

# **The Baltic Sea Region Testing Ground Facility**

---

A pioneering  
climate  
finance  
instrument



# Contents

<b>3</b> <b>Foreword</b> A pioneering initiative	<b>8-9</b> <b>Case study 2</b> Lapes landfill gas project, Lithuania	<b>14-15</b> <b>Guest commentary</b> by Dirk Forrister
<b>4-5</b> <b>Fund Manager's Overview</b>	<b>10-11</b> <b>Case study 3</b> Animal waste management in Estonia	<b>16-28</b> <b>Background to the TGF</b>
<b>6-7</b> <b>Case study 1</b> Coke oven gas utilisation at OOO PO Khimprom in Kemerovo, Russia	<b>12-13</b> <b>Case study 4</b> Alchevsk coke plant, waste heat recovery project, Ukraine	<b>29</b> <b>Guest commentary</b> by Piotr Dombrowicki
		<b>30</b> Further reading and abbreviations



**16-28**  
The TGF has supported eleven emissions reduction investments in four countries.

## FOREWORD

# A pioneering initiative



As a multi-donor fund with a regional focus, the fund was targeted at the energy sector in economies-in-transition.

Climate change presents risks and opportunities for traditional production systems and business models. The fact that it is happening in our lifetimes, with higher level of unpredictability and regional variations in the climate system, is beyond doubt. There is a high level of awareness of these challenges in communities and businesses, particularly here in Northern Europe. Corporations, both public and private, expect an emissions constrained future and have been for many years assessing the risks and opportunities inherent in the much needed transition to a low carbon economy.

There have been many changes in the policy responses to climate change over the decade that the Baltic Sea Region Testing Ground Facility (TGF) has been operational. First, there is now a broader acceptance of market pricing instruments. Despite slow progress in the international climate negotiations under the UN, many economies in the developing and developed world are planning, trialling or implementing domestic mitigation actions based on carbon pricing in some form, be they emissions trading or carbon taxes. The World Bank in 2014 estimated that 40 national and over 20 sub-national jurisdictions are putting a price on carbon, accounting for 12% of global GHG emissions. Somewhat counter-intuitively, this comes in the wake of the 2012 collapse in carbon credit market prices. There is belief that project based instruments such as Joint Implementation or their successors, together with all the lessons learned and capacity created, will have a role to play in the post 2020 world of climate policy.

Second, there has also been a growing recognition that the low carbon transition can be better achieved through public-private partnership. The private sector has the investment capacity, know-how and access to financial markets but needs the policy certainty and price signals from the

public sector to do the heavy lifting when it comes to investment. This is especially the case in the energy industry. The TGF was an early actor in this respect, and the two groups of investors, sovereigns and the private sector cooperated well when the corporate participants joined the fund in 2006.

The TGF was a pioneering initiative in many ways, as I hope you will learn in this report. As a multi-donor fund with a regional focus, the fund was targeted at the energy sector in economies-in-transition which suffer from high GHG intensity. There were multiple learning outcomes for the participants, and significant benefits for stakeholders including the project owners, their suppliers, local communities and society — including notable environmental co-benefits in many cases. For these reasons, it has been a privilege to participate in the fund.

### **Erik Nieminen**

Finance Director,  
Vapo Oy, Finland

—  
Outgoing Chair,  
TGF Investment  
Committee  
2012–14



VAPU OY



# Fund Manager's Overview

The Baltic Sea Region Testing Ground Facility (TGF) was a pioneering financial instrument established to provide proof of concept to the fledgling Joint Implementation (JI) mechanism. The fund — essentially a procurement vehicle for the products of the JI mechanism — was active between 2004–13. During this time, the fund was managed by the Nordic Environment Finance Corporation (NEFCO), an international financial institution based in Helsinki, Finland.

The TGF had its origins in the multilateral energy cooperation in the Baltic Sea Region (BASREC), involving the European Commission and countries of the region, several of which became EU members in 2004, and the Russian Federation. Hence, the first participants in the fund were the governments of the five Nordic countries and the Federal Republic of Germany. The focus of the instrument was the energy sector in line with the BASREC priorities. When the TGF converted itself into a Public Private Partnership, by welcoming nine private sector participants (“investors”), these were drawn primarily from energy companies from Denmark, Finland and Germany, which were seeking compliance units to meet their obligations under the EU Emissions Trading Scheme (ETS). It was ultimately capitalised at EUR 35 million, and was the first multi-donor carbon fund outside the World Bank Group.

## A pioneering fund

The pioneering nature of the Fund should also be seen through the lens of the broader carbon market development. It was established in 2003, before the Kyoto Protocol and EU ETS came into force. The former was a result of the ratification by the Russian Federation in 2005, intended as the principal beneficiary of the TGF due to the country's enormous technical potential for energy efficiency and associated emission reductions. The fund was ahead of the game as the carbon market developed and matured during the middle of the decade, attracting increasing private sector attention and funds (its private sector capital raising occurred 2005–06). Just as the public sector had blazed a trail for early JI through government procurement (including programmes from Denmark, Finland and Sweden), the TGF was innovative in attracting private sector funds to the JI market, which lagged behind its sister instrument the Clean Development Mechanism at the time.

This was also a time of intense regulatory development. The international rules for JI were operationalised through the launch of the Track 2 in 2006 and the mobilisation of the UNFCCC Secretariat in Bonn, Germany. In the TGF countries of operation, the Baltic countries, Poland, Ukraine and Russia, there was a flurry of institutional activity during the early days of the TGF. The JI procedures for approval were adopted in most countries during 2005–2008, but there were institutional and administrative delays in Poland and the Russian Federation. In the latter country, the fund activity including portfolio development was hampered since the first ERUs were only issued in 2012 (unlike CDM, the JI mechanism required a very close collaboration with the national authorities as the ERUs are issued directly by the Host Governments).



The portfolio delivered 2.63 million emission reduction units from Estonia, Lithuania, Russia and Ukraine.

## Portfolio development and other successes

During its lifetime, the TGF has progressed through several phases. The first (2004–2006) was establishment, preparation of documents, development of procedures, initial pipeline building and capital raising. The active procurement phase — the identification, assessment and contracting of the projects themselves, was between 2005–2009. Approximately 200 project ideas were originated and screened during this phase, and almost 100 presented to the Investor's Committee. The final portfolio of 11 projects was diverse in terms of geography and technology, with a focus on renewable energy and energy efficiency. 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 ERUs (and some AAUs) which sovereign investors could use to comply with their national greenhouse gas emission limitation targets under the Kyoto Protocol, and private sector participants with their EU ETS obligations.

### From early mover to regular JI

The first project signed was the Saaremaa animal waste treatment project in 2006 and the portfolio was developed further during the next few years. From 2010, the fund was mainly in project administration mode, ensuring the final determinations (i.e. registrations, monitoring and management of the projects) within the portfolio to optimise credit delivery for the investors. Some challenges were tackled linked to very early JI projects in order to satisfy the official JI regulations which were coming gradually operational during the TGF operations. During this phase there was some consolidation of the portfolio and some additions, in response to the price collapse. Facility's procurement strategy was also partially revised in order to take

into account individual investor's procurement preferences.

