United Nations Development Programme

Country: Russian Federation

PROJECT DOCUMENT[1]

Project Title: Building Energy Efficiency in the North West of Russia

UNDAF Outcome(s):

UNDP Strategic Plan Environment and Sustainable Development Primary Outcome:

Strengthened national capacities to mainstream environment and energy concerns into national development plans and implementation systems.

UNDP Strategic Plan Secondary Outcome:

Expected CP Outcome(s): Outcome 3. Energy and environment: Improved environmental sustainability of development processes

Expected CPAP Output (s) Improved environmental sustainability of development processes and increased energy efficiency/ Environment indicators included into development policies at the sub-national and regional levels

Executing Entity/Implementing Partner: Office of Plenipotentiary Representative of the President of the Russian Federation in the North West Okrug

Other partners: Regional Administrations of the Arkhangelsk, Pskov and Vologda oblasts

The project will build local capacities for and demonstrate local solutions to improved energy efficiency in buildings in three regions in North West Russia: Pskov, Vologda and Arkhangelsk Oblasts. The project objective will be achieved through the following three components: 1) An enabling environment and enforcement capacities for improved energy efficiency at the provincial and local levels with an emphasis on efficient building codes and their enforcement; 2) Capacity building and know-how for architects, engineers, and students; and 3) Demonstration of local energy-efficient solutions and management models.

Programme Period:	2007-2010
Atlas Award ID:	00059438
Project ID:	00074315
PIMS #	4131
Start date:	2010
End Date	2015
Management Arrangements	NEX
PAC Meeting Date	_____

Total resources required	33,340,000
Total allocated resources:	33,340,000
• Regular	_____
• Other:	
○ GEF	_____5,840,000__
○ Government	_____11,490,000__
○ Other(Private sector)	_____13,470,000__
In-kind contributions:	
○ Government	____ 2,540,000__

Agreed by (Government):

Date/Month/Year

Agreed by (Executing Entity/Implementing Partner):

Date/Month/Year

Agreed by (UNDP):

[1] For UNDP supported GEF funded projects as this includes GEF-specific requirements

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List of Acronyms

AOEEC	Arkhangelsk Regional Energy Efficiency Center
APR	Annual Project Review
CO	Country Office
EBRD	European Bank for Reconstruction and Development
EE	Energy Efficiency
GEF	Global Environmental Facility
ISO	International Standards Organisation
GHG	Greenhouse gases
kW	kilowatt
kWh	kilowatt-hour
Mt	megatonne
NEFCO	Nordic Environment Finance Corporation
NIB	Nordic Investment Bank
OFP	Operational Focal Point
PIR	Project Implementation Review
SBAA	Standard Basic Assistance Agreement
SNiP (СНиП)	Building Code
UNDP	United Nations Development Programme
UNIDO	United Nations Industrial Development Organisation
USD	United States Dollar
VSTU	Vologda State Technical University

1. SITUATION ANALYSIS

Since 2002, Russia's economy has been experiencing stable economic growth accompanied with the growth in energy demand. Compared to industrial sectors that were in decline for over a decade, energy consumption in Russia's communal and housing sector has been continuously growing: from 174 billion kW/h in 1990 to 243 billion kWh in 2006 (an equivalent of 178 Mt CO_2/year). Consequently, the share of the housing sector in overall energy consumption has been steadily growing from 13% in 1990 to 34% in 2006. Per capita CO_2 emissions related to Russia's construction and housing sector total 10.6 tCO_2/yr.

The project approach of institutionalizing improved energy efficiency through building codes and oblast-level energy efficiency programs directly contributes to the pursuit of Millennium Goal Number 7: Integrate the principles of sustainable development into country policies and programmes and reverse the loss of environmental resources. Because the project will reduce greenhouse gas emissions associated with energy consumption in the buildings sector, it is also fully aligned with the UNDP Country Programme for the Russian Federation (2008-2010), which includes "supporting sustainable use of energy and natural resources in the spirit of the Kyoto Protocol." The housing sector is also important as a point of entry for regional action on climate change mitigation. As a recent UNDP report[2] concludes, "sub-national authorities will be able create public consensus in favor of climate change action only if the recommended measures correspond to the fundamental development problems of the regions and municipalities, like the provision of basic services to the population…." Housing, which is a fundamental social issue across North West Russia, meets this test.

The Office of Plenipotentiary Representative of the President of the RF in the North West Okrug, Administrations of the Arkhangelsk, Pskov, and Vologda regions has been chosen as the Executing Partner for this project. The reason for this selection is that this office is responsible for the coordination of policies in the North West Okrug reason of Russia which makes this Office ideally suited for the dissemination of information among the different Oblasts. This coordinating role and prior experience makes the Office of the Plenipotentiary Representative of the RF in the North West Okrug the most suitable choice of Executing Partner for this project.

Background

Over the last decade, increasing building energy efficiency became a priority direction in the development of construction sector. Until recently, market transformation towards energy efficient products and technologies was restricted by low internal energy prices: while domestic construction costs in Russia were only 20-30% lower that those in international markets, domestic energy costs were 6-7 times lower. However, as Russia targeted integration into international markets, internal energy costs began to increase rapidly. In the past two years, internal electricity prices have increased by 45.8%, and gas prices have increased by 63.5%. The communal housing sector was among the first to recognize the changes, as it consumes up to 20% of electric energy and 45% of heat produced in Russia. Currently, price trends constitute direct economic incentives for energy efficiency investments in the building sector.

The choice of project sites in the Russia's North West was driven by the following factors:

1. Dynamic construction sector: In the North West Federal Okrug, the residential construction sector grew by 47.4% in 2007, a rate higher than the federal average (see table below).

[2] UNDP. *Charting a New Low-Carbon Route to Development: A Primer on Integrated Climate Change Planning for Regional Governments*. New York: UNDP, June 2009: 15.

2. Representativeness: The North Western region of Russia is representative of the rest of the country in terms of population numbers and density, household structure (50% urban – 50% rural), and aggregate share of CO_2 emissions.
3. GHG reduction potential: Northern climatic conditions have resulted in higher energy demands and an additional burden on energy systems. These conditions have led to an increased drive for improved energy efficiency, and they ensure that effective interventions will generate higher-than-average economic savings and emission reductions.
4. Existing foundation for cooperation: The lessons and outputs of an earlier GEF MSP in Russia's North West (see Section D) provided linkages and lessons that will strengthen project implementation. While specific project sites and objectives do not overlap, the new project will utilize the policy and institutional barrier analysis and the educational and management models developed through the earlier MSP project (2003-2006).
5. Strong commitment of the regional government to energy efficiency programmes: see Section B.

Average construction rates for oblasts in the North West Federal Okrug compared to the national average

Pilot oblasts	**Growth in construction sector in the first 9 months of 2007 compared with the previous year (2006)**	**New housing per 1000 inhabitants**
Arkhangelsk Oblast	39% (28%)	254 m^2
Vologda Oblast	87% (9%)	278 m^2
Pskov Oblast	14% (39%)	218 m^2
Russian average	31%	239 m^2

Energy performance per square meter in residential buildings in the pilot regions averages 29.2 W/m^2 (the Russian average is 27.2 W/m^2; in Denmark the corresponding figure is 16 W/m^2). Continuous growth in energy consumption is primarily a result of the high level of heat losses in the housing sector. 64% of all heat produced in the pilot region is used for heating residential and public buildings. In the Vologda oblast, total heat energy consumption for heating and hot water supply reaches 72 kg of oil equivalent per square meter per year (in Scandinavian countries with similar climate conditions, the corresponding figure is 18 kg of oil equivalent/sq.m). Up to 70% of heat generated at heat stations doesn't reach end consumer: 40% of losses occur during transportation and 30% at the buildings. One of the causes for high losses is inadequate thermal characteristics of main construction elements. Heat losses in an average apartment building occur through the walls (40%), windows (18%), basement (10%), roof (18%), and ventilation (14%). As a result of the project, compliance with more efficient construction norms will bring 40-50% savings in energy.

Furthermore, a comprehensive federal-level policy and legislative basis for improving energy efficiency is now in place in the form of Presidential Decree of 04.06.2008 № 889 "About some measures to improve energy and environmental efficiency of the Russian economy". A new federal law "On Energy Saving" was approved in November 2009 and will strengthen federal capacity and expand requirements for energy-saving measures in the buildings sector. Article 11 of the new law mandates a periodic review of energy efficiency in buildings, states that occupancy permits should not be granted for buildings that do not meet requirements, and holds the builder responsible for the energy performance of new buildings for the first five years of operations. Article 13 requires that all residential buildings constructed after November 2009 must have flat-level meters for power, gas, and water (and building-level meters for heat, power, and water) installed by the year 2012. In addition, current federal-level building codes СНиП 23-02 "Thermal protection of buildings" and СНиП 31-01-2003 "Residential apartment buildings" incorporate improved energy performance into their requirements. ISO EN standards are used to inform the update of the government standards (called ГОСТ) regarding the thermal performance of buildings, and it is understood that ISO 13790 will be adopted in this way over time.

Finally, the federal government has introduced a significant measure to promote housing construction in the form of "Access to Comfortable Housing," a national priority project. This project has spurred the rapid development of new construction projects in the regions and the establishment of corresponding provincial construction development programmes, which are designed to provide co-financing for federal funding. The resulting construction boom represents a huge market. In 2007, the volume of construction works was around USD 80 million (an increase of 123% compared to 2006), construction of residential buildings increased by 151% to 49.8 million m^2 and the construction of public buildings increased by 132% to 18.1 million m^2. The corresponding investment in technical building systems in 2007 amounted to more than USD 6 billion.

Consequently, there is an urgent need to translate federal-level energy efficiency legislation and regulations into the sub-federal legislative and regulatory framework, which includes the regional (okrug), provincial (oblast), and municipal levels. In addition, it is necessary to develop energy efficiency enforcement models and tools at all of these levels to ensure that stricter requirements are implemented. However the ability to increase the market for energy efficiency products and services and to ensure that the current construction boom results in more efficient buildings is still limited significantly.

The following section describes the roles and responsibilities of various federal and regional agencies. To summarize: the federal government is responsible for policy development and for oversight, monitoring, and coordination. The oversight and coordinator functions are carried out both by the Ministry of Regional Development, which will establish program indicators for the new government programs on energy efficiency, and by the regional plenipotentiaries, which will conduct ongoing monitoring of the federal program in Russia's regions. Regional governments are responsible for implementing the federal law on energy efficiency (including the development and passage of any necessary regional legislation) and for establishing regional energy efficiency programs.

Federal Government – Federal Agencies: The following agencies are directly identified in the new Federal Law on Energy Efficiency (Federal Law 261, dated 23 November 2010): the Executive Administration, the Ministry of Economic Development, the Ministry of Energy, the Ministry of Regional Development, and the Commission for Development of Mineral-Raw Materials Stocks, the Fuel and Energy Complex, and Energy Efficiency headed by Vice-Premier Igor Sechin. The roles of these agencies are detailed in Government Declaration 67, dated 2 February 2010.

Of the above ministries, the *Ministry of Regional Development* has a variety of responsibilities that result from the Federal Law 261 and Government Declaration 1225, dated 31 December 2009, which relates to the implementation of government energy efficiency programs. Specifically, the ministry is responsible for developing performance requirements and target indicators for monitoring and evaluating the federal program on energy savings, including the supporting methodology for making these calculations and calculations for facilities undergoing reconstruction and renovation. Requirements that must be monitored include the installation of meters, the mandatory incorporation of energy efficiency measures into renovated and reconstructed buildings, and the mandatory incorporation of energy performance into construction documents.

Furthermore, the roles of these ministries will be further described in the *Government Programme on Energy Savings and Increasing Energy Efficiency to 2020* (currently in draft form). This program will establish indicators for improving energy efficiency in the residential sector.

Federal Government – Regional Offices of the Presidential Administration: These plenipotentiary offices are located in each federal region, or *okrug* (the office in the North West Federal Region is the implementing agency for this project). They are tasked with oversight, coordination, and monitoring the realization of Federal Law 261, the fulfillment of presidential directive, which include components on energy efficiency, and the coordination of trans-boundary and international projects and programs in a given federal region. These functions are realized through the Council for the Coordination of Development of the Fuel and Energy

Complex and the Increase in Energy Efficiency of the Economy of the North West Federal Region. Monitoring takes place monthly, and quarterly meetings are held with the governors of the regions comprising the federal district.

Regional Government: Roles and responsibilities of Russia's regional governments regarding energy efficiency are discussed in Federal Law 261. They include the following:

- Implementation of the federal law in Russia's regions
- Development and realization of *regional programmes* for energy efficiency
- Survey of new building compliance with construction norms
- Conduct of energy audits in types of facilities outline in Law 261

Regional governments also have roles and responsibilities related to Federal Law 184 (dated 6 October 1999). These include mandates to develop and implement regional savings programs and to conduct energy audits in houses and multi-unit residential buildings that comprise housing stock in the regions.

