

Baltic Sea Region Testing Ground Facility (TGF)

Review of Experiences and Lessons Learned 2005-2009



Nordic Environment Finance Corporation (NEFCO)
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This report was prepared by NEFCO as part of its TGF dissemination and communication mandate. Project specific information on the TGF portfolio along with general information on the other activities of the Carbon Finance and Funds Unit is made available at www.nefco.org/cff

The views expressed in this report do not necessarily represent those of NEFCO, its member countries or those of the investors in the TGF.

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Table of Contents

Abbreviations 4

1 Overview: introducing the Baltic Sea Region Testing Ground Facility (TGF) 5

 1.1 Pioneering Joint Implementation 5

 1.2 Mobilising public and private resources for carbon finance 6

 1.3 Developing a portfolio of climate-friendly projects 7

 1.4 Building capacity and sharing experiences 11

2 Carbon finance: leveraging resources for emission reduction projects..... 12

 2.1 Dealing with expectations and realities of carbon finance..... 12

 2.2 Overcoming barriers to facilitate implementation..... 13

 2.3 Unleashing synergies through cooperation 13

3 Project development: finding and realising JI potential..... 15

 3.1 Identifying potential..... 15

 3.2 Ensuring results 16

 3.2.1 Picking the winners..... 17

 3.2.2 Provision of high-quality technical assistance 21

 3.2.3 Building stewardship and capacity 22

 3.2.4 Tackling bottlenecks..... 23

4 Institutions and policy: overcoming challenges of early movers 25

 4.1 Early mover issues 25

 4.2 International Track 2 issues..... 25

5 Capacity building: paving way for JI through learning-by-doing..... 26

 5.1 Dissemination and Capacity Building..... 26

 5.2 Stakeholders and Partnerships 27

6 Environmental integrity: generating co-benefits for sustainable development..... 28

7 Looking ahead: building on experience 29

 7.1 Conclusions 29

 7.2 Future Initiatives 30

References and Further Reading..... 31

Abbreviations

AAUs	Assigned Amount Units
AIE	Accredited Independent Entity
BASREC	Baltic Sea Region Energy Cooperation
CDM	Clean Development Mechanism
COP/MOP	Conference of the Parties / Meeting of the Parties
DEA	Danish Energy Agency
DVM	Determination and Verification Manual
EBRD	European Bank for Reconstruction and Development
ETS	Emission Trading Scheme
EU	European Union
IC	Investor's Committee of the TGF
JI	Joint Implementation
JISC	Joint Implementation Supervisory Committee
NeCF	NEFCO Carbon Fund
NEFCO	Nordic Environment Finance Corporation
NIB	Nordic Investment Bank
PDD	Project Design Document
STEM	Swedish Energy Agency
TGA	Testing Ground Agreement
TGF	Baltic Sea Region Testing Ground Facility
UNFCCC	United Nations Framework Convention on Climate Change

1 Overview: introducing the Baltic Sea Region Testing Ground Facility (TGF)

For the past five years, the Nordic Environment Finance Corporation (NEFCO) has been an active participant in the project-based segment of the carbon markets which have mobilised significant new investments for climate change mitigation. The Baltic Sea Region Testing Ground Facility (TGF), a pioneering regional carbon fund managed by NEFCO, has committed over 35 million euros of public and private capital to reward greenhouse gas emission reductions achieved by energy sector and other projects in the Baltic Sea Region through the Kyoto Protocol's Joint Implementation (JI) mechanism. The TGF's active procurement phase began in early 2005 and ended in December 2009. This report takes stock of the TGF's experiences and lessons learned over this five-year period.

1.1 Pioneering Joint Implementation

The origins of the TGF date back to the mid-1990s, when Nordic Council of Ministers first discussed the possibilities of establishing pilot Joint Implementation (JI) cooperation between the Nordic and Baltic Sea States with NEFCO acting as a clearing house. In 2000, the energy ministers of the Baltic Sea Region established the Baltic Sea Region Energy Co-operation (BASREC, see Box 2) and in 2003, the region was made a so-called Testing Ground for Joint Implementation to pilot and facilitate the implementation of JI in the Baltic Sea Region. The countries participating in Testing Ground Cooperation are Denmark, Estonia, Finland, Germany, Iceland, Latvia, Lithuania, Norway, Poland, Russia and Sweden.

Box 1. Joint Implementation (JI) in a nutshell

The Kyoto Protocol's Joint Implementation (JI) mechanism is designed to incentivize project owners to implement climate-friendly projects by offering financial rewards for project activities that demonstrably reduce greenhouse gas emissions compared to the baseline case. Project owners can claim Emission Reduction Units (ERUs) against monitored, verified emission reductions for reductions that take place during the Kyoto Protocol's first commitment period (2008- 2012), subject to host country approval and independent assessment of the project design ("determination") and its emission reductions ("verification").

Projects that have started in 2000 or later are eligible to apply for JI status. Emission reductions achieved before 2008 may be claimed as so-called early credit Assigned Amount Units (AAUs) and transferred within the framework of International Emissions Trading under the Kyoto Protocol, if so agreed with the host country.

The host country is responsible for approving the project and for issuing and transferring the ERUs, either in accordance with national procedures (Track 1) or international procedures (Track 2).

The TGF was established as a multilateral financing instrument for JI projects in the Baltic Sea Region, with the purpose of:

- providing economic resources for JI projects, primarily in the energy sector;
- disseminating the knowledge gained in respect of JI projects through the activities of the TGF; and
- assisting in achieving the objectives of the Testing Ground (see Box 2 for details).

The TGF implements JI projects by procuring Emission Reduction Units (ERUs) and early credit Assigned Amount Units (AAUs), generated by energy sector and other JI projects, on behalf of its investors. For project owners, the TGF offers so called "carbon finance" - income from the sale of ERUs and AAUs - as an additional revenue stream for project activities that

TGF Review 2005-2009

reduce greenhouse gas emissions. For its investors, the TGF constitutes a compliance instrument for meeting emission targets cost-effectively.

Box 2. Baltic Sea Region Energy Co-operation and Testing Ground Agreement

Baltic Sea Region Energy Co-operation (BASREC)

The energy ministers of the Baltic Sea Region Countries and the European Commission decided in 1999 that the energy co-operation in the region should be organized in the form of BASREC. BASREC offers a network and a dialogue between energy sector actors in the region. BASREC also conducts studies, analyzes the status and possibilities of development in energy policy strategies in the region, publishes handbooks and studies, and organizes seminars and workshops on regional issues and development possibilities in the energy sector.

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 (represented by the Directorate General for Transport and Energy); the Council of Baltic Sea States (CBSS); the Nordic Council of Ministers (NCM); and the Council of Baltic States (CBS).

Testing Ground Agreement for Flexible Mechanisms of the Kyoto Protocol (TGA)

The TGA creates a common **framework for the implementation of JI projects in the Baltic Sea Region**. It was signed on 29 September 2003 by seven BASREC members: Denmark, Finland, Germany, Iceland, Lithuania, Norway and Sweden. Estonia, Latvia and Poland joined the TGA later. Russia has yet to sign. The TGA came into force in February 2004.

The objectives of Testing Ground Cooperation are:

- a) 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 **realisation of high quality projects in the energy sector generating emissions reductions**;
- b) to gain **experience with the Joint Implementation (JI)** mechanism under the Kyoto Protocol in the energy sector, especially with projects in the fields of energy saving, energy efficiency, fuel switching in combination with energy efficiency or saving, and renewable energy sources;
- c) to develop **methods and procedures** in conformity with the rules and guidelines of the Kyoto Protocol with a view to ensuring the **environmental integrity** of projects;
- d) to collaborate in addressing **administrative and financial barriers** and the level of **transaction costs**, especially regarding small-scale JI projects;
- e) to facilitate generation, ensure **issuance and transfer of ERUs and AAUs** related to or accruing from JI projects and Emissions Trading and
- f) to implement projects **early** and offer credit for emission reductions **prior to 2008**.

The co-operation within the Testing Ground shall **focus on energy-related climate change mitigation projects** especially in the fields of energy saving, energy efficiency, fuel switching in combination with energy efficiency or saving and renewable energy sources.

The Parties agree to work together to **build capacity and competence** regarding the Kyoto Mechanisms in the **public and private sectors** to facilitate co-operation in this field, i.e. through arranging workshops, seminars and conferences.

The Parties are encouraged to **share information and experience** of JI activities. Such information should include information relating to the JI project cycle, credit issuance and transfer of credits. Exchange of views and experiences on institutional matters, methodology, administrative and financial barriers as well as transaction costs for JI projects should take place on an annual basis.

Participation in the activities on the Testing Ground for the Baltic Sea Region is **open to public and private** legal entities in Baltic Sea Region States that are Parties to this Agreement.

Sources: BASREC Website <<http://www.basrec-extra.net>> and the Testing Ground Agreement (2003)

1.2 Mobilising public and private resources for carbon finance

Launched as a public financing mechanism, the TGF has since evolved into a fully fledged public-private partnership. The first round of subscriptions in late 2003 was open to BASREC governments and raised 15 million euros from the governments of Denmark, Finland, Germany, Iceland, Norway and Sweden. At that time, the entry into force of the Kyoto Protocol was still uncertain - pending Russia's ratification - and investing governments were lending their support for creating a new market for Joint Implementation and for shouldering the early stage risks and uncertainties while building up the necessary capacity for the private sector to step in. The international and national rules of JI were also unclear at the time (see

TGF Review 2005-2009

Box 5 for key milestones). The TGF adopted a learning-by-doing approach, whereby capacity was built by implementing “early mover” JI projects which were likely to meet the relevant criteria and generate AAUs and ERUs which government investors could use to comply with their national greenhouse gas emission limitation targets under the Kyoto Protocol.