The final Investor Committee meeting took place in December 2012, with final deliveries made during 2013 and the fund has been in winding up mode in 2014. Notwithstanding the market conditions, the portfolio ultimately delivered 2.63 million ERUs from Estonia, Lithuania, Russia and Ukraine. In addition, some AAUs were delivered linked to pre-2008 verified emission reductions.

In addition to the quantitative successes, the TGF has met and exceeded its original objectives as set out in its founding instruments. One of these has been to build capacity and competence to use the Kyoto mechanisms and promote understanding of the concepts, rules and guidelines. As an early actor in many of the countries of operation, the fund was active in enhanced capacity building through “learning by doing plus”, a commercial activity which generated cash flow to renewable

energy and energy efficiency projects and compliance units for investors. This also established a wide range of stakeholders and partnerships in the region, increasing acceptance of market based instruments.

However, it should be acknowledged that confidence in the project based mechanisms has suffered a major setback through the decline and subsequent collapse of the carbon credit market since the end of 2011, reflecting the oversupply situation of both ERUs and CERs - as a result of high supply of credits due to success of JI and CDM combined with modest demand. Notwithstanding, NEFCO believes that carbon pricing initiatives in general and project based instruments in particular are likely to play a role in a post 2020 climate framework. JI and the TGF was ultimately a success story on many levels, demonstrating regional cooperation and public-private partnership.

We hope you will enjoy reading the story of this pioneering, multilateral endeavour.

**Ash Sharma**  
Special Adviser,  
Climate Change

**Kari Hämekoski**  
Manager



PATRIK RASTENBERGER

CASE STUDY 1

# Coke oven gas utilisation at OOO PO Khimprom in Kemerovo, Russia

→ The project  
in Kemerovo  
prevented flaring  
of excess coke  
oven gas.

↓ Mining of coal  
in Russia.



SHUTTERSTOCK/ABUTYRIN





ISTOCK/PAULBROAD

Coke oven gas is generated in coke production when coal is converted to coke. Coke is a key ingredient in the steel making process, itself an important part of the manufacturing economy of the Kemerovo region. The objective of the Khimprom JI project is to use coke oven gas which would otherwise be wasted as a fuel from a nearby coke facility at two new boilers at Khimprom site for its own consumption.

Khimprom is the biggest producer of industrial and consumer chemicals in the Kemerovskaya oblast, located over 3,400 km east of Moscow. The Khimprom facility produces more than 20 types of different chemicals. The project contributes to enhanced efficiency economic savings and improved reliability of energy (steam) supply to the production facilities of Khimprom as well as to reduce greenhouse gas emissions. Without the project, excess coke oven gas would have been flared. Furthermore, less steam is needed from Novo-Kemerovo Combined Heat and Power Plant that burns coal and natural gas. Coke oven gas will also substitute some steam produced by three existing natural gas boilers at Khimprom.

The investments at the Khimprom site included two new boilers, a 1.7 km long coke oven gas pipeline as well as some additional instrumentation for gas consumption monitoring and automation devices.

The coke oven gas utilisation project was the first ERPA signed by the TGF in the Russian Federation, back in 2007. The total verified emissions reductions were 245,000 ERUs during the monitoring period of 1.1.2008–30.6.2012. Sberbank, Russia, Khimprom and NEFCO signed a Transfer Agreement on ERU transfer that allowed the first ever transfer of Russian ERUs for the TGF in spring 2013.

“Khimprom was one of the pioneers in Russia to start JI projects. In the beginning, of course, we had some doubts. How could this mechanism work in practice? The project would not only allow us to increase energy efficiency, reliability and economic feasibility of steam supply to technological units, but will also bring additional funds from ERU sales. But as the project implementation went on, all doubts vanished and we got a firm assurance from NEFCO of successful completion. And that is how it happened at the end. In 2013 we received long-awaited funds from ERU sales, which allowed introduction of other energy savings and environmental projects at the enterprise aimed at reduction of emissions and increase in production efficiency. We believe that participation in JI projects positively results on financial position of enterprises and gives an additional possibility to implement socially beneficial activities”, says Director General I.Y. Kazantsev at LLC Khimprom.



The project generated 245,000 emission reduction units during the monitoring periods.



## CASE STUDY 2

# Lapes landfill gas project, Lithuania

The Lapes Landfill Gas Utilisation project was one of the early TGF JI projects developed by UAB Ekoresursai, a privately owned Lithuanian company. A financing request for the project idea was originally presented to NEFCO in 2003, and a JI component was added to allow financial closure of the project. It was one of the projects in the initial pipeline of TGF projects.

### Heat and power from landfill gas

The project developer constructed a landfill gas extraction system at the landfill in Lapes, close to Kaunas, Lithuania's second largest city. It consists of gas extraction, gas cleaning, pumping and flaring components. A combined heat and power (CHP) plant with an electrical capacity of 1.2 MWe and heat capacity of 1.4 MWth were also installed. The flaring system will be used if the engine is not running for safety reasons and to limit GHG emissions. Natural gas will be used as a support fuel in the engine. While the technology is rather conventional with widespread application throughout the world, the project was the first of its kind in Lithuania.

Emission reductions are generated through the destruction of methane emissions from the landfill and the displacement

of CO<sub>2</sub> from heat and electricity production. The project baseline took into account the impact of the implementation of EU Landfill Directive in Lithuania from 2011 onwards, and only emission reductions from displacement of CO<sub>2</sub> from energy production were accounted for in 2012.

### A noteworthy contribution from carbon finance

The project used a Consolidated CDM Methodology for landfill gas project activities, ACM0001, and the project was determined by TÜV SÜD. The expected amount of emissions reductions was 188,000 tCO<sub>2</sub>. Due to some technical challenges, there was a slight overestimation of baseline methane emissions and some project delays — not uncommon for projects like this — the final amount of ERUs TGF acquired was 91,343 tCO<sub>2</sub>. Underperformance was quite typical for early JI and CDM landfill projects and, in that sense, the Lapes project performed rather well with notable and continuing emission reductions, energy production and reduction of environmental impacts.

The total investment costs of the project were approximately EUR 3 million. Financing was based on own capital resources, loans — including a loan from NEFCO — and sales of emission reduction units. Carbon finance was integral to the financing of the project given the insufficient financial return and level of uncertainties relating to tariffs. The project also needed an advance payment from NEFCO to achieve the financial closure. Carbon finance contributed approximately 7% of the capital invested and played a key role in the implementation of the project.



The gas extraction from the landfill in Lapes has reduced emissions of 91,343 tonnes of CO<sub>2</sub> equivalents.





Carbon finance played a key role in the implementation of the project.



SHUTTERSTOCK/HUCUETTE ROE

CASE STUDY 3

**Animal waste  
management in  
Estonia**



PATRIK RASTENBERGER



The Joint Implementation scheme improved the project economics and thus enabled us to take into use the best available technology for treatment of pig manure, says Raul Maripuu from OÜ Saare Economics.

The idyllic island of Saaremaa is known for its spas, numerous summer cottages and other tourist attractions. Pig farming is also an important economic activity in Saaremaa. However, it has its environmental and nuisance problems for local people due to unpleasant odours and the eutrophication of waters.