Local Government: Local government (municipalities) may have legislation or construction regulations that relate to residential buildings. They are eligible to participate in regional energy efficiency programs, are required to comply with regional laws and regulations, and may also undertake investments that result in energy efficiency on an independent basis for municipally-owned housing stock.

Reasoning for GEF Involvement

The reasoning behind GEF participation in the proposed project is based on the removal of barriers, enabling the enhanced capacity of sub-federal authorities to implement energy efficiency policies and measures and increasing the ability of energy efficient products and services to enter the construction and housing maintenance sectors. Without GEF participation, regional and local authorities will continue to lack the capacity and information necessary to design and implement energy efficiency policies and measures. Also, without GEF support, awareness of energy-efficient practices in the residential construction and maintenance sectors would remain low. By building capacity at the sub-federal level, GEF funds can put current government investments in the housing sector on a lower carbon trajectory.

2. STRATEGY

Project rationale

The project strategy is to reduce existing institutional, management, information, technological, investment, and knowledge barriers that hamper wide penetration of energy efficient technologies and practices in the construction and building maintenance sectors. GEF financing will not be invested directly into renovation or energy efficiency improvements in existing/old buildings. However GEF funds will be used to leverage additional private sector investment in EE buildings. GEF funds will also be utilized to build local capacities, regulations and information for effective decision-making and management systems. The project will also focus on the enforcement of existing energy efficiency norms as outlined in the description of Component 1 below.

Country ownership: country eligibility and country drivenness

The Russian Federation is eligible for GEF funding in the climate change focal area as the result of its ratification of the UN Framework Convention on Climate Change and its status as a GEF member country.

The proposed project is submitted under the framework of the Umbrella "Russia Energy Efficiency Programme" – a partnership of UNDP, EBRD, and UNIDO involving key Russian federal sectoral agencies and regional authorities. As envisaged by the Umbrella Programme, coordination and linkages between the proposed project and other projects under the Programme will be addressed through the coordination mechanism led by

GEF OFP and consisting of GEF Agencies, Ministries of Energy, Economic development and Regional development of the Russian Federation and other key Russian Government authorities. As part of this effort, the Russian Government has recently created an inter-agency committee on energy efficiency. As suggested in the Umbrella Programme UNDP CO in Russia will be responsible for the overall communication and coordination between programme partners and projects. It is envisaged that a partnership for investments in EE buildings in north-west Russia will be developed with one or more financial institutions active in North West Russia. A list of potential partner institutions and a summary of preliminary consultations with them are provided as an annex to this document. Furthermore, the project will build on the outcomes of two UNDP/GEF energy efficiency projects implemented under GEF-3: capacity building to energy efficiency in Russian residential building (Vladimir) and energy efficiency measures in the Russian educational system (Tver, Arkhangelsk, Karelia). These projects above all helped to specify local and provincial barriers to energy efficiency and offered a number of lessons and best practices for the follow up initiatives.

Stakeholders and beneficiaries of the proposed project include: the Office of the Plenipotentiary Representative of the President of the Russian Federation in the North West Federal Okrug (inter-regional coordination, replication and up-scaling of regulatory work and management models); provincial and local Administrations of the Arkhangelsk, Pskov and Vologda Oblasts; provincial legislative bodies; regional energy committees (implementation of pilot demo projects, regulatory improvements); technical universities and energy efficiency centres (capacity building, technical training, dissemination of information, know-how and technologies); Ministry of Regional development of the Russian Federation (up-scaling and replication of building codes and standards and facilitating regulatory work); construction companies and financial institution or institutions active in North West Russia. A stakeholder involvement plan is included as a part of this document.

Design principles and strategic considerations

A number of energy saving projects have been implemented in the North Western Federal Okrug, including infrastructure projects with the World Bank, EBRD and NEFCO financing (e.g. energy metering and energy savings in water supply systems and residential buildings), TACIS supported projects on energy efficiency training, technology transfer and local norms in St.Petersburg construction sites, and the Norwegian Ministry of Foreign Affairs has provided financial support for energy efficiency activities in Arkhangelsk Oblast. These projects remained mainly uncoordinated. The proposed project will analyze, coordinate, and disseminate best practices of these initiatives through the institutional networks of the North West Federal Okrug and Representative of the President of Russia in the North West Federal Okrug. There will also be close coordination with the work of two key federal funds (the Fund to Promote Reform in the Residential and Communal Services Sector, and the Federal Fund to Promote Housing Construction) and with other investors, such as Nordic Investment Bank, EBRD, IFC which will leverage additional financing for the demonstration initiatives in order to ensure that they are of a scaleable size.

At the international level, the project will coordinate with activities taking place under the GEF multi-agency Framework Programme for Promoting Low Greenhouse Gas Emission Buildings.

The ***project objective*** is to build local capacities for and demonstrate local solutions to improved energy efficiency in new and existing buildings in the North West of Russia: Pskov, Vologda and Arkhangelsk Oblasts. The project objective will be achieved through the following: three components: 1) An enabling environment and enforcement capacities for improved energy efficiency at the provincial and local levels; 2) Capacity building and know-how; and 3) Demonstration of local energy-efficient solutions and management models. These components are described in detail below.

Outcome 1: Enabling environment and strengthened enforcement capacities for improved energy efficiency at the provincial and local levels

By creating effective enabling environment and institutional capacities at the local and regional levels, the project will help create incentives for energy efficient investments and the reduction of end-use energy consumption.

Specific barriers: Russia's approaches to building codes and standards and energy efficiency norms are largely similar to European equivalents. Key requirements to building energy efficiency included in the EU directives have been already reflected in the 2003 Russian federal construction codes (with an exception for heating boilers). However, enforcement of these codes at the design, construction and maintenance phases is undermined by the barriers described above. A gap also exists in introducing and communicating the advanced norms to various regions and municipalities and in enforcing them. Enforcement is also perceived as an area where there is little information on quality control even for previous codes. Provincial (oblast) codes and standards have been developed in a number of oblasts, but this process is not harmonized across the Federation. The oblasts in the North West federal region of the Russian Federation require assistance in developing both provincial and local regulations to implement codes that meet the federal standard. They also require assistance in structuring an enforcement system that will ensure compliance.

Specific outputs in this component will include the following:

1.1 Provincial legal and regulatory framework for enforcement and monitoring of energy efficiency construction norms in the Vologda Oblast.

1.1.a. Analysis of current model of monitoring and enforcement of the energy performance of buildings in the oblast and analysis of enforcement models in other CIS countries.

1.1.b. Development of a new model system for monitoring and enforcing energy performance in buildings in the oblast that includes strong penalties for non-compliance. The enforcement program should include providing incentives for inspectors to give them a vested interested in identifying buildings that are in non-compliance through regular monitoring and spot-checks. One model to be considered includes the contracting of private sector monitoring and enforcement companies who have incentives for identifying buildings in non-compliance. This would make the cost of enforcement self-financing after an initial period.

1.1.c Development of a regional and local regulatory framework that will institutionalize the model system for monitoring and enforcing energy standards in building codes in the oblast.

1.1.d. Establishment of an on-site inspection program.

1.1.e. Dissemination of the regulatory system and enforcement program to other Russian regions through workshops, seminars, and training events for the other two pilot oblasts and for subjects of the North West Federal District and through development of a Best Practice guide that will be distributed to regional energy efficiency centers in other federal districts and to the new federal agency responsible for energy efficiency.

1.2 Regulatory framework and improved institutional capacities for effective implementation of Energy Efficiency Programme of the Pskov Oblast.

1.2.a. Development and implementation of a legal and regulatory framework to establish and implement an energy efficiency programme in the Pskov Oblast and develop summaries of legislation/regulations for easier dissemination of information.

1.2.b. Analyze and clarify the institutional requirements at each level – federal, oblast, and municipal – for implementing the energy efficiency programme, including the roles of enforcement agencies and enforcement inspectors at all three levels.

1.2.c. Development and implementation of a oblast-level system of results-based monitoring of the enforcement program and its effect on actual energy performance in buildings.

1.2.d. Dissemination of good practice and lessons learned through the creation of a standing committee on energy efficiency for the North West Federal Region which will adopt best practice guidelines for the region,[3] through professional conferences related to energy efficiency, publication of articles, attendance at scientific meetings elsewhere in Russia and abroad, and through a website for the Energy Efficiency Programme.

1.3 Institutional and management model for energy efficient municipalities in Pskov Oblast.

1.3.a. Analysis of the current model of utilities provision in the Ostrovskii and Nevelskii Municipal Districts and preparation of technical specifications for a tender to introduce a GIS-based computer model of energy provision that can model existing flows of energy and financial resources and identify opportunities for savings.

1.3.b. Collection of all necessary baseline data, including energy audits of selected buildings as necessary, and adapt the software for use in the two municipal districts. The system that is selected should include a calculation of all resource losses in production, transmission and distribution, and end use of resources.

1.3.c. Implementation of a continuous data collection system that will provide sufficient information for monitoring results, and develop and enact the necessary regional and local regulations to put the data collection and maintenance system into place and ensure that it will have sufficient funding to remain in operation during and following the project implementation period. The management system should also document energy and economic savings due to the use of the model and the recommendations that it generates. This project component will also support local staff dedicated to data collection, entry, and analysis with the understanding that these functions will be assumed by the municipality at the conclusion of the project.

1.4 Municipal energy efficiency norms

1.4.a. Development of municipal energy efficiency norms

1.4.b. Development and implementation of a mechanism for adopting municipal energy efficiency norms.

1.4.c. Dissemination of the norms and of the models for energy efficient municipalities and mechanism across Pskov Oblast and to the other 3 participating oblasts, with results shared across the North West Federal Region.

Overview of Financing for Outcome 1:

From GEF: $1,276,000

From other sources: $6,790,000

Total financing for this component: $8,066,000

Outcome 2: Capacity building and know-how

[3] The standing committee will provide recommendations on regional building codes, municipal EE legislation, and regional EE program activities (particularly auditing and performance certification) to the UNDP-GEF project implementing agency.

Specific barriers: While the current standard on the thermal protection of buildings (adopted in 2003 by the State Construction Committee) requires that all building design projects should estimate energy performance. However, professional training and education in the area of building design and engineering do not integrate energy efficiency principles and incentives. Existing local experiences are replicated through fragmented initiatives with insufficient effectiveness.

Target groups: All of the three participating oblasts have an established system of professional and vocational education for construction sector consisting of technical and vocational schools and state and private universities. For example, in the Vologda Oblast there are two universities covering a wide range of subjects in the construction sector (including Vologda State Technical University, or VSTU), 5 technical schools, 21 professional colleges and 10 commercial educational facilities. Each of the three participating oblasts has students who study energy efficiency of buildings (design and construction, functioning, building service, heating engineering, etc.): 300-350 in the Vologda Oblast, 200-250 students in the Arkhangelsk Oblast, and 150-200 students in the Pskov Oblast. These numbers do not include those enrolled in continuing education programs for professionals. At least one university, Arkhangelsk State Technical University, has a student exchange program (with Germany) in which efficient design is covered, although the exchanges are very limited in size. In addition to the existing educational facilities, officials are planning to establish a large new university, Lomonosov Northern State University, in Arkhangelsk in 2010-2011. This university will be responsible for training of specialists in the areas of design, construction, and maintenance, and it will also emphasize research and development.

Currently, **students in post-secondary educational institutions** learn about energy efficiency in subjects that are federally mandated as part of their curriculum (e.g. “architectural physics” for architects, designers and restorers) and through components established by their universities (e.g. “building physics” for students specializing in industrial and civil architecture or urban economics and building). For other specialties (electrical engineering, heating engineering, water supply, etc.), energy efficiency is included in some individual sections of the disciplines studied.

In addition to students, all of the participating oblasts have a group of **active building design professionals** (architects, engineers, etc.) who work in design institutes and smaller studios. In each oblast, there are 3-4 large building design groups (of 300-400 professionals) that handle large-scale developments and 150-200 smaller studios with 10-15 professionals. Within these organizations, there are groups that cover energy efficiency. **Building inspectors** constitute another target group for training and outreach. The majority of inspectors (employees of the regional offices of the State Housing Inspectorate) have post-secondary vocational education in the area of industrial and civil architecture. This specialty is the most widespread in the buildings sector. Other professional target groups include **energy efficiency auditors**, most of whom have a university education and have specialized in either “heat and gas supply and ventilation” or “energy supply,” and **energy efficiency managers** (deputy managers of a firm), most of whom have a university degree in heat and gas supply and ventilation or in energy supply.

Options for continuing education for these professionals and others include the following: (1) retraining courses (from 8 to 72 hours); (2) professional retraining that gives the opportunity to choose another profession in the presence of higher education (500 hours); (3) professional retraining that helps to get one more higher education (1200 hours). The first type of retraining is regulated by the legislation of the Russian Federation. However, the others are also very important, as research indicates that only 20% of graduates work in a field that corresponds to their academic degree.

