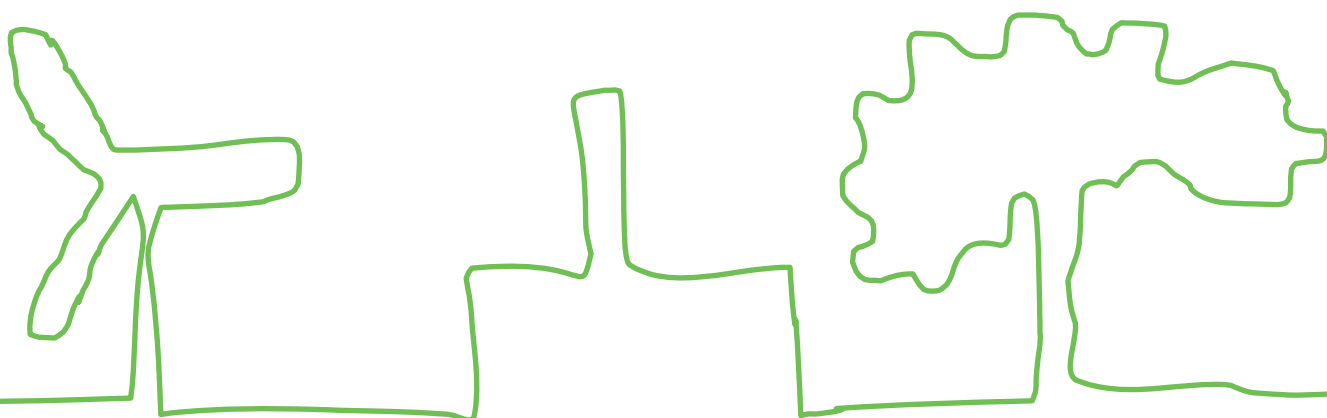


REGIONAL ENERGY SOLUTIONS

Guide to Financing Energy
Efficiency in Russia -
RENSOL Experience

Energy Efficiency
and Renewable Energy Solutions
in Kaliningrad Oblast



Partly financed by the EU

RENSOL

sustainable growth
innovation
competitiveness



Project:

**Regional Energy Solutions.
Energy Efficiency and Renewable Energy Solutions
in Kaliningrad Oblast**

Title of the Report in Work Package 4:

**Guide to Financing Energy Efficiency in Russia -
RENSOL Experience**

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December, 2013
Copenhagen



sustainable growth
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competitiveness



Table of Contents

Executive Summary	5
1. Introduction: RENSOL Project - Addressing EE in Kaliningrad and Russia	7
2. Barriers to EE Project Implementation	10
2.1. Common Barriers	10
2.1.1. Structural Barriers	10
2.1.2. Financial Barriers	11
2.1.3. Behavioural Barriers	12
2.2. Barriers to EE in Russia	13
3. Financial Instruments to Finance EE	15
3.1. Existing Financial Instruments to Finance EE	15
3.2. Potential EE Financing Options in Russia	21
4. Baltic Sea Region Experience with EE Financing	23
5. EE Financing in Russian Residential and Public sectors	28
5.1. Residential Sector	28
5.1.1. The Need for EE Investments in Residential Sector	28
5.1.2. Barriers Preventing Investments into EE in the Residential Sector	29
5.1.3. Possibilities for Increasing EE Investments in the Residential Sector	31
5.1.4. Suggestions on Possible EE Financing Solutions in the Residential Sector in Kaliningrad and Russia	33
5.2. Public Sector	35
5.2.1. The Need for EE Investments in the Public Sector in Kaliningrad and Russia	35
5.2.2. Barriers Preventing Energy Saving Investments in Russia	36
5.2.3. Final Observations and Recommendations for Energy Efficiency Financing in the Public Sector	40

6. Conclusions	42
Literature List	45
Appendixes	52
Appendix A. Energy Supplier/ Saving Obligation (White Certificate)	52
Appendix B. Energy Service Company (ESCO) Model	53
Appendix C. Products of International Development Institutions available in Russia	54
EBRD	55
IFC	55
KfW	57
NEFCO	57
Appendix D. Baltic Sea Region Experience	58
Denmark	58
Finland	59
Sweden	60
Germany	61
Poland	62
Estonia	64
Latvia	66
Lithuania	67

List of Tables

Table 1. Comparison of Different Financial Instruments	16
Table 2. Financial Instruments used in the Baltic Sea Region to Finance Energy Efficiency Activities	24
Table 3. Installation of Collective Counters	30

List of Figures

Figure 1. Russia EE Potential	9
Figure 2. Residential Energy Consumption in Russia	28
Figure 3. Public Building Sector Energy Consumption in Russia	35

Abbreviations and Acronyms

AAU	Assigned Amount Units
CFI	Commercial Financial Institution
CEB	Council of Europe Development Bank
EBRD	European Bank for Reconstruction and Development
ECA	Credit Export Agency
EDS	Energy Delivery Contract
EE	Energy Efficiency
EFA	Energy Financial Agency
EIB	European Investment Bank
EKF	Eksport Kredit Fonden
ERDF	European Regional Development Fund
ESCO	Energy Service Company
GP20	Governmental Programme of the Russian Federation "Energy Saving and Energy Efficiency Increase to 2020"
HOA	Home-Owners Association
IEA	International Energy Agency
IFC	International Finance Corporation
IFI	International Financial Institution
MAB	Multi-Apartment Building
M&V	Measurement and Verification
NEFCO	Nordic Environment Finance Corporation
NIB	Nordic Investment Bank
REA	Russian Energy Agency
VEB	Vneshekonombank

Executive Summary

This report forms part of the RENSOL project that is partly funded by the European Union within the framework of the Northern Dimension Environmental Partnership. The overall objective of the RENSOL project is to enable Kaliningrad and North West Russia - in collaboration with partners in the Baltic Sea Region to more effectively tackle climate change challenges through Energy Efficiency (EE) solutions.

Russia is the world's fourth largest energy consuming country¹ with energy intensity several times higher than of the developed world. This provides a huge potential for EE savings. Tapping into this potential requires a substantial scaling of EE projects financing. According to various estimates around 230 billion EUR are needed to reach 40% reduction of energy intensity in Russia.

As an integral part of the RENSOL project Work Package 4 that is led by the Baltic Development Forum, which aims to identify best global EE financing practices with a special focus on the Baltic Sea Region experience. It also aspires to promote and guide cross-border cooperation within the field. The report targets local authorities and municipalities, private enterprises, research and cross-border cooperation institutions. The main goal of Work Package 4 is to propose financing solutions that would not involve high upfront payments and would be aligned with the specific legal and economic specifics of Kaliningrad Oblast and North West Russia. The project also seeks for findings to be applicable more widely across Russia.

This report is organised as follows: Chapter 1 introduces the reader to the Russian EE market and the RENSOL project. Chapter 2 identifies barriers that prevent implementation of EE projects. Chapter 3 offers a short analysis of instruments that are used to finance energy saving projects. Chapter 4 introduces EE financing practices implemented in the Baltic Sea Region in order to put the situation of EE in Russia in perspective. It summarises main EE financing models used in Denmark, Finland, Sweden, Germany, Poland, Estonia, Latvia and Lithuania and presents important conclusions and lessons learned which can be applied to Russia. Chapter 5 examines the situation in Russian residential and public sectors and discusses potential EE financing instruments as well as necessary legal and regulatory changes. Finally, Chapter 6 summarises and concludes.

¹ International Energy Agency (2012)

1. Introduction: RENSOL Project - Addressing EE in Kaliningrad and Russia

Russia is the world's fourth largest energy consuming country². Its energy intensity is 2.5 times higher than the world's average and up to 3.5 times higher than that of the developed countries³. This provides a huge potential for EE savings - according to IFC estimates,⁴ Russia's energy consumption has a potential to be reduced by around 45% or some 300mtoe⁵.

For a long time EE was of little importance in Russia, the energy abundant country enjoyed low cost of energy and its economy was based on energy intense and inefficient industry development. Since around 2005, the Russian economic growth potential was clearly diminished due to the lack of energy. The percentage of satisfied grid connection applications in some regions of Russia was as low as 20%. The opportunity costs of an energy inefficient economy became too high, as Russia was not only losing a huge amount of potential export revenue, but also failed to capture a momentum of economic growth. Understanding that the current energy intensity levels of the Russian economy are no longer sustainable and that it heavily influences the competitiveness of the Russian industry, then-president Dmitry Medvedev identified EE as a top priority of modernisation and stimulation of Russian economy. In 2008 he signed Presidential Decree No.889⁶ that became a framework for the new Russian energy strategy. The decree implied **the reduction of energy intensity of the GDP by 40% by 2020** compared to 2007 levels. It was followed by a Federal Law No.261-FZ⁷ and by the Order of the Government of the Russian Federation No.2446-r⁸.

Although EE was declared as one of the priorities in Russia's energy strategy, there is still a long way to go till the ambitious goals of energy saving are achieved. To date federal funds are the main source of financing; however, the strain on the public funds is too high. According to various estimates around 230 billion EUR (10 trillion RUB) are needed in order to reach the planned 40% reduction in energy intensity. The current Russian energy strategy foresees that more than 90% of the funds should come from private sources. However, a system for financing energy saving projects that would allow a significant injection of private funds is not fully functional yet. Various *Pilot Projects* are being implemented with the help of regional partners and IFIs, but the potential for replicating those projects is limited due to the absence of commercial financing.

2 International Energy Agency (2012)

3 Government of the Russian Federation (2010)

4 International Finance Corporation (2008)

5 mtoe - millions tonnes of oil equivalent

6 "On measures to raise energy efficiency and foster environmental stability in Russia's economy" (adopted June 4, 2008)

7 "On energy saving and energy efficiency and on amendments to certain legislative acts of the Russian Federation" (adopted November 23, 2009)

8 Order No.2446-r approved the Governmental Programme (going forward GP20) of the Russian Federation "Energy Saving and Energy Efficiency Increase to 2020" (approved December 27, 2010)

RENSOL Project

This report forms part of the RENSOL project that is partly funded by the European Union within the framework of the Northern Dimension Environmental Partnership. The overall objective of the RENSOL project is to enable Kaliningrad - in collaboration with partners in the Baltic Sea Region - to more effectively tackle climate change challenges through EE solutions which allow to reduce the consumption of pollutant fossil fuels.

As an integral part of the RENSOL project Work Package 4 that is lead by the Baltic Development Forum aims to identify best global EE financing practices with a special focus on the Baltic Sea Region experience. It also aspires to promote cross-border cooperation within the field. The report targets local authorities and municipalities, private enterprises, research and cross-border cooperation institutions. The main goal of Work Package 4 is to propose and provide guidance in identifying financing solutions that would not involve high upfront payments and would be aligned with the specific legal and economic specifics of Kaliningrad Oblast and North West Russia. The project also seeks for findings to be applicable more widely accross Russia.

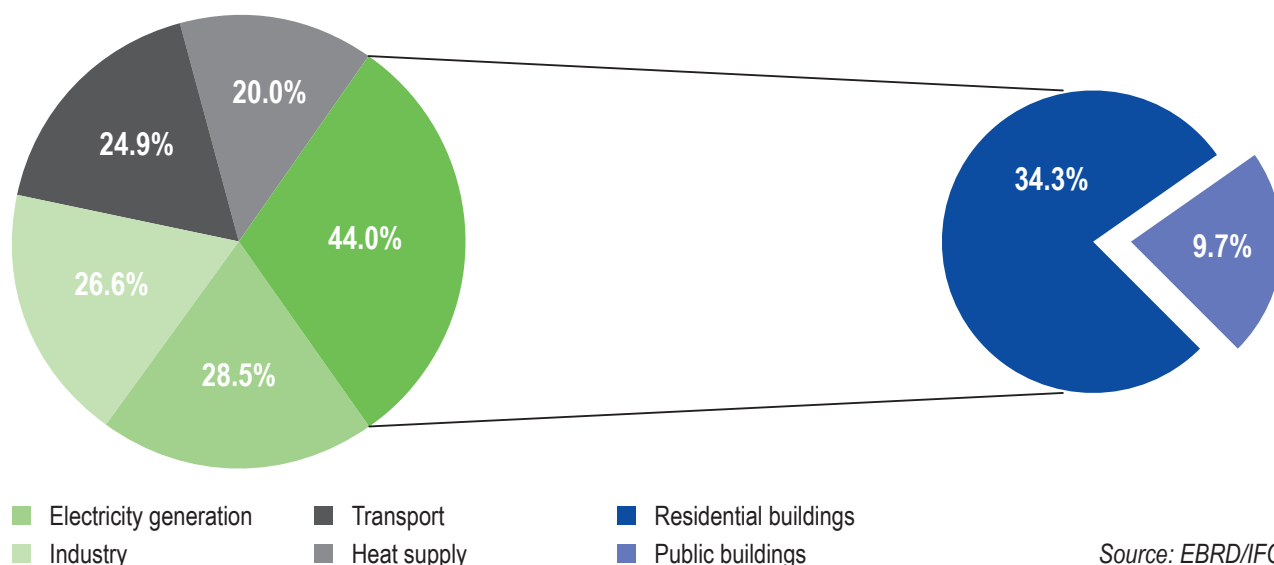
In order to demonstrate EE potential and provide best engineering and energy management solutions for Kaliningrad, pilot study projects in the residential and public sectors were selected under the Work Packages 1 and 2 of the RENSOL project. In the residential sector a multi apartment building (MAB) located in Artilleriyskaya street, Kaliningrad city⁹ is being studied. In the public sector EE solutions are being offered for "Firefly" kindergarten in Svetly municipality¹⁰ as well as energy saving street lighting options are being suggested for Lugovskoye municipality. Therefore, this report will focus on residential and public sectors.

Because approximately 44% of the foreseen 300mtoe energy savings would come from energy savings in buildings (see Figure 1. *Russia EE Potential*) a lot of attention in this report will be focused on residential (EE potential 53.4mtoe) and public (15.2mtoe) buildings. However, the report will also explore financing possibilities for other public sector projects such as public lighting and district heating.

9 The pilot case MAB is a typical residential five floor building in Kaliningrad city and is located in Artilleriyskaya street. It was built in 1983, and the total floor area of the building is 2'107m².

10 Kindergarten "Firefly" is located in Svetly municipality, Kaliningrad Oblast was built in 1963 and currently provides day care for 125 children. Building has two floors and its total area is 996m².

Figure 1. Russia EE Potential



This report is the documentation of research findings of RENSOL Work Package 4. The research process included analysis of the existing literature on EE project implementation as well as studies of international experience on financing of energy saving measures. The process also involved meetings with various stakeholders in Russia and the Baltic Sea Region. These included IFIs, commercial banks, Export Credit Agencies, ESCOs, representatives of energy management companies and energy managers on municipality level.

As a part of the RENSOL project and the research process for this report a roundtable discussion "Financing Energy Solutions in Kaliningrad Oblast" that focused on municipal EE project financing was organised on June 4, 2013. Draft findings of this report concerning the financing of public sector projects were presented during this event. The round table facilitated fruitful discussions and mutual dialogue between municipalities and IFIs, commercial banks and other financing institutions. Municipalities were asked to present their priority projects in the energy saving field, while representatives of financial institutions commented on the projects, pinpointing key issues (from the point of view of banking institutions) that should be addressed before looking for external financing and offered potential solutions for financing presented projects. The event clearly demonstrated that there is a strong potential for EE projects in Kaliningrad Region and Russia.

This report is organised as follows: Chapter 2 identifies barriers that prevent implementation of EE projects. Chapter 3 offers a short analysis of instruments that are used to finance energy saving projects. Chapter 4 introduces EE financing practices implemented in the Baltic Sea Region in order to put the situation of EE in Russia in perspective. It summarises main EE financing models used in Denmark, Finland, Sweden, Germany, Poland, Estonia, Latvia and Lithuania and presents important conclusions and lessons learned which can be applied to Russia. Chapter 5 examines the situation in Russian residential and public sectors and discusses potential EE financing instruments as well as necessary legal and regulatory changes. Finally, Chapter 6 summarises and concludes.

2. Barriers to EE Project Implementation

Despite all the benefits that energy saving measures provide, the actual investments in EE projects are much lower than the economically viable potential. Understanding the obstacles that impede energy saving projects from being implemented is key to creating appropriate EE policy, as well as successful financial products.

2.1. Common Barriers

During the analysis of literature and international experience different barriers to EE implementation were identified. Broadly, they can be divided into three main groups: structural, financial and behavioural.