The Saaremaa Animal Waste Management Project in Valjala, close to Kuresaare, has successfully addressed waste treatment issues associated of pig farming since spring 2006 as a TGF's Joint Implementation project. After some challenges linked with the supplied technology and early mover JI documentation, the clean and well managed plant of OÜ Saare Economics has been in continuous operation from 2008 onward at full capacity. Approximately 40,000 tonnes of manure is treated annually.

The project improves animal waste management practices through processing manure into biogas for energy use using state of the art anaerobic digestion technology. The end product is mineral enriched natural fertiliser. Biogas is utilised for renewable electricity generation with minor part of the gas utilised for heating purposes in nearby Valjala Seakasvatuse pig farm.

Several components of the project reduce greenhouse gas emissions. Methane emissions from manure are reduced as biogas is utilised. Renewable electricity replaces grid power in Estonia by replacing some of prominently fossil fuel based power generation. Furthermore, emissions of nitrous oxide, N<sub>2</sub>O, a potent greenhouse gas, are reduced from soil as considerable amount of nitrogen is captured in the process. Transportation of the manure is also improved due to the project leading to reduced CO<sub>2</sub> emissions in comparison to the baseline situation.

Without carbon financing, the revenue generation of the project is rather limited. It is mainly based on sales of green electricity with improved tariff and some sales of the fertiliser product. Carbon finance, partially in a form of advance payment has been an important element to ensure the project implementation.

← Approximately 40,000 tonnes of pig manure is treated in Valjala annually.

PATRIK RASTENBERGER



The biogas reactor is located on the island of Saaremaa in western Estonia.



#### CASE STUDY 4

## Alchevsk coke plant, waste heat recovery project, Ukraine

In the Ukrainian city of Alchevsk, a coke plant is running more efficiently and combating global climate change with support from the TGF. The Alchevsk Coke Plant Waste Heat Recovery project was the first Ukrainian project to be contracted for the TGF. The project has reduced over 872,000 tonnes of carbon dioxide emissions by the end of the year 2012 by displacing fossil fuel-based energy and avoiding the associated emissions. As a co-benefit, local air pollutants are also reduced.

The project consists of captive cogeneration with waste heat recovery at Alchevsk Coke Plant to displace the use of natural gas and grid electricity. Prior to the project, a traditional method of coke wet quenching was used. The project introduced a modern coke dry quenching method, installed in October 2007, which enables the recovery of waste heat and its utilisation to generate heat and electricity. The project entails installation of a waste heat recovery system, a highly efficient boiler firing coke oven gas and blast furnace gas and a 9 MW turbine generator connected to the boiler, generating up to 54 GWh per annum of net electricity.

The project progressed smoothly and swiftly through the required steps; the process from first contact to signed contract took less than six months. The project was first presented to NEFCO in late July 2009 and by mid-August, a Term Sheet had been signed, NEFCO's environmental screening completed and final approval granted by the TGF Investors' Committee. The TGF team conducted thorough environmental, financial, legal and technical due diligence during August and September. In October, the TGF team visited the site together with the project developer, Sumitomo Corporation.

Meanwhile, Bureau Veritas performed the determination to confirm that the project fulfils international JI criteria. The determination was successfully finalised in November 2009 and host country approval was received the following month. The project was finally determined in January 2010.

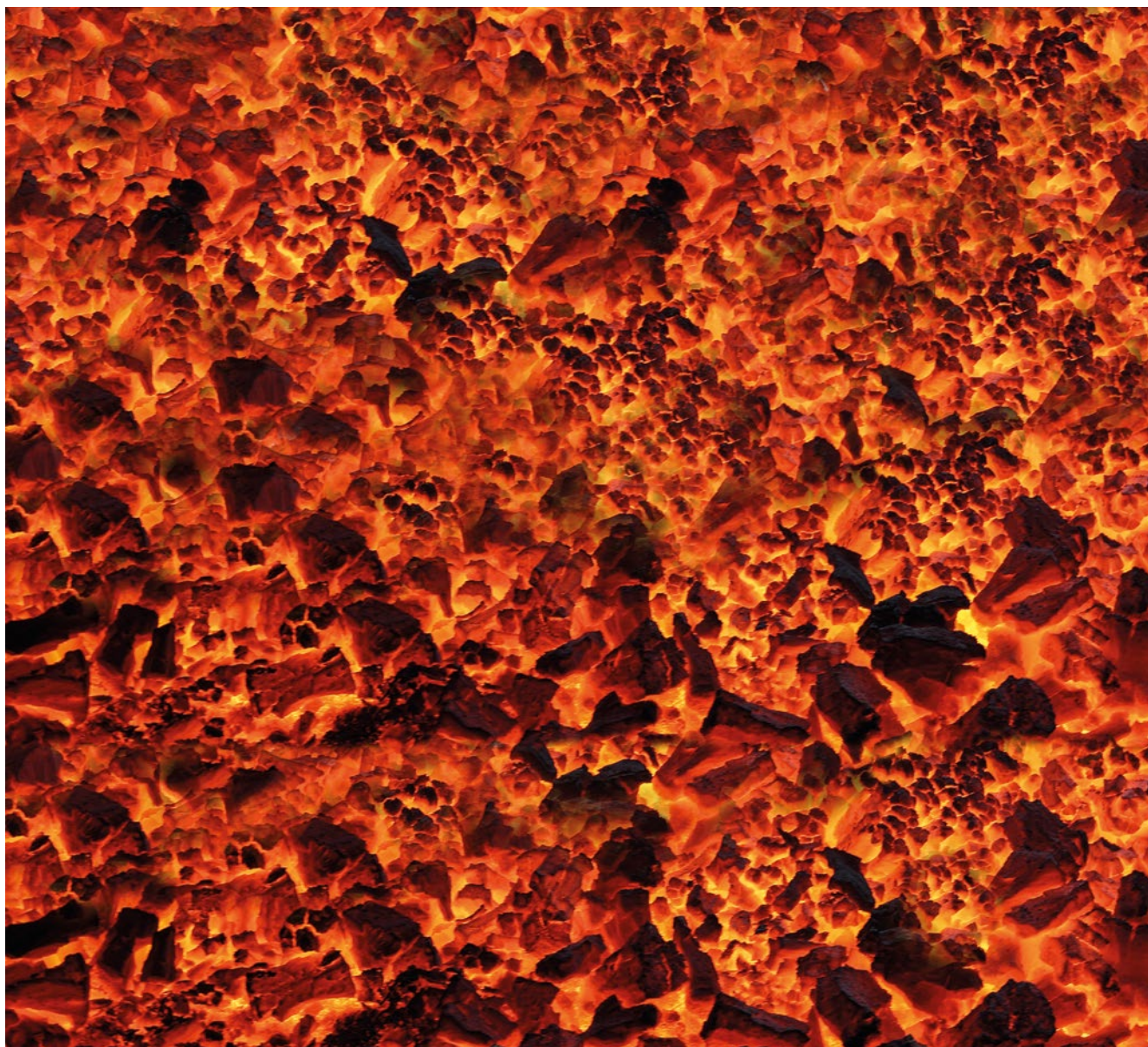


The Alchevsk  
Coke Plant is  
located in eastern  
Ukraine.