A final target group is formed by the **leading institutions in the field of building design and engineering**, such as the Scientific-Research Institute of Construction Physics of the Russian Academy of Sciences (Moscow); Nizhniy Novgorod State University, Chelyabinsk State University, and Tomsk State University. The project will exchange findings and “best practice” with these institutions and may collaborate on training and distance learning initiatives.

Summary of Activities: Component 2 of the proposed project will establish a means of disseminating new technologies in design and maintenance of energy efficient buildings and housing networks. In so doing, this component will also target current practicing architects, engineers, planners, and other target groups. In particular, the project will: (a) develop recommendations and programmes for professional education and training on energy efficiency in construction and building maintenance; (b) integrate energy efficiency units into the curricula of provincial Universities and technical schools; and (c) establish an interregional network of vocational training centers.

Specific outputs in this component will include the following:

2.1. Capacity building and professional training modules

2.1.a. Development and introduction of a module for primary school education in household energy-saving measures presented in an entertaining format for selected primary schools in the Vologda Oblast.

2.1.b. Development and introduction of an elective module in industrial and household energy efficiency for comprehensive secondary schools. The target audience includes selected comprehensive schools in the Vologda Oblast, preferably in close proximity to participating primary schools.

2.1.c. Development and introduction of an elective module to provide knowledge about energy efficiency to students receiving vocational training in fields related to construction and buildings as well as facilities maintenance and engineering. Participating institutions will be selected from vocational schools in the Vologda Oblast.

2.1.d. Development and introduction of an elective module for training specialists in professional education programs and providing them with professional skills in the field of energy efficiency (for specialties connected with design, engineering, and construction as well as facilities maintenance and engineering) and for training students in teacher training colleges who are studying to become preschool and comprehensive school teachers. Educational institutions will be chosen from vocational schools and teacher training colleges in the Vologda Oblast.

2.1.e. Development and introduction of training modules on energy efficiency for students in post-secondary educational institutions.

Furthermore, VSTU will use the modules as the basis for developing curricula and courses of study related to energy efficiency. It will also organize an inter-regional professional education and distance learning network. VSTU's current departments and the professional education network should allow it to train the following numbers of students and professionals[4] in the area of energy efficiency covering the three participating oblasts over the project lifetime:

Number of Trainees – Students (by academic discipline):

Architecture:	100 people
Industrial and civil engineering:	700-750 people

[4] When the distance learning network is organized, the programs will be able to reach even more professionals.

Heat- and gas supply and ventilation: 100-120 people
Power supply: 400-500 people
Water supply and drainage: 200-250 people
Other specialties: 300-400 people

Number of Trainees -- Working Specialists (by job):

Housing and communal services and heat supply workers, company managers: 2500-3000 people
Building workers: 500-600 people
Government officials (municipal administration): 100-200 people
Other categories: 300-400 people

2.1.f. Development and introduction of a training module on scientific research, modeling, technologies, databases and computer programs in the field of energy efficiency and energy savings.

2.2. Energy efficiency curriculum in territorial universities and technical colleges

2.2.a. Implementation of a detailed overview of faculties in each educational institution in the three oblasts that can introduce programs, disciplines, and courses on energy efficiency with at least one institution per oblast and in addition one institution in St Petersburg. The following table outlines the institutions in the North West Federal Region (in each oblast) which could participate in the project and introduce courses on energy efficiency.

Educational Institutions in North West Russia that could benefit from an energy efficiency curriculum

Name of Institution	Name of Faculty	Oblast
Vologda State Technical University (VSTU)	Faculty of Construction and Engineering; Faculty of Power Engineering	Volodga
Arkhangelsk State Technical University	Construction Faculty	Arkhangelsk
Pskov Polytechnical Institute	Engineering and Construction Faculty	Pskov
Lomonosov Northern State University (to be established)	To be determined	Arkhangelsk
St. Petersburg State Polytechnical University	Power Engineering	St. Petersburg
Novgorod State University	Polytechnical Institute (architecture, construction, civil engineering, and urban planning)	Novgorod
Murmansk State Technical University	Polytechnical Faculty (Energy and Transport Department)	Murmansk

The overview will include an assessment of faculty capacity and the geographic distribution of these institutions in order to strengthen ties between different institutions and provide effective career guidance and cohesive specialist training in energy efficiency.

2.2.b. Strengthening the scientific and technical base of a university or universities in the North West Federal Region to support the development of leading educational institutions in the sphere of energy efficiency for the

region. This component will include conduct a tender for facilities such as laboratories for building heating systems and modern thermal insulation.

2.2.c. Developing effective models and "know-how" in energy efficiency.

- An investigation of the existing system of tariff-setting from the standpoint of energy efficiency in the North West Region and proposals for tariff-setting that will provide incentives to use energy more efficiently.
- Conducting sociological studies in the Vologda Oblast on the attitude of authorities towards energy-efficient buildings and on public opinion about energy efficiency.
- Realization of the pilot project in 3 selected educational institutions (1 in each participating oblast) which include pilot energy-efficiency activities in each project,
- Utilization and adaptation of existing software to support energy efficiency computation in secondary vocational and higher vocational educational institutions. The software selected should also allow for the development of approximate business plans for enterprises relating to energy efficiency investments. Preliminary research indicates that this software could be used in 120–600 institutions, with an optimal distribution to approximately 100 institutions in North West Russia and in other parts of the Russian Federation.
- Development of the hardware necessary to assess energy efficiency of electric drives in building management systems.
- Development and implementation of methods to determine the optimum performance of power supply lines to buildings with the objective of creating an algorithm for managing of indoor energy resources and minimizing surges.
- Development of energy saving technologies and house-building under natural conditions of the north on the basis of know-how (invention and patenting)
- Development of measures for organization of road traffic in the cities of the region in order to reduce vehicle emissions.
- Development of energy-saving technologies for consumers such as special operating modes for electrical appliances, regulated speed drives for equipment, non-invasive start controls, programmable devices for managing power demand, modernization and optimization of a distributive low-voltage network, and the use of advanced methods to determine installed capacity and operating modes of manufacturing equipment.

2.2.d. Compilation and distribution of educational kits[5] on the topics of "Reducing atmospheric emissions with energy-saving buildings" and "Trends in energy-efficient generation, transmission, and consumption" and corresponding methodological documents that can be integrated into the following courses of study: post-secondary vocational education and electives (industrial and civil building, municipal building and services, heat- and gas supply and ventilation, power supply, water supply, architecture), general post-secondary technical training; post-secondary education with economic training, teacher training for primary/secondary vocational education, and teacher training teachers of preschool, primary, and secondary comprehensive schools. Course materials and textbooks will be developed and/or adapted to these groups, and a textbook on energy efficiency will be introduced for teaching younger and older primary school pupils. The distribution audience for the kit is ranges from 200 to 3000 institutions, and preliminary studies indicate that a distribution target of 600 (including North West Russia and several other regions in the Russian Federation) would be optimal.

2.3. Inter-regional professional training center

[5] Each kit contains a curriculum, a series of lecture outlines, student examinations, full-text exercise books and documents, links to useful Internet web sites, and a glossary. Nine textbooks will be included in the kit on topics ranging from district heating to renewable energy.

2.3.a. Establishment of an inter-regional professional development and staff re-training center at one university in each of the three pilot oblasts. The center will conduct the following co-financed activities:

- studying the experiences of similar centers in other regions
- providing energy audits for industrial, residential, and public facilities using a mobile thermal imaging system
- monitoring greenhouse gas emissions
- developing educational kits (see above description) on energy efficiency in buildings, energy-saving technologies, and energy auditing and offering refresher courses and distance learning courses in these areas
- developing programs and courses on energy efficiency for teachers in schools in the region. Information about the greenhouse effect and economical measures for environmental protection should be included in academic disciplines such as physics (2 hours) and economics (6 hours)
- conducting seminars on the economic of energy resources for homeowners. Participants will be provided with heat and electricity meters, switches, heat supply valves, etc.
- conducting one-day seminars on alternative energy sources and biofuels
- conducting regular seminars for energy managers
- research and development
- developing some commercial activity based mostly on computer technologies

2.3.b. Establishment of branches of an Inter-regional professional Training Center across the North West Federal Region.

2.3.c. Use of the professional training centers to provide training on energy-efficient building code compliance, including design techniques and efficient technologies that can be used to meet code requirements for building envelopes. This training will be provided to practicing architects, construction engineers, and building code inspectors in each of the three participating regions.

2.4. Distance learning and dissemination system

2.4.a. Development of training units related to energy efficiency for use in the inter-regional professional training center and in the Center for Distance Learning (through both classroom based and e-learning). The project will develop a total of 22 training units that will range from 4 to 10 classroom hours. These units will train a projected total of 1375 specialists who are seeking to enhance their qualifications and who will obtain specialized knowledge about energy efficiency in the process. The specialists will be enrolled in re-training and professional education programs ranging from 72 hours of instruction to more than 500 hours of instruction.

2.4.b. Tendering for and implementation of an internet-based distance learning program (e-learning) to incorporate the training units developed, including the development a business model for the program for providing professional training.

2.5. Inter-regional exchanges of lessons and best practices; replication programme. These activities will include materials from all three project components, allowing for a coordinated approach to managing the knowledge and materials produced by various project activities.

2.5.a. Develop dissemination strategy for all materials produced under the program. This strategy must cover the *ongoing* distribution of information and materials 1) to the project team; 2) to the teams in all three participating oblasts; 3) to all territories in the NW Federal District, particularly to their administrations and to their universities; 4) to key professional, academic, and government organizations across the Russian Federation; 5) internationally; 6) to other projects in the GEF framework programme on energy efficiency in the

Russian Federation; and 7) to other projects in the UNDP Global Framework on Low-Carbon Buildings. University networks of the Russian Ministry of Education will be engaged for the replication activities to build upon the lessons and results of the completed UNDP/GEF project on the energy efficiency in educational sector (2006).

2.5.b. Identify target groups for outreach.

2.5.c. Produce and distribute project lessons/practices materials.

2.5.d. Participate in at least one national and/or international meeting annually to disseminate project results and to keep abreast with best current practice.

2.5.e. Develop replication strategy for project as a whole

2.5.f. Identify replication partners and sign MOUs or other documentation with partners.

Overview of Financing for Outcome 2:
From GEF: $768,000
From other sources: $2,570,000
Total financing for this component: $3,338,000

Outcome 3: Demonstration of local energy efficient solutions and management models

The project will support three pilot initiatives in order to demonstrate energy saving potential of proposed technical and management solutions and provide models for replication. The project will cooperate with a financial institution or institutions active in North West Russia to leverage additional financing for each of the demonstration initiatives in order to ensure that they are of a scaleable size. Indicative demonstration projects were selected to demonstrate improved enforcement capacities and removal of regulatory, information and know-how barriers. The following outputs were developed during the process of project preparation:

3.1. Demo A (Vologda Oblast). Model residential construction site: management model integrating EE criteria, legislative and regulatory measures, integrated project design, and project monitoring.

The development of a model for managing and monitoring residential construction project based on provincial energy efficiency norms will help to consolidate efforts of local governments and investors, in particular the Nordic Investment Bank, which will review the housing development with a view to assessing their replicability. A greenfield construction site will be commissioned and monitored for compliance with EE norms from the design stage through construction and operations and maintenance.

The pilot construction site is located in Nifantov, a settlement in the Shekninskii Municipal District that is not far from Vologda City), and it consists of 50 hectares of greenfield land. Construction is planned in two phases: 20 hectares in Phase 1 and 30 hectares in Phase 2. When fully completed, the site will accommodate 4,000 residents. The site will include infrastructure (including energy supply systems), residential buildings and public buildings. The project will design an integrated management model for a rural residential construction site (low-rise buildings) that will address above all institutional, regulatory and information management issues throughout design and construction process (from land tenure to building maintenance) focusing on energy efficiency. The model will involve a partnership approach between UNDP, regional authorities, and an investment institution or institutions operating in the region. A list of these potential institutions and the status

of consultations is provided as an annex to this document. Federal and regional co-financing will be invested into design and construction of infrastructure and public buildings. The partner institution or institutions will finance residential, cultural, and commercial buildings. Involvement of various investors with different interests requires having an integrated management model that will be focused on enforcing energy efficiency throughout the entire system of buildings and infrastructure.

3.1.a. Development of underpinning legislation and regulatory measures for the model site.

3.1.b. Development of plans for the site, including energy-efficient designs for the proposed buildings, with early involvement of the contractor.

3.1.c. Project implementation (i.e., construction) that is site-sensitive and reflects local circumstances.

3.1.d. Integrate experience into the design prototypes for energy-efficient residential buildings and housing developments.

3.1.e. Replication of the design approach by developing a case study document and DVD on the model residential construction site and disseminating widely.