2.1.1. Structural Barriers

This group of barriers brings together a wide range of obstacles that start from general EE market structure and particularities as well as institutional and administrative issues that can influence the implementation of energy saving projects.

Market Barriers:

- Fragmented Market/ Transaction Costs. There are a lot of small projects where a deep EE retrofit is not economically viable as it requires dealing with different component providers and contractors. What is more, transaction costs of such measures can account for a significant part of the budget. Bundling those projects together would make a deep EE upgrade financially feasible due to economies of scale and decreased project management, execution and financial costs. This is especially true for residential buildings or upgrades in relatively small local public installations such as kindergartens or hospitals.
- Agent Problems/ Split Incentives between the owner and the tenant. More often than not, the landlord and occupant are a different person/ entity. The problem here lies in the fact that the owner, who is not responsible for the energy-bill, is inclined to provide the lowest-first-cost equipment often ignoring the EE issue. At the same time the tenant (who is the main beneficiary of the retrofit as he/she is the one who enjoys energy savings and improved living standards) is not likely to be willing to invest in equipment that cannot be taken with him/her. On the other hand, it is the tenant who is to suffer from any inconveniences during the building upgrade process, and an owner, who is to benefit from the increase of the building's market value and/or potential increase in rent income.
- Lack of Data and a Measurement and Verification Protocol (M&V). Although interest in EE is not new, however, a standardised and globally accepted M&V protocol is absent, making it difficult to implement a cost and benefit analysis. There is also no international practice on how to compare the financial side of various energy saving measures. This

creates a hidden risk in EE projects and results in increased project transaction costs, as financiers have to spend more time evaluating each project. This discourages potential investors' interest in energy saving retrofits.

Legal/ Regulatory Barriers:

- Regulatory Distortions. Sometimes existing government policies encourage higher energy consumption, rather than energy saving. For example when governments subsidise energy prices, but at the same time impose high customs duties on EE equipment. Or when the level of subsidisation of energy prices is so high that end-users are discouraged to implement energy saving measures.
- Burdensome Procedures. Sometimes the procedure for receiving refurbishment permit might be so difficult and time consuming that it may prevent EE retrofits.
- Change in Ownership/ Tenancy. During the lifetime of an EE retrofit an ownership or tenancy of the building might change leading to potential changes in energy consumption habits. Ideally the costs of energy saving project should be linked to the building, and paid by the building occupant as he/she is the main beneficiary of the refurbishment.
- Ambiguities in the Decision Making Process (residential sector) caused by the legal status of homeowners associations (HOAs) and the involvement of a large number of decision makers.¹¹ It can be difficult to establish clear ownership and responsibility limits in multi apartment buildings (MABs); therefore, it can be difficult to arrive at consensus decisions that would satisfy different property owners.

2.1.2 Financial Barriers

Lack of own funds or inability to secure financing on acceptable terms have always been an issue as regards energy saving retrofits. The current financial crisis has made those barriers even more important.

- High Upfront Costs/ Long Payback Time. Usually a significant initial investment that has a relatively long payback time (anywhere from 5 to 25 years) is required to develop EE project. Residential and public energy users that lack money for initial investment are often deterred by high upfront costs. At the same time potential investors are cautious because a secondary market for EE securities is not well developed yet, meaning that they cannot easily exit from the investment.
- Lack of Awareness on the side of commercial financial institutions (CFIs)¹². Due to the lack of experience of working with EE finance, CFIs often fail to consider cash flow generated by energy cost saving activities. Therefore, they allocate higher risk to energy retrofit projects which results in high interest rates.

¹¹ T'Serclaes de, P., (2007)

¹² Energy Efficiency Expertise is almost non-existent among financial institutions.

- Lack of Scale. Relatively small, stand alone EE projects require a lot of time consuming analysis and financing solutions that often need to be tailored individually to each project. This turns EE financing into a laborious and not so lucrative niche business for banks. Therefore, banks are generally more willing to provide standardised mortgage or big scale project financing.
- Balance Sheet Constraints. Sometimes property owners are reluctant or not able to finance energy retrofit on their balance sheet and require non-standard EE project financing solutions.
- Low Collateral Asset Value of EE Equipment. A big part of energy saving project costs goes to design and engineering solutions. Project development and installation costs also account for an important part of the budget. At the same time the collateral value of the equipment is diminished by the fact that EE retrofits usually require highly specific equipment that limits the possibilities to resell it in the secondary market.¹³ This increases the project risks and the required rate of return.
- Mismatch between Savings and Payments Time. It is very often that the payments for EE investment do not match the cash flow produced by energy savings, making it difficult for energy users to pursue EE projects. Ideally, payments for EE retrofit should be covered by the savings that occur due to the project.

2.1.3. Behavioural Barriers

Another important group of obstacles that deter implementation of EE projects is behavioural barriers. Lack of awareness and uncertainty about the benefits of EE measures, as well as consumer behaviour and/or unwillingness to change habits are custom barriers to undertake energy saving retrofits.

- Customer Information Failure. Energy users usually neither know how to implement energy saving measures, nor understand the benefits of the projects, as those are initially invisible.¹⁴ Furthermore, customers often are unaware of the possibilities to finance EE projects. This results in consumer's lack of interest in energy saving measures as they cannot make educated decisions and see EE as risky investments.
- Lack of Trained Personnel - the majority of energy managers do not have sufficient technical expertise in EE and the effort from manufacturers and suppliers to promote energy saving products is insufficient. Therefore, more often than not energy managers are not able to recommend optimal EE measures to their clients.

¹³ Rezessy, S., Bertoldi, P., (2010)

¹⁴ Fuller M., (2008)

- The Priorities and Rules of Budgeting. In large corporations and in the public sector specific budgeting rules may apply. First of all, it is very common for entities to prepare one or three year budgets, however, a deep retrofit payback period can be anywhere from 5 to 25 years. What is more, sometimes reduction in operational costs due to undertaken energy savings measures results in a cut to next year's budget. This undermines a motivation to invest in EE projects.
- Non-Economic Decisions. Not all consumer decisions are based on purely economic logic and thorough investment analysis. Sometimes they can be based on general consumer preferences and tastes, on his/her goals and needs.
- The Rebound Effect. Contrary to general expectations, sometimes implemented energy saving measures may actually lead to increased energy usage - consumers may just feel that after the retrofit they can afford to consume more.¹⁵
- Cherry Picking occurs when deep EE retrofits are foregone for the so called "low hanging fruits". This means, that at first a relatively cheap upgrades with a short pay-back periods are undertaken. This effectively locks-in underinvestment and higher than economically optimal energy use until the next (harder and more expensive) energy saving upgrade is implemented. At the end, more complex and expensive EE measures (with higher benefits) are not implemented, as they become financially nonviable and the final energy consumption stays at below optimal level.

2.2. Barriers to EE in Russia

All of the barriers that were discussed above apply to Russian EE market. However, when talking about commercial financing of energy saving measures "**expensive money**" is the main problem in Russia. The country has always suffered from high inflation (over the last decade inflation in Russia averaged at 10.37%¹⁶; in August 2013, annual inflation stood at 6.5%) and high refinancing rate (from mid September, 2012 it is stable at 8.25%) which leads to a high cost of capital for banks. In addition, Russian commercial banks have **limited access to long term funding**: the share of long term deposits within Russian commercial banks is just around 5%. To make the matters worse, the current financial crisis has reduced the access to foreign funds. Thus, Russian CFIs are mainly interested in providing short to medium term loans. The average period of an in-depth EE retrofit averaging 10-20 years is too much for Russia, where 5 years is already a long period of time.

¹⁵ Sweatman, P., Mamagan, K., (2010)

¹⁶ Over the past decade annual inflation in Russia reached as high as 15.02% in 2002 and 13.28% in 2008. however, over the last 5 years it slightly decreased averaging 8.7%.

On top of the absence of long term funding, Russian banks perceive EE projects as high risk and lacking collateral. This all adds up and results that large and well established companies have to borrow at around 12-15%, while smaller companies are looking at commercial credit priced at around 15-18% or even more. Such **high interest rate levels** significantly reduce the economics of energy saving projects and deter end-users from implementing EE initiatives.

During a short period of time Russia has been trying to replicate the experience of Western Countries that have been tackling energy saving problems for around forty years. Therefore, it is not surprising that another key problem of EE project implementation in Russia is a **lack of qualified personnel**. Since the adoption of the Federal Law No.261-FZ in 2009 it was virtually impossible to prepare enough qualified energy auditors and EE specialists.¹⁷ The lack of competent specialists not only slows down implementation of energy saving measures, but also influences their funding.

EE project financing is also influenced by the level of energy prices. The **low cost of energy** in Russia not only does not motivate consumers to save energy and undertake respective measures, it also negatively influences the economics of EE projects. In Russia, the prices of the products of natural monopolies (electricity, gas, etc.) are set by the government. The upper tariff limits are established by the Federal Tariff Service and regulated by the Federal and Regional Energy Commissions. As a result, end-user prices in Russia are heavily subsidised and are much lower than in the EU. The convergence of energy tariffs to European levels has been much slower than it was envisaged at the beginning of the energy sector liberalisation reform tariff growth has been lower than inflation. An increase in domestic energy prices would encourage companies and customers to search for energy saving solutions, as well as attract the attention of foreign investors.

The next section will give an overview of the financial instruments that are used to address the barriers presented above.

¹⁷ Quality preparation of energy audit specialist takes around 2 years and involves supervised preparation of certain amount of energy audits. It takes around 3-5 years to prepare competent energy manager. However, according to current regulation, one needs to take a 72hours course in order to obtain energy auditor diploma. Since the establishment of the law ~20,000 energy auditor diplomas were issued.

3. Financial Instruments to Finance EE

3.1. Existing Financial Instruments to Finance EE

A wide variety of energy saving projects as well as different types of barriers, that were discussed in the previous section, require adequate financial solutions that would suite each project needs and address its individual issues. During the research process various funding options that are used for EE financing were distinguished. They can be gathered into four groups: traditional financing solutions, governmental support and regulatory measures, alternative financing mechanisms and finally, international financial institutions. Table 1. *Comparison of Different Financial Instruments* gives a short summary of the main funding mechanisms available for EE financing. Table explains which barriers are addressed by each instrument, as well as provides arguments *for* and *against* each measure.

Table 1. Comparison of Different Financial Instruments

Product	Description	Barriers Addressed
Traditional Financing Solutions		
1. Own Funds	<ul style="list-style-type: none"> Consumers finance energy saving activities with their own funds 	<ul style="list-style-type: none"> Lack of awareness on the side of CFIs Balance sheet Low collateral value of equipment
2. Equity Financing	<ul style="list-style-type: none"> Issue of common or preferred shares in order to obtain funds for EE projects 	<ul style="list-style-type: none"> Upfront investment Balance sheet Low collateral value of equipment
3. Loan Financing	<ul style="list-style-type: none"> Borrowing from a lender usually at a fixed interest rate and a predetermined maturity date 	<ul style="list-style-type: none"> Upfront investment Mismatch in savings and payments time
4. Leasing: Operating Capital	<ul style="list-style-type: none"> Financial product that provides a use of a certain fixed assets in exchange of a series periodic payments. 	<ul style="list-style-type: none"> Upfront investment Mismatch in savings and payments time
5. Bond Issuing	<ul style="list-style-type: none"> Issue of debt security - <i>bond</i> - under which the issuer is obliged to repay the principle at the end of bond maturity plus interest (the coupon) 	<ul style="list-style-type: none"> Upfront investment Low collateral value of equipment Mismatch in savings and payments time
Government Support and Regulatory Measures		
6. Grant or Subsidy	<ul style="list-style-type: none"> Non-repayable financial assistance given directly by one party (usually government) for recipient that is implementing EE measures 	<ul style="list-style-type: none"> Upfront investment Balance sheet Credit risk
7. Soft Loan	<ul style="list-style-type: none"> Loan that offers low or zero interest rates 	<ul style="list-style-type: none"> Upfront investment Mismatch in savings and payments time
8. Revolving Fund	<ul style="list-style-type: none"> Financial mechanism, where an initial fixed investment generates more funds that can later be reinvested 	<ul style="list-style-type: none"> Upfront investment Mismatch in savings and payments time
9. Guarantee Fund	<ul style="list-style-type: none"> Fund that offers coverage of the credit risks (at 1-3% p.a. of the outstanding loan balance) 	<ul style="list-style-type: none"> Credit risks Low collateral value of equipment

Pros	Cons
<ul style="list-style-type: none"> • Does not depend on financial institutions • Does not impair balance sheet 	<ul style="list-style-type: none"> • End-users usually do not have initial funds needed for EE investment • Leverage might increase the return on capital • Might lead to "cherry picking"
<ul style="list-style-type: none"> • Suitable at early stages of development • Improves balance sheet and leverage ratios 	<ul style="list-style-type: none"> • Loss of control and profit share of business
<ul style="list-style-type: none"> • Mature and widely available financing • Does not lead to a loss of control of business 	<ul style="list-style-type: none"> • Medium to high interest rates • May lack flexibility • Usually does not cover full investment amount. • Usually payback associated with the borrower and not the project • On-balance sheet, may create debt concerns
<ul style="list-style-type: none"> • Off-balance sheet financing • Aligns payback with savings timing • Low rates due to income tax exemption • Ability to claim depreciation 	<ul style="list-style-type: none"> • Inability to deduct depreciation • Covers just fixed asset value • On-balance sheet, may create debt concerns • Covers just fixed asset value
<ul style="list-style-type: none"> • Does not lead to a loss of control of business • On-balance sheet, may create debt concerns 	<ul style="list-style-type: none"> • Due to high issue cost not suitable for small projects
<ul style="list-style-type: none"> • Direct impact on the market • Can substitute loan financing in case of small scale investments • Facilitates access to debt markets • Improves cash flows, removes project risk • Increases rate of return, shorten payback time 	<ul style="list-style-type: none"> • Puts a strain on public budgets • Lacks flexibility • Difficult to prevent free-riders • May not have a long-term effect on the market • May not be effective if consumers are poorly informed about its existence
<ul style="list-style-type: none"> • Stimulates CFIs interest in providing EE loans 	<ul style="list-style-type: none"> • Puts a strain on public budgets • Difficult to prevent free-riders • May fail to create EE financing market
<ul style="list-style-type: none"> • Often provides soft loans and/or offers loan guarantees • Do not depend on market swings and external financing 	<ul style="list-style-type: none"> • Requires substantial initial investment • Have relatively slow reinvestment cycle
<ul style="list-style-type: none"> • Removes risks associated with long term lending, lack of collateral and implementation of EE projects 	<ul style="list-style-type: none"> • Do not function in an underdeveloped and illiquid financial environment

10. Fiscal Measures	<ul style="list-style-type: none"> • Governmental policy that can be used to stimulate EE measures 	<ul style="list-style-type: none"> • Credit risk • Balance sheet
11. Climate Change Levy	<ul style="list-style-type: none"> • An environmental energy tax that is charged on the business use of energy 	<ul style="list-style-type: none"> • Lack of economic incentive to invest in EE
12. Energy Supplier/ Saving Obligation/ White Certificate	<ul style="list-style-type: none"> • Environmental policy measure that certifies that a certain reduction of energy consumption has been attained. Usually a predetermined amount of energy savings is set and failure to comply leads to penalty 	<ul style="list-style-type: none"> • Upfront investment • Lack of awareness on the side of CFIs • Lack of data and M&V protocol
Alternative Financing Mechanisms		
13. ESCOs	<ul style="list-style-type: none"> • Private or public company that provides comprehensive EE solutions from development and engineering to implementation 	<ul style="list-style-type: none"> • Upfront investment • Operating risk
14. On-bill financing	<ul style="list-style-type: none"> • EE loan payments repaid via additional payment on utility bill 	<ul style="list-style-type: none"> • Upfront investment • Credit risk barrier
15. Energy Efficient Mortgage	<ul style="list-style-type: none"> • Loan product that recognises higher credit capacity of the consumer due to undertaken energy saving measures 	<ul style="list-style-type: none"> • Upfront Investment • Lack of awareness on the side of CFIs
16. Pooled Procurement	<ul style="list-style-type: none"> • Joining forces to carry out a joint tender for EE services and equipment 	<ul style="list-style-type: none"> • Market fragmentation/ transaction costs barrier
17. Vendor Financing	<ul style="list-style-type: none"> • A form of financing where seller lends money (with interest charge) to the client to buy its products 	<ul style="list-style-type: none"> • Upfront investment • Mismatch in savings and payments time
18. Credit Export Agencies	<ul style="list-style-type: none"> • Private or quasi-governmental institutions that act as intermediaries between national governments and exporters to issue export financing 	<ul style="list-style-type: none"> • Upfront investment • Credit risk barrier
International Financial Institutions		
19. International Financial Institutions	<ul style="list-style-type: none"> • Financial institutions (usually development banks) that are established in more than one country. Usually their shareholders are governments. 	<ul style="list-style-type: none"> • Upfront investment • Balance sheet • Credit risk • Mismatch in savings and payments time