In 2005, the Kyoto Protocol entered into force, and the EU launched an Emissions Trading Scheme (EU ETS), imposing emission caps on large energy and industrial installations within the EU. Companies under this scheme were allowed to cover part of their emission caps with units generated by JI projects. The second TGF subscription, open between November 2005 and March 2006, was primarily directed at private entities and raised the total TGF capital to 35 million euros with contributions from nine EU ETS companies from Denmark, Finland and Germany, and an additional investment from the government of Finland.

The final composition of the TGF Investors is shown in Figure 1:

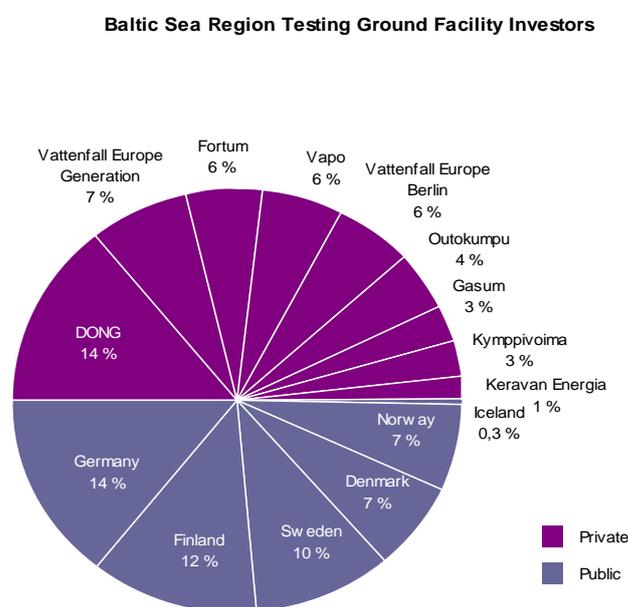


Figure 1: Investors in the TGF

The evolution from a public financing mechanism to a commercially oriented public-private partnership was seamless, reflecting the shared objectives and priorities of public and private investors and the natural shift in emphasis over time from learning and capacity building to implementation to high-quality, cost-effective JI projects. From mid 2006 onwards, when the private sector investors had joined the Investor’s Committee (IC), this group maintained common goals in overseeing the facility and the work of the fund manager.

1.3 Developing a portfolio of climate-friendly projects

NEFCO, as a multilateral financial institution whose principal mandate is for environmental investments (see Box 3), is well positioned to tap into synergies between traditional project

TGF Review 2005-2009

finance and carbon finance and possesses the required resources and networks to identify, develop and manage high-quality environmental projects.

Box 3. Nordic Environment Finance Corporation (NEFCO)

The **Nordic Environment Finance Corporation (NEFCO)** is a multilateral financial institution, founded in 1990 by the five Nordic countries, namely Denmark, Finland, Iceland, Norway and Sweden, to finance investments and projects primarily in Russia, Ukraine, Estonia, Latvia, Lithuania and Belarus, in order to generate positive environmental effects of interest to the Nordic region. NEFCO prioritizes projects that reduce emissions of greenhouse gases, improve the ecological status of the Baltic Sea or mitigate release of toxic pollutants.

NEFCO's portfolio currently comprises nearly 350 small and medium-sized projects spread across different sectors, including: chemical, mineral and metals, food and engineering, agriculture, water treatment, power utilities, municipal services, waste management, nuclear remediation, environmental management and environmental equipment manufacturing.

To provide the capital necessary to support projects, NEFCO works with a series of different funding bodies. The most significant of these are the Investment Fund, the Nordic Environmental Development Fund, the Testing Ground Facility (TGF), the NEFCO Carbon Fund (NeCF) and the Barents Hot Spots Facility. In 2009, NEFCO launched the Nordic Climate Facility (NCF) in cooperation with the Nordic Development Fund (NDF) and the Baltic Sea Action Plan (BSAP) Trust Fund together with the Nordic Investment Bank (NIB).

NEFCO also administers funds on behalf of other parties who are providing resources to environmental projects. These include, inter alia, the European Commission and the governments of the Nordic countries. Through its network of partnerships, NEFCO supplements finance from other interested parties and financial institutions. NEFCO also co-operates with bilateral environmental assistance programmes.

More information available at <http://www.nefco.org>.

The tasks of NEFCO as the TGF Fund Manager include developing a portfolio of high-quality JI projects and managing the full JI project cycle, from identifying and selecting projects to facilitating the evaluation and approval of the projects as well as the monitoring and verification of the associated emission reductions, and ultimately, ensuring the issuance and transfer of the ERUs and AAUs and their distribution to the investors.

NEFCO originates and screens project ideas against project selection and portfolio criteria, as set out in the TGF Operating Guidelines (see Box 4 for details), and presents eligible and potential project ideas for initial approval by the TGF IC. Reflecting the BASREC origin of TGF, projects with energy component are given strong preference (for example, landfill gas management projects without productive utilisation of heat or power have been excluded).

Box 4. Baltic Sea Region Testing Ground Facility (TGF)

The **Baltic Sea Region Testing Ground Facility (TGF)** is an open trust fund based on a public-private Partnership and managed by NEFCO. The fund invests in energy sector and other projects by purchasing AAUs and ERUs on behalf of its investors.

The TGF is overseen by an Investor's Committee (IC) and regulated by its Operating Guidelines. The IC usually meets four times a year. The Chair of the Committee is a revolving post. The Founding Investors each have one seat in the IC and new investors from the second subscription round that contributed more than 2 million euros are each entitled to a seat at the IC. Other investors, invited experts and observers from the BASREC secretariat and the Secretariat of the NCM can attend the IC meetings as observers.

Since 2005, the TGF has employed a full-time fund manager and with the extension of the fund in 2006 also a legal counsel, a technical advisor, a financial and project manager and a local representative from Ukraine, with NEFCO's two investment advisors in Russia also trained for working with JI. The Facility is managed by the Carbon Finance and Funds Unit of NEFCO.

NEFCO screens Project Idea Notes (PINs) against project selection and portfolio criteria, as laid out in the Operating Guidelines, and submits these to the TGF IC as investment proposals. Members of the IC vote on the approval of the PINs, with each member holding one vote. A majority of IC members present at a meeting constitutes a quorum for the approval of projects.

Given the BASREC origins, energy-related projects with a focus on renewable energy, fuel switch, supply side energy efficiency and cogeneration and demand side energy efficiency and conservation are given high priority. Also other sectors, such as waste management and projects related to reduction of other greenhouse gases, are eligible for financing from the TGF.

Project selection criteria include:

- eligible host country (the Baltic countries, Poland, Russia and, since 2006, also Ukraine);

TGF Review 2005-2009

- compatibility with relevant host country policies and priorities;
- compatibility with the strategic objectives and operational principles of the Testing Ground;
- compliance with relevant national and international JI rules and guidelines under the UNFCCC and/or Kyoto Protocol;
- use of proven technology with reasonable replication potential in the Testing Ground region;
- standard viability criteria (economic, financial, technical, institutional)

Portfolio criteria include:

- high level of cost-effectiveness
- preference given, to a reasonable extent, to energy sector projects;
- payments for ERUs/AAUs made predominantly against delivery, with upfront payments possible on a case-by-case basis,
- reasonable balance that takes into account and meets the needs of the Investors;
- eligible host country (the Baltic countries, Poland, Russia and, since 2006, also Ukraine);
- compatibility with relevant host country policies and priorities;
- compliance with relevant national and international JI rules and guidelines under the UNFCCC and/or Kyoto Protocol;
- use of proven technology with reasonable replication potential in the Testing Ground region;
- standard viability criteria (economic, financial, technical, institutional)

Since 2004, NEFCO has reviewed in excess of 200 investment proposals and presented around 90 projects for initial approval to its Investor's Committee. Of these, 33 projects proceeded to Option Agreement stage (equivalent to a Letter of Intent), launching an exclusive negotiation period for an Emission Reductions Purchase Agreement (ERPA) between the project owner and NEFCO. As of the end of 2009, NEFCO had concluded ERPAs with 13 projects, with the fund capital fully committed and the active procurement phase ended (see Figure 2).

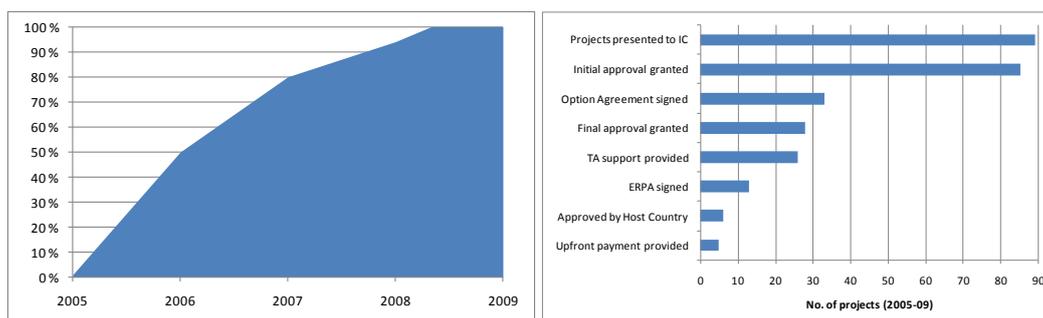


Figure 2. TGF capital committed and pipeline statistics

The TGF portfolio consists of wind power, energy efficiency (some with a fuel switch component), and methane avoidance (with energy utilisation) projects in Estonia, Lithuania, Russia and Ukraine (see Figure 3 and Figure 4). These projects represent over 400 million euros of investments, resulting in estimated annual emission reductions of over 3 million tonnes of carbon dioxide equivalent, or over 10 million tonnes between 2006 and 2012. On average, one euro of TGF carbon finance leverages over ten further euros for climate-friendly investments.