Overview of Financing for Demo Project 3.1:

Co-financing will cover the initial design, baseline construction costs, and maintenance costs whereas GEF support will be for the improved design, incremental construction costs, oversight of more efficient construction materials and techniques, and monitoring of energy performance, including documentation of results. Federal and regional co-financing will be invested into design and construction of infrastructure and public buildings, while private investors will finance residential, cultural and commercial buildings.

3.2. *Demo B (Arkhangelsk Oblast): Energy efficiency certification of buildings: methodology and introduction*

This demonstration of energy efficiency building certification will result in the establishment of a regulatory framework ensuring mandatory enforcement of national and provincial energy efficiency norms and standards. Introduction of energy efficiency building certification requires considerable time and will be twofold: certification of newly constructed buildings and certification of existing buildings classified in groups according to their maintenance life.

3.2.a. Adoption of a regulatory framework for calculating the thermal performance of buildings

3.2.b. Development of a guidebook for measuring heat consumption in commissioned buildings and approval of the guidebook as a methodological-regulatory document at the oblast level.

3.2.c. Adoption and realization of a list of specific energy efficiency measures in buildings in the Arkhangelsk Oblast.

3.2.d. Dissemination of results by developing a case study document and DVD on the demonstration of energy-efficient certification and disseminating widely.

Overview of Financing for 3.2:

GEF financing will support the design of building passports and certification systems; the design and introduction of related institutional systems to enforce building certification; the design and introduction of

information and monitoring systems; and related training to regional and local authorities. Co-financing will pay for the introduction and replication of building certification throughout the pilot site in Arkhangelsk and beyond. The certification system that is developed will be used in the audit and renovation pilot projects in Component 3.3.

3.3. Demo C (Arkhangelsk Oblast) Collect and maintain reliable and timely information for decision making on energy efficient construction and building maintenance in municipalities. Systematic energy audits and effective information system within municipalities should provide for tracking and assessing information on the effectiveness and efficiency of building projects at various stages. While focusing on local governments, this sub-component of the project will also improve information available for corporate sector decision-makers and end users. These activities are designed to overcome barriers related to misperceptions and inform decision makers and consumers at all levels: government agencies, municipal enterprises, large commercial consumers and households. The implementation of emerging national and provincial legislation on energy efficiency norms requires that energy consumers possess reliable and accessible information on energy losses, associated costs, and alternative energy saving solutions. The project will also build partnerships with companies that are willing to implement energy efficiency improvements.

Energy audits of enterprises and organizations include an assessment of all aspects of operation that involve energy use. The purpose of this activity is to increase awareness of all stakeholders, reducing barriers related to wrong perceptions or inadequate information of stakeholders involved in project management and decision making. The project will work with regional authorities, municipal enterprises, large commercial consumers and residential consumers. There have been growing number of incentives for energy saving including regulatory and technical. In order to realize those incentives, all consumers should possess reliable and accessible information on the losses, costs and alternatives. The project will build partnerships with companies that are motivated to shift to a more energy efficient systems and will promote competitive building maintenance services and introduction of maintenance concessions.

Finally, the project will support the reconstruction of six residential buildings in urgent need of renovation and it will provide energy performance certificates both for these buildings and for more than 570 buildings that will be audited. The reconstruction and certification will demonstrate the economic benefits of energy efficiency in a highly visible way.

The scope of the demonstration project in Component 3.3 will be the residential and public buildings sector in the Isakogorskii District of the City of Arkhangelsk, the capital of the Arkhangelsk Oblast. The Isakogorskii District has more 27,600 inhabitants, 8 micro-districts, and 960 residential buildings with an area of 708,400m^2. Public buildings in the district include 11 city schools, 10 preschools, a youth center, a cultural center, four libraries, a medical clinic, and a first aid station. During 2008-2009, construction has included a 119-unit condominium, three 12-unit condominiums, and the reconstruction of a 12-room apartment building. Plans for construction in the district for 2010-2012 include the construction of nine apartment buildings, three 80-room buildings, and the reconstruction of a 12-room apartment building.

3.3.a. Analyze options for an information management tool.

This activity will survey possibilities and will include two key sub-activities: 1) Drafting a municipal power consumption program; and 2) Designing and compiling an electronic database of areas under construction and construction projects. The work under this sub-activity will also include generating a territorial fuel and energy balance, ensuring that the targets under the oblast-level energy-saving program can be reached, and determining benchmarks for oblast-level targets. Finally, this sub-activity will assess the possibility for public-private partnerships and various means of financing energy-saving improvements at the municipal level.

3.3.b. Develop and introduce a technique for integrating energy efficiency into building design and the provision of communal services.

This activity will establish requirements for participation in a municipal energy efficiency program in areas such as heat, water, lighting, public buildings, and social housing. It will also create municipal energy efficiency

programs for the heat supply and water delivery sectors, and it will establish an energy-efficient design office at the regional energy efficiency center and create a working group of representatives of energy producers and consumers in the municipality. Finally, it will introduce the stage-by-stage certification of public and residential buildings and monitor power consumption in these facilities. This will allow the municipality to understand current consumption, identify areas for improvement, and maintain an overview of the resource needs for the municipality.

3.3.b.i. Establish requirements for participation in a municipal energy efficiency program in areas such as heat, water, lighting, public buildings, and social housing; create municipal energy efficiency programs for the heat supply and water delivery sectors;

3.3.b.ii. Establish an energy-efficient design office at the regional energy efficiency center; create a working group of representatives of energy producers and consumers in the municipality;

3.3.b.iii. Introduce the stage-by-stage certification of public and residential buildings based on an electronic database and data management system;

3.3.b.iv. Develop a cost-revenue model for assessing economic and investment benefits of energy efficiency investments; and

3.3.b.v. Monitor power consumption in these facilities

3.3.c. Develop and introduce an energy audit program for buildings when they are commissioned. The project will conduct energy audits for public buildings and residential buildings in order to assess their compliance with building codes and to identify buildings that are in most urgent need of reconstruction. Here, the project will collaborate with the ongoing compilation of a database on energy use in public buildings in the City of Arkhangelsk that is currently funded by the Norwegian Ministry of Foreign Affairs. All audited buildings will receive energy performance certificates and receiving and energy performance certificate will be a pre-requisite for any project which wishes to be considered for development of an energy-efficiency pilot demonstration project.

3.3.c.i. Design and pilot energy audit programme for public buildings

3.3.c.ii. Design and pilot energy audit programme for residential buildings

3.3.c.iii. Inspect public buildings and residential buildings and the heat exchangers

3.3.c.iv. Provide “energy passports” or performance certificates to at least 579 of the buildings that are audited

3.3.c.v. Design and introduce an administrative model for interaction with all participants in the energy market to improve the transparency of resource accounting.

3.3.d. Reconstruction of Inefficient Residential Buildings in Urgent Need of Renovation

This activity will reconstruct six existing buildings in the Isakogorskii District in order to demonstrate and quantify energy savings for a range of existing residential building design types that are in urgent need of renovation. Details of these buildings are provided in the estimates of GHG emission reductions in Section II.H.

3.3.d.i. Propose highly-efficient design for each of the building series for six buildings

3.3.d.ii. Obtain permits and approval for construction

3.3.d.iii. Undertake reconstruction and commissioning

3.3.d.iv. Measure energy performance of the renovated buildings and provide buildings with energy certificates.

3.3.d.v. Produce design guidebook for the building series illustrating techniques used for distribution to housing authorities, energy departments, and building engineers. Disseminate the design guidebook widely.

3.3.e. Inter-regional Exchange of Experience and Best Practice

The project will work in two main directions here: 1) Developing information materials for experts involved in buildings auditing, energy supply, and management; and 2) Increasing awareness of energy efficiency issues among end-users (the public). The public awareness campaign will include using local media for targeted awareness raising activities. Each of the measures and the supporting methodologies in the demo project will be documented, such as a methodology for monitoring the energy performance of office buildings and other public facilities, a methodology for carrying out monitoring using the support of information systems to monitor energy consumption, and a methodology for conducting "express monitoring" for regional and local governments. This set of methodological materials will support initiatives such as the creation of energy passports for buildings and the creation of indicators for energy consumption, enable the assessment of energy savings potential at a given site, and allow local authorities to refine their energy efficiency plans. The documentation will then be provided to the project management unit in order to ensure that it reaches target groups in other participating oblasts, other subjects in the North West Federal Region, key stakeholders in other parts of the Russian Federation, and the international research and policy community.

Overview of Financing for Demo Project 3.3:

GEF financing will cover the design of the information management system at the regional and local levels; training in energy auditing and project planning; and awareness-raising among commercial and residential consumers. GEF funding from Component 3.2 will be used to develop and implement energy performance certificates for the renovated and audited buildings. Co-financing will fund energy auditing, construction work related to building renovation, replication and scaling up information models and awareness campaigns. Replication of all of the demonstration projects will be supported through activities under Component 2, including those under Output 2.5. "Inter-regional exchanges of lessons and best practices."

Overview of Financing for Outcome 3 <u>as a whole</u>:

From GEF: $3,274,000

From other sources: $15,420,000

Total financing for this component: $18,694,000

<u>Key indicators, risks and assumptions</u>

Key indicators and assumptions are listed in the project results framework below. Risks related to project implementation are assessed as follows:

Risk	Rating	Mitigation
Regional Governments do not adopt regional construction norms	L	This risk is considered low during the period of project implementation, as the pilot regions will now be required to

and enforcement mechanisms		implement regional energy efficiency programs under the new federal law on energy savings that went into effect in November 2009. The Administration of the North West Federal Okrug will continue to support and leverage the regions' commitment to energy efficiency.
Construction companies will not adopt energy efficient technologies and materials.	L	This risk is considered low, as companies are driven by the increasing market demand for energy efficient buildings and by rising energy prices. This risk will be addressed through the project components that improve enforcement of construction norms and, as applicable, create new incentives from the local and regional authorities.
Energy price subsidies in residential and public sectors remain in place, leading to an insufficient incentive for efficient products	L	The government has already initiated the process of rationalizing energy prices. Although the actual pace of this process may change, the direction and goal of these government policies are firmly established.

Financial modality

The project is centered around regulatory development, capacity building, and technology demonstration. The project objectives will be attained through technical assistance and investment in demonstration activities. Loan and/or revolving-fund mechanisms are not considered appropriate for these approaches, and therefore grant-type funding is considered most adequate to enable the successful delivery of project outcomes. However, the project will work with a selected financial institution or institutions active in North West Russia, which will support the sustainability and replicability of the project.

The Plenipotentiary of the President of the Russian Federation in the North West Federal Okrug will execute this project. The Plenipotentiary oversees the federal district that covers the ten administrative entities that comprise North West Russia (including the three participating oblasts), and it has served as the executing agency for the preparatory phase of this project.

Cost-effectiveness

The project emphasis on regulatory development and capacity building is seen as highly cost-effective. In particular, strengthening building codes and enforcement from one end and giving architects and engineers the know-how to comply with stricter codes on the other will result in more efficient buildings that "lock in" a lower energy consumption over their lifetimes.

Sustainability

The development of long-term municipal energy efficiency programmes and the establishment of regional energy efficiency centres in the most advanced Russian regions have proved to be decisive in the success of energy efficiency projects. The proposed UNDP-GEF programme will develop the institutional and technical capacities of municipal and regional energy managers.

Because the stricter building codes developed under the project will remain in force after the project comes to an end, the impact that the project activities will have on the buildings sector is highly sustainable. In addition, the curriculum and materials developed for professional training and the prototype building plans will be used after the project concludes and will continue to improve the capacity of architects and engineers to design more efficient buildings.

Replicability

This project will work specifically at the local and provincial levels in three selected provinces of the North West of Russia. Given Russia's vast territory, diversity and decentralized governance structure, the proposed regional (sub-federal) approach appeared to be most effective. The pilots in Component 3 will cover both

institutional and technological models and financing arrangements for projects. The outputs of these local pilots will then be further replicated and scaled up to the regional and federal levels through the institutional networks of the North West Federal Okrug, which is the regional branch of the Presidential Administration and by developing a sustainable financing model with project partners.