The project has reduced over 872,000 tonnes of carbon dioxide emissions by displacing fossil fuel-based energy.

The heat recovery system generates up to 54 gigawatts of electricity per year.



SHUTTERSTOCK/PECOLD

# Guest commentary

The Joint Implementation mechanism of the Kyoto Protocol hit its stride in recent years, thanks to the pioneering efforts of NEFCO and other buyers who took the policy idea and made it a commercial success.

As this report demonstrates, carbon markets are powerful tools — and we need them to endure and grow stronger, if the global community is to be successful in addressing the climate challenge. Perhaps the greatest legacy of the JI instrument is that it brought carbon market experience to so many countries throughout Eastern Europe and the Baltics. It provided a concrete example of how project-based carbon offsets can offer economic and environmental benefits, even in capped emissions environments — a lesson that international negotiators need to appreciate as they develop a policy framework for the future.

Carbon markets are at an inflection point. Looking back at 2014, we can reflect on an impressive set of global developments — which may harken a revitalisation of these markets in the near future. The EU is strengthening its ETS with a set of reforms. China has 7 fully operational pilots and has announced that it is speeding up plans for a national ETS. The US EPA's proposed regulations for power plants offers states the flexibility to adopt emissions trading markets to achieve compliance — and Canada is considering similar flexibilities to its provinces. As an example of future trends, Quebec and California linked their programs in 2014 — and recently held their first joint auction. Many other jurisdictions are examining their example, considering moves in the same direction.

Looking forward, 2015 will be a critical year, culminating in negotiations in Paris on the post-2020 policy framework. These negotiations will draw on the progress at national and subnational levels — as well as the significant achievements of the JI and CDM mechanisms. It is not yet clear how

much language on market mechanisms we can expect in the Paris agreement. Given that it is foreseen to be a short text, it might simply include a sentence or two on economic instruments. But we should keep in mind that the “emissions trading” section of the Kyoto Protocol was only one paragraph — and CDM and JI had a few paragraphs each. Nevertheless, with just a few provisions, the Kyoto Protocol's flexibility mechanisms produced unexpected success and helped stimulate emissions reductions worldwide.

We enjoy a rich legacy from JI and CDM. As NEFCO proved in managing its funds, these mechanisms prompted investments in places where emissions reductions could occur at the least cost, proving that the idea works in practice. They were instrumental in achieving a new level of engagement and communication between the UN system and the private sector and civil society. They introduced many important elements of national systems, such as participation rights, due process and transparency into the UN context. They represent a powerful instrument for developing processes and standards, setting up institutions, building capacity and enhancing dialogue between different actors engaged in mitigation activities.

NEFCO's Testing Ground Facility made a major contribution to the success of the JI instrument. Congratulations to the countries of BASREC for having the foresight to develop such a facility, and to NEFCO, for its outstanding work in managing it successfully for the last 10 years. Hopefully, we can all draw inspiration from examples like this as we work hard in 2015 to establish a future for carbon markets in the fight against climate change.

## Dirk Forrister

President and CEO  
International Emissions  
Trading Association



IEA





JONAS HAGGELUND

Most of the investors in the Testing Ground Facility were countries with access to the Baltic Sea.

# Background to the TGF

The origins of the TGF can be traced back to the mid-1990s, when the 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 Cooperation (BASREC, see p. 19) 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.

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 p. 19 for details).

The TGF has implemented JI projects by procuring Emission Reduction Units (ERUs) and some 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 reduce greenhouse gas emissions. For its investors, the TGF constitutes a compliance instrument for meeting emission targets cost-effectively.



JONAS HÄGGSTRÖM



The origins of the TGF can be traced back to the mid-1990s.

## Joint Implementation (JI)

**The Kyoto Protocol's Joint Implementation** mechanism is designed to incentivise 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").

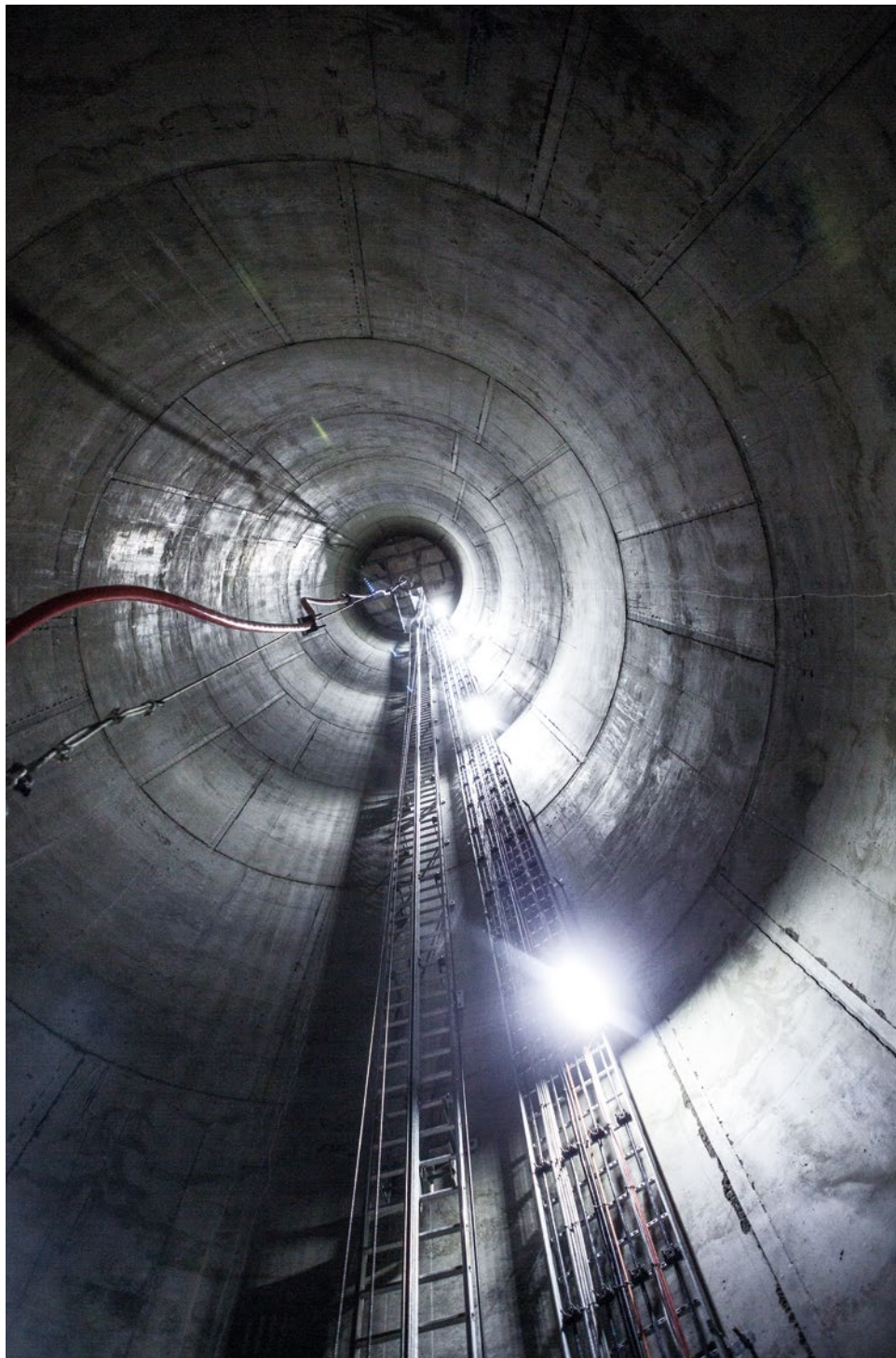
Projects that have started in 2000 or later are eligible to apply for JI status. Emission reductions achieved before 2008 may be claimed as so-called early crediting as Assigned Amount Units (AAUs) and transferred within the framework of International Emissions Trading under the Kyoto Protocol, if so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



PATRIK RASTENBERGER





Scared of heights?  
Climbing up the  
walls of a wind  
mill in Noarootsi  
(Nuckö), Estonia.