TGF Review 2005-2009

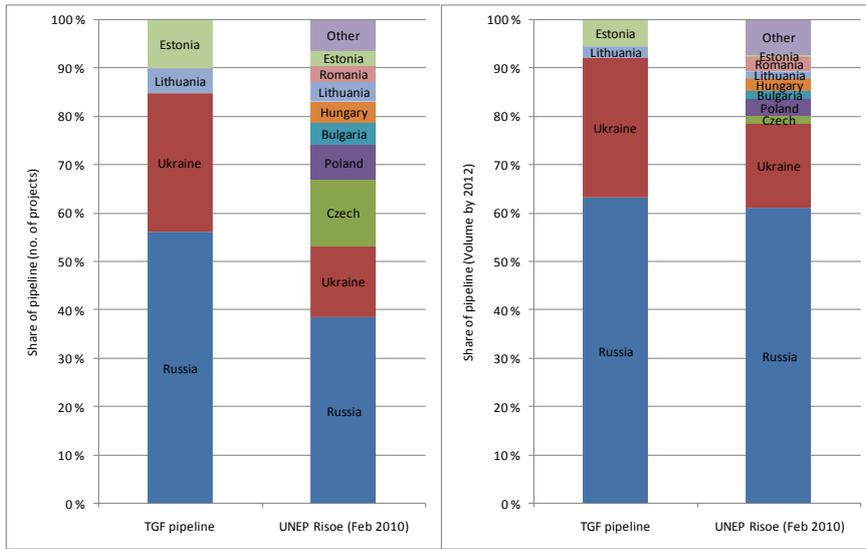


Figure 3. Host countries in TGF and overall JI pipelines

* TGF data on fuel switch includes also switch to biomass, whereas UNEP Risoe data on fuel switch includes only fossil fuel switch.
 Source: UNEP Risoe CDM/JI Pipeline Analysis and Database, 1st February 2010 (available at www.cdmpipeline.org).

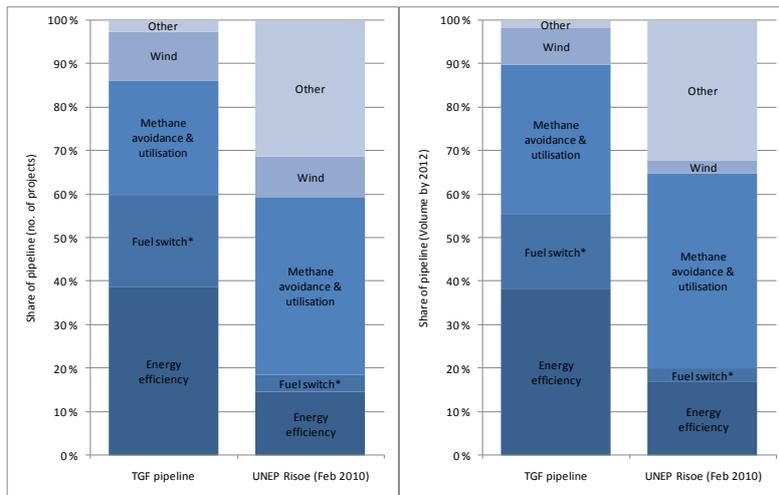


Figure 4. Project types in TGF and overall JI pipelines

* TGF data on fuel switch includes also switch to biomass, whereas UNEP Risoe data on fuel switch includes only fossil fuel switch.
 Source: UNEP Risoe CDM/JI Pipeline Analysis and Database, 1st February 2010 (available at www.cdmpipeline.org).

TGF Review 2005-2009

Box 5. Key milestones in international and host country policy, and TGF

Year	International policy	TGF host country policy	TGF milestones	TGF ERPAs	TGF funds committed
1992	UN Framework Convention on Climate Change (UNFCCC) adopted				
1993			Ad Hoc Group for Energy Related Climate Change Issues established under the Nordic Council of Ministers (NCM)		
1994	UNFCCC into force		First publication on JI cooperation in the Baltic Sea Region		
1995					
1996			Environment and Energy Group established under the NCM		
1997	Kyoto Protocol adopted		NEFCO analyses climate component of five energy projects		
1998					
1999					
2000			Baltic Sea Region Energy Co-operation (BASREC) established		
2001	CDM/JI rules approved CDM launched CDM EB established				
2002			Testing Ground for Joint Implementation projects established Environment and Energy Group renamed as Climate Group		
2003	EU ETS Directive approved TGA approved		Testing Ground Agreement for Flexible Mechanisms of the Kyoto Protocol (TGA) signed Baltic Sea Region Testing Ground Facility (TGF) established		
2004	EU ETS Linking Directive approved	Russia ratifies Kyoto Protocol	TGF documents developed TGF procurement launched		
2005	Kyoto Protocol into force EU ETS launched First CDM project registered First CERs issued JISC established		Full-time TGF Manager employed First TGF Option Agreement signed First Estonian LoA issued for TGF project	0	0%
2006	JI Track 2 launched First designations of Operational Entities under CDM	Ukrainian JI procedures published	First TGF ERPA in Estonia signed Private investors join TGF TGF expands to Ukraine	2	50%
2007	First JI project achieves Track 2 Final Determination	Russian JI procedures published Lithuanian JI procedures published	First TGF ERPAs in Russia and Lithuania signed First Lithuanian LoA issued for TGF project	7	80%
2008	Kyoto Protocol's first commitment period starts	Latvian JI procedures published	First TGF project achieves Track 2 Final Determination NeCF launched	10	94%
2009	First accreditations of Independent Entities under JI First ERUs issued	Estonian JI procedures published Polish JI procedures published Russian JI procedures revised	First ERUs issued for TGF project First deliveries for Investors made First TGF project achieves Track 1 Registration First TGF ERPA in Ukraine signed First Ukrainian LoA issued for a TGF project Active TGF procurement ends	13	100%
2010					
2011					
2012	Kyoto Protocol's first commitment period ends				
2013			Last TGF deliveries expected TGF expected to close		

1.4 Building capacity and sharing experiences

As previously outlined, the objectives of the TG cooperation were to build capacity amongst the relevant actors, both public and private, in the region to undertake JI and to share experiences. In this regard, the TGF has been successful. High quality investment projects have been supported and realised as a result of JI, and these have been carried forward to successful project registration, issuance and transfer of ERUs and AAUs.

However, in certain respects the concept and full potential of JI have not been realised. This may be attributed to a number of reasons, which are explored in the next chapter of this paper.

2 Carbon finance: leveraging resources for emission reduction projects

2.1 Dealing with expectations and realities of carbon finance

Throughout its existence, the TGF has operated under regulatory risks and uncertainties related to rules and institutions for JI both internationally and in TGF host countries. These uncertainties directly weaken the leverage effect of carbon finance on attracting traditional project finance, leading to a reality that falls short of the great expectations loaded onto JI and in some cases, rendering many project developers disillusioned and frustrated.

Many project types, such as renewable energy projects, require a high upfront investment before cash starts to flow in, and lack of access to capital is a common barrier to the implementation of first-of-a-kind and non-conventional projects. While energy efficiency or fuel switch projects do not usually require such large investments, they often face other prohibitive barriers, despite their apparent profitability. Carbon finance can help to overcome these barriers by boosting the financial viability of emission reduction projects relative to conventional alternatives, provided that carbon finance is recognised as a credible and valuable source of future income.

Especially in the early days, JI was often mistakenly expected to fully cover the upfront investment costs of the underlying project (a common misconception in many segments of the market as late as 2008) although, in fact, carbon finance more often is structured as a supplementary cash flow item, available only once the project has been implemented and approved as a JI project. Carbon finance is not easy money: it is the TGF's experience that navigation through the complexities of the JI project cycle requires special expertise, patience, time and a strong sense of local ownership. The extent and certainty carbon finance is directly linked to the implementation schedule and performance of the project as well as the timeline and likelihood of the project's approval as a JI project. The higher the uncertainties and risks, the heavier the discount on, and the weaker the leverage impact of, the carbon finance is in financial calculations.

Revenue from the sale of Emission Reduction Units only starts to flow in a year after implementation at the very earliest, with a typical time lag of two to three years and even more for early projects. Delays and uncertainties in the JI assessment and approval processes, delays and underperformance in the underlying project, and inadequate monitoring of emissions directly influence the timing, level and certainty of JI cash flows, sometimes dramatically. Under the current five-year window for claiming ERUs, delays in financial closure or construction can quickly extinguish the JI potential of promising project ideas. The TGF has found this in a number of cases which had looked promising at the Project Idea Note stage, but subsequently proved to be uneconomical.

However, for well designed and structured low carbon projects, with adequate financing, carbon revenues provide an important revenue stream that enhances the overall viability of of the project.

2.2 Overcoming barriers to facilitate implementation

To overcome the financial barriers of potential JI projects, the TGF has, in some cases, paid part of the expected ERU revenue upfront, against acceptable guarantees and agreed milestones. These upfront payments played an important role in the successful financial closure and timely implementation of several wind parks, a CHP unit fired by pig manure and a landfill gas cogeneration project in Estonia and Lithuania. The security for these advances were bank guarantees from financial institutions acceptable to NEFCO, and in one case a corporate guarantee from an investment grade guarantor.