<ul style="list-style-type: none"> • Easy to implement, relatively effective and flexible • Specifically target liquidity issue • Aims to create market demand 	<ul style="list-style-type: none"> • Puts a strain on public budgets • Difficult to prevent free-riders • Not effective if end-users are not paying taxes, lack transparency
<ul style="list-style-type: none"> • Funds generated from the levy can later be used to support EE activities 	<ul style="list-style-type: none"> • Can impair the competitiveness of business
<ul style="list-style-type: none"> • Have skills and experience to choose optimal EE measures • Can pool different projects together and achieve economies of scale • Access to cheaper debt financing • Have reliable data, heavily controlled by regulators • Aligns payback with savings timing • Reduces non-payment risk 	<ul style="list-style-type: none"> • Too low energy saving targets for energy providers, established by regulators. • The rebound effect
<ul style="list-style-type: none"> • Access to cheaper financing • Removed performance risk • Mediation between end-users and financiers 	<ul style="list-style-type: none"> • Risk of "cherry picking" • Takes time to negotiate contracts • Typically not able to provide own financing
<ul style="list-style-type: none"> • Off-balance sheet • Aligns payback with savings timing • Reduces credit risk • Easy to administer 	
<ul style="list-style-type: none"> • Access to cheaper financing • Higher proportion of loan financing • Aligns payback with savings cashflows 	<ul style="list-style-type: none"> • Immaturity and lack of availability • Usually payback associated with the borrower and not the project
<ul style="list-style-type: none"> • Brings down transaction costs • Brings down equipment costs • Access to cheaper financing 	
<ul style="list-style-type: none"> • Aligns payback with savings cashflows 	<ul style="list-style-type: none"> • On-balance sheet, may create debt concerns • Covers just fixed asset value
<ul style="list-style-type: none"> • Provide financing or guarantees • Minimises credit risk • Aligns payback with savings timing 	<ul style="list-style-type: none"> • On-balance sheet, may create debt concerns • Covers just fixed asset value • Covers just important equipment
<ul style="list-style-type: none"> • Can substitute loan financing in case of small scale investments • Facilitate access to debt markets • Improves cash flows, removes project risk • Increases rate of return, shortens payback time • Stimulates CFIs interest in providing EE loans 	<ul style="list-style-type: none"> • Difficult to prevent free-riders • May not be effective if consumers are poorly informed about its existence

Traditional Financing Solutions look at the energy saving investments as if they were any other traditional investments and include own funds, equity and loan financing, leasing and bond issuing. As discussed in the previous section, due to the lack of experience of working with EE projects, investment decisions are made based on traditional valuation methods, like payback time. This puts EE projects at a disadvantage, as they have relatively long payback times.

Governmental Support and Regulatory Measures may help address this issue by stimulating the creation of an energy saving market and encourage CFIs to create dedicated EE products. There is a wide range of mechanisms used by governments to promote EE. This includes grants, soft loans, guarantees, fiscal measures as well as the creation of energy supplier/saving obligation schemes¹⁸. Since most energy saving retrofits are commercially viable, a complex of various measures that support EE investments can demonstrate political will and help create a competitive environment for commercial financing. However, it is of crucial importance that public support is structured in a way that it encourages, rather than substitutes commercial financing in the long term. Only the participation of the private funds may insure that the implementation of energy saving projects reaches its economically viable potential.

Alternative Financing Mechanisms offer another range of instruments to address the downsides of traditional financing. Most of the instruments under this category have been created specifically for EE financing (ESCOs¹⁹, on-bill financing, Energy Efficiency Mortgages, Pooled Procurement), while other (vendor financing and credit export agencies) are designed to stimulate sales²⁰.

Last, but not least an important group is financing solutions provided by *International Financial Institutions* (IFIs)²¹. Multilateral or bilateral development organisations can play an important role in promoting EE by addressing various market barriers, such as absence of long-term financing or liquidity, high transaction costs or perceived risk. By sharing their knowledge of the sector, IFIs can help recipient countries to address legal barriers that prevent CFIs from investing in EE measures.

Having said that, it is important to emphasise that the existence of a wide range of various EE financing products is not the only measure of the maturity of the energy saving market²². Rather, the degree of product specialisation²³ is a better indication. Sometimes a combination of different financial mechanisms may offer a more effective solution than a single product, therefore, it is essential to have a flexible market setting.

18 Energy Supplier/Saving Obligation (White Certificate) Scheme is explained in more detail in Appendix A.

19 ESCO model is explained in more detail in Appendix B

20 In this case of EE equipment.

21 Some of the products of International Financial Institutions available in Russia are listed in Appendix C.

22 Rezessy, S., Bertoldi, P., (2010)

23 In this case product specialisation means the ability of the existing financing products to address the individual needs of various EE projects.

3.2. Potential EE Financing Options in Russia

Interest in energy saving activities on federal level is relatively new in Russia and its financial and EE market is currently undergoing a lot of changes. Although most of *traditional financing instruments* are available in Russia, however, until recently foreign investors found it difficult to access Russian bond market due to significant restrictions. All transactions with Russian Federal Loan Obligations (OFZs) had to be carried through Russian banks²⁴. However since February, 2013 this has changed - investors are now allowed to process OFZs through the Belgian clearing house Euroclear.²⁵ Simply the anticipation of a **liberalisation of the rouble bonds** has helped to drive down OFZs prices by 120-150 basis points and after it actually happened the yields have declined even further. What is more, liberalisation of corporate and municipal bonds is also expected to follow. This could create an opportunity to issue dedicated Infrastructure and **Green bonds**, not only on a federal, but also on a regional and municipal level²⁶.

A couple of years ago, plans to create the **Energy Financial Agency (EFA)** by the Russian Energy Agency (REA) and Vnesheconombank²⁷ (VEB) were made public²⁸. EFA is planned as a commercial profit oriented organisation with 9.14 million EUR (400 million RUB) capital (50/50% Joint Venture of REA and VEB). It is foreseen that EFA is to provide target financing and guarantees to EE projects, that are to be implemented mainly by ESCOs. Initial financing (approximately 29.7 million EUR (1.3 billion RUB) is to be provided by VEB, but going forward the agency would have to mobilise financing offered by IFIs and Russian banks. EFA is also expected to tackle bond markets via Green Bond issues.

The Federal Law No.261-FZ envisions **ESCO** model as one of the main tools to finance EE in Russia. However, in order to be able to successfully implement ESCO model in Russia, a possibility to **freeze energy tariffs**²⁹ is required - this would provide certainty over the future and possibility to offer guaranteed energy savings to clients. Currently, the Federal Law No.261-FZ allows tariff freezing just for two years (sometimes it can be extended to five years), however there is no possibility to offer tariff guarantees for the ESCO contracts with a duration of 10 or more years. This provides uncertainty and deters ESCOs from providing deep-retrofit services that have long payback periods to its clients.

24 Due to this restriction, the share of foreign investors in OFZ market was very low - between 6%-14%. In comparison to other developing countries like Hungary where foreign investors hold over 40% of governmental bonds, or Mexico and South Africa with 30% foreign ownership.

25 This not only makes the purchase of rouble bonds easier for foreign investors, but also safer, as the title to security is now protected under Belgian law.

26 So far Russian sub-federal and municipal market is not very big, in 2012 it was just EUR 2.66 billion (RUB 116.5 billion), but it has a potential to grow.

27 Russian Development Bank.

28 It was communicated that EFA was expected to be fully operational by 2013, however, there is no information available on its current state.

29 Or to sign an agreement that would ensure that for a certain period of time energy tariffs are set in a fair and predictable way, that would allow to recover investments in EE.

A possibility to create an **Energy Supplier/Saving Obligation Scheme (White Certificate Scheme)** in Russia is also being discussed. When designing the scheme, the government can assign sectors (e.g. residential, public, industrial) where implementation of energy saving activities would give a right to receive white certificates. Such a scheme would encourage investments in targeted sectors as well as development of the ESCO market. To achieve meaningful results, the government needs to include ambitious targets and relatively high penalties when creating the scheme.

IFIs are active in Russian EE market, what is more they are also trying to at least partially address the issue of lack of qualified personnel by providing **technical assistance** for local banks and property owners during EE project preparation and implementation. By providing advisory services IFIs are trying to increase the scale of private sector involvement in energy saving market, while by participating in public information campaigns they are trying to raise general awareness of the benefits of EE.

The next section is to introduce existing EE funding practices in the Baltic Sea Region.

4. Baltic Sea Region Experience with EE Financing

As discussed in the introduction, this report forms part of the RENSOL project, which aims to enable Kaliningrad (and Russia) - in collaboration with Baltic Sea Region partners - to more effectively tackle climate change challenges through EE solutions. Specifically, Work Package 4 of the RENSOL project aims to draw not only on global EE financing practices, but also on the Baltic Sea Region experience. Therefore, after the short introduction and discussion of the main financial instruments used to finance energy saving measures, it is important to put the situation of EE financing in Russia in the context of the Baltic Sea Region. As part of the research process, an analysis of existing energy saving funding practices in Denmark, Finland, Sweden, Germany, Poland, Estonia, Latvia and Lithuania is presented.

The above listed countries belong to the Baltic Sea Region and can also be considered as representatives of the European EE investment market. The Scandinavian countries are considered the most energy savvy, while Germany is the biggest single EE market in Europe. While, Poland and the Baltic States share a lot of characteristics with Russia: post-communist mass-privatisations of apartments as well as a high level of decay due to underinvestment in maintenance of residential and public buildings, district heating, etc.

Table 2. *Financial Instruments used in the Baltic Sea Region* provides an oversight of existing EE financing programmes in the Baltic Sea Region.³⁰ First, one can see that all the countries that are analysed have various on-going programmes that support EE measures. The most popular means of support are grants and subsidies - they are used in all Baltic Sea Region countries. However, the extent of support and its overall importance differs from country to country. It is important to note that most of the instruments are designed to finance energy saving activities in buildings.

Second, the new Member States of the European Union are highly reliant on support received from IFIs and EU Structural Funding³¹. This might be explained by the fact that they are less developed in comparison to the richer neighbours: Germany, Denmark, Sweden and Finland. Another reason for this reliance is that the general state of the residential and public building stock in the Baltic States and Poland is much worse due to years of poor maintenance during the communist era.

³⁰ A detailed country by country discussion of financial instruments that are used to finance EE projects in the Baltic Sea Region is provided in Appendix D.

³¹ It is slightly concerning that the new EU Member countries are heavily reliant on financing from IFIs and EU Structural Funds as it may limit the development of competitive commercial products. However, those countries are relatively new to the energy saving activities, and combined with the right policy IFIs and EU Structural Fund support may help to create a healthy commercial financing market.

Government and IFIs subsidies in popularity are followed by fiscal measures: Poland and Lithuania offer a reduced VAT rate for EE equipment, while Sweden and Finland allow income tax deductions. In addition, Lithuania also allows a corporate tax rebate. In general fiscal measures have similar effects as grants and subsidies; however they are administered differently and allow end-users to avoid undergoing application process for the grant financing.

As can be seen in the summary table, the ESCO model is not very popular among the Baltic Sea Region Countries and is mainly used in Germany (the single biggest European ESCO market with an estimated market size of 4-5 billion EUR).³² It should be noted that it is mainly the public sector that utilises the ESCO model to finance EE projects. ESCO concept, although to a lesser extent, is also being used in Latvia, where first steps to finance MAB retrofits via an ESCO model are being taken.

Commercial financing is not widely available in the Baltic Sea Region - it is only active in Finland and the Baltic State countries, where CFIs are offering loan products based on

32 Marino, A et al.(2010)

Table 2. Financial Instruments used in the Baltic Sea Region to Finance Energy Efficiency Activities

Instrument/ Country	Scandinavia			Germany
	Denmark	Finland	Sweden	
Government Guarantees				
Grants and subsidies for energy audit		40% for household 50% to public and industry sector that have joined energy conservation agreement		Various direct federal grants and regional schemes
Grants and subsidies for EE retrofit	Until Spring 2009: 40% (up to 2'000 EUR) of labour costs 20% (up to 1'350 EUR) of equipment costs	10-15% for household sector 15-25% for public and industry sector entities that join an energy conservation agreement	25% of equipment costs Up to 30% of EE windows costs (up to 1'150 EUR) and boilers costs (up to 1'727 EUR)	Various direct federal grants and regional schemes

EU Structural Funds Programmes. In other countries there is little interest from CFIs in EE projects. One of the reasons might be the widely available public and IFI funding which can lead to a limited development of the commercial financing products. However, Polish, Estonian, Latvian and Lithuanian markets are not yet mature enough to make this conclusion.

All in all, there are a lot of different financial instruments and different programmes that promote EE investments in the Baltic Sea Region. However, the information on the extent of their overall effectiveness is limited, as there is no widely used practice of comparison. What is clear is that there is no *silver bullet* that would solve energy saving financing issues. A regional dialogue sharing best practices might prove worthwhile, as in order to effectively address EE barriers a combination of different funding instruments might be necessary. A special attention needs to be paid to the long-term goals of any policy, as only with the participation of the private funds the implementation of energy saving projects may reach its economically viable potential.

Poland	Baltic States		
	Estonia	Latvia	Lithuania
	Up to 75% guarantee on loan for MAB renovation at 1.2-1.7% fee		Up to 75% guarantee on loan for MAB renovation at 1.2-1.7% fee
	50% (up to 700 EUR for energy audit and 4'000 EUR for reconstruction project)	282 EUR /MAB	
45% of the equipment loan	15-35% of total cost; depends on energy savings. (Financed by 30m EUR sale of unused Kyoto Protocol credits). 10% for reconstruction and restoration of the main structures 50% for technical inspection.	Up to 50% under GIS programme Up to 60% (up to 50 EUR /m2) under ERDF programme 20% subsidy on loan under Law on Energy Performance of Buildings	100% for feasibility study 15% loan rebate 100% renovation costs for low income residents 50% depending on the EE measures

Instrument/ Country	Scandinavia			Germany
	Denmark	Finland	Sweden	
Soft Loans				2.55-3% interest rate for envelope and equipment for 5-10Y up to 50'000-100'000 EUR loan
Energy Saving Obligation	2.6% of total end use (until 2013 at 1%)			
Fiscal Measures		60% of labour costs (6'000 EUR) for envelope and equipment on household income	5'000 EUR p.a / building labour costs on household income	
Pooling				Berlin Energy Agency is pooling a number of buildings and conducts pooled procurement from ESCOs.
ESCOs	Some presence, but not active	Small market, mainly active in industrial sector	60-100 m EUR market, mainly in public sector	4-5 b EUR market, mainly in public and private commercial buildings sector
EU Structural Funds				
International Financial Institutions				
Commercial Financial Institutions	Not very active. Danske Bank Group finances the renovation of homes	Active: commercial loans and leasing		Umwelt Bank - the most active. Offers various products linked to programs of the KfW
Other	Energy Saving Trust - 0.006 DKK/kWh for households and public Sector		Subsidies in municipal and climate advisory services	

Source: Maio, J et al (2012), IFC Advisory Services in Europe and Central Asia (2011), Marino, A et al.(2010), Mure database, author research

