

NEFCO Renewable Energy Projects in Russia - Experiences and challenges

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Seminar on Renewable energy in Russia: How can Nordic and Russian actors work together?

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Scope of Today's Discussion

- Introduction
- Overview of NEFCO Energy Projects in Russian Federation
- Overview of TGF Investment Portfolio
- Energy Sector Investment Projects in Russian Federation
- NEFCO / TGF Challenges and Possibilities in Russia
- Concluding Comments

Introduction



NEFCO as a Nordic Institution is committed to battling global climate change; saving the Baltic Sea; protecting the Arctic environment; and follows the Nordic Energy Policy for:

- ensuring efficient energy systems
- securing supply and self-sufficiency
- contributing to the competitiveness of industry and sustainable development
- decoupling economic growth from CO₂ emissions and other pollution
- promoting renewable energy

Overview of NEFCO Energy Projects in the Russian Federation

Key Features of NEFCO in Russia

- NEFCO Concept for Investments includes: Clear Environmental Targets; Defined Indicators; Duplicable Measures; and Competitive Financial Support
- Work in Russia through own staff, intermediaries, Energy Efficiency Centres and consultants
- Increased cooperation with Nordic partners including Danish Energy Authority, STEM, BASREC, NEEG and others
- NEFCO can offer
 - competitive financial support in terms of credits
 - to buy carbon credits through TGF and NeCF funds
 - limited technical assistance

LOANS

MEZZANINE.