The TGF also typically arranges and pays for JI-related upfront technical assistance (delivered through third parties), thus absorbing upfront costs in case the project fails to obtain JI status.

In the five-year period 2005-2009, the TGF has committed carbon finance to 13 emission reduction projects which, in total, mobilise over 400 million euros worth of investment to reduce over 10 million tonnes of carbon dioxide equivalent by 2012. On average, each euro of TGF carbon finance leverages over 10 euros of further capital investment for emission reduction project activities. The share of carbon finance as a proportion of the total capital investment for contracted TGF projects ranges from 3% to over 90%.

The TGF has paid disbursed a total of over 2 million euros of carbon finance upfront to Baltic projects in order to facilitate implementation, as well as over 1 million euros upfront for 26 projects for JI-related technical support.

2.3 Unleashing synergies through cooperation

NEFCO, in its dual role as Fund Manager and a multilateral financial institution, has sought to bring together lending, traditional project finance and carbon finance, for example by offering NEFCO loans or equity to eligible projects, and by utilising its networks to find co-financiers for the project and co-buyers for the project's Emission Reduction Units.

Awareness-raising, open dialogue and practical cooperation with financiers, project developers, technology providers, consultants and JI authorities have been key tools for introducing and actualizing the potential leverage impact of carbon finance and for designing and implementing successful JI projects.

NEFCO started its quest for financial synergies at home by integrating climate considerations into its standard screening procedures. As a small organisation wholly dedicated to environmental finance, it was relatively easy for NEFCO to introduce the carbon finance concept into mainstream operations, compared to many larger organisations. Externally, NEFCO has originated projects by promoting wider awareness on an ongoing basis through consultations and cooperation, bringing different parties around the table, coordinating efforts and roles of these actors, and translating JI concepts into tangible technical and financial components.

The TGF's geographic and sectoral scopes coincide with NEFCO's mandate as a financial institution, and thus, NEFCO's project pipeline is routinely screened for JI potential. The synergy potential is strengthened by the availability of relevant local networks and in-house procedures and expertise. The JI potential of NEFCO's lending pipeline is limited by NEFCO's

TGF Review 2005-2009

focus on relatively small projects and emphasis on small district heating and energy efficiency projects, which are often associated with prohibitively high JI-related transaction costs. Furthermore, NEFCO financing under certain of its instruments is available only to projects with a long-term Nordic interest.

Due to these limitations, the TGF has always sought project opportunities also outside NEFCO. The public-private partnership structure of TGF offers access to wide range of experiences, expertise, networks and modes of cooperation. The TGF is involved in co-purchase deals with the European bank for Reconstruction and Development (EBRD), the Swedish Energy Agency (STEM) and the Danish Energy Agency (DEA), among others. Besides sharing ERUs, co-purchasing enables the sharing of transaction costs, resources and risk. Co-financing, for example with TGF investors, the Nordic Investment Bank (NIB) or Nordic export credit funds, provides access to larger projects with greater volumes of emission reductions.

Box 6. Case study on carbon finance: Lapes landfill project in Lithuania



In Lithuania, TGF's JI project turns landfill gas collected from the Lapes landfill into heat and electricity for the nearby city of Kaunas. The project mitigates global climate change in two ways: firstly by trapping methane that would otherwise be released into the atmosphere at the landfill, and secondly by displacing fossil fuel-based heat and power generation and avoiding associated carbon dioxide emissions. In total, the Lapes project is expected to reduce greenhouse gas emissions by some 150,000 tonnes of carbon dioxide equivalent between July 2008 and December 2012.

The Lapes project is a pioneering project in many ways: it is first of its kind in Lithuania and one of the early mover JI projects, developed prior to the launch of international (Track 2) JI procedures in October 2006. It also paves the way for the implementation of the EU Landfill Directive, which mandates landfill gas collection - but not utilisation - from all old landfills in Lithuania from the beginning of 2012. Already in August 2004, a project developer approached the TGF with a Project Idea Note describing the project concept and also invited NEFCO to finance the project. The independent JI assessment was launched in March 2006 and the TGF Investors' Committee granted preliminary approval to the project in May 2006.

The project suffered considerable delays in the JI cycle, due to, *inter alia*, the lack of host country authorities, needed for issuing host country approval for the project, and revision of early project documentation to conform to international (Track 2) JI procedures and relevant international methodologies. The project obtained a Letter of Approval from Lithuania in December 2006, and achieved final JI status (Track 2 "final determination") on 1 January 2010, 3 years and 9 months after the launch of the determination process. The combined heat and power plant was inaugurated in October 2008.

Carbon finance was an integral block of the project's financial package from the beginning. Project financing consists of equity, a subordinated loan from NEFCO, a commercial loan from DnB and revenue from the sale of emission reductions to the TGF, 40% of which was paid upfront to facilitate implementation, against a bank guarantee and agreed milestones. Carbon finance covered over one quarter of the total investment cost - each TGF euro leveraged over 3.50 euros of further capital - and was critical in closing the financing gap and improving the project's viability. Without carbon finance, the project's internal rate of return (IRR) would have been 4.7% which would have been insufficient to even cover the loans' interest rates. Revenue from the sale of emission reductions increased the project's IRR to above 10%, rendering it economically feasible. This case demonstrates the ability of the Joint Implementation mechanism to boost project economics enough to realise a climate-friendly project activity that would have not happened without carbon finance.

3 Project development: finding and realising JI potential

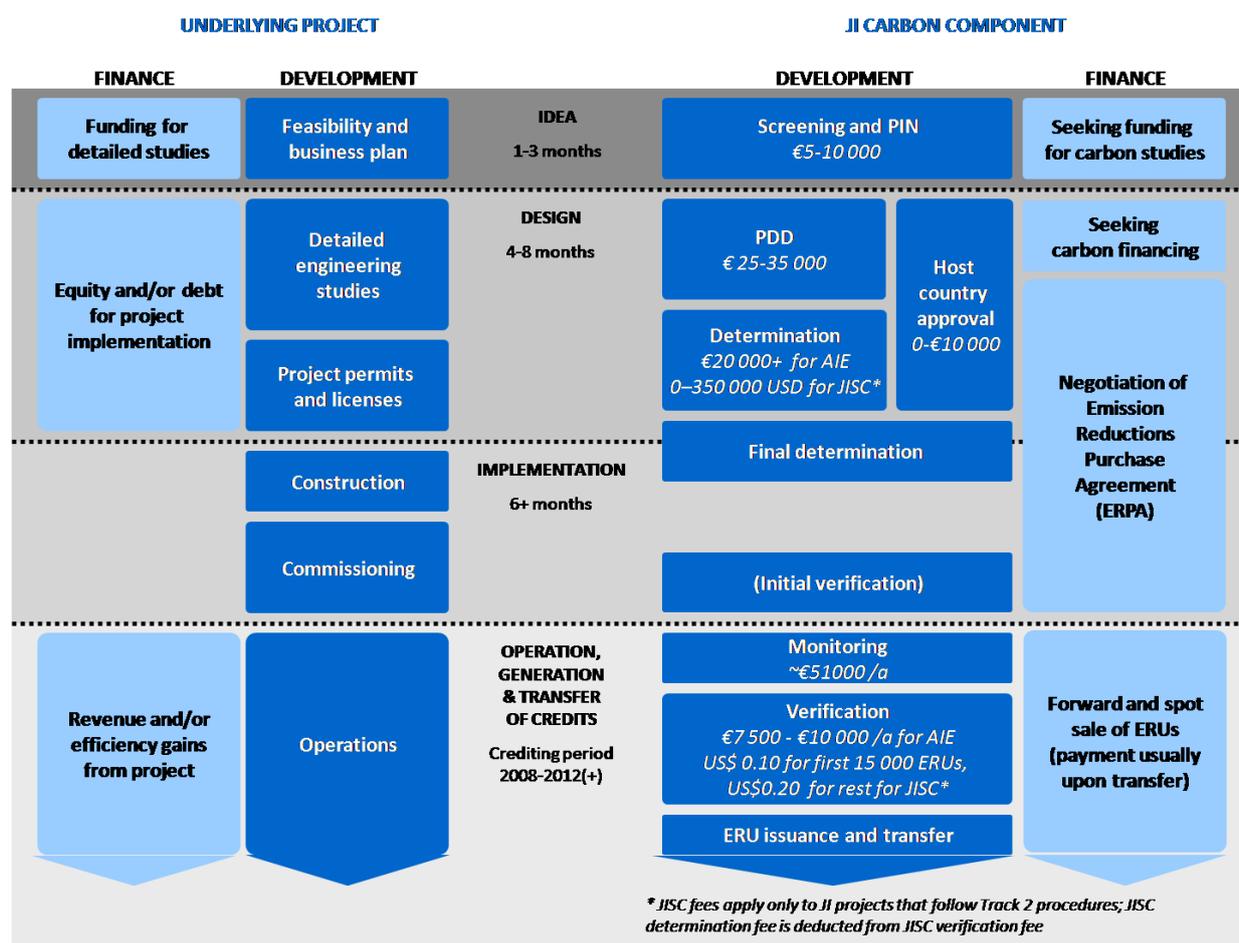


Figure 5. JI Project Cycle

3.1 Identifying potential

NEFCO used a number of channels to identify and develop projects for the TGF, including:

- the NEFCO pipeline, especially the NEFCO Investment Fund and the Special Finance Facilities (Cleaner Production Facility, Energy Savings Credits etc.);
- local and international intermediaries (e.g. the regional energy efficiency centres in Northwest Russia, the Cleaner Technology Centre in Kiev) and Nordic and German consultants;
- collaboration with institutions such as NIB, EBRD, DEA, STEM and co-purchasing with other buyers;
- tenders by ERU sellers;
- open call for projects and promotional activity; and

TGF Review 2005-2009

- outreach activities, speaking at and sponsoring conferences in the host countries and internationally.

