
Russia: Karelian boiler house conversions from mazut and coal energy to gas and biomass	Fuel switch, renewable energy	203,000	Option Agreement

Project and location	Category	Emission Reductions (tCO <sub>2</sub> e)	Status
Russia: Biomass boiler fuel switch from mazut to biomass	CHP, fuel switch, renewable energy	69,000	Option Agreement
Ukraine: Kramatorsk district heating rehabilitation project	Energy efficiency	122,000	Option Agreement
Ukraine: Kubash-Lukva associated gas utilisation, Ivano Frankivsk	Associated gas utilisation	200,000(est.)	Option Agreement
Russia: Leningrad Oblast wind project	Renewable energy	387,000	Option Agreement
Russia: Biomass boiler conversion and associated energy savings, Mytishi	Fuel switching biomass, energy efficiency	152,000	Option Agreement
Estonia: Aravete biogas plant	Renewable energy, waste treatment, CHP	60,400(est.)	Option Agreement

Note: Emission reductions reported are those accruing to the project over the contract period.

\*Co-purchased with another buyer.

Current NeCF portfolio as of December 2008

Project and location	Category	Emission Reductions (tCO <sub>2</sub> e)	Status
China: Xiangshui 201MW wind project, Jiangsu province	Renewable energy	1.4 million	Contracted
China: 19MW Hydro Project, SW China	Renewable energy	245,000	Contracted

## Governance

The governance of the fund is based on a set of Operating Guidelines and overseen by an Investors' Committee, which meets usually four times a year (TGF) and two times per year (NeCF).

The Chair of the Committee is a revolving post, and was held in 2008 by Germany. At the end of 2008 the TGF Investors' Committee had the following composition:

- Bengt Boström, Swedish Energy Agency (Sweden)
- Inge Gerhardt-Pedersen, Danish Energy Agency (Denmark)
- Kenneth Topgaard Chmura, DONG Energy (Denmark)
- Barbara Appel, Ministry of Environment (Finland)
- Shamsheer Khan, Fortum (Finland)
- Uwe Schröder-Selbach, Federal Ministry for Economics and Technology (Germany, Chair)
- Helga Barðadóttir, Ministry of Industry and Commerce (Iceland)
- Line Sunniva Flottorp Østhagen, Ministry of Petroleum and Energy (Norway)
- Asko Dahlbom, Vapo (Finland)
- Antje Buder, Vattenfall Berlin (Germany) and Vattenfall Generation (Germany)



*Inaugural meeting of NeCF Investor Committee in Humlebaek, Denmark, July 2008*

At the end of 2008, the NeCF Investors' Committee had the following composition:

- Kenneth Topgaard Chmura, DONG Energy (Denmark, Chair)
- Inge Gerhardt-Pedersen, Danish Energy Agency (Denmark)
- Natalia Svejgaard, Industrialisation Fund for Developing Countries (Denmark)
- Magnus Rystedt, NEFCO (as Investor)
- Jon Kristian Pareliussen, Ministry of Finance (Norway)
- Jani Vesanto, Kymmipoima (Finland)

## CFF staff

The Carbon Finance and Funds Unit currently operates with nine full time staff, and in addition, draws significantly upon the resources of the NEFCO team in terms of environmental and technical due diligence and financial administration.

Two local climate change experts in Ukraine are employed on a full-time consultancy basis, and NEFCO's local Investment Advisors in Russia (located in St. Petersburg and Novgorod) have been trained in the application of carbon finance and are developing and managing JI projects in TGF's principal country of operation. A regional representative for Asia will be appointed in early 2009.

CFF staff during 2008 (based in Helsinki, unless otherwise indicated) were:

- Ash Sharma, Head, (coordination, origination, investor relations)
- Lotta Aho, Legal Counsel (legal, contractual and institutional issues)
- Hanna-Mari Ahonen, Project Manager (from 1st August 2008)
- Janika Blom, Legal Counsel (currently on maternity leave)
- Raili Kajaste, Chief Technical Advisor (technical due diligence, origination & environmental)
- Maija Saijonmaa, Project Manager (from 1st December 2008)
- Vladimir Morozov (origination & project management in Ukraine), based in Donetsk
- Vasyl Vasylychenko (origination & project management in Ukraine), based in Kyiv
- Tina Nyberg (administration matters)
- Kimmo Siira (origination & project management in Asia), based in Singapore (starts 1st February 2009)

### Further information

For additional information on NEFCO CFF, please visit <http://www.nefco.org/cff> or contact:

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