Poland	Baltic States		
	Estonia	Latvia	Lithuania
Up to 50% of total project cost up to 20Y	Min 6'400 EUR 10Y loan fixed at interest rate below 5%.		Long term loans with fixed interest rate of 3% for 20Y for envelope, equipment
Started in January, 2013			
8% VAT on envelope and other instead of normal rate of 23%			9% VAT on EE equipment. Corporate Tax rebates available
Not active due to the lack of awareness, experience and legislation issues. Positive experience in public lighting	Not active	Supported by ERDF. Agreements typically for 20Y. ESCOs facilitate 15-25Y bank debt financing	Not active
Bank Gospodarstwa Krajowego is responsible for the payment of the majority of EU funds	17m EUR (in 2009) for Renovation Loan programme by KredEx	ERDF subsidy programme and support for ESCOs	227m EUR MAB modernisation programme, o/w EUR127m from the ERDF and EUR100m national funding
	CEB EUR28.8m loan for Renovation Loan programme		NIB provides the 100m EUR loan for the EUR227m programme
Not very active due to Thermo-modernisation and renovation program popularity	Swebank and SEB provide Renovation Loans under 49m EUR Kredex programme	Active, including Swedbank, Seb, DnB, etc.	Active. Provide loans under Jessica programme (Swedbank, Seb, etc)
EcoFund Foundation; National Fund for Environmental Protection and Water Management	Tallinn, Paide and Rakvere municipalities offer subsidies for loans to housing cooperatives Tallinn offers loans with 2.85% 5Y, 3.8% 10Y interest	GIS programme, Municipal Development Fund	Vilnius, Kaunas and Klaipeda regional programmes (in the past)

5. EE Financing in Russian Residential and Public sectors

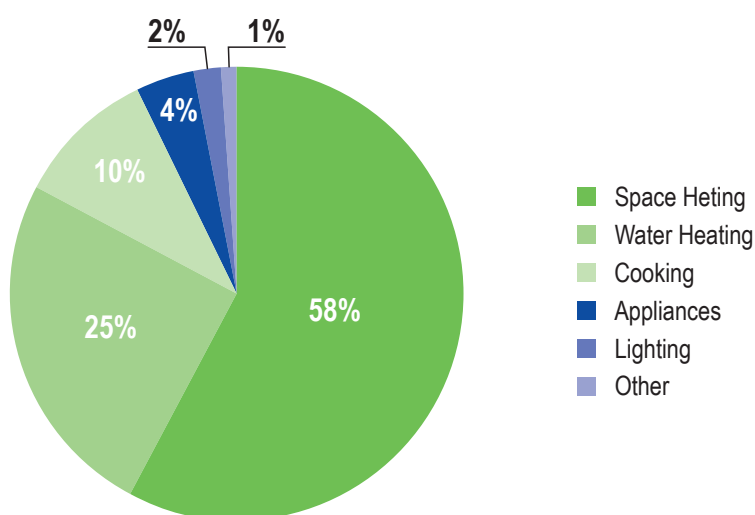
This section of the report is to discuss in more detail the barriers and potential financing sources specific to the Russian residential and public sectors. As of integral part of the RENSOL project, one of the aims of this report is to provide potential funding solutions for pilot projects that were selected by the RENSOL project in the residential and public sectors.

5.1. Residential Sector

5.1.1. The Need for EE Investments in Residential Sector

The housing and utilities sector is one of the key sectors of the Russian economy - it accounts for 95.6 billion EUR (4.2 trillion RUB)³³ or 6.9% of GDP. Residential housing is also the second largest total energy consumer (after manufacturing) in Russia. It accounts for around 20% of electricity consumption and around 60% of heat demand. In residential sector space heating accounts for most of the energy use (58%), followed by water heating (25%)³⁴ - see Figure 2. *Residential Energy Consumption in Russia* for more details.

Figure 2. Residential Energy Consumption in Russia



Source: Bashmakov, I., et al., (2008)

³³ Of which utility bill is 29.6 billion EUR (1.3 trillion RUB)

³⁴ Bashmakov, I., et al., (2008)

The energy intensity of residential space heating in Russia is currently double that of European countries with similar climatic conditions. According to various calculations, if only one-third of residential housing is brought up to European standards, Russia could save the amount of energy that is equivalent to half of its natural gas exports to the EU. This would allow the country to export higher amount of natural gas at higher Western Europe prices and thus improve its current account balance as well as the state of federal finances. What is more, increased EE in the housing sector would also provide additional savings of public funds, as Russia not only indirectly subsidises domestic energy prices, but also provides direct utility bill subsidies for low-income households. In 2012 the Russian government subsidised utility bills for 38 million low-income residents spending a total of 5.7 billion EUR (250 billion RUB). Had energy efficiency measures been implemented, the accumulated savings could have been used to stimulate economic growth, develop infrastructure or provide better public services.

5.1.2. Barriers Preventing Investments into EE in the Residential Sector

Despite all the benefits that energy saving measures in the dwelling sector could bring to the Russian economy, certain particularities of the country's housing sector prevent the implementation of EE retrofits.

After the collapse of the Soviet Union the Russian housing sector underwent a transition from state to private housing - in 1991 the Law "On Privatisation of Housing" allowed tenants to claim ownership of their apartments free of charge. By the end of 2011 84.7% of housing belonged to private owners. The vast majority (76.3%) of housing in Russia consists of apartments in multi-apartment buildings (MABs). However, the framework for adoption of House Owners Associations (HOAs) is undeveloped in Russia, as by the end of 3rd quarter of 2012 only 13.63% of MABs were managed by HOAs. One of the main reasons for such a low number is the provision of part two, Article 30 of the Constitution of the Russian Federation that establishes that "nobody can be forced to enter organisation or participate in it". This provision effectively prevents Russian government from obliging homeowners to form HOAs.

Now, after decades of neglectful maintenance, the Russian housing market is facing new challenges. According to Rosstat data by the end of 2012 wear out of 1,65 million MABs stood at 31%-65%, and 210 thousand houses where wear out wast 66%-70%. Therefore, more than 50% of MABs (where around 48 million of population live) require to undergo capital repairs. Currently the rate of capital renovation is very low: up to 3% per annum. Most capital repairs are financed with federal funds³⁵ via the Fund for Reformation of the Communal Housing Sector. Those retrofits are usually minimal and rarely aim at increasing EE. According to various estimates selective renovation would require an investment of around 27 billion EUR (1.2 trillion RUB), while implementation of complex measures would cost around 82 billion EUR (3.6 trillion RUB).

35 Less than 8% of investments in residential dwelling sector comes from private sources.

As discussed previously, the main barrier for increasing implementation of EE projects is high upfront costs and lack of financing. What is more, a lot of consumers, especially in older housing are elderly people, who lack access to modern information sources and do not fully understand the benefits of EE and renovation. They still remember Soviet times, when government took care of everything. Besides, a very low number of residential properties have meters (for sector breakdown see Table 3. *Installation of Collective Counters*) and thus an average utility bill does not reflect actual usage of energy and water.³⁶

Table 3. Installation of Collective Counters

Type of meter	% in 2Q'09	Houses in 2Q'09	% in 3Q'12	Houses in 3Q'12
Heat	3.4%	77,159	16.69%	199,643
Cold Water	5.81%	131,967	19.32%	231,098
Hot Water	2.38%	54,028	11.51%	137,644
Electricity	12.63%	286,815	38.14%	456,196

Source: compilation of interactive data available at <http://www.reformagkh.ru/>

As argued previously, a very low number of MABs is being managed by HOAs. Without a functioning HOA, the Housing Code demands that the management of the building is undertaken by a management company. By the end of 3rd quarter of 2012 53.73% of the MABs were managed by management companies. However, it is very common that there is no mutual trust between the management company and the residents. This diminishes the possibilities to undertake renovation projects and implement energy saving measures³⁷.

36 From 2015 the utility bill of MABs that do not have collective counters will be calculated using increased coefficient. Currently households that do not have collective counters pay according to the normative.

37 The reader can find more details on this argument in "RENSOL Experience - Barriers to Energy Efficiency Investments" box.

RENSOL Experience - Barriers to Energy Efficiency Investments

Within the framework of this report the researcher met with various Kaliningrad residential EE market actors. Interviews helped to get better understanding of the Kaliningrad and Russia context, as they provided a number of first-hand experience.

By the end of 2012 there were roughly 26'370 residential houses in the Kaliningrad region, with a total floor space of approximately 23,55 million square meters, or approximately 24m² per person. The number of HOAs was slightly lower than the Russian average and stood at 11.57%, while 57.18% of the housing stock was managed by management companies. Most of those companies (67.6%) were private.

It is the responsibility of the management company to prepare a capital repairs plan, which is later voted during the MABs' residents meeting. According to the interviewed representatives of Kaliningrad management companies, the main reasons for the stagnation of the renovation of MABs are:

- Inactive property owners - often the quorum of property owners is not reached, therefore a decision regarding capital repairs can not be made.
- Low penetration of meters - low energy prices do not motivate residents to install meters, as at the moment it does not pay back. The Federal Law No.261-FZ required MABs to install collective counters by the end of the 1st half of 2013, however by the end of 3rd quarter 2012 only 5.65% of residential houses had collective heat meter installed, 4.68% cold water meters, 1.59% hot water meters and 14.12% electricity meters. Due to such low meter penetration rates in MABs the deadline has been prolonged to the end of 2015.
- Residents tend to choose the cheapest management company that does not care too much about the general state of the MAB, and concentrates mainly on fees collection.
- Residents tend not to trust the management company due to overall bad experiences. This seriously impairs working relationship between the two parties. In addition, the maximum duration of the contract with a management company (as established by law) is five years, while a deep-retrofit payback period can be anywhere from 5 to 25 years. In addition, homeowners also have the possibility of terminating this contract annually.
- Currently there are no legal measures that can be used by the management companies to collect debts. This uncertainty combined with the long term duration of the payback of any comprehensive retrofit prevents management companies from borrowing from commercial banks on behalf of homeowners. This creates additional risk for management companies wanting to carry out EE projects.
- Virtually no commercial financing is available - in general CFIs are somewhat reluctant to provide loans to MABs or management companies as they consider them high risk. When considering a loan to a management company, banks are asking for a long term relationship with the company; however, as mentioned above, the maximum duration of the contract is 5 years. CFIs are also asking for a very low overdue rates on utility bills -usually at least 98% of households have to pay their bills on time. Commercial banks also require some kind of guarantees and at the moment no residential guarantee scheme is available in the Russian EE market. Finally, there is a legal requirement to form additional reserves within the Bank of Russia upon the issue of loans without real estate mortgage. Since most of the HOAs and management companies do not own real estate, their access to commercial lending is even more limited.

5.13. Possibilities for Increasing EE Investments in the Residential Sector

Based on the lessons learned it is safe to conclude that to date there is no reasonable and easily accessible financing that can be used to finance EE retrofit. Up to now most capital repairs were financed with federal funds via the Fund for Reformation of the Communal Housing Sector. However, the situation is about to change. On December 14th, 2012 the Russian Duma adopted a Federal Law No.271-FZ "On Capital Repairs" that came into effect on January 1st, 2013. The new law, which also focuses on EE, introduces mandatory monthly capital repair payments that will be added to the utility bill from July 1st, 2014.³⁸

38 On-bill payments will considerably reduce non-payment risk

Before the end of February 2014, residents have to decide on the method to form a capital repair fund. There are two options available - property owners may decide to open a special capital repairs account in one of the major banks³⁹ or entrust the funds to a regional operator that is to pool the funds and decide on the sequence of capital repairs.

RENSOL Experience - the Kaliningrad Region MABs Capital Repair Programme 2013-2015

During the period of a previous MABs Capital Repair Programme 2008-2012 of the Kaliningrad Region, 828 MABs (where 36'700 people live) with a total floor space of 895'000 m2 were renovated. From 2007 the quantity of residential housing with a wear out of 31%-65% has decreased from 45% to 39% in the Kaliningrad oblast. However, there are still 4008 MABs that require renovation.

The 2013-2015 capital repair programme foresees renovation of 787 MABs and aims to decrease the average wear out of MABs to 45.2% by the end of 2015. The programme foresees total investments of 146 million EUR (6.4 billion RUB), of which 41 million EUR (1.8 billion RUB) will be provided from regional budget. The rest should come from municipal budgets and homeowners.

Until recently regional capital repair programmes of MABs were able to receive federal co-financing that was being allocated by Housing and Utilities Reform fund. The fund was scheduled to stop its operation in 2013, but has been prolonged it until 2018. During this period, only co-financing for emergency state MABs will be offered.

According to EBRD experts on average socially acceptable amount for capital repairs per household is around 20 RUB/m2/month, while the average cost of complex capital repair is around 5,000-7,000 RUB/m2 (114-160 EUR/m2). This means, that it would take 20-30 years for the property owners to save/pay for the capital repairs of their housing. This means that an effective subsidy scheme, especially one that targets low-income households, is required.

In order reach optimal levels of economically viable EE retrofits, access to affordable long term commercial financing is essential. IFC specialists estimate that the market potential for new financing of capital repairs in Russia is approximately 2.8-9.1 billion EUR (125-400 billion RUB)⁴⁰. The main advantage of the new law on mandatory capital repair payments is that it allows accumulated funds to be used not only to pay for capital repairs, but also to cover EE project preparation costs, costs of installation of collective meters, as well as cover interest payments of bank loans. Depending on the final structure of the obligatory capital repair payments system - the measure can allow MABs to borrow funds from commercial banks using the mandatory capital payments account as collateral for the bank loan.

Changes in legislation, as well as active involvement of IFIs creates new opportunities for commercial EE financing. In May 2013 EBRD's Russian Sustainable Energy Efficiency Facility⁴¹ was extended to include the residential sector. So far, the residential programme has one partner: Rostov-on-Don based Centre-Invest bank that was the first bank to borrow 17.1 million EUR (750 million RUB) for lending to its clients in Southern Russia⁴². Currently the bank provides loans for up to 5 years and charges 13-16% interest rate depending on duration. This is the first EE dedicated product in the Russian financing market.

39 The law specifies that bank capital should be at least RUB 20billion.

40 www.ifc.org/wps/wcm/connect/topics_ext_content/ifc_external_corporate_site/cb_home/news/feature_russia_feb2013

41 RuSEFF, www.ruseff.com. The total volume of the programme is EUR 75million.

42 It is worth noting, that Centre-Invest bank does not fall under the category of the banks, where MABs can open capital repair payments account, as it's capital is less than RUB 20 billion.

A changing market environment, its vast potential size as well as active support and EE dedicated credit lines that are provided by IFIs are raising some interest from the side of financiers.⁴³ Currently, despite the existence of Governmental Order of Russian Federation No.2446-r that specifies the necessity to allocate guarantees for EE projects, the system of guarantees is not working. Private financiers also require a flexible guarantee mechanism- at the moment funds corresponding to guarantees issued by federal or regional government usually reach the lender only after 3-5 years after a bankruptcy procedure.

On May 24th, 2013 the first ESCO contract in the residential sector in Russia was signed. This is a pilot project that is being implemented with the help of the Norwegian government in a 12storey MAB in St.Petersburg. The project foresees implementation of 3 energy saving measures that are to bring the buildings' energy consumption down by 30%. Total investment in EE retrofit amounts to 91'100 EUR (4 million RUB). The main aim of the project is to test financial and legal mechanisms that would enable implementation of ESCO models in the residential MABs sector on a larger scale.

RENSOL Experience - Pilot Project in Kaliningrad City

In order to demonstrate a potential of EE measures a typical residential five store MAB building, located in Artilleriyskaya street, Kaliningrad city was chosen. The building was built in 1983 and its total floor are is 2'107 m2. RENSOL partners from Immanuel Kant Baltic Federal University (Kaliningrad, Russia) and Lappeenranta University of Technology/Northern Dimension Institute (Lappeenranta, Finland) have prepared a detailed study, suggesting optimal EE solutions.

To date there are not many options to finance residential EE activities - traditional financial institutions are not very interested in the sector. One of the options to finance residential energy saving projects in Kaliningrad/ Russia would be to try to use vendor financing or, in case that chosen equipment is produced abroad, to use the services offered by ECAs. In the near future the number of options to finance EE retrofits in MABs sector should include the possibility of using regional operator services and savings from capital repair payments funds.

A NEFCO representative stated that NEFCO is interested in financing MABs renovations, however in order to provide loans, the corporation requires a functioning residential guarantee scheme. If established, EFA could be used as a tool to provide the required guarantees.

5.1.4. Suggestions on Possible EE Financing Solutions in the Residential Sector in Kaliningrad and Russia

- There are no reasonable and easily accessible commercial financing products in Russia that can be used to finance EE projects in MABs. First steps in this direction are being taken by Centre-Invest bank with the help of EBRD. However, interest rates on commercial loans are somewhat high for residential clients.
- **Obligatory capital repair payments** that are to enter into force from July 1st, 2014 should provide another impulse for creating of EE dedicated commercial bank products. The capital savings account and obligatory monthly payments could be used as some kind of collateral when seeking commercial financing.