3. PROJECT RESULTS FRAMEWORK:

This project will contribute to achieving the following Country Programme Outcome as defined in CPAP or CPD:					
Country Programme Outcome Indicators:					
Primary applicable Key Environment and Sustainable Development Key Result Area (same as that on the cover page, circle one): 1. <u>Mainstreaming environment and energy</u> OR 2. Catalyzing environmental finance OR 3. Promote climate change adaptation OR 4. Expanding access to environmental and energy services for the poor.					
Applicable GEF Strategic Objective and Program: Climate Change, Strategic Programme 1					
Applicable GEF Expected Outcomes:					
Applicable GEF Outcome Indicators:					
	Indicator	**Baseline**	**Targets End of Project**	**Source of verification**	**Risks and Assumptions**
Project Objective[6] **(equivalent to output in ATLAS)** Build local capacities for and demonstrate local solutions to improved energy efficiency in construction and maintenance of buildings in the North West of Russia: Pskov, Vologda, and Arkhangelsk Oblasts.	CO_2 emissions from energy use in new and renovated buildings in the 3 participating oblasts.	85,000 tCO_2 emitted due to space heating in new and renovated buildings during the 5-year project period (2010-2015) 1.7 $MtCO_2$ emitted due to space heating in new and renovated buildings during their lifetime (assuming a 20-year lifetime)	Direct reductions of 48,050 tCO2e as compared to the baseline. Indirect reductions of 599,000 tCO_2 emitted due to space heating in new and renovated buildings during their lifetime (assuming a 20-year lifetime)	Calculations based on the quantitative measurements of energy use in space heating and fuel mix described above based on standard practice.	Assumption: building trends will continue as projected (conservatively) by the project. Assumption: More efficient codes prepared under the project will enter into effect and be enforced.
Outcome 1[7] **(equivalent to activity in ATLAS)**	Operational oblast-level legal and regulatory	Lack of current, comprehensive program for codes	Model system operating in the oblast including an on-site (inspection program) and the	*Project documentation. *Regional	Assumption: Oblast-level, okrug-level, and municipal-level support for the project will remain strong, and

[6] *Objective (Atlas output) monitored quarterly ERBM and annually in APR/PIR*

[7] *All outcomes monitored annually in the APR/PIR. It is highly recommended not to have more than 4 outcomes.*

Provincial and local policies and regulations ensuring enforcement of energy efficient building norms	framework for enforcing and monitoring building codes in Vologda oblast; effective implementation of the Pskov Oblast Energy Efficiency Programme; effective implementation of an institutional and management model for EE municipalities in the Pskov Oblast; development of municipal energy efficiency norms in Pskov Oblast	enforcement with systematized, regular on-site inspections; Pskov Oblast Energy Efficiency Programme lacks regulatory framework and institutional capacity for effective operation; lack of a model for EE municipalities in Pskov oblast; absence of municipal energy efficiency norms.	program shared with other oblasts; oblast-level system of results-based monitoring operating in Pskov; capacity of the EE Programme increased in at least 3 key areas as stated in the capacity development plan; and good practice disseminated in Russia and abroad; applied model of utility services provision in place and functioning for 2 municipal districts; Municipal EE norms adopted in 2 municipalities in Pskov oblast; norms disseminated to other oblasts.	regulations. *Enforcement program documentation. *One-on-one interviews *Comparison with other oblast-level Energy Efficiency Programmes *Documentation from 2 municipal districts *Documentation from municipalities *Independent review	legislation and supporting regulations will be accepted.
Outcome 2 **(equivalent to activity in ATLAS)** Improved local capacities to leverage and manage investments into energy efficiency.	Development and introduction of capacity-building and professional training modules (Vologda Oblast); development and introduction of EE-related curricula in universities and technical colleges in the three participating oblasts; fully-functioning inter-regional professional training center; access of	Limited exposure to energy- efficiency-related topics at the post-secondary level; absence of programs at other levels of education Lack of specific, focused EE curriculum in educational institutions in the participating oblasts; no professional training center in the NW Federal Region focusing	Modules introduced in additional schools in each category and disseminated to other oblasts; "know-how," including software, developed and distributed by VSTU; and two kits (curriculum, lecture outlines, exams, texts and workbooks) are produced and in use; branches of a university-based training center established across the NW Federal Region; 22 training units developed and in use at the inter-regional training center and in the Center for Distance Learning; Project lessons/best practices are produced and distributed to target groups and influence target group practices;	*Modules *Project documentation *Independent review *Educational materials and course guides for educational institutions *Interviews *University documentation *Center for Distance Learning documentation *Project materials	Assumption: Students and practicing professionals will have a strong incentive to apply the techniques that they have learned through training because of reduced operating costs and because the buildings they design will have to meet with increasingly stringent energy performance regulations.

	professionals to a distance learning system for EE topics; level of exchange of best practices and lessons learned	specifically on continuing education in energy efficiency and energy management; no training units specifically focusing on energy efficiency No means of capturing or disseminating experiences in EE programs	replication partners are identified and a relationship with them is formalized.	and publications/presen-tations *Interviews with a sample of target group members *MOUs with replication partners	
Outcome 3 **(equivalent to activity in ATLAS)** Reduction of GHG emissions demonstrated: 45-76% reduction in energy consumption in construction and maintenance sectors; 10-20% reduction in energy losses in energy networks.	Reduction in energy consumption in the construction and communal services (utilities) sectors of Vologda oblast. Use of energy performance certificates in the building stock in Arkhangelsk. Building renovations do not capture the full potential of cost-effective energy	No architectural or civil engineering approach to new, more-efficient residential developments exists in the NW federal region. Energy performance certificates are not used in the building stock in Arkhangelsk.	Necessary legislation adopted and applicable permits are obtained for a model site in Vologda oblast; Construction is completed, with buildings demonstrating savings of 45-76% over the regional average for thermal performance of buildings and network losses that are lower by 10-20%. The prototype residential development is finalized and replicated. At least 579 buildings will receive audits and the corresponding energy performance certificate ("energy passport"), and specific EE measures will be undertaken in six existing buildings in response to information generated from the certification process; results	*Project documentation *Construction permits and land titles *Site visits *Oblast regulatory documents *Review of energy performance certificates *Survey of selected buildings in Arkhangelsk. *Electronic database and data management system *Documentation from audits and review of energy performance	Assumption: Building-level and network-level savings will be similar to savings achieved in similar buildings in similar climatic conditions. Assumption: Municipalities will have sufficient interest and awareness in the energy efficiency programs for heat supply and water delivery.

	measures. Reliable and timely information on EE buildings available for decision-making in municipalities in Arkhangelsk Oblast.	No coordinated information available for decision-making; lack of a methodology for EE project management in the housing and communal services sector in Arkhangelsk oblast.	disseminated. Municipal-level programs for heat supply and water delivery created; energy-efficient design office created at AOEEC, the regional energy efficiency center. Certification system introduced for public and residential buildings based on an electronic database and data management system; power consumption monitored on an ongoing basis. Energy audit program in place for public and residential buildings when they are commissioned; inspections of public and residential buildings carried out. Best practices and lessons learned shared across the NW federal region.	certificates *Project outreach materials *AOEEC documentation *Independent review	

TOTAL BUDGET AND WORKPLAN

Award ID:	00059438 / **Project ID:** 00074315
Award Title:	PIMS 4131 CC FP Buildings Energy Efficiency in the North West of Russia
Business Unit:	Russian Federation (RUS10)
Project Title:	PIMS 4131 CC FP Buildings Energy Efficiency in the North West of Russia
Implementing Partner (I	Presidential Administration in the NW Federal Okrug (NWFO)

GEF Outcome/ Atlas Activity	Responsible Party/Implementing Agent	Fund ID	Donor Name	Atlas Budgetary Account Code	ATLAS Budget Description	Amount Year 1 (USD)	Amount Year 2 (USD)	Amount Year 3 (USD)	Amount Year 4 (USD)	Amount Year 5 (USD)	Total (USD)	Budget note
OUTCOME 1:Enabling environment and enforcement capacities for improved building energy efficiency				71200	Intl. Consultants		50000				50000	Green standards international consultant
				71300	Local Consultants	16000	16000	16000	16000	16000	80000	Pskov site coordinator/expert on regulations
				71300	Local Consultants	20000	20000				40000	1.1.1. Building energy performance monitoring and enforcement model
				71300	Local Consultants	20000	20000				40000	1.2.1. Legal and regulatory fraework for Pskov EE programme
				71300	Local Consultants		10000	10000	10000	10000	40000	1.2.4.
				71300	Local Consultants	50000	50000				100000	1.3.2.
				72100	Contractual services		50000	50000			100000	1.3.3.
				71300	Local Consultants				50000	50000	100000	1.4.3.
				71600	Travel		7000		7000		14000	1.1.5.
				71600	Travel	7000	10000	7000	10000	7000	41000	1.1.1-1.4.3. + Inception workshop, SC meetings
				72100	Contractual service	20000	10000				30000	1.1.2.
				72100	Contractual services		40000	50000	50000		140000	1.1.3.
				72100	Contractual service	20000	30000				50000	1.2.2.
				72100	Contractual services		20000	30000	30000	10000	90000	1.2.3.
				72100	Contractual service	40000					40000	1.3.1.
				72100	Contractual services			30000	40000	30000	100000	1.4.1., 1.4.2.
				72800	IT equipment		15000	15000			30000	1.3.3.
				74200	Printing&public-s				8000	8000	16000	
				74100	Evaluation			50000		50000	100000	MTE, FE
				75700	Seminar		10000		10000	10000	30000	1.1.5., SC meetings
				75700	Seminar		10000	10000		10000	30000	1.2.4.
				74500	Miscellan. expense	3000	3000	3000	3000	3000	15000	
	NWFO	**62000**	**GEF**	**Total Outcome**		**196000**	**371000**	**271000**	**234000**	**204000**	**1276000**	

OUTCOME 2: Capacity building and know-how				71200	Intl. Consultants	30000			20000		50000	
				71300	Local Consultants	16000	16000	16000	16000	16000	80000	Vologda site coordinator/education expert
				71300	Local Consultants	8400	8400	8400	8400	8400	42000	Communication and information expert, part time
				71300	Local Consultants	5000	10000	10000	5000	5000	35000	2.1
				71300	Local Consultants		10000	5000	10000		25000	2.2
				71600	Travel		8000	6000	8000	6000	28000	
				72100	Contractual service	20000	30000	30000	30000	30000	140000	2.1-2.2
				72100	Contractual services		40000	40000	40000	30000	150000	2.3-2.4
				72100	Contractual services		10000	10000	10000	10000	40000	2.5
				72200	Equipment	20000	30000	30000	20000	20000	120000	2.2-2.3
				74200	Printing&public-s		10000	10000	11000	12000	43000	2.2.4, 2.4.1,2.5
				74500	Miscellan. expense	3000	3000	3000	3000	3000	15000	
	NWFO	**62000**	**GEF**	**Total Outcome**		**102400**	**175400**	**168400**	**181400**	**140400**	**768000**	
OUTCOME 3: Demonstration of local energy efficient solutions and management models	**NWFO**	**62000**	**GEF**	71200	Intl. Consultants	50000	50000				100000	Consultants on Vologda demo - 3.1.2, 3.1.3.
				71300	Local Consultants	16000	16000	16000	16000	16000	80000	Arkhangelsk site coordinator/energy management expert
				71300	Local Consultants	14400	14400	14400	14400	14400	72000	GHG emission reduction expert
				71300	Local Consultants	14400	14400	14400	14400	14400	72000	EE construction expert
				71300	Local Consultants	20000	20000	20000	20000		80000	3.1.1.
				71300	Local Consultants		20000	20000	40000	40000	120000	3.2.3-3.2.4
				71300	Local Consultants	20000	20000	20000	15000	15000	90000	3.3.2 . electronic catalogue
				71300	Local Consultants			40000			40000	3.3.4 . Institutional model for energy market stakeholders (3.3.4.4.)
				71300	Local Consultants			20000			20000	(3.3.5.1.)
				71600	Travel	20000	25000	20000	25000	20000	110000	3.1.-3.3.
				72100	Contractual service	90000	90000		20000		200000	3.1.2.
				72100	Contractual service	270000	270000	400000			940000	3.1.3.
				72100	Contractual service	20000	40000				60000	3.3.1.
				72100	Contractual services		50000	50000			100000	3.3.3. cost-revenue result management model
				72100	Contractual services		20000	25000	30000	30000	105000	3.3.3. building certification and database(3.3.3.3)
				72100	Contractual services		30000	30000	30000	30000	120000	3.3.3. power consumption monitoring
				72100	Contractual services		30000	40000	40000	40000	150000	3.1-3.3 monitoring
				72100	Contractual services		20000		20000		40000	3.3.4.
				72800	Software product	20000	20000	20000	20000	20000	100000	3.2-3.3
				72200	Equipment	30000	30000	15000	20000	15000	110000	3.2-3.3
				72200	Equipment		80000	90000	90000	80000	340000	3.1.4. Demo state-of-art EE equipment
				74200	Printing&public-s		15000		15000	20000	50000	3.1- 3.3 and
				75700	Seminars	10000	10000	10000	10000	15000	55000	3.1.5.
				75700	Seminars		20000	25000	20000	25000	90000	3.2.5-3.3.5. interregional exchange of experience and best practice
				74500	Miscellan. expense	6000	6000	6000	6000	6000	30000	
				Total Outcome		**600800**	**910800**	**895800**	**465800**	**400800**	**3274000**	