### **Baltic Sea Region Energy Cooperation (BASREC)**

The energy ministers of the Baltic Sea Region Countries and the European Commission decided in 1999 that the energy cooperation in the region should be organised in the form of BASREC. BASREC offers a network and a dialogue between energy sector actors in the region. BASREC also conducts studies, analyses the status and possibilities of development in energy policy strategies in the region, publishes handbooks and studies, and organises 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 created 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 were:

- 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;
- 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;
- 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;
- to collaborate in addressing administrative and financial barriers and the level of transaction costs, especially regarding small-scale JI projects;
- to facilitate the generation, ensure the issuance and transfer of ERUs and AAUs related to or accruing from JI projects and Emissions Trading, and
- to implement projects early and offer credit for emission reductions prior to 2008.

The cooperation 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 agreed to work together to build capacity and competence regarding the Kyoto Mechanisms in the public and private sectors to facilitate cooperation in this field, i.e. through arranging workshops, seminars and conferences.

The Parties were also encouraged to share information and experience of JI activities including information relating to the JI project cycle, credit issuance and transfer of credits. Participation in the activities on the Testing Ground for the Baltic Sea Region was open to public and private legal entities in the Baltic Sea Region States that are Parties to this Agreement.

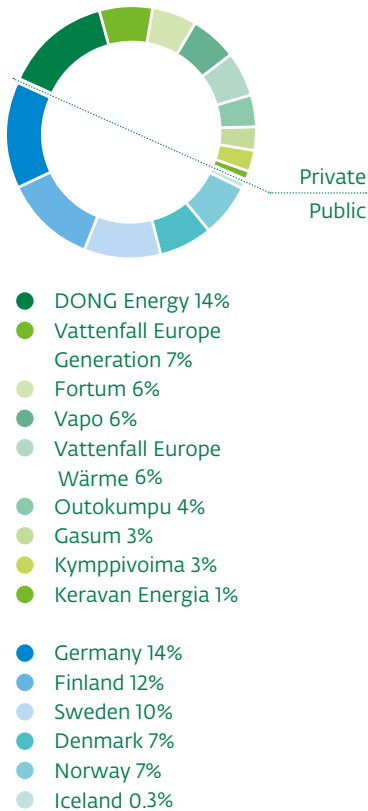
Sources: BASREC and the Testing Ground Agreement (2003)



The Testing Ground Agreement was signed on 29 September 2003.

## Baltic Sea Testing Ground Facility

### Capitalisation of the fund (EUR 35 million)



The TGF has purchased emission reductions from projects owned and operated by private enterprises, public utility companies, public-private partnerships and municipal, regional or governmental authorities. Due to its BASREC origins, TGF has only operated in Russia, Poland, the Baltic States and Ukraine and prioritised energy-related projects.

The TGF was structured as a public-private partnership (PPP) with investors from six governments and nine heat and power and industrial companies (see diagram). It was finally capitalised at EUR 35 million, split equally between public and private sectors. As the first dedicated JI multi-donor fund in the market, TGF has been an excellent example of a functioning PPP, starting from its origins as a publicly backed demonstration facility and graduating to a commercially operating, compliance vehicle.

The success of the TGF and demand from existing investors were the principal drivers behind the concept of a larger, post-2012 fund with a wider geographic reach. In 2008, the global NEFCO Carbon Fund (NeCF) was launched, which was capitalised at EUR 165 million with both sovereign and private sector participants, and continues to this day.

### Pipeline and portfolio development

NEFCO, as a multilateral financial institution whose principal mandate is for environmental investments in the emerging markets of the BASREC region, was well positioned to tap into synergies between traditional project finance and carbon finance and possesses the required resources

and networks to identify, develop and manage high-quality environmental projects. The tasks of NEFCO as the TGF Fund Manager included 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 originated and screened project ideas against project selection and portfolio criteria, as set out in the TGF Operating Guidelines, and presented 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 were excluded).

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

- the NEFCO pipeline, especially the NEFCO Investment Fund and its 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 Nordic Investment Bank, EBRD, Danish Energy Agency, Swedish Energy Agency and co-purchasing with other buyers;
- tenders by ERU sellers;
- open call for projects and promotional activity; and
- outreach activities, including speaking at and sponsoring conferences in the host countries and internationally.



The TGF presented 97 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.

### Development of JI infrastructure

Upon reflection, TGF's early mover status has been both a boon and a disadvantage. Whilst pipeline development benefited from an early start, institutional constraints at national level and slow development of international approval, and regulatory and administrative infrastructure adversely affected the TGF operations in the early days. For example, constantly changing bottom-up rules led to uncertain auditing processes and updating of documentation such as reformatting of PDDs in some cases led to additional work undertaken by independent entities introducing more costs and delays into an already convoluted procedure. In 2010, NEFCO recorded and analysed the measurable time lags in the JI cycle as related to the TGF projects. The time lag between start and finalisation of project determination alone ranged from 2.4 months to over 3.5 years, averaging 556 days (18.5 months).

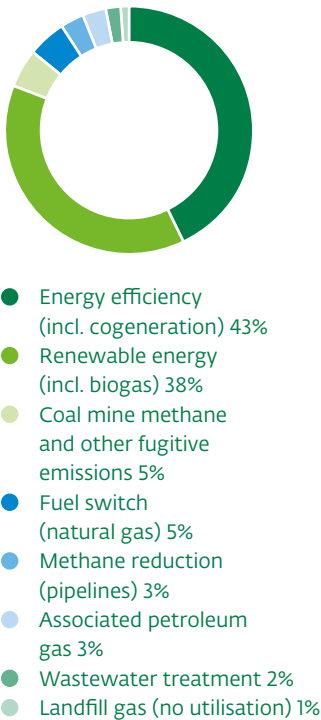
However, in the subsequent years of the Kyoto period, the procedures became established and administrative systems for registration and processing of projects improved markedly in particular for the issuance of ERUs. Toward the end of the 2012, the level of credit issuance was extremely high, mostly from Russia and Ukraine. As of December 2014, total issued ERUs nearing 0.85 billion credits (against 1.50 billion for CERs).

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 of the TGF, 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. However, in Russia, the early focus by TGF on small to medium-sized projects (as demanded by the founding instruments and its limited capital) was misplaced as these were not subsequently prioritised by the government for approval.

