NEFCO Renewable Energy Projects in Russia

Experiences and Challenges

Raili Kajaste

Alterenergy 2008, Moscow 23-24 October, 2008

Scope of Today's Discussion

- Introduction
- Overview of NEFCO Energy Projects in Russia
- Alternative Energy Potential in Russia
- 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 Artic 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

Key Features of NEFCO in Russia

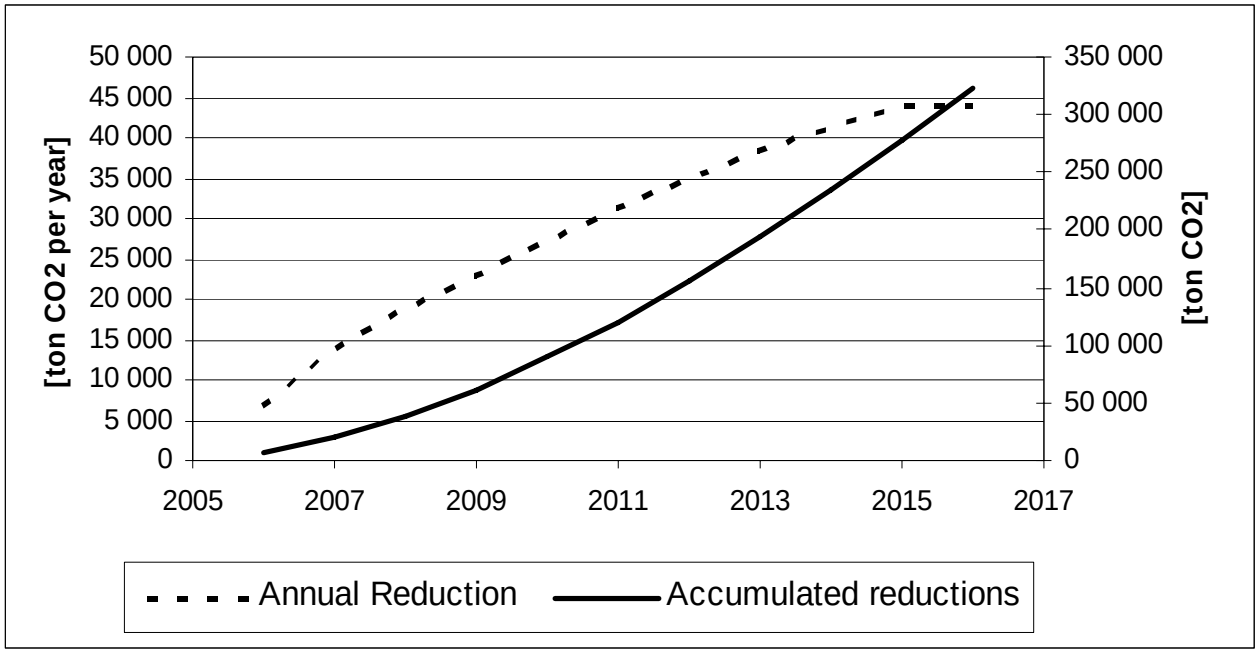
- NEFCO Concept for Investments includes: Clear Environmental Targets; Defined Indicators; and Duplicable Measures
- Work in Russia through own staff, intermediaries, Energy Efficiency Centres and consultants
- Increased cooperation with Nordic partners including Danish Energy Authority, and others
-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

Overview of NEFCO Energy Projects in Russia

- NEFCO Russia investment portfolio in 2007
  - 20 active & 37 completed energy sector projects
  - 10 TGF projects for acquiring carbon credits at various stages of contracting in Russia
- Over 17 years experience in NW Russia marketplace through successful cooperation with local partners in the region
- Ability to contribute additional financing through concessional loans and carbon credits, 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, 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

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 tCO_2e 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

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 Teploenergosnabzhenie
- Emission reductions : 89,000 tCO_2e 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