Project ideas are pre-screened against basic criteria and eligible projects are presented to the TGF Investors' Committee for preliminary approval. Approved projects undergo thorough due diligence, including an assessment of the projects' JI eligibility and potential; technical, financial and economic feasibility; environmental impacts; and project risks.

The TGF manages the variety of risks related to project development and performance, financial and political risks, JI approval and delivery of ERUs. Box 7 lists some key risks and mitigation options.

Box 7. Key risks and mitigation possibilities of JI projects

JI eligibility

The risk that the project does not meet the relevant JI criteria can be mitigated by using experts to investigate the project's eligibility at the earliest stage possible; selecting and replicating project types with good track records; and making payments only upon ERU delivery. However, especially in the early years when no experience existed, the TGF had a mandate to shoulder some of the TGF eligibility risks and to test different project types, with a focus on energy sector projects.

JI potential

The risk that the project does not generate a sufficient volume of emission reductions can be managed by selecting sufficiently large projects or pooling together small projects; using a conservative approach and sufficient JI expertise for estimating the emission reduction potential; and contracting less than the full estimated volume, with an option to buy any further ERUs.

Host country approval

The risk that a host country approval is not obtained can be mitigated by focusing on projects that are in line with host country priorities; maintaining an open and regular dialogue with host country authorities, and selecting projects that are located in host countries that are supportive of JI and that have a solid track record of approvals. However, the TGF has a clearly defined geographic mandate which sets limits to diversification away from risky host countries.

Financial

The risk that the project fails to achieve financial closure or faces financial trouble after implementation can be mitigated by subjecting prospective projects to rigorous financial due diligence; engaging potential financiers in the project; and selecting projects at or near financial closure. However, JI considerations need to be introduced at a relatively early stage if the project is to demonstrate additionality, that is, to show that carbon finance was indeed pivotal in implementing the JI project instead of some alternative baseline activity.

Technical

The risks of delayed implementation and under-performance can be mitigated by choosing project technologies with good track records; ensuring relevant experience, solid stewardship and sufficient on-site training of project developers; and applying a conservative approach to implementation schedules and expected performance.

3.2 Ensuring results

Of the nearly one hundred project ideas that passed pre-screening, only 13 were eventually contracted, as shown in Table 1. Figure 6 and Figure 7 depict the composition of the TGF pipeline and portfolio by host country and project type, respectively.

TGF Review 2005-2009

Table 1 TGF portfolio as of January 2010

Project and Location	Category	Emission Reductions (tCO _{2e} by 2012)*	Status
Estonia: Biogas Energy Utilisation, Saaremaa	Renewable energy (biogas cogeneration), methane avoidance	89,000	Contracted
Estonia: 24 MW Wind Park, Viru Nigula	Renewable energy (wind)	330,000	Contracted (Track 1 Registration)
Estonia: 9 MW Wind Park, Vanaküla	Renewable energy	127,000	Contracted
Lithuania: 16.5 MW Wind Park, Benaiciai	Renewable energy (wind)	131,000	Contracted (Track 2 Final Determination)
Lithuania: Landfill Gas Energy Utilisation, Lapes	Renewable energy (landfill gas cogeneration), methane avoidance	152,000	Contracted (Track 2 Final Determination)
Lithuania: 6+8 MW Wind Parks, Sudenai and Lendimai	Renewable energy (wind)	79,000	Contracted (Track 2 Final Determination)
Russia: Waste Coke Oven Gas Utilisation, Khimprom	Energy efficiency (supply side)	354,000	Contracted
Russia: District Heating Rehabilitation, Strezhevoi	Energy efficiency (supply side)	70,000	Contracted
Russia: District Heating Fuel Switch and Rehabilitation, Priozersk	Renewable energy (biomass), fuel switch (to natural gas), energy efficiency (supply side)	155,000	Contracted
Russia: District Heating Fuel Switch and Rehabilitation, Kirov	Renewable energy (biomass), fuel switch (to natural gas), energy efficiency (supply side)	955,000	Contracted
Russia: District Heating Rehabilitation, Belokurikha	Energy efficiency (supply side)	395,000	Contracted
Russia: Associated Petroleum Gas, confidential	Methane avoidance (Associated Petroleum Gas utilisation)	1 million**	Contracted
Ukraine: Coke Plant Waste Heat Recovery, Alchevsk	Energy efficiency (demand side)	1.1 million	Contracted (Track 1 Registration)

* Estimated emission reductions based on latest version of the Project Design Document (PDD). Note that NEFCO does not necessarily contract the full amount.

** NEFCO's share of project's estimated emission reductions.

3.2.1 Picking the winners

Figure 6 shows that the success rate of Estonian and Lithuanian projects is higher than that of Russian and Ukrainian projects, especially in terms of numbers of projects (graph on the left)

TGF Review 2005-2009

but also in terms of emission reduction volume (graph on the right). The Baltic Countries were expected to be hosting more JI projects but many opportunities were effectively ruled out owing to concerns related to double counting under the EU's Emission Trading Scheme following the accession of these countries to the European bloc in 2004. The ETS offers higher prices than the ERUs since the EU Allowances have less risk attached.

The relative success in the Baltic States is explained by a combination of factors, including; NEFCO's long-standing presence and good reputation in the countries; NEFCO involvement in financing of underlying projects; stable investment environment and supportive regulatory framework; ability of project owner to provide an acceptable guarantee for upfront payments; and less interest amongst buyers for JI in the Baltic States compared to Russia and Ukraine, due to the smaller size of projects in these jurisdictions. Meanwhile, a political standstill regarding the issuance of Letters of Approval JI in Russia prompted many JI buyers to switch their attentions to Ukraine, which was new territory for NEFCO and added as a TGF host country only in 2006. Ukraine had already been an established JI host country with significant interest from Austrian, Danish and Dutch governmental purchasers, to name a few. Due to its political mandate and the support of its Investors, the TGF has remained active in the Russian JI space throughout this long period of uncertainty.

The contracting success of Estonian and Lithuanian wind projects is evident from Figure 76; the success rate of wind projects has been relatively high in terms of contracted TGF projects. However, the wind projects are small, in common with other energy projects in these countries, constituting barely more than a tenth of the total TGF contracted volume.

Fuel switch (including fossil fuel switch and switch to biomass) has a good success rate, and the success rate of methane avoidance and utilization is also reasonable. Methane avoidance and utilization covers the collection of methane from manure, landfills, sludge lagoons and oil fields. All contracted TGF methane avoidance projects also include an energy utilization component. While fuel switch is a relatively straightforward and predictable project type, methane avoidance - especially in landfills - faces challenges on many fronts, with landfill gas rights issues delaying implementation, poor maintenance reducing predictability of emission reduction volume, and insufficient monitoring and malfunctioning or poorly installed equipment jeopardising the yield of ERUs against realised emission reductions. Furthermore, in the former Soviet Union (Baltic countries excluded), the tariff structures of non-conventional power are not conducive to landfill gas fired generation, and landfills are typically remote from load centres or power transmission infrastructure, which could off-take heat and power. There is virtually no operational experience in Russia and Ukraine for management of such projects, which is a critical success factor for this project type. However, the TGF has shown that when well-managed, landfill gas projects can generate significant emission reductions with relatively low capital costs as shown by the Lapes project in Lithuania (see Box 6).

Energy efficiency (mainly in the district heating sector in TGF's case) is the category with the largest unrealised potential, especially in terms of project numbers. Given the high energy intensity, poor efficiencies and significant need for capital investment for rehabilitation and modernisation in the district heating sector, this should be a promising area for JI. The main challenges of this project type encountered by the TGF are linked to the small, distributed

TGF Review 2005-2009

nature of individual energy-saving measures, exacerbated by the lack of historical data to reliably measure the achieved savings and the need to use conservative default factors instead. This was encountered in the ambitious Kirov oblast fuel switching project (which aimed to convert ca. 100 boiler houses from coal and mazut to biomass and natural, together with the Danish Energy Agency), where reliable records of boiler house conversion dates and a lack of monitoring equipment has significantly reduced the emission reductions.

Furthermore, the apparent profitability and short payback times of energy efficiency investments complicate the demonstration of additionality, as non-financial barriers must be identified and justified on a case-by-case basis. These challenges can lead to prohibitively high unit transaction costs, often rendering small energy efficiency projects non-viable. In the TGF portfolio, this was illustrated by projects in Mytishchi city in Moscow oblast and Kramatorsk city in Donetsk oblast, Ukraine which proved to be economically unviable owing to their inability to sustain the transaction costs. One conclusion that may be drawn is that such projects may lend themselves better to aggregated forms of crediting, such as programmatic JI or Green Investment Schemes, than project specific JI.

TGF has found that in several instances, the financial additionality concept does not fully address the importance of the investment barrier to the projects implementation. In Russia and Ukraine there are many highly profitable projects which would not be implemented owing to limitations on access to financing. In other words, the role of the investment barrier is increasingly underestimated in the JI additionality procedures, while the role and importance of investment appraisal methods, as a primary decision making factor, is often over estimated.

Industrial scale waste heat or gas recovery projects are an exception; they can generate large volumes of emission reductions through a relatively small number of energy efficiency measures, and within a relatively short timescale owing to reduced planning and licensing challenges. Due to their high profitability, however, demonstration of additionality can be difficult given the move toward investment analysis, despite the existence in many cases of financing, operational or technical barriers to adoption.