⁴³ As discussed above, there is no effective legal mechanism that can be used to recover debts.

- In order to stimulate commercial financing of residential EE projects, the government needs to create a **flexible guarantee mechanism**. (For example a mechanism similar to the one provided by KredEx in Estonia).
- A clear structure of **subsidies targeting low-income households** would encourage EE renovations. However, it is very important to think about an effective "exit" strategy, as prolonged subsidisation of EE measures in MABs could prevent the development of competitive financing products offered by commercial banks. Germany is a good example of the consequences of prolonged and intensive subsidisation. Although, German government support to energy saving measures is well developed. however CFIs are not active in residential EE project financing. Thus, it might be more sensible to focus on soft loans, rather than direct subsidies for non-low-income households. An introduction of differentiated subsidies and soft loans (depending on the depth and complexity of the energy retrofit) should also be considered.
- It is important to overcome households' resistance to reconstruction of MABs. For example, in Lithuania one of the main obstacles for MABs renovation was the indifference to EE projects of the low-income households that receive utility bill subsidies. They simply would not vote in favour, despite the fact that government covers 100% of low-income households' share of renovation costs. Therefore, the Lithuanian government introduced a measure that allows to automatically cancel utility bill subsidy to low-income households that vote against MAB renovation.
- The potential of EE in the residential building sector is huge, but the market is highly fragmented. Regional operators can be used to bundle renovation projects (like the Berlin Energy Agency in Germany) and by doing so decrease transaction costs, as well as reach economies of scale due to lower prices.
- Regional operators of bigger regions could also look at the possibility of issuing dedicated **Green Bonds**, if their funding requirements are relatively high. This could provide an opportunity to tap into cheaper long term funds provided by international (and maybe local) pension funds and dedicated Clean Energy Funds. Few potential investors can justify the laborious evaluation and underwriting work needed when individual EE projects are financed, however dedicated green bond issue that is liquid in the secondary market, might attract the attention of those investors.
- Despite the fact that **ESCO** based financing of MABs is in its infancy stage in Russia, ESCO model might be one of the mechanisms to fund EE reconstruction of MABs. At the moment the first pilot project is being implemented in Russia. However, before ESCO financing can become a widespread solution, existing ESCO regulation needs to undergo various changes.
- In order to stimulate EE loans and ESCO financing, legislation regulating non-payments in the residential sector should be changed - a clear and effective mechanism to recover non-payments should be established. This would significantly diminish the credit risks of the projects.

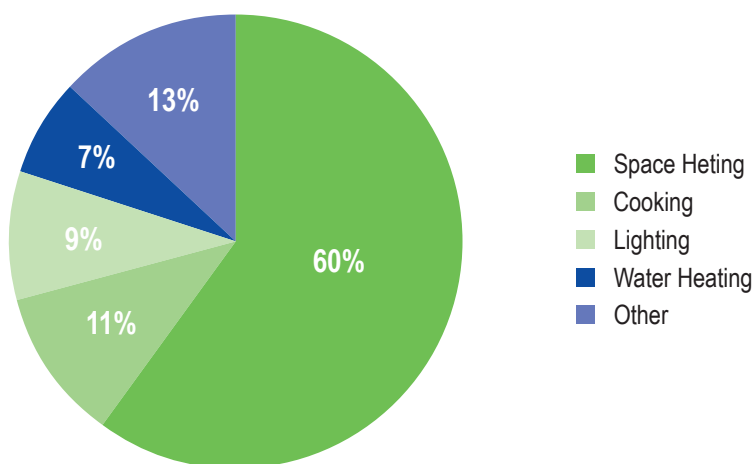
- **An Energy Saving Obligation Scheme** (if established) targeting EE activities in the residential segment might be a good and sustainable way of decreasing energy usage in residential buildings that would not require an upfront payment from energy end-users.
- A dedicated **Energy Finance Agency** could also serve to facilitate financing of residential EE projects. It could play an important role not only by providing financing, but also by granting guarantees.

5.2. Public Sector

5.2.1. The Need for EE Investments in the Public Sector in Kaliningrad and Russia

Another major area to implement EE measures is public sector. In 2006 energy bills of all Russian public buildings (including regional and municipal buildings) stood at above 7.7 billion EUR (335.8 billion RUB)⁴⁴. Technically viable energy saving potential in the public building sector stands at 42% or 15.2mtoe, of which 90% is economically viable and 58% financially viable.⁴⁵ 49% of energy savings would come from space heating accounting for 60% of total energy use in public buildings.⁴⁶ See Figure 3. *Public Building Sector Energy Consumption in Russia* for more details.

Figure 3. Public Building Sector Energy Consumption in Russia



Source: Bashmakov, I., et al., (2008)

44 International Finance Corporation (2008)

45 International Finance Corporation (2008)

46 Bashmakov, I., et al., (2008)

Various sources estimate that direct annual cost savings after implementation of EE measures in the public building sector could amount to around 4 billion EUR (175.5 billion RUB). However, public sector energy use does not involve only public buildings, but also street lighting, district heating, etc. According to World Bank (WB) data, the public sector accounts for roughly 9% of all energy end-use in Russia.⁴⁷ Inclusion of EE activities in other areas of the public sector would increase potential savings even more. It is also worth mentioning, that direct energy savings in public building sector would lead to even higher savings in primary energy,⁴⁸ as energy in public buildings is usually used at peak hours.⁴⁹ Freeing some of the capacity margin used to cover demand during peak hours would allow to satisfy more grid connection applications, without having to add to infrastructure. In addition, reduction of public sector energy bill would allow municipalities to invest saved funds into various socio-economic projects.

5.2.2. Barriers Preventing Energy Saving Investments in Russia

One of the main advantages of the public sector is that projects (in some areas) are highly homogenous. Therefore, it is relatively easy to bundle them and create economies of scale. For instance street lighting project usually require similar engineering and equipment solutions, and projects in kindergartens or hospitals across different neighbourhoods or districts are also comparable). Energy requirements in the public sector are usually stable and easy to calculate. An aggressive policy in public sector EE would be a way of sending a *signal* to the market and demonstrate a strong political will towards energy saving measures. It would also provide an example to other market participants and encourage them to create EE dedicated products.

47 International Finance Corporation (2008)

48 Primary Energy - a natural energy form that has not been subject to any transformation.

49 Public buildings account for around 3 times more peak load consumption than their actual share of end-use energy consumption and usually the change in energy demand during peak hours is covered by the less efficient technologies than off-peak hours.

RENSOL Experience - Kaliningrad EE Programme 2010-2015 with a view to 2020

Russian regional and municipal authorities are obliged to establish programmes that would promote penetration of EE and Renewable Energy (RE) solutions locally. In accordance with Federal Law No.261-FZ and GP20, "Regional Programme in the field of Energy Conservation and Energy Efficiency of the Kaliningrad Region for the period 2010-2015 with a view to 2020" was approved by Kaliningrad Government in November 2010. The Regional Programme is divided into two phases: 2010-2015 and 2016-2020. The programme foresees total investment of 776 million EUR (34 billion RUB) during the first phase.

In line with GP20 the Regional Programme of Kaliningrad anticipates a 40% reduction of the energy intensity of the GDP by 2020 as compared to 2000, with decrease during the first phase being no less than 14.5%. Total expected primary energy savings during the first phase is 0.44mtoe and total cumulative cost savings are 54.6 million EUR (2.4 billion RUB). During the second phase expected primary energy savings are 1.18mtoe with cumulative energy cost savings during both phases of 407 million EUR (17.9 billion RUB). It is planned that around 0.220mtoe or just above 24% of Kaliningrad energy savings potential is to come from **residential and public buildings**. The programme also foresees that 100% of the utility billing in the region is to be based on counters' data by the end of 2015.

According to GP20 the Russian Federal Ministry of Energy each year selects a certain amount of regions with the best EE programmes which are to receive a 5%-95% co-financing from the federal budget with a minimum amount of 1 million EUR and maximum 11 million EUR (45-500 million RUB). In 2011 the Ministry of Energy received 73 applications from the regions, of which 55 received federal subsidies valued at 120 million EUR (5'271 million RUB). In 2012 70 applications were received, of which 36 received co-financing of 130 million EUR (5'721 million RUB). In 2013 67 applications were received, of which only 28 regions received federal co-financing of 129 million EUR (5'678 million RUB). It is important to note that in 2011-2012 the federal government focused on subsidisation of energy audits and meter installation.

Despite the possibility to receive federal support for regional EE programme implementation, the Kaliningrad region failed to obtain support - mostly due to the low levels of co-financing from the oblast budget. In 2012 700'000 EUR (30.8 million RUB) were assigned from the oblast budget to co-finance mainly energy audits and installation of meters in municipalities and public entities. In 2013 the Oblast planned to assign 387'000 EUR (17 million RUB) to help low-income residents to install energy and water meters.

The problems of the Kaliningrad to receive co-financing is a very good example of an important issue in Russia - the absence of well co-ordinated multi-level legislative and communication system. Another good example is the implementation of the obligatory energy audits for all public entities by the end of December 2012 (the issue will be covered in more detail further in this section). At the moment implementation of different laws is based on a so called "**top-down**" approach, which functions as follows - Federal > Regional > Municipal level. In case of EE the Federal Law No.261-FZ was approved at the federal levels which spelled out specific country-wide EE targets with very little financing offered from the federal budget. Regions, in turn, via regional programmes have delegated the responsibility to implement federal targets to municipalities. Consequently, municipalities and public entities lack motivation and resources to implement regulation which they often fail to understand or see as pointless. As a result, the actual implementation of the GP20 is not as effective as planned. According to recent IEA estimates, the Russian goal to reduce energy intensity by 40% by 2020 will be reached only in 2028.

The Federal Law No.261-FZ imposes a legal requirement to reduce energy consumption in public entities by 15% by 2014. However, implementation of EE projects in municipal and budget entities remains low. As in the residential sector, one of the main barriers is high upfront costs. It is common for Russian budget organisations to run very tight budgets and therefore to lack initial funds to undertake energy saving measures. What is more, for budget entities, the decrease in energy costs one year usually leads to the decreased overall budget the next year.

At the same time municipalities often have too many other pending issues and fail to see the value of EE projects. They also lack flexibility in their budget policy - long term plans cannot be made, as the budget is usually prepared for 3 years. This seriously diminishes public sector ability to implement optimal EE retrofits that usually are characterised by long payback periods.⁵⁰ However, it has to be noted, that there is an exception to the 3 year

50 Comprehensive EE measures have a payback period anywhere from 5 to 15 years, and in some cases it might even reach 25 years.

budgeting rule. New regulation allows municipalities to take on financial obligations that are longer than 3 years under ESCO contracts.⁵¹

Another major issue is the absence of a long term funding in Russia. It is important to highlight, that municipalities usually are not desirable clients, since their financials are weak and more often than not, they have problems paying for the services received. At the same time regional guarantees are rather difficult to obtain. Therefore banks usually are willing to provide loans of up to 5 years with an interest rate of 13-17%.

RENSOL Experience - EE Round Table Discussion in Kaliningrad

A roundtable discussion on June 4th, 2013 "Financing Energy Solutions in Kaliningrad Oblast" that focused on municipal EE project financing was organised as a part of the RENSOL project. The event was moderated by Hans Brask, Director of Baltic Development Forum, and Arne Grove, Head of the Nordic Council of Ministers' Information Office in Kaliningrad. Various financial institutions, including EBRD, IFC (World Bank), NEFCO, KfW, EKF, Nordea, VEB and Transcapitalbank participated in the event.

During the first part of the event the regulatory and legal framework for EE in Russia was presented and the implementation progress of the Kaliningrad Regional EE Programme was discussed. Draft findings of this report concerning the financing of public sector projects were also presented during the event. It set the ground for fruitful discussion that facilitated a dialogue between municipalities and financing institutions. The municipalities were asked to present their priority projects in the energy saving field. The financiers commented on those projects, pinpointing key issues (from the point of view of banking institutions) that should be addressed before looking for external financing, and offered potential financing solutions to the presented projects.

Key takeaways from the round table:

- The Russian EE market is still immature and various legal and regulatory discrepancies are present. Despite the government efforts to address the issue, the implementation level of energy saving projects in the public sector is still low.
- In Kaliningrad there is a big appetite from the side of municipalities to implement EE projects - mainly **District Heating** and **Street Lighting projects**.
- Financing public EE projects is available and is offered by IFIs, commercial banks (up to 5 years) and alternative financing institutions (such as ECAs).
- Although there is a general interest in co-operation on both sides (public entities and financial institutions), however there is a lack of mutual understanding between municipal energy managers and financiers. Public sector energy managers usually lack knowledge of financial products and do not understand financial terminology and key indicators that financing institutions are looking for in investment projects. In other words, commercial financing is there, but **there is a lack of investment ready projects**.
- There is an **important need to facilitate further dialogue between municipalities and financial institutions** not only in Kaliningrad, but across the whole Russia as there is no environment where common ground can be reached.

There are two important points, to add to the key takeaways from the seminar and RENSOL experience in Kaliningrad. First, contrary to the residential sector, public entities can choose from various financial products available to finance their EE projects. However, some financial products are not accessible either due to the size of the planned investment (usually the size of a stand alone municipal projects is too small for IFIs where a minimum project size requirement is usually set at around 10 million EUR (436 million RUB)), due to duration of the project (as mentioned previously commercial banks tend not to provide financing longer than 5 years) or due to its price (sometimes the rates charged by the CFIs are too high for municipalities).

Second, although there are accessible products offered by IFIs (mainly soft loans offered by NEFCO, that provide 90% of the funds needed to undertake EE investment projects at just around 3% in roubles (which is below annual inflation in Russia)), municipalities are wary of taking out loans. NEFCO experience shows that despite various years of promotion of their EE financing products in the Kaliningrad region - the number of projects implemented in public sector is low. This can be attributed to the fact that regardless of the very attractive conditions that NEFCO is offering, loans still need to be returned (i.e. it is neither a grant, nor a subsidy). This creates a certain reluctance from the side of municipalities prefer grant or subsidy financing.

51 Possibilities of EE efficiency in public sector via ESCO model will be discussed later in this section.

The Federal Law No.261-FZ envisions an ESCO model as a main tool to finance EE in the public sector. However, to date few EE projects in public sector have been implemented using ESCO model. First of all, the law stipulates that the ESCOs have to provide financing for public energy saving projects. However, the Russian ESCO industry is very immature and there is a lack of well established ESCOs. Therefore, just a few companies that are able to finance capital intensive projects themselves or secure third party financing.⁵²

What is more, there is no legal and regulatory framework that would allow earning reasonable return on investment - there are various discrepancies between budget law, tax law and accounting law. A constantly changing tariff environment adds additional risk to ESCO contracts. Therefore, at the moment ESCOs try not to sign contracts longer than one year, to avoid taking on serious tax, operational and other risks.

The current requirements of the Public Procurement Law also discourage ESCOs from implementing EE projects in public sector. The requirements of the law do not allow bundling of EE projects. ESCOs need to apply separately for various tenders and prepare separate documentation for each of them. This significantly increases transaction costs.

Until recently tendering was a one stage process, and after submitting a proposal ESCOs were not allowed to change neither the guaranteed level of savings, nor the duration of the project, etc. Given that most of the obligatorily energy audits that have been carried out in the Russian public sector are not reliable⁵³, ESCOs have had to conduct their own in-depth and costly energy audits before submitting their offers. This deterred a lot of ESCOs from the bidding process, since they had no guarantee of winning the tender and getting a return on the invested time and assets spent to carry laborious thorough energy audits. To at least partially correct this flawed practice, President V.Putin in April 2013 signed Decree No.636 "On Federal Contract System", where at least two stages of the public tender process were established. During the first stage the qualifications of the ESCOs are to be checked, and during the second stage - 5-6 players are to be allowed to visit the tender object in order to prepare the final offer. It is also important to note, that the Decree No.636 also foresees compensations and financial guarantees in case of the radical price change.

52 What is more, most of the current ESCOs are created as daughter companies of well established energy companies or banks (e.g. Energo Effekt - a subsidiary of Gazprom), that are oriented at implementation of energy saving measures within the group or in big industrial companies.

53 It is a public secret that the requirement of Federal Law No.261-FZ to complete energy audits and receive energy passports for all public entities by December 31, 2012 in many cases failed to be taken seriously. According to the Ministry of Energy, out of 38,000 submitted energy passports only 2,000 were considered correctly implemented amounting to just 5%. One of the reasons, as discussed previously, is the lack of qualified energy auditors. Another reason is the lack of funds to undertake a costly thorough energy audit. Not least important is the failure to accept and understand the importance of the exercise on regional/ municipality level.