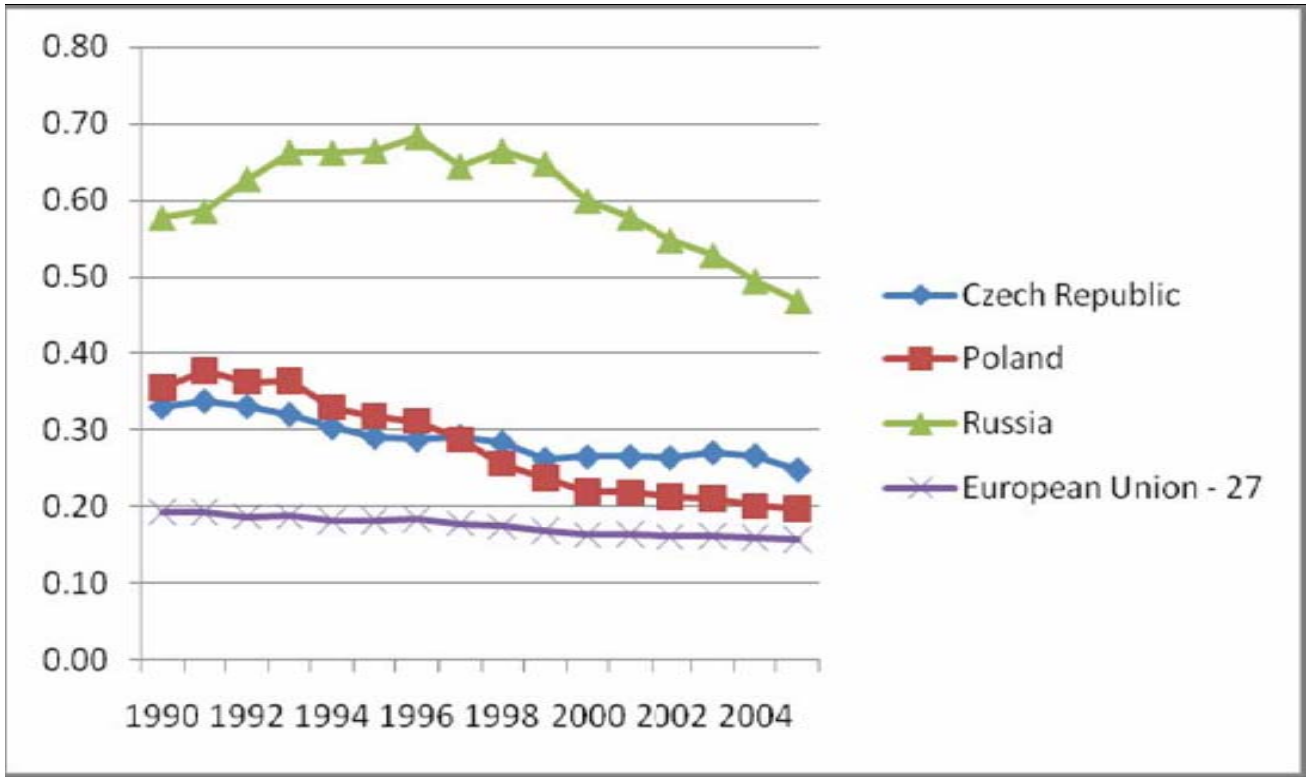
Alternative Energy Potential in the Russian Federation

- Today all renewables: 22.1 Mtoe or 3.4% of total primary energy supply (TPES).
- In 2005 only 0.9% of electricity generation from biomass, geothermal, wind or small hydro's and only 5% of heat supply from renewable sources.
- Russia has enormous potential for renewables: total economically feasible potential is 224 Mtoe i.e. 35% of current total primary energy supply in Russia.
- Wind 175 000 MW, Biomass 15 000 MW, Hydropower 9% of world's resources and Geothermal 3000 MWe