RISK-
CAPITAL

Eco
Efficiency

Cleaner
Production

Energy
Savings

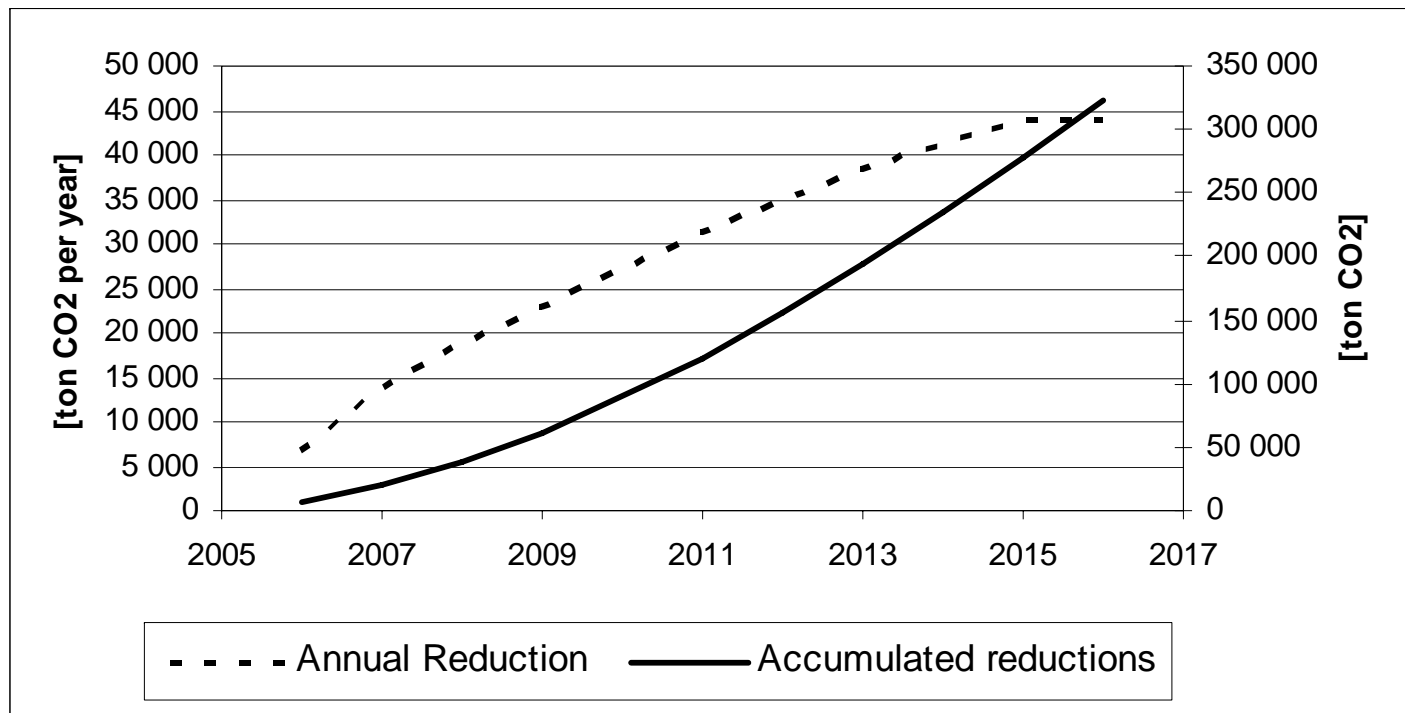
TGF
CO2
Purchase

Overview of NEFCO Energy Projects in Russia

- NEFCO Russia investment portfolio in 2007
 - 20 active & 37 completed energy sector projects
 - 10 TGF projects at various stages of contracting in Russia
(A regionally focused purchase fund, acquiring carbon credits on behalf of its public/private investors)
- Increased levels of awareness, and good positioning in NW Russia marketplace through many years of successful cooperation in the region
- Ability to contribute additional financing through concessional loans (CP and ESP), including public sector organisations
- Focus on energy related climate change projects
 - Emphasis on renewable energy technologies, energy efficiency, others include fuel switching, waste (biogas) and wastewater treatment

Environmental Effect of Energy Saving Credits

- Based on the experience of the ESP, the expected environmental cost efficiency was estimated to be between -13 and -7 EUR per tonne CO₂. The figure below shows the expected annual and accumulated reductions from the Energy Saving Credits.



Successful projects



Onega hospital boiler house

- Efficiency of not less than 80% complete with mechanised fuel conveying plant, service platforms, valves, safety devices and automation
- Investment cost 29 million RUR
- CO₂ emission reduction min 4400 tons/a
- Pay back period 8.8 years
- Fuel substitution 2150 tons coal/a
- CH₄ emission reduction 382 tons

Petrozavodsk School Nr. 3

- Insulation of pipes and balancing heat system
- Heating substation upgrade
- Sealing of windows, improved roof insulation
- Renovation of greenhouse + cold water meter
- Investment 36 000 USD
- Energy savings 490 500 kWh/a *
- Pay back period 4.3 years
- * 26.5 % of previous consumption



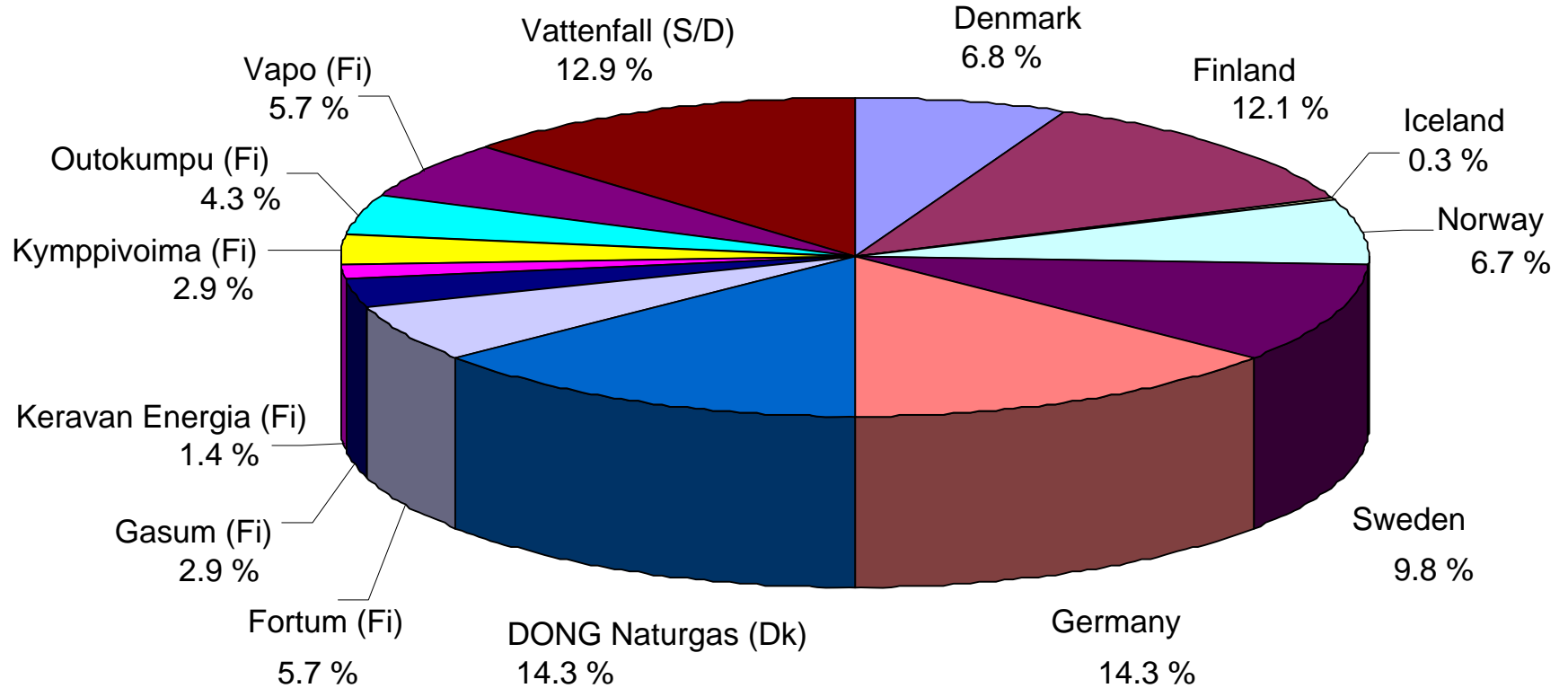
Overview of TGF Investment Portfolio in the Russian Federation