RENSOL Experience - Pilot Projects in Public Sector

In order to demonstrate the potential of EE measures and provide the best engineering and energy management solutions for Kaliningrad, two pilot study projects in the public sector were selected as part of the RENSOL project. RENSOL partners from the Immanuel Kant Baltic Federal University (Kaliningrad, Russia) and Lappeenranta University of Technology/Northern Dimension Institute (Lappeenranta, Finland) have offered EE solutions for "Firefly" kindergarten in Svetly municipality, as well as energy saving street lighting options for Lugovskoye municipality.

Different financing options could be used to finance the implementation of EE solutions. On top of the traditional loan financing (which is available for the medium term projects in Kaliningrad and generally in Russia), alternative funding instruments could be used. Vendor finance or ECAs (in case that the installed equipment is produced abroad) could be employed; however, this type of financing is limited to equipment cost only and excludes engineering and labour costs.

Pilot projects could be also implemented by an ESCO - that would take care of the initial upfront costs. However, the number of ESCOs that provide services to municipalities and public entities is very low at the moment. If the EFA was already created, or project pooling would be allowed - EE activities in pilot projects could have been financed via green bond issue by EFA, regional government or municipality.

5.2.3. Final Observations and Recommendations for Energy Efficiency Financing in the Public Sector

The implementation of Russian EE goals is hindered by a so called "**top-down**" approach, functioning as follows - Federal > Regional > Municipal level. As a result public entities lack understanding, motivation and often the resources required to implement federal goals. Therefore the final result of federal programmes is unsatisfactory.

- There are already various options that public sector can use to finance EE upgrade projects. These include medium to long term financing offered by IFIs at very attractive rates⁵⁴, as well as various medium term products offered by commercial banks. However, public entities may be reluctant to take out debt.
- Despite various financing options available for public EE retrofit, municipalities often lack knowledge of financial products and terminology as well as an understanding of key issues to be covered in a successful investment plan application. Therefore, there is an **important need to facilitate further the dialogue between municipalities and financial institutions** across whole Russia. One of the possible solutions could be the creation of Russia-wide platform that would offer public entities and financiers an environment where common grounds could be encountered. This could be reached e.g. via the design of special training courses or a handbook dedicated to mayors and municipal energy managers.
- As demonstrated during the round table in Kaliningrad, when equipment forms an important part of EE project budget, vendor financing as well as Export Credit Agencies financing can be used as an alternative to traditional debt financing.

⁵⁴ It is important to note, that most of the direct support offered by IFIs is designed for big projects and usually municipal projects are too small to receive this financing. Therefore, they are often referred to commercial banks that have dedicated EE credit lines with IFIs. However, in this case offered interest would be higher, as commercial banks would add their own margin.

- Although ESCOs is one of the main financing instrument foreseen in GP20, the Russian ESCO market lacks capital to finance investment intensive EE projects in the public sector. Various contradictions within the legal framework, as well as inability to bundle public EE projects prevents ESCOs from entering the sector. Low interest in municipal projects from the ESCO side could be partially explained by the lack of maturity of the market - one of the most important obstacles is the lack of mutual trust between ESCOs and its public clients. A potential way to solve those issues would be to gradually build a relationship starting with implementation of not very complicated projects with a relatively short payback period (for example street lighting) and then gradually move to implementation of more complex energy saving measures. This would not only help to gain experience in the public sector, but also help to build mutual understanding and trust and lead to potential future collaboration.
- The creation of quasi-governmental regional ESCOs (that could be privatised later) could also be a way forward. However, this approach requires considerable initial public investment.
- An introduction of a tariff agreement that would ensure that regulated energy prices are set in a predictable way that would allow recovery of investments in EE projects is of crucial importance for ESCO business to start working properly.
- The implementation of a credible, flexible and easily accessible federal or regional guarantee system would remove various credit risks. This would contribute to more accessible commercial financing of energy saving projects in the public sector, as few entities have established credit ratings and/or have enough balance sheet flexibility.
- The creation of EFA would facilitate ESCO and municipal access to financing, as the EFA would not only be able to mobilise financing offered by IFIs, but also to utilise bond markets while sourcing money for EE projects.
- As discussed under the residential sector section, the creation of an Energy Saving Obligation market could also lead to increased EE in target sectors.
- Finally, changes in the public procurement allowing the bundling of similar projects would make it possible for smaller projects to be eligible for to use direct IFI financing products that offer very favourable conditions and are otherwise not accessible due to minimum loan size requirements (instead of being obliged to work with CFIs acting as intermediaries). What is more, project bundling would draw more attention from commercial banks by decreasing transaction costs as well as credit and operational risks. For the same reasons public projects bundling would attract more ESCOs to the municipal EE projects.
- Project bundling under some regional entity would also allow the public sector to pursue financing opportunities offered by bond markets⁵⁵ and dedicated Green Bonds could be used to finance regional or municipal EE programmes.

55 That due to recent liberalisation could offer new financing opportunities to Russian Infrastructure and EE projects.

6. Conclusions

Russia is the world's fourth largest energy consuming country⁵⁶ with energy intensity several times higher than of the developed world. This provides a huge potential for EE savings. Tapping into this potential requires a substantial scaling of EE project financing. According to various estimates around 230 billion EUR (10 trillion RUB) are needed in order to reduce energy intensity in Russia by 40%. However, despite Russian government efforts to address the issue the level of implementation of energy saving projects is still very low.

This report introduces the reader to the existing barriers that prevent implementation of EE projects in residential and public sectors in Russia with a special focus on Kaliningrad Region as well as potential financing solutions that are available in the local market. The analysis also offers insight into the global and Baltic Sea Region practices in the field.

The study of the Russian market revealed that it is still immature and various legal and regulatory discrepancies are present. Governmental Programme "Energy Saving and Energy Efficiency Increase to 2020" foresees that more than 90% of the funds required to reduce Russian energy intensity by 40% should come from private sources. However, the Russian commercial market is characterised by "expensive money" - high inflation (around 10% over the last decade) and high refinancing rate (8.25% since mid-September 2012), which leads to a high cost of capital for banks. What is more, the Russian commercial banks have a limited access to long term funding.

Another important barrier preventing commercial financing of EE in Russia is low and difficult to predict energy price. This adds additional risks as well as diminishes economic benefits of energy saving projects. Therefore, most of the currently implemented measures are financed from the federal budget or by IFIs and regional partners. Most of those projects are the so called *Pilot Projects* that due to the absence of accessible commercial financing can not be replicated on the large scale. However, it needs to be mentioned that due to the efforts by the Russian government, regional partners and IFIs the Russian commercial banks are increasingly interested in providing financing for the energy saving projects.

In Russian residential sector, high upfront costs and lack of accessible financing are the main barriers to EE measures implementation. In addition, the Russian society most of which still remember Soviet times (when government took care of everything) usually is inactive and lack access to modern information sources and therefore do not fully understand the benefits of EE. Besides, the penetration rate of energy and water meters still very low and thus the utility bills do not reflect the actual usage of resources.

56 International Energy Agency (2012)

Another important barrier to energy saving project implementation in the residential sector is a lack of mutual trust between the property owners and the management companies of the building. This strongly diminishes the possibilities for undertaking EE renovations and implementing energy saving measures.

An important finding of this report was that the implementation of Russian EE goals in public sector is hindered by the so called "top-down" approach when it comes to setting country wide energy saving goals. As a result public entities lack understanding, motivation and often the resources required to implement federal goals.

The lack of accessible commercial financing is another important barrier preventing the implementation of energy saving measures in the Russian public sector. The interest rates offered by domestic banks are too high, while duration of the credit is too short for Russian municipal and budget entities. What is more, public authorities often lack knowledge of financial products and this results in a lack of mutual understanding between the municipal energy managers and CFIs.

However, the RENSOL project experience shows that there is a general interest in cooperation on both sides (public entities and financial institutions). Therefore, there is an important need to facilitate further the dialogue between municipalities and financial institutions across whole Russia. One of the possible solutions could be the creation of Russia-wide platform that would offer public entities and financiers an environment where common grounds could be encountered. This could be reached e.g. via the design of special training courses or a handbook dedicated to mayors and municipal energy managers.

The study of the Baltic Sea Region EE market showed that there is a wide range of financial instruments that are used to promote EE. The most popular being grants and subsidies. The analysis also revealed that the new Member States of the European Union are highly reliant on the support received from IFIs and EU Structural Funds. The dependence on public and EU financing is slightly concerning, as prolonged and intensive subsidisation may limit the development of competitive commercial products. Indeed, commercial financing is not widely available in the Baltic Sea Region - it is only active in Finland and the Baltic States, where CFIs are offering loan products based on the EU Structural Funds Programmes. ESCO model is also not widely used among the Baltic Sea Region countries and is mainly employed in Germany, where its estimated market size is around 4-5 billion EUR and where it is mainly utilised by the public sector.

When it comes to EE funding in Russia, a variety of financing mechanisms are planned, but not yet implemented. A lot of various changes in legal framework (especially the Public Procurement Law and ESCO regulation) are needed in order to achieve the available potential of energy savings.

To date there are not many options to finance residential EE activities in Russia - commercial banks are not very interested in financing energy saving retrofits in residential sector. However, the RENSOL experience shows, that international development institutions may be ready to provide funding for EE projects, if functioning residential guarantee scheme is present. What is more, the creation of an effective mechanism to recover non-payments would stimulate not only residential EE loan but also ESCO financing.

On the other hand, the obligatory capital repair payments scheme that is to enter into force from July 1st, 2014 should provide a much required impulse for the creation of EE dedicated commercial bank products. The important property of the obligatory capital repair payments is that it allows the accumulated funds to be used not only to finance capital repairs but also to finance EE project preparation, installation of collective meters, as well as cover interest payments on bank loans.

The creation of the regional operators under the obligatory capital repair payments scheme might also provide an opportunity to bundle residential renovation projects together and by doing so reach the economies of scale. Regional operators could also be used to issue dedicated green bonds.

An efficient and sustainable way to encourage residential EE financing would be to establish Energy Saving Obligation Scheme that would focus on residential market. A creation of Energy Finance Agency could also serve to facilitate of residential energy saving projects, as it could not only mediate when receiving financing, but also provide guarantees.

Public sector EE market could be stimulated by introducing changes in Public Procurement Law that would allow bundling of projects. This would allow to seize the benefits of economies of scale and attract attention of more ESCOs. Creation of dedicated Energy Finance Agency would not only facilitate development of ESCO market, but also pursue opportunities offered by bond markets. the establishment of quasi-governmental regional ESCOs (that could be privatised later) could also facilitate the creation of ESCO market in Russia.

In case when equipment costs account for a major part of residential or public energy saving project costs - vendor financing could be a way forward. If equipment under consideration is from abroad - Export Credit Agencies might help to address financing or guarantees issue.

To sum up, as demonstrated by this report there are a lot of different financial instruments and different programmes available to finance EE investments. It is clear that there is no single way or a so called *silver bullet* that would solve energy saving funding issues. In order to effectively address them a combination of different financing instruments might be necessary. A special attention needs to be paid to the long term goals of any policy, as only with the participation of the private funds the implementation of energy saving projects may reach its economically viable potential. Therefore, **a regional dialogue sharing best practices is crucial in order to succeed in promoting EE financing.**

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Internet Resources:

Denmark:

Danish Energy Agency www.ens.dk

Danish Energy Saving Trust www.savingtrust.dk

Danish Environmental Protection Agency www.mst.dk

Estonia:

KredEx www.kredex.ee

Finland:

Motiva <http://www.motiva.fi/en>

Germany:

KfW www.KfW.de

Latvia

Riga Energy Agency www.rea.riga.lv

Zemgales Regional Agency for Energy Efficiency <http://www.zrea.lv>

Lithuania

JESSICA – Atnaujink Būstą www.atnaujinkbusta.lt

Housing and Urban Development Agency www.bkagentura.lt

Lithuanian Energy Agency www.ena.lt

Lithuanian Energy Consultans Asociacion www.leka.lt

Lithuanian Energy Institute www.lei.lt

Ministry of Environment of the Republic of Lithuania www.am.lt

Poland

National Energy Conservation Energy www.nape.pl
Polish Foundation for Energy Efficiency www.fewe.pl

Russia

Energy Forecastin Agency..... www.e-apbe.ru
FESCO www.fes-com.ru
Russian Energy Agency www.rosenergo.gov.ru
The Institute for Urban Economics www.urbaneconomics.ru

Sweden

Swedish Energy Agency www.energimyndigheten.se

Other:

Baltic Energy Efficiency Network for the Building Stock..... www.been-online.net
Building Rating www.buildingrating.org
Buildings Performance Institute Europe www.bpie.eu
Build-up Energy Solutions for Better Buildings..... www.buildup.eu
Climate Change Capital..... www.climatechangecapital.com
Climate & Strategy Partners www.climatestrategy.es
Concerted Action Energy Performance of Buildings..... www.epbd-ca.eu
Covenant of Mayors www.eumayors.eu
E3G www.e3g.org
Euro-Mediterranean EE Forum www.ee-forum.eu
European Energy Service Initiative www.european-energy-service-initiative.net
European Federation of Agencies and Regions
for Energy and Environment..... www.fedarene.org
European Comission (Energy Section) www.ec.europa.eu/energy/index_en.htm
European Investment Bank (Elena, etc.)..... www.eib.org

Financing EE Investments
for Climate Change Mitigation www.feei.info/eng/background | www.isedc-u.com/

Financing Products for Investments
for Small-Scale RE and EE Technologies www.finaret.eu

Institute for Building Efficiency/ Johnson Controls..... www.institutebe.com

ManagEnergywww.managenergy.net

Mure Database www.muredatabase.org

Policies to ENforce the TRAnsitioN to Nearly Zero Energy buildings www.entranze.eu

RICS www.joinricsineurope.eu

The European Council for Energy Efficient Economy www.eceee.org

The European Forum for Renewable Energy Sources..... www.eufores.org

United Nations Economic Comission for Europe..... www.unece.org/energyefficiency.html

URBACT European exchange & learning programme www.urbact.eu

World Energy Council..... www.worldenergy.org

World Business Council for Sustainable Development www.wbcsd.org

Appendixes

Appendix A. Energy Supplier/ Saving Obligation (White Certificate)

Energy Supplier Obligation (White Certificate) is an environmental policy measure that certifies that a certain reduction of energy consumption has been attained. Under white certificate scheme producers, distributors and suppliers are required to achieve a predetermined amount of energy savings. In case the target of energy consumption reduction is not met, market participants are required to pay a penalty. Every time, when energy saving is achieved - a white certificate is issued that can be either used to meet energy consumption obligation or sold on the market to the participants⁵⁷.

Energy supplier obligation is a policy measure that can address various barriers of EE implementation. First of all energy suppliers and distributors have necessary knowledge and training to implement optimal energy saving activities. They can also pool projects together achieving economies of scale and by doing this addressing market fragmentation barrier. What is more, being traditional well established and usually regulated companies, energy suppliers and distributors have easier access to financial and capital markets, and can achieve more favourable interest rates that a typical end-user.

White certificates can also address the M&V barrier as energy providers also have reliable data on energy consumption of their consumers, and are being tightly controlled by energy regulators. Finally, it is generally assumed that the costs of undertaken EE measures as a result of energy supplier obligation scheme will be passed to end-users through energy prices⁵⁸. This allows consumers to immediately start enjoying the benefits of EE retrofit, gradually repaying its costs from energy savings. It also allows reducing non-payment risk, as the cost of EE measures is recovered via regular energy bill payment. What is more, governments might use collected fines for non-meeting energy savings requirements to establish a fund that can finance EE retrofits.

The main drawback of white certificate scheme is that policy regulators might establish too low energy saving targets for energy providers. Another important downside is the rebound effect - consumers may feel that now they can afford to consume more energy.

⁵⁷ typically trading energy suppliers obligations is allowed

⁵⁸ Bertoldi, P., Rezessy, S (2009)

Appendix B. Energy Service Company (ESCO) Model

Energy Service Company (ESCO) - is a private or public company that provides comprehensive EE solutions from development and engineering to installation of EE projects to its clients. ESCOs often provide or arrange financing for their customers⁵⁹ and in immature EE markets can become an important intermediary between financial institutions and end-users.