Source: IEA, EBRD, P. Bezrukikh, Mtoe = million tons of oil equivalent

Challenges and Possibilities in Russia

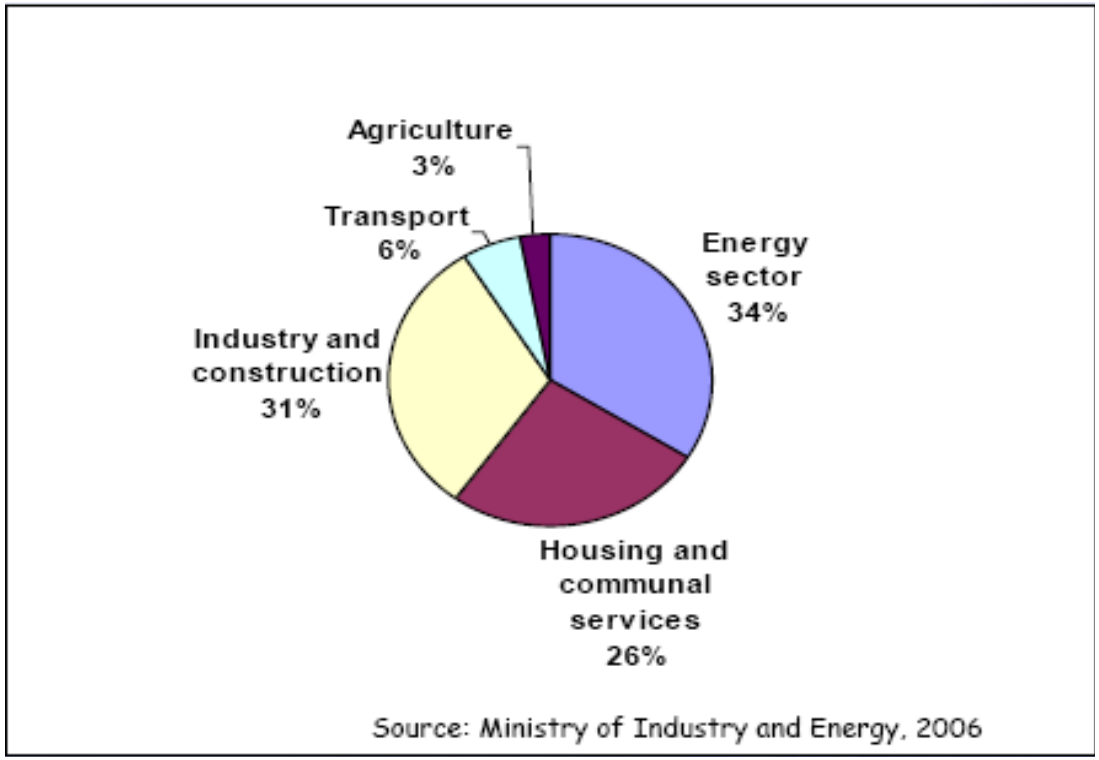
- Russia's economy is energy intensive



Relative energy intensity in ktoe/2000$ PPP Comparative, Source: IEA

Challenges and Possibilities in Russia

- Russia total primary energy supply today: 647 Mtoe
- Russia total energy savings potential: 308 Mtoe