### Pipeline development

#### Projects presented to the Investor's Committee by technology



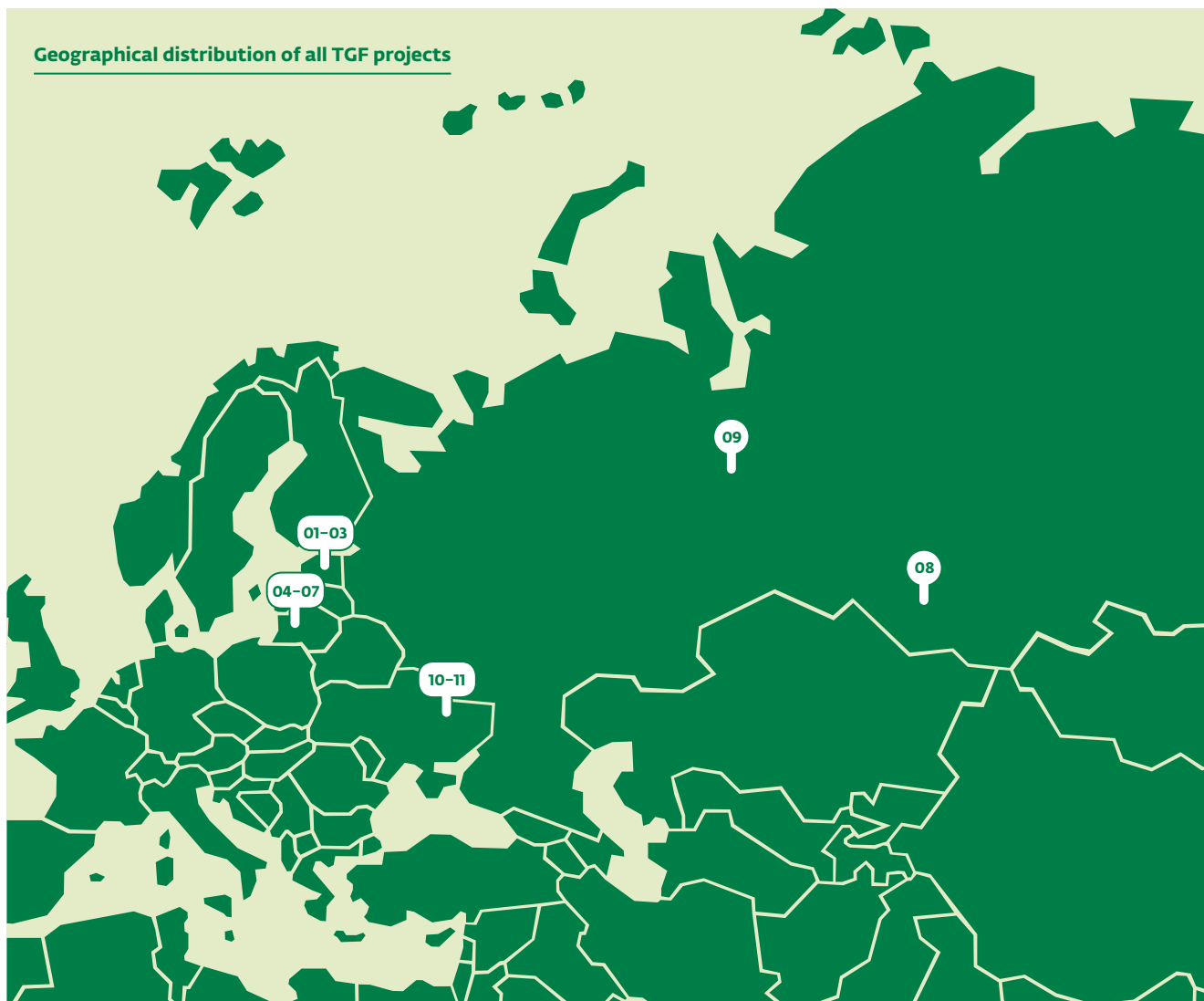
#### Projects presented to the Investor's Committee by host countries



## Final TGF portfolio

Project	Country	Category	Delivered ERUs (and AAUs)
<b>01</b> Saaremaa animal waste management project	Estonia	Animal waste/ biogas	57,155
<b>02</b> Viru Nigula 24MW wind power project (Joint purchase with Swedish Energy Agency)	Estonia	Wind	115,851
<b>03</b> Vanaküla 9MW wind power project	Estonia	Wind	52,656
<b>04</b> Lapes landfill gas utilisation project	Lithuania	Landfill gas management	94,252
<b>05</b> Benaiciai 16MW wind power project	Lithuania	Wind	113,742
<b>06</b> Sudenai and Lendimai 14MW wind power project	Lithuania	Wind	69,003
<b>07</b> Rudaiciai 30MW wind power project	Lithuania	Wind	43,954
<b>08</b> Khimprom waste coke oven gas utilisation project	Russian Federation	Energy efficiency (supply side)	272,167
<b>09</b> Associated petroleum gas project (Confidential)	Russian Federation	Associated gas	69,935
<b>10</b> Alchevsk coke plant waste heat recovery	Ukraine	Energy efficiency (demand side)	872,753
<b>11</b> Industrial cleaner production project (Confidential)	Ukraine	Energy efficiency (demand side)	863,840

### Geographical distribution of all TGF projects



The TGF has been able to demonstrate the utility of Joint Implementation as a tool for mobilising significant financing for energy related investment.



**Final TGF portfolio**

Individually, the projects generally performed well against expected performance.

The TGF was an early actor in JI project development — of the first 50 Track 2 projects globally, 9 were TGF projects. The final portfolio shows a strong emphasis on renewable energy and energy efficiency projects. The projects are distributed between wind, biomass/biogas technologies and cleaner production projects.

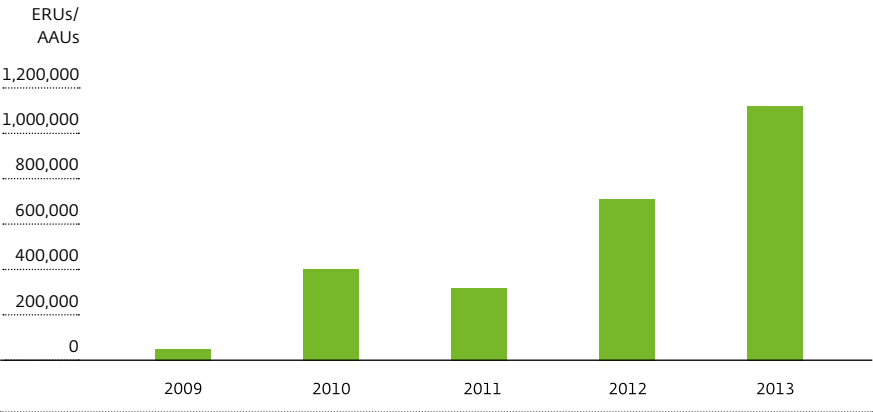
In total, the Facility has cumulatively generated 2.625 million ERUs and a small volume of project- linked AAUs. These have now been distributed to the investors.