TGF Review 2005-2009

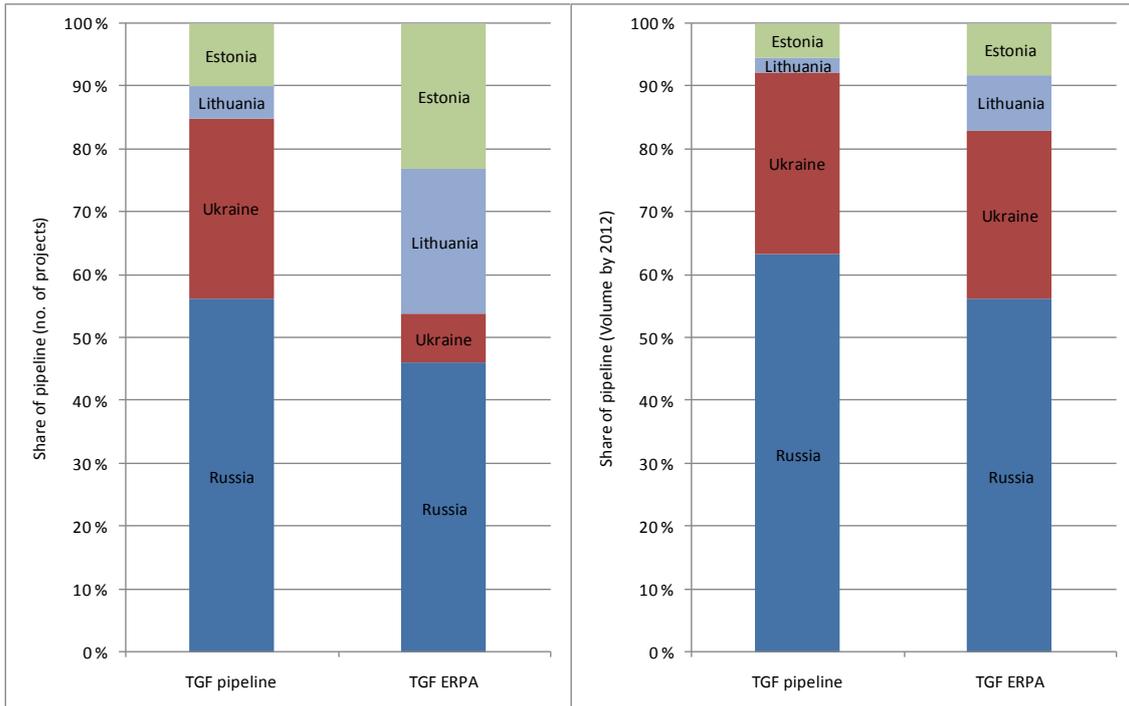


Figure 6. Host countries of TGF pipeline vs. final portfolio

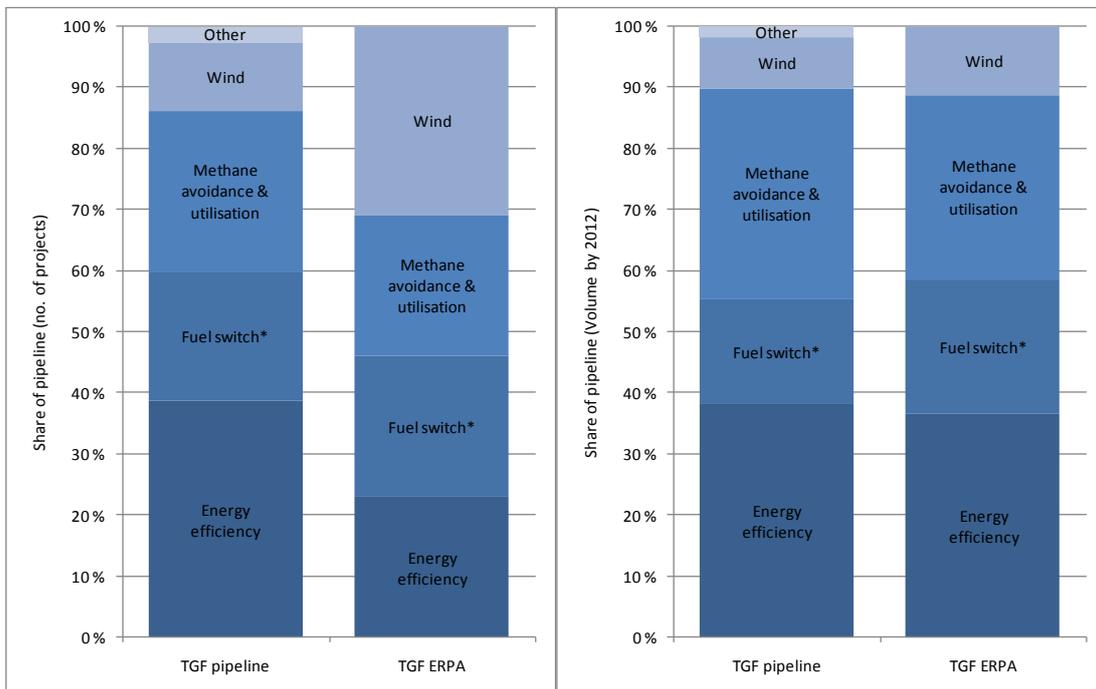


Figure 7. Project types of TGF pipeline vs. final portfolio

* TGF data on fuel switch includes also switch to biomass

3.2.2 Provision of high-quality technical assistance

In addition to all traditional project development work required to realise the underlying investment, JI project owners are required to prepare extra studies, undergo rigorous independent assessment, obtain host country approvals, monitor and verify implementation, and ensure the issuance and transfer of Emission Reduction Units (ERUs) before the project's JI status is confirmed. The TGF from the onset has provided and financed technical assistance to offset the project cycle costs, particularly the preparation of Project Design Documents, determination and in some cases, monitoring related costs. At inception, the Investors agreed to set aside up to 5% of the fund capital for this purpose, and NEFCO has additionally been able to mobilise technical assistance resources from other sources under its management such as the Barents Hot Spots Facility.

NEFCO has found the critical importance of using experienced JI experts to develop projects in line with JI requirements. This has been underscored by the increasing demands of the independent entities, due to JISC and other imperatives (insufficient numbers of auditors, prioritisation of CDM where methodologies have impending expiry dates etc). The time spent on addressing these "regulatory" issues has been out of all proportion to the materiality of the questions posed, leading to large overruns on time and costs. Where these costs have been capped, this has placed significant burdens on consultants (to whom the TGF owes a debt of gratitude for their professionalism and perseverance) and the independent entities themselves, whose costs on individual contracts are also fixed, but have increased for new assignments. The additional work required has offset the expected benefits and reduced costs due to expected competition between independent entities, since the capacity constraints applied across the sector.

The changing and generally increasing, demands of the mechanism, has to a large extent, undone some of the "learning by doing" benefits would otherwise accrue to developers of PDDs. These consultants have had to charge more for their services, when it would be expected that costs would reduce over time as the process standardises. It has also erected *de facto* barriers to entry for new consultants to enter the market, since fund managers will elect to minimise risk by selecting only those who have first hand experience of navigating the choppy waters of the JI mechanism.

The importance of direct involvement in PDD preparation from company staff and local consultants should not be underestimated. Local knowledge and ownership is crucial particularly in the monitoring and verification phase.

Another practical constraint for consultants has been that most of the Ukrainian and Russian companies have inadequate energy and environmental data collection and management systems. Many of them often do not have reliable and documented measurements for previous year's energy consumption, energy sold, plant efficiencies, etc and, in some cases, have poorly prepared feasibility studies to support their JI project investment decisions. In those instances, it is difficult to apply CDM methodologies to the projects proposed.

In addition to hiring independent consultants, the Carbon Finance and Funds Unit of NEFCO has provided significant technical support at all stages of the project cycle to project owners, through its own project managers, to minimise risk for projects. Whilst not measured or

TGF Review 2005-2009

costed in any scientific manner, this investment in kind has been essential to get projects through. In the most part, the project owners have been patient and understanding, despite the complexities of the project cycle.

Overall, the TGF was able to keep a control on transaction costs across the portfolio although there has been large variation between projects, given the size and project type, with smaller projects bearing a higher unit cost. Costs have generally increased over time such that later projects added to the portfolio have borne higher unit costs. Unit transaction costs incurred by TGF for projects reaching the ERPA stage have been between 0.10 and 0.40 euros per tCO_{2e} (using ERPA volume and gross TA costs), with an average of 0.13 euro per tonne.

3.2.3 Building stewardship and capacity

An open, regular dialogue with project owners undertaken by local project coordinators is critical for the success of JI projects. To ensure strong local stewardship for the project, project owners need to be engaged already during the project design stage, have a balanced and realistic view of the JI-related benefits, duties, risks and uncertainties, receive appropriate and sufficient training in monitoring and reporting, and maintain a regular dialogue about progress throughout the crediting period. It is also essential to have a “JI champion” within the project owner willing and able to drive the project, influence management and ensure the project is effectively executed from the host company side.