There are three main types of Energy Performance Contracting (EPC) offered by ESCOs:

- *Shared Savings* - when energy costs are shared by the ESCO and its client at a predetermined proportion for a fixed number of years. Under this type of contract ESCO removes initial cost barrier and assumes actual energy saving as well as end-user credit risks.
- *Guaranteed Savings* - under this type of agreement ESCO does not provide financing to its clients, but guarantees a certain level of energy savings. Despite the fact, that ESCO does not provide financing, ESCO clients usually are able to enjoy financing at lower rates, due to the fact that ESCO removes EE project performance risk.
- *Energy Supply Contracting* focuses on energy supply. ESCO takes over the management of end-user's energy system (assumes all responsibility and costs of upgrades, operation and maintenance) and sells energy to the consumer. The fee paid by the customer to ESCO is calculated based on current energy bill minus a pre-agreed saving (usually 3-10%). This type of contract allows the consumer to immediately start enjoying savings over the initial energy bill and guarantees the optimal increase in EE, as ESCO profits from the difference from actual savings and pre-agreed savings.

A main benefit of ESCOs is that they remove initial cost barrier from end-users. They also take on performance risk of EE retrofit, and if implemented energy saving measures do not provide pre-agreed savings, ESCO does not receive profit. ESCOs. Well established ESCOs are usually able to obtain financing at very favourable rates.

However, sometimes for relatively small projects ESCO model is not suitable, as administration costs of the contract might be too high. If the projects that are being implemented by ESCOs are big and complicated - it can take a lot of time to negotiate the final agreement and establish the level of guaranteed energy savings. Driven by actual energy savings, ESCOs might be more tempted to go for the "low hanging fruit" and undergo important, but riskier EE measures.

⁵⁹ It is important to note that ESCOs in turn also require financing in order to be able to undertake EE projects. To finance themselves they can pursue equity financing, as well as debt financing.

Appendix C. Products of International Development Institutions available in Russia

EBRD

The EBRD is a multilateral development bank, that help to build market economies. The bank is owned by 64 countries and the European Union and European Investment Bank with its headquarters being in London. Together with financial partners EBRD mainly finances private enterprises.

EBRD Sustainable Energy Initiative (SEI) in Russia

“EE is one of the key priorities for the EBRD’s activities in Russia. The country has enormous potential for saving energy across the economy and the entire energy chain from generation and distribution to final consumption. Investing in efficient and sustainable energy use will allow Russia to enhance its competitiveness, reduce environmental costs and improve the standard of living for its population. In 2009, the EBRD signed an EE Action Plan with Russia to support the country’s transition to a less energy- and carbon-intensive economy.

The EBRD’s Sustainable Energy Initiative (SEI) finances sustainable energy projects by combining investments with technical assistance and policy dialogue with stakeholders. Under the SEI, the EBRD has invested 2.4 billion EUR in 102 projects in Russia, of which 20 projects worth 337 million EUR were signed in 2012. The Bank has invested across a number of sectors in Russia such as manufacturing and services, municipal infrastructure energy efficiency and power and energy.”⁶⁰

SEI Performance since 2006⁶¹

SEI Business Area	SEI Volume (million EUR)	Number of Projects
Industrial EE	921	54
Sustainable Energy Financing Facilities	85	9
Cleaner Energy Production	744	13
Renewable Energy	368	3
Municipal Infrastructure EE	317	23
Total	2,434	102

60 EBRD, Sustainable Energy Initiative in Russia (2013). EBRD, pg 1. Available at: <http://www.ebrd.com/downloads/research/factsheets/seiruss.pdf>

61 ibid

Financial Instruments

"The EBRD has developed a unique business model to finance EE and RE projects, combining investment with technical assistance and policy dialogue. The SEI uses the full range of the EBRD's financial instruments, including:

- Direct EBRD financing and syndication in the form of private, non-sovereign and sovereign guaranteed loans, direct equity, equity funds and credit lines in the context of individual EE and RE projects;
- Co-financing with the private financial sector, public sources such as multilateral donor funds, and other IFIs as part of the project financing plan;
- Selective and smart use of subsidies (where necessary) to address specific barriers and market failures in line with the guidelines developed by the Bank;
- Carbon finance or other market-based systems which can provide additional revenues for projects. This includes technical support to EBRD clients for structuring transactions that will benefit from carbon finance or similar mechanisms;
- Project preparation support in the form of technical cooperation and grant co-financing to support implementation of selected SEI components;
- Project-related institution building and policy dialogue to support the effective development and implementation of projects in terms of policy, legal, regulatory, technical and organisational capacity in EBRD's countries of operations."⁶²

On April 24, 2013 EBRD launched the first EE lending programme for Russian households. EBRD dedicated USD 100 million credit line for the local private banks. Centre-Invest Bank, based in Rostov-on-Don, was the first local commercial bank to receive RUB 750 million financing under this programme. Potential beneficiaries of the programme include not only private individuals, but also housing associations, management companies, providers of housing maintenance services as well as ESCOs.

IFC

The IFC is the largest global development institution that focuses on the private sector development in transition and developing economies. The IFC is a member of the World Bank Group, with a headquarters based in Washington, D.C. The IFC is owned and governed by its 184 member countries, that provide the paid-in capital.

62 EBRD, Sustainable Energy Initiative (2013). EBRD, pg 11. Available at: <http://www.ebrd.com/downloads/research/brochures/sei.pdf>

IFC Initiatives in Russia

IFC's investment portfolio in Russia stands at USD 2.24 billion, which makes it the fourth-largest country exposure for IFC globally.

- Russia Sustainable Energy Finance Program (2005-present). "works across Russia to encourage investments in EE projects. The project helps financial institutions and companies to access modernization projects, and provides long-term credit to banks to enable EE loans. By participating in public information campaigns, the project also works to raise general awareness about the need for greater EE in Russia."⁶³ So far 12 IFC partner institutions have financed 342 EE projects for over USD 289 million, majority of which were provided by IFC partner banks in Russia. The Russia Sustainable Energy Finance Program "is supported with funds from the Global Environment Facility, Danish Energy Agency, Ministry for Foreign Affairs of Finland and Ministry of Economy and the Employment of Finland."⁶⁴
- Russia Residential EE Project (2010-present) focuses on creation of "an effective legal and institutional platform to support local homeowner associations and housing management companies in obtaining access to financing."⁶⁵ By the end of the project (October 2015) 1,500 MABs are expected to reduce energy consumption by 419-628GWh. Total investments in residential EE measures are expected to be at USD 134 million. The Russia Residential EE Project is "supported with funds from the Ministry for Foreign Affairs of Finland, the Ministry of Employment and the Economy and the Global Environment Facility."⁶⁶
- Russia Renewable Energy Program (2010-present) "aims to mobilise investments and through advisory services increase the scale of private sector involvement in RE. The Project also promotes a sustainable market for RE in the Russian Federation by supporting the development of enabling policies, institutional capacity, introduction of financial mechanisms, and expanding access to finance."⁶⁷ The Program is supported with the Global Environmental Facility funds.

63 Available at: http://www.ifc.org/wps/wcm/connect/region__ext_content/regions/europe+middle+east+and+north+africa/ifc+in+europe+and+central+asia/countries/mainstreaming+energy+efficiency+in+ruusia

64 ibid

65 Available at: http://www.ifc.org/wps/wcm/connect/region__ext_content/regions/europe+middle+east+and+north+africa/ifc+in+europe+and+central+asia/countries/promoting+energy+efficiency+in+russian+residential+housing

66 ibid

67 Available at: http://www.ifc.org/wps/wcm/connect/region__ext_content/regions/europe+middle+east+and+north+africa/ifc+in+europe+and+central+asia/countries/developing+renewable+energy+in+ruusia

- Russia Resource Efficiency Program (2008-present) is a 5 year program, that "aims to stimulate investments and encourage resource efficient practices by private sector companies across the country."⁶⁸ The program is "supported with funds from the Free State of Saxony, the Ministry of Employment and the Economy of Finland (MEE), the Agency for International Business and Cooperation of the Dutch Ministry of Economic Affairs, and IFC FMTAAS."

KfW

The KfW is a German state-owned development bank with its headquarters in Frankfurt. KfW is focusing on environment and climate, financial sector development as well as scientific cooperation.

KfW Initiatives in Russia

- SME Support Program in Russia - a program together with "SME Bank" designed to fund innovation and modernisation
- Baltic Sea Cooperation - Pilot Financial Initiative.
- Utility Infrastructure Without Compromising Climate in Russia (under development)
- Economy Without Compromising Climate in Russia (under development)

KfW also acts as export credit agency as well as provides project financing.

NEFCO

"The Nordic Environment Finance Corporation (NEFCO) is an international finance institution established in 1990 by Denmark, Finland, Iceland, Norway and Sweden. NEFCO provides loans and makes capital investments in order to generate positive environmental effects of interest to the Nordic region.

To date, NEFCO has financed a wide range of environmental projects in Central and Eastern European countries, including Russia, Belarus and Ukraine. NEFCO's activities are focused on projects that achieve cost-effective environmental benefits across the region."⁶⁹ NEFCO portfolio is currently comprised of around 400 small and medium sized projects, of which around 150 are in Russia.

⁶⁸ Available at: http://www.ifc.org/wps/wcm/connect/region_ext_content/regions/europe+middle+east+and+north+africa/ifc+in+europe+and+central+asia/countries/eca+cleaner+production+program

⁶⁹ Available at: http://www.nefco.org/introduction/this_is_nefco

NEFCO initiatives in Russia

- NEFCO Investment Fund - amounts to around 113.4 million EUR and provides equity and loan financing. The loans are provided at market conditions for up to 10 years.
- Energy Saving Credit Line - is dedicated to energy saving projects in municipal sector with a focus on social sector, e.g. kindergartens, schools, hospitals. NEFCO provides up to 90% for up to 5 years at a fixed interest rate of 3%. The minimum amount of financing is RUB 3.5 million and maximum is RUB 16 million.
- Nordic Environmental Development Fund - Cleaner Production Revolving Facility provides up to 90% financing for projects that reduce environmental and human risk and have a payback period for up to 7%. Minimum amount of loan is 100'000 EUR while the maximum amount is 400'000 EUR.

Appendix D. Baltic Sea Region Experience

Denmark

The long term target of Danish energy policy is to cover 100% of its energy needs - electricity, heating, industry and transport - from renewable sources by 2050. As a part of this policy a New Energy Agreement was reached in Denmark in March 2012. This agreement contains various measures, for the period up to 2020. The agreement calls for 50% of electricity consumption to be covered by wind power, and 35% of final energy demand to come from renewable sources. The Energy Agreement also foresees a 7.6% reduction in gross energy consumption in relation to 2010 and 34% reduction in GHG emissions in comparison to 1990.

The major financing mechanisms available for EE in Denmark include:

- Energy Saving Trust - in March, 2010 the Danish Electricity Saving Trust became the Danish Energy Saving Trust with its scope expanding from electricity savings to cover savings for all forms of Energy in all sectors, other than transport. The Trust is financed by a special Energy Savings Charge of DKK 0.006/kWh payable by households and public sector, with annual proceeds amounting around 12 million EUR (90 million DKK). The Trust uses those proceeds to promote various energy saving initiatives across various sectors (except transport) according to socio-economic and environmental considerations.

- Energy Savings Obligation for energy companies. From 2013 the energy savings obligation was increased to 2.6% of final energy consumption (excluding transport) (previously stood at 1% with annual proceeds of around 32.3 million (240 million DKK)). For the period of 2015-2020 the obligation is set to increase to 2.9% of total energy end-use. The initiative mainly targets industry and existing residential buildings - energy companies are obliged to offer subsidies or consultancy services for energy saving activities.
- Renovation Fund. Just after the 2008 credit crunch Danish Government offered a special short-time (has been available for building owners in the Spring 2009) measure to encourage EE in residential sector, as well as boost economy and create jobs. 200 million EUR (1.5 billion DKK) Renovation Fund was created. Homeowners could apply for a 40% grant of labor costs (up to a maximum of around 2,000 EUR (15,000 DKK)) for general home renovation, and additional 20% grant of material costs (up to a maximum around 1,350 EUR (10'000 DKK)). It is reported, that around 100'000 homeowners got access to grant funds.
- CFIs - are not very active in energy saving sector. The Danske Bank Group finances the purchase and renovation of homes.
- ESCOs - Danish ESCO market is not very active. According to Marino, A et al.(2010) report estimates Danish ESCO market to be around 8-25 million EUR, with just around 10 ESCOs being operational with most projects being carried in public sector.
- Government and Municipalities are financing EE projects with their own funds. Large projects may also be financed via bonds issue or loans from IFIs.

Finland

The Long Term Climate and Energy Strategy for the period 2010-2020 was adopted in 2008 in Finland. It lays down a roadmap to meet GHG emission targets for Finland. In February 2010 the Finnish Government passed a resolution on energy saving and energy efficiency measures that serves as an action plan for 2010-2020 Energy Strategy implementation. The Energy Strategy was updated in 2012. The latest update sets a 37 TWh end-use (49 TWh of primary) energy saving target by 2020 with a total projected final energy demand of 310 TWh (vs 347 TWh if no action is taken). As a comparison overall energy consumption in Finland in 2010 stood at 323TWh. The country also aims for 38% of final energy consumption for 2020 to come from renewable sources.

The major financing mechanisms available for EE in Finland include:

- The Housing Finance and Development Centre of Finland (ARA) from 2003 provides funding for reparation and improvement of residential buildings. The grants provided by ARA cover independent energy audits, external repair work, ventilation and heating system improvements as well as the installation of RE sources. The grants are managed

by local authorities and cover 40% of the energy audit costs and 10-15% of costs of other measures. Annual grand funding stands at around 24 million EUR.

- A Household Tax Deduction has been available for households since 2000. It allows to deduct from the taxation 60% (up to 6'000 EUR for both spouses) of labor costs incurred during replacing, upgrading and repairing the heating systems as well as general maintenance and renovation (including EE) of small residential houses. Finnish Tax Administration is responsible for implementation of the measure.
- Energy Subsidy is available for municipalities as well as commercial and industrial sector from 1992 via Ministry of Trade and Industry. The subsidy covers 40% of energy audit costs and 50% for those entities that have joined energy conservation agreement.
- The Ministry of Trade and Industry also offers 25-35% subsidy for projects that involve new technologies. The subsidies amounting 15-20% for projects utilising conventional technologies is only granted for those entities that have joined energy conservation agreement. The measure is set to continue until 2016.
- CFIs - are active in Finland EE sector. The most common financial products to finance energy saving measures are commercial loans and leasing. The majority of EE projects financed by CFIs are in industrial sector as well as public lighting and public buildings.
- ESCOs - According to Marino, A et al.(2010) data as of 2009 there were 8 operating companies in Finnish market, o/w only four were active. ESCOs in Finland are mainly providing services to industrial sector. The total ESCO market in the country is estimated to be at around 4 million EUR.

Sweden

National EE Action Plan for 2008-2016 was adopted in Sweden which aimed for 41.1 TWh (~9% of final energy consumption) energy savings from buildings, transport and small industries (excluding sectors under the EU ETS) by 2016. In June 2011 a second National EE Action Plan which aimed for 20% primary energy reduction by 2020 (in comparison with 2008) was adopted. Sweden is targeting a 20% reduction of energy use for building heating (residential, public and commercial) by 2020 and 50% by 2050 in comparison to 1995.

The major financing mechanisms available for EE in Sweden include:

- A special investment support for the purchase of EE windows and biomass boilers is available for the purchases above 1'145 EUR (10'000 SEK). The support is set at 30% with maximum support amount being 1'145 EUR (10'000 SEK) for EE windows and 1'715 EUR (15'000 SEK) for biomass boilers.

- Support when converting from electric heating to a heat pump (except air heat pump) or district heating was available from 2006 to 2010.
- Public authorities can receive up to 1.145 million EUR (10 million SEK) to implement EE measures in their buildings.
- 2010-2014 EE programme for public buildings and transport - annual support for chosen municipalities within a 5 year period. Total size of the programme around 11 million EUR (99 million SEK).
- ESCOs - first intentions to establish ESCO companies were as early as in the 1980s. According to Marino, A et al.(2010) report to date there are more than 5-10 ESCOs operating in Sweden with an estimated market size of 60-100 million EUR and the majority of the projects are being developed in the public sector.