Geographically, the final TGF portfolio is split between Estonia, Lithuania, the Russian Federation and Ukraine, achieving a good diversification given the limitation in the Facility’s countries of operation.

The Russian Federation had the greatest technical potential in the TGF countries of operation due to the high energy and GHG intensity of its economy, but the portfolio had been subject to regulatory and contractual delays and uncertainties throughout the fund’s life. However, in 2013 there was a culmination of these efforts, with the first Transfer Agreements finally signed between Sberbank and the project proponents allowing credits to be successfully issued for the Khimprom energy-efficiency project and an associated gas project.

**TGF deliveries to investors**

Total 2,625,308 ERUs/AAUs



Maintenance of a TGF-supported wind farm in Vanaküla (Gambyn), Estonia.

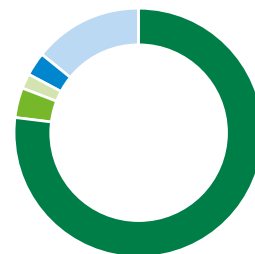




PATRICK RASTENBERGER

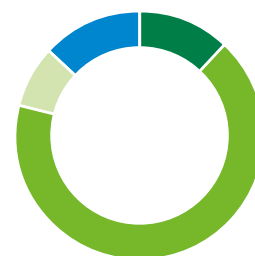
## Final TGF portfolio

### Delivered TGF credits per project type



- Energy efficiency:  
3 projects / 76%
- Landfill gas management:  
1 projects / 4%
- Animal waste / biogas:  
1 project / 2%
- Associated gas:  
1 project / 3%
- Wind:  
5 projects / 15%

### Delivered TGF credits per project country



- Lithuania:  
4 projects / 12%
- Ukraine:  
2 projects / 66%
- Estonia:  
3 projects / 9%
- Russia:  
2 projects / 13%

**Collapse in market pricing**

Ultimately, the TGF procured its credits at a gross weighted final average of EUR 6.67 per ERU. For most of the lifetime of the fund, this was significantly below the market price offering a good return for the investors in exchange for the risk of developing primary contracts. However, following the market price slide starting end of 2011 and subsequent collapse, the projects were no longer “in the money”. During 2013 and 2014, the market price for issued ERUs was near zero. The fund portfolio was accordingly consolidated, and little further procurement took place in the final years.

This unfortunate development was symptomatic of the carbon market as a whole — the asset class generated by JI’s sister instrument, CERs from the Clean Development Mechanism suffered a similar fate.

**TGF as a contributor to green growth**

The TGF projects have offered significant broader environmental and green growth benefits as well as climate change mitigation. For energy sector projects in particular, 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 reduction of coal, mazut, heavy fuel oil and oil shale, with benefits for human health;
- reduced groundwater pollution through reduced release of nutrients (primarily for animal waste treatment systems);
- 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.

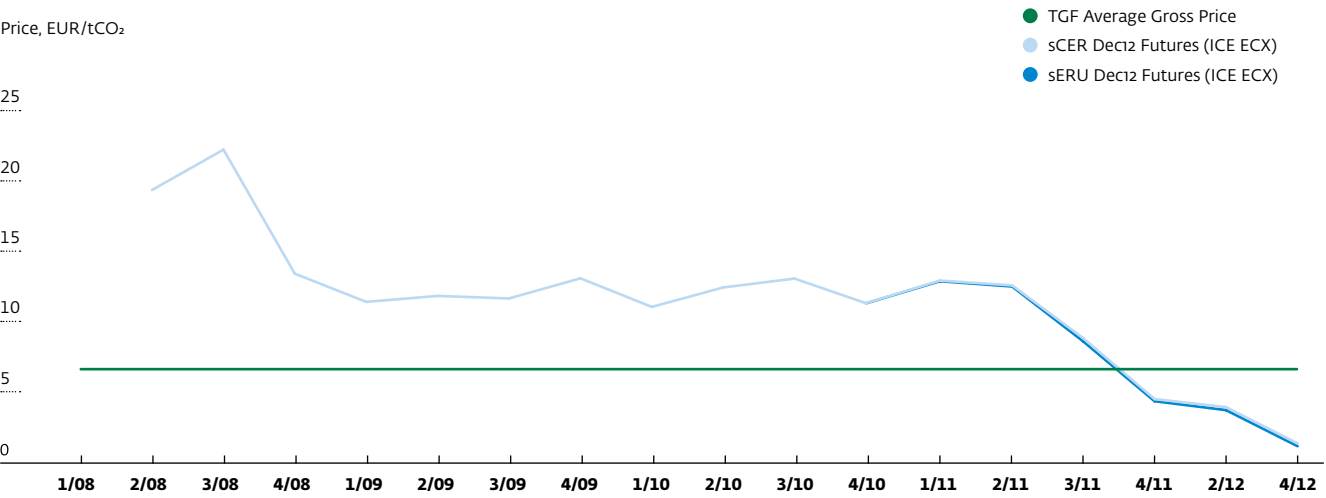
In 2010, NEFCO calculated, based on the portfolio at that time, that on average one euro of TGF carbon finance leverages over ten further euros for climate-friendly investments.

**Dissemination and capacity building**

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, an enduring facility with substantial financing was envisaged by BASREC stakeholders, more akin to the Prototype Carbon Facility, established by the World Bank in 2000.

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 had no promotional or institutional budget for instance). Some of the activities are summarised on page 27.

**Evolution of CER — Collapse in market pricing**





## TGF 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 was 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 a fraction 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, UN-FCCC technical workshops, COP/MOP side events, and events organised by BASREC, the European Commission, the World Bank and others.
- NEFCO 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 was 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 has disseminated all project related information at its website, publishing project summaries, the latest Project Design Documents and Determination reports.



The TGF projects have offered significant green growth benefits.



SHUTTERSTOCK/KURKUL

## Conclusions and lessons learnt

The TGF has been able to demonstrate, at a practical and regional level, the utility of Joint Implementation, and of project related market based instruments in general, as a tool for mobilising significant financing for energy related investment.

Some key conclusions can be drawn from its 10 years of operation:

- 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 generated, issued and distributed to investors.
- If successfully implemented and of course, under reasonable pricing scenarios, JI can cover a significant share of total investment costs, especially in the case of energy efficiency and methane avoidance and utilisation (i.e. biogas, landfill gas and associated petroleum gas capture and energy use), up to 20% of capital invested in nominal terms. The TGF has demonstrated that there is a potential for leveraging carbon finance to promote energy related investments by over 10:1.
- 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 have typically been 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, achieving a high leveraging ratio.

- 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 is a form of results based financing which can create incentives for prudent financing, good operational 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 a magic bullet, but that it can improve the financial viability of good 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). The objectives of the original public financing mechanism have been fulfilled, with lessons learnt and returns generated for investors.

More generally, the TGF offers a good example of a climate finance instrument that can achieve public policy goals in a post 2015 capped emissions environment. JI as a baseline and credit system has provided several lessons for a future Paris agreement; the power to incentivise innovation and ultimately capital investment to reach emission reduction goals, with due process, transparently and cost effectively.



TGF has shown that JI is not a magic bullet, but that it can improve the financial viability of good projects.