Overview of the Testing Ground Facility

- A regionally focused carbon purchase fund, acquiring AAUs & ERUs on behalf of its public/private investors
- Established under auspices of BASREC
 - Own governance structure: TGF Investors Committee
 - Includes Nordic countries, Germany and private companies
- Countries of operation: Russia, Ukraine, Baltic States
- Focus on energy related climate change projects
 - Emphasis on renewable energy technologies, energy efficiency
 - Others include fuel switching, waste (biogas), wastewater treatment
- A “reasonable balance” of project size, technologies & host countries across the portfolio is sought

TGF Investor Base: a Public Private Partnership

Baltic Sea Region Testing Ground Facility Subscriptions
Total Fund €35 million



NEFCO Carbon Fund (NeCF)

- New fund launched in March 2008, as a successor to TGF
- Focus on JI /CDM in Russia, Ukraine and China
- Target capitalisation of €50m (currently €35m) based on similar Public Private Partnership structure of TGF
- No limitations on project types (so long as eligible under Kyoto and ETS), with preference for larger projects

Country Overview: Russian Federation

Key Issues in Russia

- Bulk of TGF activity & pipeline, large and diverse technical potential
- Increasingly focus on large scale projects
- Awaiting final domestic approval procedures - no LoAs issued
- More interest from project owners
- NEFCO well established in NW Russia, working here since 1991

Project Potential in Russia

- Biomass fuel switch
- Industrial energy efficiency
- Power and heat supply
- Fugitive emissions

TGF Projects

- 10 diverse projects currently under negotiation
- District heating, coke gas utilisation, wastewater treatment, biomass and natural gas fuel switch, landfill gas utilisation

Waste Coke Gas Utilisation, Western Siberia

- Type : Waste coke utilisation at chemical works to displace natural gas consumption
- Financing: Own equity, short term loans, carbon finance
- Supplier: Local chemical manufacturer, OOO Khimprom
- Emission reductions: 332,000 tCO₂e over commitment period
- PDD; determination by DNV, ERPA signed, will make application to MEDT when possible



Existing Gas Boilers



Old Natural Gas Pipeline

District Heating Rehabilitation, Murmansk

- Type : Replacement of heat exchangers, VSP pumps, new burners improved controls etc
- Financing : NDEP, SIDA grants, IFIs NIB & NEFCO
- Supplier : MUE TEKOS
Municipal owned heat utility
- Emission reductions :
~300,000 tCO₂e over CP
(co-purchase with STEM)
- PDD; determination by TÜV SÜD ; Draft ERPA prepared, no approvals