Mtoe = million tons of oil equivalent, Source: OECD/IEA 2007

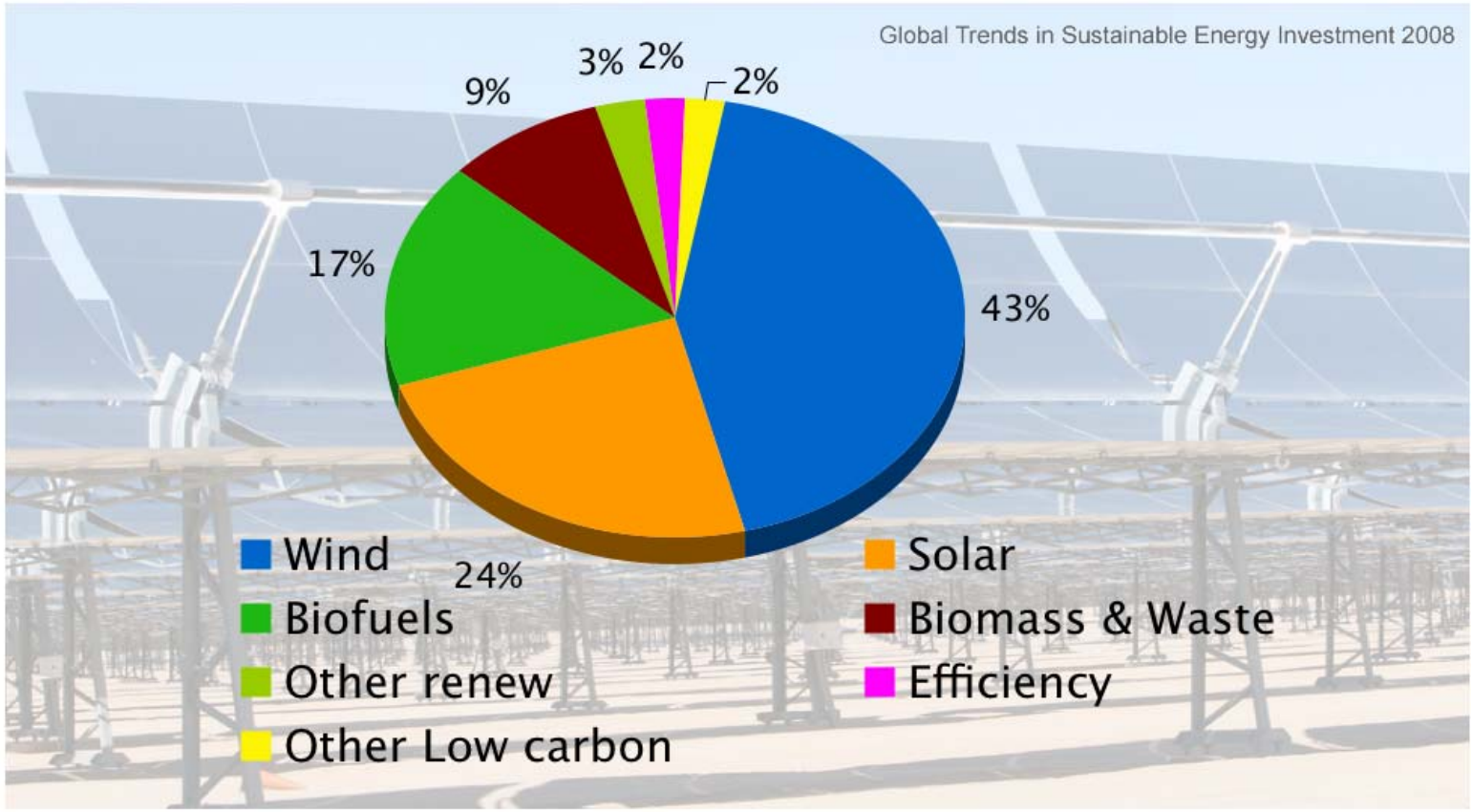
Challenges and Possibilities in Russia

- How to balance investing in energy saving and alternative sources of energy ?
- How to produce 21 % of energy from renewable sources by 2020? At present this share is less than 4 % in the Russian Federation.
- Enabling regulatory framework and possibilities for foreign investors required to fill the technological caps.
- Global new investments in clean alternative energy were $150 billion and corresponded of 21% of power generation increase in 2007.

Concluding Comments

- Global trends in alternative energy resources

Global Investment by Technology, 2007



Source: New Energy Finance

Concluding Comments

- Challenges for big cities

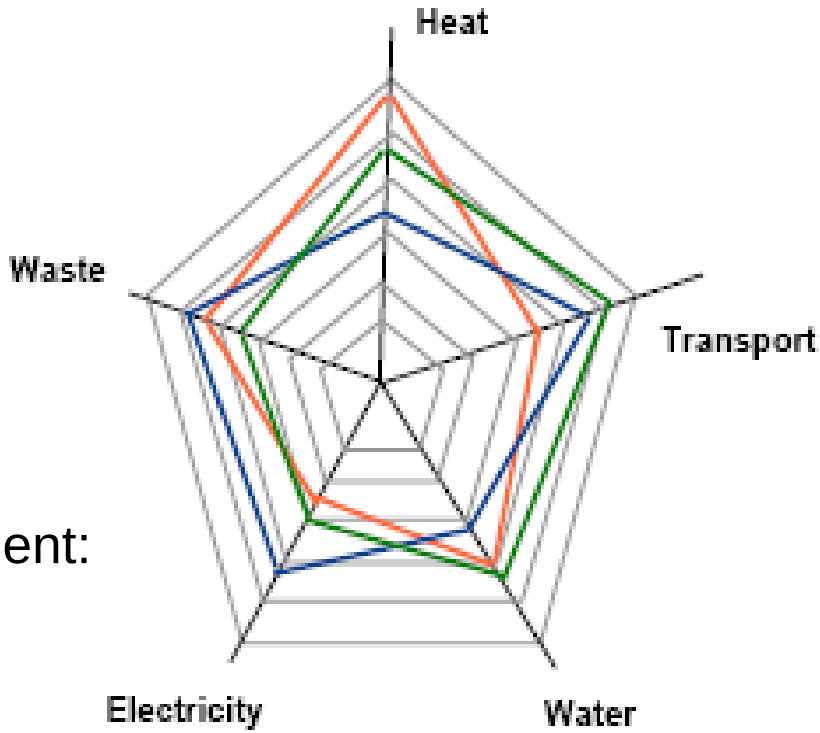
Sustainable urban planning:

- Energy supply
- Energy efficiency
- Transport
- Waste Management

3 Pillars of Sustainable Development:

- Economy
- Social
- Environment

Alternative energy resources and energy efficiency are part of solution !



Source: EconPöyry

For further information

Ulf Bojö
Senior Investment Manager
Nordic Environment Finance Corporation (NEFCO)

Ash Sharma
Senior Investment Manager,
Carbon Finance and Funds

For general information visit
www.nefco.org

Investment Advisors in Russia:
Ksenia Koloshtivina (St Petersburg)
+7 921 961 1740
Vitaliy Artyushchenko (Novgorod)
+7 911 646 6872