# Guest commentary

## Piotr Dombrowicki

Chair, Joint  
Implementation  
Supervisory  
Committee (JISC)



JISC

The Joint Implementation (JI) mechanism is one of the two market-based, project-based mechanisms under the Kyoto Protocol. JI encourages and rewards emission reduction initiatives in industrialised countries with a commitment under the Kyoto Protocol. JI has achieved a lot up to date with more than 856 million tonnes of carbon dioxide equivalent of emissions reduced or avoided through a capped environment baseline and crediting (831 million under Track 1 with host party oversight and 25 million under Track 2 with international oversight). More importantly, vast experience has been accumulated over the years of implementation of the mechanism, both by the Designated Focal Points (DFP) and the many private sector actors involved.

This experience also indicates that the utilisation of JI as a climate mitigation tool was most prominent in the eastern European countries, among which, in the Baltic Sea Region Energy Cooperation (BASREC) the facilitative role of the TGF to implement JI projects has proven to be both innovative and effective.

The lessons learned with the implementation of the mechanism internationally also show that the international community should strive to keep the vast capacity built over the years. We are now at an important turning point, where decisions that countries may take internationally can scale up and drive forward the increasing wave of investment interest in market-based opportunities to mitigate climate change. We see more and more countries and constituencies launching market-based systems. It should be pointed out that JI is uniquely equipped to mobilise and direct investment within such capped emissions systems. Parties, private and public sector stakeholders and the JISC have built a tool that has a role now and an important role in the future when countries agree on ambitious action to address climate change.

The TGF initiative has enabled interested countries to take the role of “early movers”, use the JI mechanism to identify and tap into areas of cost effective reduction potential and implement high quality projects. This pioneering public-private partnership, piloted and administered by NEFCO over the course of 10 years of TGF’s operation, should undoubtedly be commended.



The TGF initiative has enabled interested countries to use the JI mechanism to tap into areas of cost effective reduction potential and implement high quality projects.



# Further reading

NEFCO Carbon Finance and Funds, Operational Reviews 2009–2013

H. Ahonen and A. Sharma (2010),  
Baltic Sea Region Testing Ground Facility (TGF)  
–Review of Experiences and Lessons Learned  
2005–2009, Nordic Environment Finance  
Corporation

[http://www.nefco.org/financing/testing\\_ground\\_facility](http://www.nefco.org/financing/testing_ground_facility)

Nordic Council of Ministers (2007) Evaluation  
of the Baltic Sea Region Testing Ground Facility,  
ECON Analysis

## Abbreviations

**AAU** Assigned Amount  
Unit

**BASREC** Baltic Sea  
Region Energy  
Cooperation

**CO<sub>2</sub>** Carbon dioxide

**CO<sub>2</sub>e** Carbon dioxide  
equivalent

**CDM** Clean Develop-  
ment Mechanism

**CER** Certified Emission  
Reduction issued in  
return for a reduction  
of atmospheric carbon  
emissions through  
projects under the Kyoto  
Protocol's Clean De-  
velopment Mechanism  
(CDM). One CER equals  
an emission reduction of  
one tonne of CO<sub>2</sub>.

**COP** Conference of  
the Parties, The United  
Nations Framework on  
Climate Change (see  
UNFCCC) meetings held  
each year.

**Designated Focal Point**  
A nominated body  
in a JI host country for  
approving projects.

**EB** Executive Board

**ERPA** Emission  
Reductions Purchase  
Agreement

**ERU** Emission Reduction  
Unit generated via Joint  
Implementation. See  
also CER.

**EU ETS** European Union  
Emissions Trading  
Scheme

**GHG** Greenhouse gas

**GW** Gigawatt

**GWh** Gigawatt hours

**JI** Joint Implementa-  
tion, one of the flexible  
mechanisms set forth  
in the Kyoto Protocol  
to help countries with  
binding greenhouse gas  
emissions targets

**Kyoto Protocol** An  
international agreement,  
negotiated in 1997, that  
set binding targets for  
industrialised countries  
to reduce their green-  
house gas emissions  
before 2012.

**LoI** Letter of Intent

**MW** Megawatt

**NeCF** NEFCO Carbon  
Fund

**NEFCO** Nordic  
Environment Finance  
Corporation

**PDD** Project Design  
Document

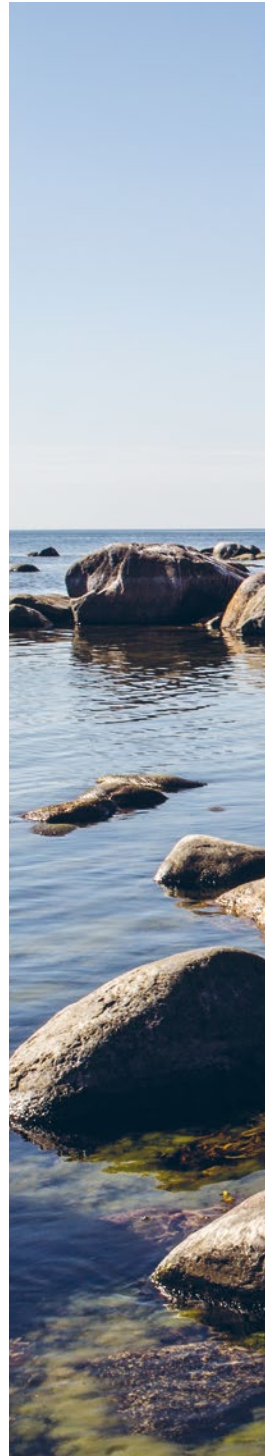
**PIN** Project Idea Note

**Post-2012** Period after  
year 2012. See also Kyoto  
protocol.

**TGF** Testing Ground  
Facility

**Transfer Agreement**  
The three-party Transfer  
Agreement between  
the seller, the buyer and  
Sberbank signed before  
the issued ERUs can be  
transferred abroad from  
Russia.

**UNFCCC** United Nations  
Framework Convention  
on Climate Change. An  
agreement signed by the  
United States and 191  
other countries in 1992  
stating that the coun-  
tries will seek to keep  
greenhouse gases from  
becoming dangerous for  
our climate.





When quoting the report, please refer to:  
Sharma, A. & Hämekoski, K. (2015), The Baltic Sea Region Testing Ground Facility – A pioneering climate finance instrument, Nordic Environment Finance Corporation

—  
This NEFCO publication has been printed on FSC certified paper.

—  
Editors:  
Ash Sharma, Chief Editor  
Kari Hämekoski  
Lia Oker-Blom  
Mikael Sjövall  
Graphic design:  
Nimio / [www.nimio.fi](http://www.nimio.fi)  
Front cover photo:  
Jonas Häggblom  
Back cover photo:  
Patrik Rastenberger

—  
Printhouse:  
Lönnerberg Print Oy,  
Helsinki 2015



**Mixed Sources**  
Product group from well-managed forests, controlled sources and recycled wood or fibre  
—  
Cert no. DNV-COC-000149  
[www.fsc.org](http://www.fsc.org)  
© 1996 Forest Stewardship Council



441 017  
Printed matter



The Testing Ground Facility offers a good example of a climate finance instrument that can achieve public policy goals in a post 2015 capped emissions environment.