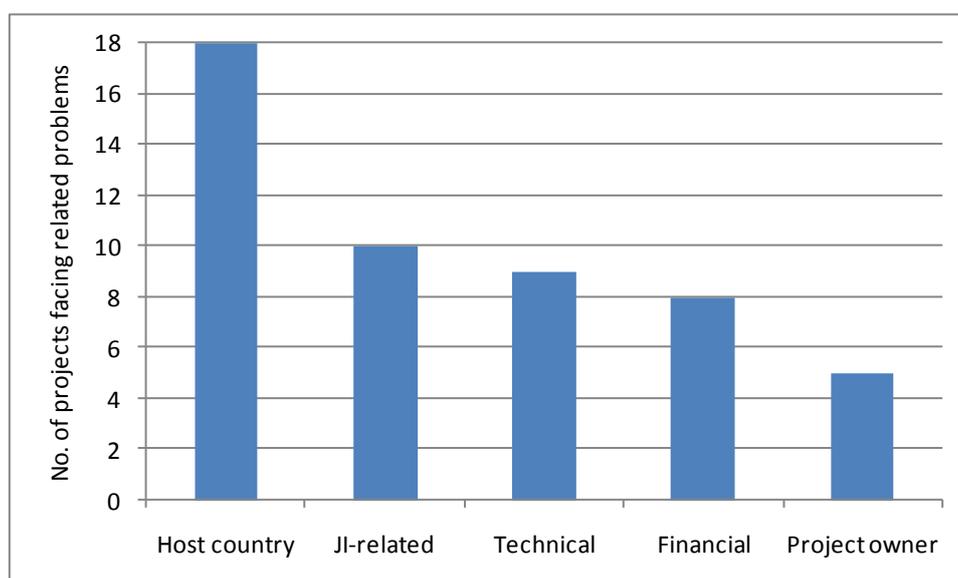


Figure 8. Main challenges of advanced TGF projects

It should be recognised, however, that the challenges, costs and most of all, the predictability of the process have changed significantly over the period of the TGF’s operation. One of the key challenges with project owners, particularly in Russia and Ukraine has been the limited understanding of the international processes and explaining the reasons for the lengthening timescales. In Russia where the bulk of JI potential lies, many of the companies that TGF had

TGF Review 2005-2009

engaged were cautious about a mechanism which had not been fully embraced by the government, and which was seen as being overly bureaucratic, even in the domestic sphere.

NEFCO's experience is that one of the key challenges of JI is that all pieces of the puzzle must work; a single bottleneck can prevent success even if all other areas work fine. Some of these concerns can be addressed, to a limited extent, by good sequencing and parallel tracking of activities and project management, but many activities are beyond the control of the project owner and the fund manager. However, with perseverance, the TGF has been successful getting projects across the finishing line, with 5 projects reaching the final stage at the time of writing.

3.2.4 Tackling bottlenecks

NEFCO has recorded and analysed the measurable time lags in the JI cycle as relate to the TGF projects. The time lag between start and finalisation of project determination alone ranges from 2.4 months to over 3.5 years, averaging 556 days (18,5 months), as illustrated for a selection of projects in Figure 9. There has been a significant increase in the length of determination process as a result of the regulatory tightening over time. In 2005-2006, determinations (ie evidenced by a draft determination report) often took place in typically less than 3 months, and included programming of review time for comments by PDD consultants. By 2008, they were routinely taking 9-12 months, and often much longer. If evaluation, PDD preparation and post determination activities are included, then project implementation typically takes 2-3 years. There are several early stage projects in the final portfolio which were part of the early (2004) pipeline, including projects at the final determination stage.

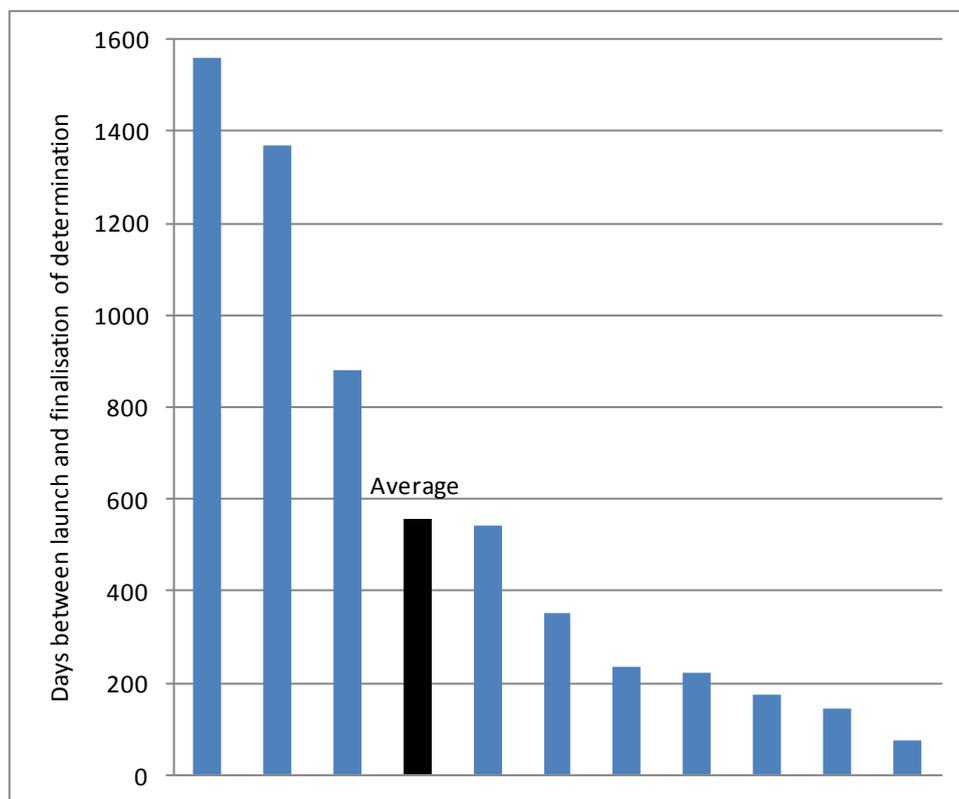


Figure 9. Time lag between start and finalisation of determination

Some of the causes of these time delays are outlined in Box 8.

Box 8. Causes of time lags at different stages of the JI cycle

PDD preparation (2-6 months): data collection can be challenging and time-consuming, especially in more complicated and/or decentralised projects; communication between project owner and PDD consultant can be a challenge (language, and otherwise).

Determination (5 months - 3+ years): formalities, contracting, publication of PDD; organisation of site visit, availability of supporting material, delays in issuing determination report, delays and lags in the dialogue between IE and PDD consultant; delays in technical review and lack of key documents (e.g. host country LoA) to finalise determination.

Host Country Approval (1 month - several years): lack of functional procedures or other reasons can prevent issuance of Letters of Approval (LoAs) and thus, block the project's progress. As of February 2010, no LoAs had been issued for Russian projects, and Estonia has seized issuance of LoAs for new energy sector JI projects until a court case on the national allocation plan has been settled.

Track 2 Final Determination / Track 1 registration of JI project (1.5 months -): lack of LoA and/or accreditation of IE can block final approval as JI project. Once papers are in order and if no review is requested, track 2 Determination is deemed final 45 days after the Determination Report has been published. Track 1 registration can be achieved typically in two to four weeks.

Monitoring and verification (2-10+ months after end of monitoring period): if monitoring is conducted properly, monitoring reports can be prepared in a few days and verification can be conducted within a few weeks, subject to availability of AIEs. Track 1 Verification is deemed final 15 days after the publication of the Verification Report, if no review is requested.

Issuance and transfer of ERUs (approx. 1 week after final verification): the speed of issuance and transfer of ERUs against verified emission reductions depends on host country procedures. NEFCO has thus far received ERUs only from Lithuania. ERUs were issued and transferred two business days after the Verification was deemed final.

4 Institutions and policy: overcoming challenges of early movers

4.1 Early mover issues

In many industries and technologies, early adoption often leads to a competitive edge. TGF has benefitted from its relatively early engagement in the JI market. Notably, this has been in the developing of relationships with national authorities and the building of networks in the host countries. However, in common with other early movers in the JI, such as the World Bank and early national programmes, the TGF has experienced some hurdles as relates to its projects.

The constantly changing bottom-up rules led to uncertain auditing processes and updating of documentation (notably in 2006). The reformatting of PDDs has in some cases led to additional work undertaken by independent entities, introducing more delays into the procedure.

Joint Implementation demands an important role for national institutions in the promotion of the mechanism, evaluation and approval of projects and ultimately transfer of credits. In the early years, there were human capacity constraints in some of the countries with too few staff, often stretched across several tasks, and a lack of internal guidelines. These were addressed over time. In particular, the TGF has benefited from the overarching Testing Ground Agreement, which is mentioned in the JI procedures of certain of the Baltic countries. Of the TGF countries of operation, Estonia showed particular support to early mover projects by accepting PDDs in various formats.

4.2 International Track 2 issues

Track 2 JI was operationalised in April 2006, but the mechanism has failed to register many projects. As of March 2010, 217 projects has been submitted to this procedure but only 11 (of these 3 are TGF projects) had achieved final determination. Furthermore, only 5 projects are issuing credits.

CDM has been the model for Track 2 JI, although there has been a trend of focusing more and more on the differences between the mechanisms – especially the possibility to use project-specific methodologies - rather than simply copying the procedures. So in that respect, Track 2 – and indirectly, CDM - has had a key role in formulating Track 1 JI. CDM and Track 2 JI are extremely dependent on the functionality of the key institutions, especially host country approval and AIEs. In NEFCO's experience, one bottleneck can clog the entire system and demotivate the other actors into becoming bottlenecks, too. For example the numerous delays in obtaining determination reports have knock on delays for submission of Letters of Intent. In Russia, this has meant that the TGF has been unable to submit three projects - half its portfolio - to the LoA tender in March 2010. Another key challenges in JI has been the freedom to use project-specific methodologies combined with the lack of specific guidance from host countries and/or JISC and the abundance of very specific but non-systematic guidance from the EB, and this combined by the reluctance and insufficient capacity of AIEs to make such judgments on their own, possibly due, in part, to mistrust and miscommunication between JISC/EB and AIEs and also host countries.