Germany

Germany's National EE Plan 2008-2016 sets energy saving target for buildings, transport and small industries (excluding sectors under the EU ETS) at 231TWh by 2016, or ~9.3% of its final energy consumption. In addition in September, 2010 German government presented Energy Strategy up to 2050. It foresees an overall reduction of primary energy consumption of 20% by 2020 and 50% by 2050 in comparison to 2008 energy usage. Electricity consumption is to be cut by 10% by 2020 and by 25% by 2050 if compared to 2008 electricity consumption. It also foresees doubling of building renovation rate from 1% to 2% per annum with heating requirements being reduced by 20% by 2020 and 80% by 2050 from 2008 levels.

The major financing mechanisms available for EE in Germany include:

- KfW - is a non-profit development bank (80% owned by the government and 20% by the Laender) that is responsible for all governmental funding of EE measures. KfW supplements federal government subsidies with additional resources raised in financial markets. The bank then allocates funds to various program applicants via commercial banks. Currently available KfW programs are:
 - KfW Housing Modernisation Programme targets existing residential buildings and provides either a grant or a long term low fixed interest rate (2.55%-3.0%) loan with interest grace periods. Based on the level of energy saving effort, residential clients can either receive a 7.5-20% grant (but not more than 15'000 EUR) or a soft loan for up to 75'000 EUR with an additional repayment bonus of 2.5%-12.5% (that is calculated on the loan amount) for complete refurbishment projects. The programme also allows to implement individual measures (if comprehensive renovation costs are too high), in this case the loans for up to 50'000 EUR are granted.

- KfW Ecological Construction Programme provides low interest loans for up to 50'000 EUR are available for residents that are building or purchasing EE homes (including passive homes). Repayment bonus depends on the level of EE of the home.
- KfW Municipal Loan Programme is an important source for German municipal EE project financing.
- There is also a number of direct grants or subsidies that target a limited number of residential dwellings that provide relatively insignificant support for implemented EE measures. On Laender level various EE support schemes also exist.
- Berlin Energy Agency (BEA) has pioneered pooled procurement of energy saving measures. BEA is acting as project manager, for a tender of EE services for pooled EE projects⁷⁰ in public and private buildings in Berlin. According to the scheme, the winning ESCO is to pay the upfront costs of the EE retrofit and is later repaid over the period of years from realised energy savings. BEA uses governmental grant funds to pay for the initial energy audits.⁷¹
- CFIs - in general are not very active in Germany. Umwelt bank is the most active CFI in the country offering various commercial financing products (ranging from 10'000-50'000 EUR and 50'000-400'000 EUR) for EE measures implementation.
- ESCOs - Germany has a biggest ESCO market in Europe. According to Marino, A et al.(2010) report the size of German ESCO Market is estimated at around 4-5 billion EUR. There are around 10 big ESCOs operating in the country, with another 250-500 smaller actors. The majority of contracts involve public and private commercial buildings

Poland

Poland in its National EE Action plan (approved June 2007) aimed for at least 9% (53.5TWh) and was later updated to 11% (67.2TWh) of final energy consumption reduction by 2016 in comparison to 2008. The National EE Action plans foresees that 38% of energy usage reduction is to be achieved through the white certificate system⁷², 19% through informational campaigns, 24% transport sector, 12% residential sector (Thermo-Modernisation Programme), 4% industry and 3% public sector. Poland also targets a 20% final energy consumption reduction by 2020 (vs 2008 business as usual levels) with 15% of final energy consumption coming from renewable sources (mainly wind power and biomass). The Energy Policy (adopted in 2009) up till 2030 aims for "zero-energy" economic growth by 2030 and country's energy intensity level reduction of the EU-15 average.

⁷⁰ On average 20 buildings are pooled for each tender.

⁷¹ BAE programme is currently being replicated in various countries: including Bulgaria, Romania, Slovenia and Chile.

⁷² Energy Efficiency Act (adopted in April, 2011) introduced White Certificate Scheme as one of the main measures to EE. The scheme was designed to provide white certificates for energy consumption reduction by end users (~80%), generators (10%) and electricity network operators (10%).

The major financing mechanisms available for EE in Poland include:

- Thermo-Modernisation Fund (1998-2016). At the beginning the program subsidised 25% of the amount of the loan taken for thermo-modernisation. The subsidy was granted at the end of the loan term. Due to this and high interest rates at the time, the program was not very popular.
- From 2002 the subsidy started to be provided at the beginning of the loan term and combined with decreased interest rates lead to increased usage of the program - over 16,000 MFBs were renovated for a total cost of 1.5 billion EUR with a total program cost of 200 million EUR generating 131,000 toe energy savings. The subsidies that are provided by the Thermo-Modernisation Fund are:
 - Thermo-modernisation bonus - 20% of the loan taken for EE investment (but it cannot be higher than 16% of the total project expenses or two times the projected annual energy expenses savings). Can be used for residential as well as public buildings thermal modernisation. There are different minimum energy usage reduction requirements depending on implemented EE measures.
 - Renovation bonus - can be obtained only for the renovation of MABs built before August 14, 1961. The bonus amounts to 20% of the total loan, but can not be greater than 15% of the total cost of the renovation. A reduction of energy usage for heating and domestic hot water preparation of at least 10% is required to be achieved.
 - Compensational bonus - can be paid to a natural person who on April 25, 2005 was an owner of/ or a heir to a residential building with at least one council flat. The bonus is to be used for paying back part of the renovation loan.
- National Fund for Environmental Protection and Water Management (NFO_iGW) provides subsidies and soft loans for EE and RE from 1989. Soft loans for up to 50% of total project costs are being offered for up to 20 years. Every year ~800 projects receive support from the fund, o/w ~200 are soft loans (with the average duration of 5 years) with the rest being grants mainly for the improvement of the thermal performance of public buildings.
- EcoFund Foundation provides grants of 10-50% for EE and RE projects for private and public sector (including financing of heat insulation works and solar collectors in buildings).
- Reduced VAT of 8% (on envelope and other equipment) is offered instead of a standard 23% rate.
- White Certificate Scheme started in Poland in January, 2013 and is expected to deliver a considerable amount of targeted energy savings.
- CFIs - are not very active in EE financing in Poland, mainly due to popularity of Thermo Modernisation Fund loans. Bank Ochrony Środowiska S.A (has a line from NFO_iGW) and is the CFI providing financing for energy saving projects, such as street lighting, central heating and hot water supply systems modernisation.

From January 2010, Bank Gospodarstwa Krajowego (the only Poland's state-owned bank) is responsible for the payment of the majority of EU funds granted to Poland.

- ESCOs - although ESCO financing opportunities started to be explored since as early as 1991, however due to the lack of experience, awareness as well as inappropriate regulation, ESCO model did not become popular. According to Marino, A et al.(2010) report there are around 10-12 companies providing ESCO services in Poland. Total market size is estimated to be around 3-10 million EUR. Successful Polish ESCO projects are mostly related to public lighting.

Estonia

Estonia's National EE Action Plan covers a period of 2007-2013 and foresees final energy savings target of final 2.1TWh by 2016 (excluding transport). The National Development Plan of the Energy Sector until 2020 is targeting renewable development. Therefore, Renewable Energy Action Plan was adopted in July 2010 introduces a target for renewable energy to be at 4.8% of electricity production by 2020 and at 25% of final energy consumption.

The major financing mechanisms available for EE in Estonia include:

- Credit and Export Guarantee Fund (KredEx) is one of the main actors financing EE solutions. Currently available KredEx products are:
 - Guarantees - on loans for the renovation of MABs up to 75% of the loan principal. The guarantees are provided for HOAs or apartment owner unions for house heating system renovation, roof repairs, insulation of outer walls, stairwell/ entrance hall repairs, window replacement or insulation as well as replacement/ repair of communications, elevator renovation and other construction maintenance and landscaping works that increase the economy and security of MAB or quality of life.
 - The guarantee is granted for an annual fee of 1.2-1.7% of the loan balance and covers up to 75% of the loan principal with proportionally reduced with each loan repayment.
 - KredEx may also cover the loan repayment during up to 12 months (but not more than 75% of the loan balance) in case borrower has financial difficulties.
 - Renovation Loans Fund⁷³ (49 million EUR)- are provided by KredEx with the financing provided by Council of Europe Development Bank (CEB) EU Structural Funds. KredEx combines grant financing from the EU Structural Funds (17 million EUR) with CEB loan (28.8 million EUR) and KredEx own funds (3.2 million EUR) and channel them through commercial banks (Swedbank Eesti AS and AS SEB Pank) at fixed interest rate below 5% to eligible end-users - HOAs and apartment owner unions of houses built before 1993.

73 Estonian Renovation Loans Fund is a Revolving Fund

- Since 2009, 391 loan contracts are signed for a total amount of 34.3 million EUR which led to total investment of 45.2 million EUR in renovation of 939,176m² floor space of 14,680 apartments.
- In 2011 the average loan amount stood at 100'000 EUR with the average duration of 15.2 years. The amount of average self-financing stood at 27.9% and average estimated energy savings stood at 39.23%. Roughly half of signed agreements were for renovation of buildings in Tallinn.
- Renovation Grants - are being issued by KredEx since 2010 for the amount of 15-35% of the total cost of renovation project (mainly used together with a renovation loan granted by Swedbank and SEB). The renovation grant programme is financed by 30 million EUR sale of unused Assigned Amount Units (AAU; Kyoto Protocol) to Luxembourg under the Green Investment Scheme.
- The grant limits are set at 15%, 25% and 35% of the total project cost and depend on the level of energy saving effort. The grant programme has activated Estonian MAB renovation market. By the end of 2011 it was decided to allocate grants to 266 MABs (15% to 162 buildings, 25% to 78 buildings and 35% to 26 buildings) totalling 5.8 million EUR leading to total investment of 31 million EUR in renovation of MABs.
- Support for EE renovation of residential buildings (10% for reconstruction/ restoration and 50% for technical inspection of load-bearing and envelope structures). To apply for support, the apartment building has to carry a comprehensive technical inspection that includes energy audit. The application for support has to be submitted to local government (that has signed a cooperation agreement with KredEx)
- Grants for Energy Audits and Reconstruction Projects - can be granted for HOAs for 50% of energy audit cost (up to 700 EUR per energy audit and up to 4'000 EUR for reconstruction project).
- Various local government programmes exist in Estonia - municipalities of Tallinn, Paide and Rakvere are offering subsidies for loan to housing cooperatives. HOAs in Tallinn can take a 5 year loan at 2.85% interest rate or a 10 year loan at 3.8% interest rate. However, the demand in for such loans is far above the annual budget set aside for such loans.
- CFIs - are not very active in Estonia in EE financing. SEB and Swedbank are involved in allocation of Renovation Loans provided by KredEx.
- ESCOs - there is hardly any ESCO market in Estonia. As of 2007 there were just 2 companies, that supplementary to their core business were offering ESCO type contracts.

Latvia

Latvia adopted its first National EE Plan in 2008 and updated it in 2011. The target for energy savings is set at 3.5 TWh by 2016 and 6.1 TWh by 2020. 78% of 2016 target energy savings must be achieved in residential sector, 12% in services sector, 6% in transport sector and 5% in industry. Latvia's Energy Development Guidelines 2007-2016 seek to reduce average heat consumption in buildings by 11%. Energy efficiency of heating is also set to increase from 70% in 2006 to 90% in 2016, with heat distribution losses falling from 16% to 14% by 2016.

The major financing mechanisms available for EE in Latvia include:

- A long term Programme "Housing Energy Performance" created in 2008 provides grants for MABs for energy audits for up to 282 EUR per MAB. In addition, the programme provides 20% of the total project cost as co-financing. In order to reduce the overall EE loan costs, the 20% subsidy is paid directly to the bank.
- Modernization Program for Residential Buildings – offers 62 million EUR provided by Latvian Ministry of Economics, with 10 million EUR for modernisation of social housing. In addition, EFRD can grant up to 60% of projects costs (up to max 50 EUR/m²). As a whole, the programme can offer financing for up to 85% of total investment costs. The loan has a maximum duration of 15 years.
- Green Investment Scheme (GIS) – in 2009 government of Latvia sold to New Energy and Technology Development Organisation 1.5 million Assigned Amount Units (AAUs) under the Kyoto Protocol, GIS scheme. Latvia uses those funds to provide a 50-85% subsidy for EE and renewable energy projects.
- The Municipal Development Fund - is an entity created under the Latvian Ministry of Economy. The entity finances municipal EE projects for up to 10 years. The loan from WB is being utilised to provide funds, in addition a 30-35% state subsidy under Public Investment Programme is available for municipalities.
- CFIs - various Latvian CFIs (including Swedbank, SEB Bank, DnB, etc.) have dedicated product to finance EE in MABs. They provide up to 100% financing needed for up to 15 years.
- ESCO model in Latvia is operational already for several years. Agreements between ESCOs and MAB residents are signed for up to 20 years. The most common type of the contract - Energy Delivery Contract (EDS), under which ESCOs are responsible for supplying building with heat in order to maintain a pre-agreed temperature. One of the sector leaders in Latvia - RENesco is operating according to EDS model. Initially it has sourced funding from ERDF, GIS, received guarantees from various sources, including the Netherlands International Housing Guarantee Fund.

Lithuania

Lithuania adopted National EE Action Plan in July 2007, which it later revised in December 2008. The second National EE Action Plan was adopted in May 2011. Lithuania aims to save almost 4TWh of final energy consumption in 2008-2016, o/w 19% should come from energy sector, 14% industry and residential sector, 12% transport sector, 10% services and 31% through cross-sectoral measures (such as building regulations, tax rebates, information campaigns, etc). In 2011 National EE Action Plan country is targeting an annual rate of energy savings of 1.5% through 2020 and then 1.3% through 2030.

The major financing mechanisms available for EE in Lithuania include:

- JESSICA Holding Fund in Lithuania⁷⁴ (227 million EUR) was established in June 2009. The JESSICA revolving fund financing is available due to ERDF grant of 127 million EUR + National Funding (Ministry of Finance and Ministry of Environment of Lithuania) lent to Lithuania by EIB. EIB is a manager of the fund in Lithuania and is providing loans to MABs built before 1993 via local commercial banks in EUR at 3% interest rate. In order to receive JESSICA loan, 5% of own funds are required. There is a possibility to receive up to 50% subsidy from the Ministry of Environment and up to 50% subsidy from the Lithuanian government. CFIs would provide the loan up to 95% investment for up to 20 years. 15% loan rebate is offered if C class building energy performance is achieved. Low-income households get 100% subsidy.
- Despite favourable financing conditions, the actual amount of implemented renovations is not very high. Until recently, main issue was low-income households (that receive utility bill subsidies) and that get a 100% subsidy for retrofit would not vote in favour for renovation. In order to foster renovations, government introduced a measure, that automatically cancels utility bill subsidy to low-income households, if they vote against renovation of their MAB.
- Using JESSICA funds, Lithuania plans to renovate 24'000 houses (70% of stock built prior 1994) by the end of 2020 with expected total energy savings of 3%.p.a (average energy savings for a single house of 50% or 3TWh p.a. are expected).
- Modernisation of MABs Programme (2004-ongoing) foresees a subsidy of up to 50% depending on energy savings resulting from the implemented retrofit. The programme is directly related to preferential 9% VAT, that is applied to construction, renovation and heating of the residential buildings, which are paid from the state or municipal budgets. The financing model set is not optimum because it requires a large amount of State financial assets to be contributed each year for the provision support.

74 Lithuanian Revolving EE Fund. One of the largest JESSICA funds established so far and also one of the first to be launched

- Corporate Tax Rebate is available since 2009 - a reduction of 35% of incurred EE investment costs can be applied to the taxable amount of profit. In addition natural and legal bodies are exempt from pollution tax, if emissions reduction measures (reducing pollutant release by at least 5%) are implemented.
- Various local government programmes: Kaunas and Klaipeda implemented a programme called "Municipality Support for HOAs". Kaunas distributed 377'000 EUR in 2006-2007 and Klaipeda 478'000 EUR. Vilnius in 2007 provided 580'000 EUR for energy audits and investment projects.
- EE in the public sector is financed under the "Implementation of Energy Saving Projects" programme.
- CFIs - various commercial banks (including SEB and Swedbank) that offer EE loans for MABs for up to 20 years with 3% interest rate under JESSICA programme.
- ESCOs – there is almost no ESCO market in Lithuania. There are couple of companies, that although consider themselves as ESCOs are simply providing energy supply services. There are no companies that would be offering guaranteed or shared savings agreement.