Severnaya
Heat Plant



Existing Heat Connection Point

Vodokanal Wastewater Projects, St. Petersburg

- Type : Methane reduction from displacement of anaerobic digestion at sludge pits/lagoons to state of art incinerators (SW and northern)
- Financing: Own equity, IFIs (EBRD, EIB and NEFCO), grants (NDEP, TACIS) carbon finance (TGF/EBRD)
- Supplier: SUE Vodokanal of St. Petersburg
- Emission reductions : 467,000 tCO₂e over commitment period (CP) using AM0013
- PDD; determination by TÜV SÜD, draft ERPA prepared, no approvals yet



Existing Sludge Lagoon for SW WWTP



Sedimentation Tanks at SW WWTP

Zheshart Plywood Factory, Komi Republic

- Type : Biomass fuel switch of heat only boilers (natural gas to sawdust) at industrial manufacturing facility
- Financing : Own equity (22%), NEFCO loan, carbon finance
- Supplier : Local plywood manufacturer, CJSC Zheshart Plywood Factory
- Emission reductions : 63,000 tCO₂e over commitment period (CP) - v.small
- PDD; determination by TÜV SÜD , draft ERPA prepared, no approvals yet
- Full details available at www.nefco.org/tgf



Zheshart Plywood Factory

Priozersk Integrated Fuel Switch, Leningrad Oblast

- Type :Fuel switch from mazut to biomass and natural gas by replacing outmoded CHP plant, and associated energy efficiency actions
- Financing : Own equity, NEFCO loan, carbon finance (TGF/DEA)
- Supplier : OJSC TeploService
- Emission reductions : 199,000 tCO₂e over commitment period using ACM009 (gas) & ACM0036 (biomass)
- PDD prepared by Force Technology; determination ongoing by DNV, draft ERPA prepared, no approvals yet

Old Boiler House, Priozersk



Biomass Resources, Priozersk

Strezhevoi Heat Supply Station Reconstruction

- Type : System rehabilitation to reduce energy losses and fuel use, by installing improved control equipment and new heat exchangers at sub-centrals
- Financing : Own equity, local bank loans, carbon finance (TGF)
- Supplier : OOO Strezhevoi Teploenergосnabzhenie
- Emission reductions : 89,000 tCO₂e over 2008-12 using AMS IIA
- PDD prepared; determination by DNV, draft ERPA agreed, no approvals yet

New Sub Central Equipment



Network Reconstruction Works, Strezhevoi

Energy Sector Investment Projects in Russian Federation

- Significant opportunity for introduction of efficient steam turbines
- Fuel switching from heavy fuel oil/coal to natural gas
- Development of renewable energies (especially small and medium hydro (new & rehab), biomass, geothermal and wind)
- Improvements in combined heat and power (CHP) and district heating systems
- Energy savings (control, instrumentation and automation, variable speed motor drives, fuel efficient burners etc)

Indicators

Reductions of CO₂, NO_x and SO₂

More renewable energy

Efficient use of energy

Saving of energy

Security of supply

RE Potential in Russia

Wind 175 000 MW

Biomass 15 000 MW

Hydropower 9% of world's
resources

Geothermal 3000 MWe

Source: EBRD

NEFCO / TGF Challenges and Possibilities in Russia

- Key challenge
 - how Russia is going to produce 21 % of its energy from renewable sources by 2020. At present this share is less than 1 %.
 - enabling regulatory framework and possibilities for foreign investors
- What do we offer:
 - good commercial conditions and possibilities for advance payment with appropriate security
 - potential for co-financing through NEFCO and NIB
 - limited technical assistance and technology transfer with Nordic partners
 - over 15 years of experience in the region, and good political support
- What are we looking for:
 - biomass fuel switching, CHP, biogas and energy efficiency projects in public or private sector, energy or industry preferred
 - advanced stage projects, with feasibility studies and financing plan in place, with some own equity contribution. Starting 2009.

Concluding Comments

- RE&JI is significant opportunity for project owners & developers
 - to add to project cashflow and improve project economics
 - to co-finance with other NEFCO finance products
 - to work with creditworthy international partners and neighbours with a long term interest in NW Russia
- Regulatory uncertainty in Russia is reducing
 - International JI framework in place (Track 2 JI) but slow
 - Domestic approval procedures are ready, window for applications open. However, restrictions on foreign owners.
 - Better awareness generally of the possibilities for Russian enterprises and public companies, high growth in recent number of projects
- Good local technical capacity in Russia for project development, documentation and auditing

For further information

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