Management				71400	Project personnel	75000	75000	75000	75000	75000	375000	PM, Assistant, Accountant
				71600	Travel	4000	4000	4000	4000	4000	20000	
				72200	Equipment	10000		2000			12000	
				72400	Communication	4000	4000	4000	4000	4000	20000	
				72500	Supplies	5000	5000	5000	5000	5000	25000	
				74100	Audit	10000	10000	10000	10000	10000	50000	
				74500	Miscellan. expense	4000	4000	4000	4000	4000	20000	
	NWFO	**62000**	**GEF**	**Total Management**		**112000**	**102000**	**104000**	**102000**	**102000**	**522000**	
					PROJECT TOTAL	**1011200**	**1559200**	**1439200**	**983200**	**847200**	**5840000**	

Summary of Funds: [8]

	Amount Year 1	Amount Year 2	Amount Year 3	Amount Year 4	Amount Year 5	Total	
GEF	1,011,200	1,559,200	1,439,200	983,200	847,200	**5,840,000**	
Co-financing (cash and in-kind)							
Govt of Arkhangelsk Oblast						4,267,000 **Error! Bookmark not defined.**	
Govt of Vologda Oblast						4,000,000 **Error! Bookmark not defined.**	
Govt of Pskov Oblast						1,330,000 **Error! Bookmark not defined.**	
Nevelskii District, Pskov Oblast						833,000	
Agency for Energy Balances						**Error! Bookmark not defined.**5 50,000	
ERT						1,670,000 **Error! Bookmark not defined.**	
Energoaudit						1,600,000	
NW Engineering Center (Joint Stock Company)						1,670,000	
Pskov Polytechnical Institute						320,000	
Vologda State Technical University						880,000	
Vologda Construction College						180,000	

[8] *Summary table should include all financing of all kinds: GEF financing, cofinancing, cash, in-kind, etc...*

Kaduysk Polytechnical College						180,000	
Cherepovets College						180,000	
Govt of Vologda Oblast (Education Department)						1,000,000	
City of Vologda (Education Department)						310,000	
Wetbex JSC						1,700,000	
North West Holding						3,000,000	
JSL Oblstroyproekt						830,000	
Vologdaoblstroyzakazchik						3,000,000	
Co-financing total						**27,500,000**	
Project TOTAL						**33,340,000**	

MANAGEMENT ARRANGEMENTS SEE UNDP POPP FOR FURTHER DETAILS

Coordination will be ensured through the **national project implementing agency**, the Office of Plenipotentiary Representative of the President of the RF in the North-West Federal Okrug according to the UNDP National Implementation Modality (NIM). The Office carries out coordination of and administrative support to the implementation of the national priority projects in the North-Western regions, including the housing project. The Office is also responsible for replication of best practices and lessons within the North-Western Federal Okrug through the Council of Governors, the Council for National Priority Projects and through its international contacts targeting investment promotion and technology transfers. Decisions of the Councils are binding for the participating regions and drive the development of regional programmes and budgets.

As the Implementing Partner for this project, the Plenipotentiary will appoint a **National Project Director (NPD)** to be in charge of overall responsibilities, including planning, coordination, administration and financial management of the project with support by UNDP-Russia. The NPD will be responsible for the achievement of the project objectives, for all projects' reporting, including the submission of Annual Work Plans (AWP) and financial reports. He/She will ensure the delivery of the project outputs and the judicious use of the project resources. This will ensure that expected outputs are delivered using the most efficient and cost-effective implementation strategies and procedures. The NPD will be also a member of the PSC and will act as its permanent secretary. Regional Administrations of the pilot regions will play key roles in the project implementation.

The **Project Board/Steering Committee** is responsible for making management decisions for a project in particular when guidance is required by the Project Manager. The Project Board plays a critical role in project monitoring and evaluations by quality assuring these processes and products, and using evaluations for performance improvement, accountability and learning. It ensures that required resources are committed and arbitrates on any conflicts within the project or negotiates a solution to any problems with external bodies. In addition, it approves the appointment and responsibilities of the Project Manager and any delegation of its Project Assurance responsibilities. Based on the approved Annual WorkPlan, the Project Board can also consider and approve the quarterly plans (if applicable) and also approve any essential deviations from the original plans.

In order to ensure UNDP's ultimate accountability for the project results, Project Board decisions will be made in accordance to standards that shall ensure management for development results, best value money, fairness, integrity, transparency and effective international competition. In case consensus cannot be reached within the Board, the final decision shall rest with the UNDP Project Manager. Potential members of the Project Board are reviewed and recommended for approval during the PAC meeting. Representatives of other stakeholders can be included in the Board as appropriate.

The duties, responsibilities and operating rules of the above Project Board are as following:

- Provides assistance and political support to the National Project Director, Project Manager, and national experts and counterparts during the implementation process of all project activities.
- Reviews and make necessary comments for the all draft documents prepared by the national clime change team
- Receives information on regular basis on the status of the implementation of the project activities and problems to be faced with. The Project Manager submits the report on the status of the implementation of project activities.

Rules under which the Project Board operates:

- The Project Manager serves as Moderator of Project Board meetings. The NPD chairs the Project Board meetings
- The Project Board meets not less than four times during the project life-time. In special cases the Project Board shall meet upon the initiative of the National Project Director.
- When the Project Board does not meet, the NPD and Project Manager may request inputs and support from individual members of the Project Board.

Project Manager: The Project Manager has the authority to run the project on a day-to-day basis on behalf of the Implementing Partner within the constraints laid down by the Board. The Project Manager's prime responsibility is to ensure that the project produces the results specified in the project document, to the required standard of quality and within the specified constraints of time and cost.

Regional Team Leaders: Three regional team leaders will provide day-to-day coordination of project activities at the oblast level, with one team leader serving in each of the three pilot oblasts. The team leaders will coordinate technical experts in the field and will be responsible for disseminating project findings and best practice in their respective oblasts. They will report to the Project Manager.

Project Support: The Project Support role provides project administration, management and technical support to the Project Manager as required by the needs of the individual project or Project Manager.

4. MONITORING FRAMEWORK AND EVALUATION

The following general text is to be used in the project document though it should be amended to suit the specific requirements of the project and best practice in various RCUs and UNDP GEF focal areas. Three UNDP corporate tools are to be used in project monitoring and evaluation:

1. ERBM which is linked to ATLAS
2. UNDP Evaluation Resource Centre

The project will be monitored through the following M& E activities. The M& E budget is provided in the table below.

Project start:

A Project Inception Workshop will be held within the first 2 months of project start with those with assigned roles in the project organization structure, UNDP country office and where appropriate/feasible regional technical policy and programme advisors as well as other stakeholders. The Inception Workshop is crucial to building ownership for the project results and to plan the first year annual work plan.

The Inception Workshop should address a number of key issues including:

a) Assist all partners to fully understand and take ownership of the project. Detail the roles, support services and complementary responsibilities of UNDP CO and RCU staff vis à vis the project team. Discuss the roles, functions, and responsibilities within the project's decision-making structures, including reporting and communication lines, and conflict resolution mechanisms. The Terms of Reference for project staff will be discussed again as needed.
b) Based on the project results framework and the relevant GEF Tracking Tool if appropriate, finalize the first annual work plan. Review and agree on the indicators, targets and their means of verification, and recheck assumptions and risks.
c) Provide a detailed overview of reporting, monitoring and evaluation (M&E) requirements. The Monitoring and Evaluation work plan and budget should be agreed and scheduled.
d) Discuss financial reporting procedures and obligations, and arrangements for annual audit.

e) Plan and schedule Project Board meetings. Roles and responsibilities of all project organisation structures should be clarified and meetings planned. The first Project Board meeting should be held within the first 12 months following the inception workshop.

An Inception Workshop report is a key reference document and must be prepared and shared with participants to formalize various agreements and plans decided during the meeting.

Quarterly:

- Progress made shall be monitored in the UNDP Enhanced Results Based Managment Platform.
- Based on the initial risk analysis submitted, the risk log shall be regularly updated in ATLAS. Risks become critical when the impact and probability are high. Note that for UNDP GEF projects, all financial risks associated with financial instruments such as revolving funds, microfinance schemes, or capitalization of ESCOs are automatically classified as critical on the basis of their innovative nature (high impact and uncertainty due to no previous experience justifies classification as critical).
- Based on the information recorded in Atlas, a Project Progress Reports (PPR) can be generated in the Executive Snapshot.
- Other ATLAS logs can be used to monitor issues, lessons learned etc... The use of these functions is a key indicator in the UNDP Executive Balanced Scorecard.

Annually:

- Annual Project Review/Project Implementation Reports (APR/PIR): This key report is prepared to monitor progress made since project start and in particular for the previous reporting period (30 June to 1 July). The APR/PIR combines both UNDP and GEF reporting requirements.

  The APR/PIR includes, but is not limited to, reporting on the following:
  - Progress made toward project objective and project outcomes - each with indicators, baseline data and end-of-project targets (cumulative)
  - Project outputs delivered per project outcome (annual).
  - Lesson learned/good practice.
  - AWP and other expenditure reports
  - Risk and adaptive management
  - ATLAS QPR
  - Portfolio level indicators (i.e. GEF focal area tracking tools) are used by most focal areas on an annual basis as well.

Periodic Monitoring through site visits:

UNDP CO and the UNDP RCU will conduct visits to project sites based on the agreed schedule in the project's Inception Report/Annual Work Plan to assess first hand project progress. Other members of the Project Board may also join these visits. A Field Visit Report/BTOR will be prepared by the CO and UNDP RCU and will be circulated no less than one month after the visit to the project team and Project Board members.

Mid-term of project cycle:

The project will undergo an independent Mid-Term Evaluation at the mid-point of project implementation (insert date). The Mid-Term Evaluation will determine progress being made toward the achievement of outcomes and will identify course correction if needed. It will focus on the effectiveness, efficiency and timeliness of project implementation; will highlight issues requiring decisions and actions; and will present initial lessons learned about project design, implementation and management. Findings of this review will be incorporated as recommendations for enhanced implementation during the final half of the project's term. The organization, terms of reference and timing of the mid-term evaluation will be decided after consultation between the parties to the project document. The Terms of Reference for this Mid-term evaluation will be prepared by the UNDP CO based on guidance from the Regional Coordinating Unit and UNDP-GEF. The management response and the evaluation will be uploaded to UNDP corporate systems, in particular the UNDP Evaluation Office Evaluation Resource Center (ERC).

The relevant GEF Focal Area Tracking Tools will also be completed during the mid-term evaluation cycle.

End of Project:

An independent Final Evaluation will take place three months prior to the final Project Board meeting and will be undertaken in accordance with UNDP and GEF guidance. The final evaluation will focus on the delivery of the project's results as initially planned (and as corrected after the mid-term evaluation, if any such correction took place). The final evaluation will look at impact and sustainability of results, including the contribution to capacity development and the achievement of global environmental benefits/goals. The Terms of Reference for this evaluation will be prepared by the UNDP CO based on guidance from the Regional Coordinating Unit and UNDP-GEF.

The Terminal Evaluation should also provide recommendations for follow-up activities and requires a management response which should be uploaded to PIMS and to the UNDP Evaluation Office Evaluation Resource Center (ERC).

The relevant GEF Focal Area Tracking Tools will also be completed during the final evaluation.

During the last three months, the project team will prepare the Project Terminal Report. This comprehensive report will summarize the results achieved (objectives, outcomes, outputs), lessons learned, problems met and areas where results may not have been achieved. It will also lay out recommendations for any further steps that may need to be taken to ensure sustainability and replicability of the project's results.

Learning and knowledge sharing:

Results from the project will be disseminated within and beyond the project intervention zone through existing information sharing networks and forums.

The project will identify and participate, as relevant and appropriate, in scientific, policy-based and/or any other networks, which may be of benefit to project implementation though lessons learned. The project will identify, analyze, and share lessons learned that might be beneficial in the design and implementation of similar future projects.

Finally, there will be a two-way flow of information between this project and other projects of a similar focus.