TGF Review 2005-2009

TGF made a decision in 2008 to focus on Track 1. It can be noted that even when Track 1 is used, Track 2 has a big influence, as most host countries have adopted elements (project cycle steps, actors) of Track 2 procedures. Some TGF countries have developed their own Track 1 procedures, such as Lithuania, but this has nonetheless worked well.

NEFCO has maintained a dialogue with the UNFCCC Secretariat, and has been invited to participate and present at its experiences of the mechanism in all the annual JI Technical Workshops since 2006. These have been a useful platform for information sharing. In its response for the call for comments for the determination and verification manual (DVM) in 2009, NEFCO made the following recommendations:

- Introduction and definition of the concept of materiality to avoid excessive focus on minor issues that have insignificant impact on the project's emission reduction calculations
- Inclusion of elaboration, explanations and examples into the DVM, for example as an annex, bearing in mind that the DVM can also facilitate the preparation of high-quality PDDs. Examples could include reference to relevant ISO standards, BAT documents and other recognised, standardised sources.
- Allow use of versions of methodologies, tools and PDD templates that are valid at the time of launching the determination (i.e. at the time of publishing the PDD at the JI website for the first time). Determinations can take years due to internal bottlenecks at IEs over which the project developer has no control. The requirement to revise the PDD every time there is a new version available will introduce unreasonable uncertainty into the JI cycle in terms of timeline and cost.

At the September 2009 JI workshop, NEFCO called for practical support to alleviate bottlenecks by providing further clarity on JI requirements and asking the Secretariat to provide checklists and helplines to avoid the repetition of common mistakes and to tackle minor issues (e.g. formatting of documents).

5 Capacity building: paving way for JI through learning-by-doing

5.1 Dissemination and Capacity Building

In essence, the TGF was envisioned as an enhanced capacity building activity, with a practical approach of learning by doing. Whilst "learning by doing" research projects had already tested this approach, including notably the Joint Implementation for International Emissions Trading through Electricity Companies in the EU and Central and Eastern Europe (JOINT) programme funded by the European Commission (2000/1), an enduring facility with substantial financing was envisaged by BASREC stakeholders, more akin to the Prototype Carbon Facility, established by the World Bank.

The TGF has attempted to remain true to the capacity building and dissemination aspects of its founding mandate, albeit with a focus on specific project activities (it has no promotional or institutional budget for instance). Some of the activities are summarised in Box 9.

TGF Review 2005-2009

Box 9. Dissemination and Capacity Building activities

NEFCO has undertaken a range of activities to build awareness of the TGF and capacity in its countries of operation, including

- Engagement with project owners is a key part of the operation of the TGF. NEFCO has originated and evaluated in excess of 200 energy related project proposals across a range of host countries, sectors and technologies, and whilst proceeding with less than half of these, it provided feedback to developers and projects.
- Regular speaking at conferences and workshops, with an emphasis on host country events. Outside of the host countries, NEFCO has shared its experiences at various international fora including commercial conferences, UNFCCC technical workshops, COP/MOP side events, and events organised by BASREC, the European Commission, the World Bank and others.
- NEFCO has participated in capacity development initiatives in practical terms in both Russia and Ukraine. This has included the Capacity Building Programme on Joint Implementation in North West Russia, funded by the Nordic Council of Ministers (2005/2006) and Promoting Energy Efficiency and Renewable Energy in Ukraine by JI Capacity Building, funded by the Norwegian Ministry of Foreign Affairs (2007/2008). Both initiatives worked on a learning by doing approach, focussing on taking investment projects through the project cycle.
- NEFCO is a participant in a Danish Ministry of Finance funded project “Future Perspectives in Carbon Market Mechanisms” (2010) which aims to share and disseminate practical experiences in the procurement of JI /CDM projects, and outlining future interventions.

NEFCO undertakes dissemination of all project related information at its website, publishing project summaries, the latest Project Design Documents and Determination reports.

Wherever possible, NEFCO has supported the development of host country institutions and policies through ongoing dialogue with national authorities, and by implementing some of the first JI projects in the TGF countries of operation.

5.2 Stakeholders and Partnerships

The TGF has engaged 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, TGF 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 terms of capital equipment and engineering work, the projects supported by TGF projects have employed a wide range of international suppliers and contractors, including significant local content, particularly in Russia. Technology transfer has been an important element of the emission reduction projects.

Table 2 lists some of the organizations with which it has cooperated.

Table 2. TGF Cooperation with companies

Local (Host Country) Companies	Nordic and German Companies
<ul style="list-style-type: none"> • Bureau Veritas Certification Russia (UK / Russia) • Carbon Management Service GmbH (Estonia) • COWI (Denmark / Russia) • Ecopolis Ltd. (Russia) • FORCE Technology Rusland (Russia) • Intercon Energy OÜ (Estonia) • Kareljan Energy Efficiency Center (Russia) • Nelja Energia OÜ (Estonia) • OÜ Saare Economics (Estonia) • UAB Ekoresursai (Lithuania) 	<ul style="list-style-type: none"> • COWI (Denmark / Russia) • Det Norske Veritas (Norway) • Grue & Hornstrup (Denmark) • Norsk Energi (Norway) • Vattenfall (Sweden) • DENA (Germany) <p>Other Companies</p> <ul style="list-style-type: none"> • Bureau Veritas Certification Russia (UK / Russia) • Evolution Markets Ltd. (UK) • Norton Rose LLP (UK) • TÜV-SÜD Industries Service (Germany)

6 Environmental integrity: generating co-benefits for sustainable development

As an institution, NEFCO's *raison d'être* is environment finance. Hence, NEFCO pays particular attention to environmental impacts in its screening and assessment of projects. TGF projects have been found to offer significant broader environmental and sustainability co-benefits as well as climate change mitigation. For energy sector projects, these have included:

- 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 the TGF countries of operation;
- 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.

7 Looking ahead: building on experience

7.1 Conclusions

The TGF has been able to demonstrate, at a practical and region wide level, the utility of Joint Implementation as a tool for mobilising significant financing for energy related projects. Some key conclusions can be drawn from its operation over the period 2005-2009:

- The TGF has played a role in the building of JI capacity in its countries of operation, in both public and private sectors, by promoting high quality energy related projects generating emission reductions which can ultimately be used for compliance purposes. This was a key objective of the Testing Ground Agreement under BASREC. TGF projects have been taken through the entire project cycle, resulting in AAUs and ERUs being issued and distributed to Investors at the end of 2009.
- If successfully implemented, JI can cover a significant share of total investment costs, especially in case of energy efficiency and methane avoidance and utilisation (i.e. biogas, landfill gas and associated petroleum gas capture and energy use), typically at least 20%. The TGF has shown there is a potential for leveraging carbon finance to promote energy related investments. The 35 million euro TGF facility, has mobilised over 400 million euro of capital investment in the countries of operation.
- Upfront payments and technical assistance can be used to share project development risks and to facilitate the implementation of the project, especially in case of wind power projects with high upfront investment and relatively low operating costs. However, the security issues for these prepayments need to be addressed since carbon procurement vehicles such as the TGF are unable or unwilling to take significant credit risks. Herein lies a potential role for a public financing mechanism which offer guarantees based on the ERPA contract as a security instrument.
- However, the main benefit of carbon finance through JI, is that it provides a revenue stream that can support energy projects over a period of time. Payment on delivery can create incentives for good management and appropriate monitoring, placing a large share of the risks on the project owner's shoulders. However, underlying projects must be well developed, with good business plans demonstrating financial viability. TGF has shown that JI is not alchemy, but that it can improve the financial viability of good projects.
- The JI process has experienced a number of procedural constraints which if they are not addressed, will significantly reduce the scope for the mechanism to play an active role in the post 2012 climate mitigation world. For it to play a meaningful role, the modalities and procedures of JI (or successor mechanisms) should afford a more timely, predictable flow of projects. In certain, respects, smaller projects are better suited to aggregated approaches rather than the project specific model that currently exists.

7.2 Future Initiatives

Whilst the active procurement phase of the TGF effectively ceased in 2009, the facility remains active in the fund administration (closing out final determinations, monitoring and verification, back office functions) and portfolio management modes. The Operational Guidelines foresaw a termination of TGF activities by 31 December 2012, unless investors decide to continue the business of TGF. However, in response to Investor demand, in April 2008, a global “TGF continuation fund”, later named the NEFCO Carbon Fund (NeCF) was launched, building on the experience and the networks of the TGF. A Public Private Partnership model based in certain key respects on the TGF (and differing in others), the NeCF has continued the work of the TGF albeit on a more commercial procurement basis, and remains open to JI projects.

The original philosophy of the TGF was to test projects within the Joint Implementation mechanism and gain experience in what was, at the time, an emerging carbon market. However, by the time the Facility started operating in 2004 and with the subsequent addition of private sector Investors in 2006, implementation of investment projects was more relevant than “testing” the JI concept, although the name remained. To a great extent, many of the objectives of the original public financing mechanism have been fulfilled, with lessons learnt and returns generated for Investors.

A successor facility could remain true to the origin of the Testing Ground Cooperation by “testing” novel concepts and experimenting with new financing mechanisms, sectors, and/or approaches, including programmatic activities, sectoral approaches and variants of so-called Green Investment Schemes which could have useful scale up possibilities for climate mitigation interventions in transitional economies. A new facility could test standardised approaches taking into account the need for accuracy and environmental integrity, accessibility, applicability and transaction costs.

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