M& E workplan and budget

Type of M&E activity	Responsible Parties	Budget US$ *Excluding project team Staff time*	Time frame
Inception Workshop	▪ Project Coordinator ▪ UNDP Russia ▪ UNDP GEF	10,000	Within first two months of project start up (share of Atlas budget code 75700 in Comp 1)
Inception Report	▪ Project Team ▪ UNDP Russia	None	Immediately following IW
Measurement of Means of Verification for Project Purpose Indicators	▪ Project Coordinator will oversee the hiring of specific studies and institutions, and delegate responsibilities to relevant team members	To be finalized in Inception Phase and Workshop.	Start, mid and end of project
Measurement of Means of Verification for Project Progress and Performance (measured on an annual basis)	▪ Oversight by Project GEF Technical Advisor and Project Coordinator ▪ Measurements by regional field officers and local IAs	To be determined as part of the Annual Work Plan's preparation.	Annually prior to APR/PIR and to the definition of annual work plans
APR and PIR	▪ Project Team ▪ UNDP Russia ▪ UNDP-GEF	None	Annually

TPR and TPR report	▪ Government Counterparts ▪ UNDP Russia ▪ Project team ▪ UNDP-GEF Regional Coordinating Unit	None	Every year, upon receipt of APR
Steering Committee Meetings	▪ Project Coordinator ▪ UNDP Russia	60,000	Following Project IW and subsequently at least once a year (Atlas budget codes 75700 and 71600 in Comp. 1)
Periodic status reports	▪ Project team	5,000	To be determined by Project team and UNDP CO (share of Atlas budget 71300 for PM and site coordinators)
Technical reports	▪ Project team ▪ Hired consultants as needed	15,000	To be determined by Project Team and UNDP-CO (share of Atlas budget 71300 for PM and site coordinators)
Mid-term External Evaluation	▪ Project team ▪ UNDP Russia ▪ UNDP-GEF Regional Coordinating Unit ▪ External Consultants (i.e. evaluation team)	50,000	At the mid-point of project implementation (Atlas Budget 74100, Comp 1)
Final External Evaluation	▪ Project team, ▪ UNDP Russia ▪ UNDP-GEF Regional Coordinating Unit ▪ External Consultants (i.e. evaluation team)	50,000	At the end of project implementation (Atlas Budget 74100, Comp 1)
Terminal Report	▪ Project team ▪ UNDP Russia ▪ External Consultant	None	At least one month before the end of the project
Lessons learned	▪ Project team ▪ UNDP-GEF Regional Coordinating Unit (suggested formats for documenting best practices, etc)	15,000 (average 3,000 per year)	Yearly (share of Atlas budget 74200 for Component 3 and share of Atlas budget 71300 in Component 2 for Communications Expert)
Audit	▪ UNDP Russia ▪ Project team	50,000 ($10,000 per year)	Yearly (Atlas Budget code 74100, Project management)
Visits to field sites	▪ Government representatives ▪ Project team ▪ UNDP Russia ▪ UNDP-GEF Regional Coordinating Unit (as appropriate) ▪	20,000 ($4,000 per year)	Yearly
TOTAL INDICATIVE COST *Excluding project team staff time and UNDP staff and travel expenses*		$ 285,000	

5. LEGAL CONTEXT

The Standard Basic Assistance Agreement (SBAA) between the Government of the Russian Federation and the United Nations Development Program was signed on 17 November 1993.

This document together with the CPAP signed by the Government and UNDP which is incorporated by reference constitute together a Project Document as referred to in the SBAA [or other appropriate governing agreement] and all CPAP provisions apply to this document.

Consistent with the Article III of the Standard Basic Assistance Agreement, the responsibility for the safety and security of the implementing partner and its personnel and property, and of UNDP's property in the implementing partner's custody, rests with the implementing partner.

The implementing partner shall:

a) put in place an appropriate security plan and maintain the security plan, taking into account the security situation in the country where the project is being carried;

b) assume all risks and liabilities related to the implementing partner's security, and the full implementation of the security plan.

UNDP reserves the right to verify whether such a plan is in place, and to suggest modifications to the plan when necessary. Failure to maintain and implement an appropriate security plan as required hereunder shall be deemed a breach of this agreement.

The implementing partner agrees to undertake all reasonable efforts to ensure that none of the UNDP funds received pursuant to the Project Document are used to provide support to individuals or entities associated with terrorism and that the recipients of any amounts provided by UNDP hereunder do not appear on the list maintained by the Security Council Committee established pursuant to resolution 1267 (1999). The list can be accessed via http://www.un.org/Docs/sc/committees/1267/1267ListEng.htm. This provision must be included in all sub-contracts or sub-agreements entered into under this Project Document.

Annex 1: Stakeholder Matrix and Institutional Coordination

The proposed project is submitted in the framework of the Umbrella "Russia Energy Efficiency Programme " – a partnership of UNDP, EBRD, UNIDO involving key Russian federal sectoral agencies and regional authorities. As envisaged by the Umbrella Programme, coordination and linkages between the proposed project and other projects under the Programme will be addressed through the coordination mechanism led by GEF OFP and comprising of GEF Agencies, Ministry of Energy of the Russian Federation and other key Russian Government authorities. As part of this effort, the Russian Government has recently created an inter-agency committee on energy efficiency. As suggested in the Umbrella Programme, UNDP CO in Russia will be responsible for the overall communication and coordination between programme partners and projects. Full project proposals to be developed over the coming months will include detailed description of coordination arrangements based on consultation with OFP, Agencies and Russian partners.

Furthermore, the project will build on the outcomes of two UNDP/GEF energy efficiency projects implemented under GEF-3: capacity building to energy efficiency in Russian residential building (Vladimir) and energy efficiency measures in the Russian educational system (Tver, Arkhangelsk, Karelia). These projects above all helped to specify local and provincial barriers to energy efficiency and offered a number of lessons and best practices for the follow up initiatives.

A number of energy saving projects have been implemented in the North Western Federal Okrug, including infrastructure projects with the World Bank, EBRD and NEFCO financing (e.g. energy metering and energy savings in water supply systems and residential buildings), TACIS supported projects on energy efficiency training, technology transfer and local norms in St.Petersburg construction sites, and the Norwegian Ministry of Foreign Affairs has provide financial support for energy efficiency activities in Arkhangelsk Oblast. These projects remained mainly uncoordinated. The proposed project will analyze, coordinate, and disseminate best practices of these initiatives through the institutional networks of the North West Federal Okrug and Representative of the President of Russia in the North West Federal Okrug. There will also be close coordination with the work of two key federal funds: the Fund to Promote Reform in the Residential and Communal Services Sector, and the Federal Fund to Promote Housing Construction. At the international level, the project will coordinate with activities taking place as illustrated in Table A2.1.

Table A2.1: Proposed project coordination with related international initiatives

Organization/Initiative	**Means of Cooperation**
GEF Multi-Agency Framework for Promoting Low Greenhouse Gas Emission Buildings	Provision of findings and materials from all components of the project to other projects participating in the GEF framework programme. Dissemination of materials from other GEF framework projects to project staff and stakeholders.
Barents Energy Group Initiative	Provision of project findings to the group; participation in meetings as necessary.
Energy Charter	Provision of project findings to the Energy Charter's Working Group on Energy Efficiency and Related Environmental Aspects.

UNECE (Committee on Housing and Land Management workshops on Energy Efficiency in Housing)	Provision of data and findings from pilot sites in Component 3. Distribution of materials and presentations to project staff and stakeholders in the North West Federal Region.
International Energy Agency	Provision of project findings to the EE Policies and Measures Database; provision of supporting materials as necessary to G8 Gleaneagles Programme (IEA G8/G20).
SPARE (Intl. Initiative on Energy Efficiency in Schools)	Provision of all curriculum materials developed under Component 2 to the SPARE international network of schools using Russian-language materials.

Stakeholders and beneficiaries of the proposed project include: the Office of the Plenipotentiary Representative of the President of the Russian Federation in the North West Federal Okrug (inter-regional coordination, replication and up-scaling of regulatory work and management models); provincial and local Administrations of the Arkhangelsk, Pskov and Vologda Oblasts; provincial legislative bodies; regional energy committees (implementation of pilot demo projects, regulatory improvements); technical universities and energy efficiency centers (capacity building, technical training, dissemination of information, know-how and technologies); and construction companies. A stakeholder overview is provided in the table below.

Table A2.2: Stakeholder Overview

Stakeholder(s)	**Role in Project**
Component 1: Enabling environment and enforcement capacities for improved building energy efficiency at the provincial (*oblast*) and local levels	
The plenipotentiary of the President of the RF in the North West Federal District (Okrug)	Coordination of the work of the enforcement agencies across participating municipalities and oblasts.
Federal authorities responsible for enforcement of building codes and related legislation: the Ministry for Regional Development; the Ministry of Energy; and the Ministry of Natural Resources and Ecology.	Participation in taking project-related legal documents related to building efficiency at the regional and local level and to efficiency in the construction sector to the federal level.
Legislative bodies at the federal and regional (oblast) level: the State Duma of the RF and regional-level assemblies.	Consideration and acceptance of the proposed legislation to improve energy efficiency in the buildings sector.
Authorities responsible for enforcement of building codes and related legislation at the regional (oblast) level, including: The State Housing Inspectorate of the Vologda Oblast; the Central Administrative Board for Architecture and Town Planning of the Vologda Oblast; the Department of Natural Resources and Environmental Protection of the Vologda Oblast; the Department of Construction, Industry, and Electric Power of the Vologda Oblast; the regional power commission of the Vologda Oblast; the Pskov Oblast State Committee for Construction, Housing and Communal Services; the Pskov Oblast State Housing and Building Inspectorate; the Pskov Oblast State Committee on	Preparation of regulations and legislation to provide a legal foundation for energy efficiency in buildings and in the construction sector.

Tariffs; the Arkhangelsk Oblast Department of Tariffs and Pricing, the Department of Natural Resources of Arkhangelsk Oblast; the Department of Fuel and Energy, Housing, and Communal Services of Arkhangelsk Oblast; the Architecture and Town Planning Authority of Arkhangelsk Oblast; and the State Housing Inspectorate in Arkhangelsk Oblast.	
Municipal authorities: municipal authorities responsible for enforcement; relevant committees, departments, and authorities.	Preparation and introduction of local legislation and regulations to support energy efficiency in the housing and construction sector.
Federal funds: the Fund to Promote Reform in the Residential and Communal Services Sector, and the Federal Fund to Promote Housing Construction	Preparation and support of legislation to improve energy efficiency in the funds' target sectors; integration of energy efficiency considerations into the operating procedures of the funds.
Property developers and construction companies and related business associations	Cooperation on efforts to increase energy efficiency in the construction and buildings sector
Housing maintenance organizations / communal services organizations	Cooperation on efforts to increase energy efficiency in buildings maintenance
Design institutes and energy-related R&D organizations	Cooperation on efforts to increase energy efficiency in the construction and buildings sector
Technological regulation authorities: the management of the Federal Service on Ecological, Technological, and Nuclear Supervision	Cooperation on technical regulations to improve energy efficiency in the construction and buildings sector.
Generating companies and heat and power marketing companies (utilities)	Participation in resulting programs to improve energy efficiency.
Other businesses	Participation in resulting programs to improve energy efficiency.
Civil society	Participation in resulting programs to improve energy efficiency.
Component 2: Capacity Building and Know-How	
Educational institutions: Institutions providing initial vocational training, average vocational training, and advanced vocational training.	Development and introduction of training programs, re-training programs, and the corresponding academic plans and curricula.
Federal enforcement authorities: The Ministry of Education and Science	Review and dissemination of training programs, re-training programs, and the corresponding academic plans and curricula.
Other authorities: Regional monitoring bodies	Introduction of a system of training and re-training for their employees, including curriculum and general requirements.
The media	Provide information to the general public on energy efficiency and the potential for saving energy in the buildings sector; contribute to awareness of an energy-efficient mindset.
Component 3: Demonstration of local energy efficient solutions and management models	
Enforcement authorities at the level of the NW Federal Okrug	Coordination of the work at the sub-federal level

Oblast-level and local-level authorities	Acceptance of legal and organizational decisions, oversight of interests of all stakeholders at the sub-federal level.
Federal funds: the Fund to Promote Reform in the Residential and Communal Services Sector, and the Federal Fund to Promote Housing Construction	Cooperation in funding the demonstration projects, uptake of findings from these projects.
Other sources of investment and co-financing for federal funds: Norwegian Investment Bank, other bilateral and multilateral investment funds and banks.	Cooperation in funding the demonstration projects; provision of financing and/or guarantees for property developers (see below).
Technological regulation authorities: the management of the Federal Service on Ecological, Technological, and Nuclear Supervision	Monitoring and oversight on all civil-engineering-related work associated with the demonstration projects.
Property developers	Provision of technical and financial support.
Design institutes: design and R&D organizations working in the participating oblasts	Participation in the design process for the demonstration projects.
Construction companies working in the participating oblasts	Construction of buildings under the demo project.
Manufacturers of construction materials	Provision of efficient materials for the demonstration projects.
Energy audit companies	Work on baseline auditing and monitoring the performance of buildings involved in the demonstration projects and in a control group of buildings.
Building management companies	Day-to-day management of buildings in the demonstration projects
Energy producers and utilities	Provision of heat and power to demonstration project sites.
Businesses whose offices are located in the demonstration zones	Beneficiaries of reduced energy demand.
Households located in the demonstration zones	Beneficiaries of reduced energy demand.
Public organizations	Representation of the interests of the project beneficiaries (households and businesses).
The media	Raise awareness of the results of the demonstration projects and of the overall benefits of improving energy efficiency in the buildings sector.

Coordination will be ensured through the Office of Plenipotentiary Representative of the President of the RF in the North-West Federal Okrug. The Office carries out coordination of and administrative support to the implementation of the national priority projects in the North-Western regions, including the housing project. The Office is also responsible for replication of best practices and lessons within the North West Federal Okrug through the Council of Governors, the Council for National Priority Projects and through its international contacts targeting investment promotion and technology transfers. Decisions of the Councils are binding for the participating regions and drive the development of regional programmes and budgets.

Annex 3: Summary of International Financial Institutions Consultations

1. World Bank Group, including
    - IFC
        - funding possibility for projects discussed with deputy representative of the President of the Russian Federation in the North-West Federal District and vice-governors of the districts, plans presented and key focus areas identified;
        - project funding possibilities under component 3 discussed (project site in Vologda region discussed at meeting with vice-governor of the Vologda region; projects for Arkhangelsk region discussed at meeting of the regional department for fuel and energy facilities and municipal building maintenance services). The administration and the bank are ready to examine funding plans for the projects under a guarantee by the region for a period of up to 15 years at the stage of project justification and launch. Vologda region is currently discussing practical issues related to project implementation. A possibility of funding energy efficiency advocacy activities through an IFC grant is currently being examined in the Pskov region.

2. MDM Bank, branch of OJSC 'MDM-Bank' North-West Bank
    - issues discussed include funding of energy audit, certification, implementation of infrastructure projects for boiler plants conversion and other system-level activities in the Arkhangelsk and Pskov regions.
3. BNP Paribas
    - funding possibility for projects discussed with deputy representative of the President of the Russian Federation in the North-West Federal District and vice-governors of the districts, plans presented and key focus areas identified;
    - issues of funding of energy audit, certification, implementation of infrastructure projects for boiler plants conversion and other system-level activities discussed for Vologda and Pskov regions, as well as funding of component 2 of the project (interuniversity center for energy efficiency)
4. Eurasian Development Bank
    - funding possibility for projects discussed with deputy representative of the President of the Russian Federation in the North-West Federal District and vice-governors of the districts, plans presented and key focus areas identified;
    - funding possibility for projects under component 3 discussed (project site in Vologda region discussed at meeting with vice-governor of the Vologda region; projects for Arkhangelsk region discussed at meeting of the regional department for fuel and energy facilities and municipal building maintenance services), reconstruction of community facilities and introduction of modern equipment.
5. Nordic Environment Finance Corporation (NEFCO)
    - funding possibility for projects discussed with deputy representative of the President of the Russian Federation in the North-West Federal District and vice-governors of the districts, plans presented and key focus areas identified;

- NEFCO is actively involved in and ready to continue activities related to energy saving in the Arkhangelsk region. Funding schemes are based on revolving funds, are successfully implemented, and will be used in the project.

6. Finnvera
    - funding possibility for projects discussed with deputy representative of the President of the Russian Federation in the North-West Federal District and vice-governors of the districts, plans presented and key focus areas identified;
    - projects aimed at the introduction of energy efficient activities and events in Pskov region. Negotiations conducted with the local administration. Funding schemes involving Finnish companies currently being developed.
7. National Housing Bank of Norway ‘Husbanken’
    - actively involved in and ready to continue activities related to energy saving in the Arkhangelsk region. Funding schemes are based on revolving funds, are successfully implemented, and will be used in the project. Possibility for replication of scheme in the Vologda region under discussion.
8. Northern Investment Bank
    - funding possibility for projects discussed with deputy representative of the President of the Russian Federation in the North-West Federal District and vice-governors of the districts, key priorities identified.
9. Gazprombank (OJSC)
    - funding possibility for projects discussed with deputy representative of the President of the Russian Federation in the North-West Federal District and vice-governors of the districts, key priorities identified. The bank supports joint work with IFC in this field.
10. VTB Saint-Petersburg
    - funding possibility for projects discussed with deputy representative of the President of the Russian Federation in the North-West Federal District and vice-governors of the districts, key priorities identified. The bank is identifying the possible areas for its participation in the project, as well as timeframe.
11. LLC ‘Finconsult’ – leasing company
    - funding possibility for projects discussed with deputy representative of the President of the Russian Federation in the North-West Federal District and vice-governors of the districts, key priorities identified, the company is examining the list of equipment, conditions and duration of the lease, and potential partners.

Annex 4: Overview of GEF Umbrella Programme in Energy Efficiency for the Russian Federation

	EBRD Municipal Buildings Project	*EBRD Urban Housing Project*	*UNDP NW Buildings Project*	*UNDP Standards/Labels*	*UNDP Efficient Lighting*	*EBRD-UNIDO Industrial EE*
Geographic Region	Municipalities to be determined during PPG	Khanty-Mansi autonomous region, Siberia National scope for Housing Fund work	Three oblasts in the NW Russian admin. territory	Regions to be determined. National scope for labeling	National scope with demonstration activities in Nizhny Novgorod and Moscow	National, by industry and company
End-Use Sector	Public administration buildings Public facilities (educational and healthcare) Public lighting Both new and existing buildings	New public and private urban residential buildings	Buildings in all sectors	Household appliances Other equipment Lighting	Efficient lighting in all sectors	GHG-intensive industries
Co-financing	EUR 10-50 million in credit to municipalities Forfaiting mechanism for suppliers	USD 34 million in EBRD loans USD 50 million EBRD line of credit Russian Housing Municipal Reform Fund	Federal target programmes on housing Regional EE funds	Federal EE programme Product retailers	Government co-financing CFL producers	Government co-financing Private Sector (Designated Financing Mechanism)
Key Barrier Addressed	Finance gap for municipalities	Under-representation of EE in municipal planning and housing policy	"Policy-to-practice" gap	Absence of institutional arrangements for S&L and efficient procurement	Local production and standards	EE not reflected In facilities Management or investments
Activities to define and support "energy-	Will develop criteria for prioritizing EE	Will establish criteria for "EE buildings"	Will develop criteria for certification of	Will establish norms for appliances and	Knowledge center, procurement, local production	Training, Targets, Preferred

	EBRD Municipal Buildings Project	*EBRD Urban Housing Project*	*UNDP NW Buildings Project*	*UNDP Standards/Labels*	*UNDP Efficient Lighting*	*EBRD-UNIDO Industrial EE*
efficient" technologies	investments		EE buildings Will develop criteria for municipal EE norms	equipment	support	suppliers
TA Mechanisms	Support for project preparation Tendering Unit	Guidance to state fund Support for municipal energy planning	Three demonstration projects Curriculum Professional training	Public awareness campaign Demonstration of implementation	Public awareness and marketing	Outreach to industry Professional training
Focus of Capacity Development Efforts and Target Group	Project ID and preparation (for municipalities and public facilities)	Planning (for municipalities) Mainstreaming (for fed govt) Project prep (entities)	Capacity to support EE buildings in policy and implementation (Oblast govts) Training (professionals; trainers)	Education (households, buyers, sellers) Institutional mechanisms (federal govt)	Producers Commercial buyers City and regional procurement	Energy managers Policy-makers Commercial lenders
Replication: Strategy and Scope	Lessons learned shared with participating municipalities Forfaiting mechanism scaled up to additional municipalities	Federally through the Housing Fund; to other oblasts/okrugs through IA activity Disseminate best practice for "highly efficient buildings and in municipal energy planning	Lesson from demos in 3 oblasts shared at the territorial (okrug) and federal level Professional training	Policy at federal level, and *then* Trials at oblast level	Building of national capacity for local ownership Demonstration in Moscow and Nizhny Novgorod	Agreements with key sectors and firms

Annex 5: Terms of Reference for Key Project Personnel

Project Manager

I. Position information

Position	Project Manager (PM)
Project title	Building Energy Efficiency in the North West of Russia
Duration	5 years

Under the direct supervision of the National Project Director and UNDP CO Head of Environment & Energy Unit, the Project Manager is responsible for the day-to-day management and implementation of the UNDP-GEF project, including all programme and administrative matters. All work of the Programme Manager will be carried out in line with the Country Programme Action Plan and in full compliance with the UNDP Rules and Regulations. The management and coordination process will be pursued through undertaking appropriate actions in programme formulation, implementation and evaluation. Strong emphasis will be made on ensuring cohesion with other UNDP programmes.

II. Functions

(i) Manage the Project implementation during the Project implementation in accordance with approved Project Document;
(ii) Be responsible for management of all Project activity, staff, consultants, etc., for timely implementation of requirements on M&E ;
(iii) Manage the activity of Project Management Unit (PMU) consisting of a Project Assistant and three Regional Team Leaders (off-site) and oversee the work of national and international consultants on all project components.
(iv) Be accountable to the National Project Director and UNDP
(v) Analyze outputs and accounts of successful projects and experience from previous Projects;
(vi) Raise public awareness of Project activities ;
(vii) Coordinate Project activity with relevant activities and initiatives of the Government ;
(viii) Provide technical and organizational support to key partners at project inception;

III. Outputs

Expected outputs:

- Successful and timely Project implementation in accordance with objectives, schedule and planned budget.
- Successful achievement of general objectives of the Project, in particular:
    - Preparation of annual Project reports, PIRs, work plans and other relevant Project documents ;
    - Other project documentation resulting from Project activities.

IV. Required qualifications/Competences

Education: Higher education in economics, finance, business administration and management, engineering, energy or relevant field. An advanced degree in a relevant field (Master degree, PhD, etc) is an advantage

Experience: Work experience in project management of not less then 3-5 years; - international project management experience is an advantage

Languages: Excellent knowledge of Russian and English

Other skills:

- Strong interpersonal and communication skills
- Able to take decisions
- Strong computer skills (Microsoft Office, Internet, e-mail)

Regional Team Leader

I. Position information

Position	Regional Team Leader (RTL)
Project title	Building Energy Efficiency in the North West of Russia
Duration	5 years

Under the direct supervision of the Project Manager, the Regional Team Leader is responsible for the day-to-day management and implementation of the UNDP-GEF project activities in his/her respective oblast, including all programme and administrative matters.

II. Functions

(ix) Be able to manage of the Project activities at the oblast level during the Project implementation in accordance with approved Project Document;
(x) Be responsible for overseeing Project activities, consultants, and contractors operating in the pilot oblast;
(xi) Manage local consultants in the oblast on a day-to-day basis.
(xii) Be accountable to the project manager and ensure that information flows from the oblast level to the project manager.
(xiii) Provide inputs for all monitoring and evaluation documents on a timely basis to the Project Manager.
(xiv) Liaise with oblast-level and municipal officials in the oblast on a regular basis to ensure smooth communication and project implementation.
(xv) Provide technical and organizational support to oblast and local partners at project inception;

III. Outputs

Expected outputs:

- Successful and timely Project implementation in the corresponding oblast in accordance with objectives, schedule and planned budget.
    - Timely project documentation and technical reports and other deliverables to be submitted to the Project Manager.

IV. Required qualifications/Competences

Education: Higher education in economics, finance, business administration and management, engineering, energy or relevant field. An advanced degree in a relevant field (Master degree, PhD, etc) is an advantage

Experience: Work experience in project management of not less then 3-5 years; - international project management experience is an advantage

Languages: Fluent knowledge of Russian; proficiency in English.

Other skills:

- Strong interpersonal and communication skills
- Able to take decisions
- Strong computer skills (Microsoft Office, Internet, e-mail)

Project Assistant

The Project Assistant will work under the direct supervision of the National Project Manager and provide assistance to project implementation in the mobilization of inputs, the organization of training activities and financial management and reporting.

Job content

The Project Assistant will be responsible of the following duties:

(i) Prepare all payment requests, financial record-keeping and preparation of financial reports required in line with NEX financial rules and procedures
(ii) Assistance to the recruitment and procurement processes, checking the conformity with UNDP and the Government rules and procedures
(iii) Assistance to the organization of in-country training activities, ensuring logistical arrangements
(iv) Preparation of internal and external travel arrangements for project personnel
(v) Maintenance of equipment ledgers and other data base for the project
(vi) Routine translation/interpretation during projects meetings and drafting of correspondence as required
(vii) Maintain project filing
(viii) Other duties which may be required

Qualifications

Education:	University Degree, some training in business and/or administration desirable (finance or accounting)
Experience:	At least five years administrative experience
Skills:	Good organizational skills
	Good computer skills, including spread-sheets and database
Languages:	Fluent in Russian and English

Annex 6: Overview of Relevant Legislation

The system of normative documents of buildings with efficient use of energy
International Documents
The basic directions and principles of interaction of CIS member states in the field of maintenance of energy efficiency and energy security (March 11th, 2005)
Federal Documents
№ 261-FZ “About Energy Savings and Increasing Energy Efficiency and about the Entry into Force of Changes to Distinct Legislative Acts of the Russian Federation” (signed November 2009)
Presidential Decree of 04.06.2008 № 889 "About some measures to improve energy and environmental efficiency of the Russian economy"
№ 184-FL "About technical regulation" of 27.12.2002
№ 28-FL "About Energy Saving"
СНиП 23-02 "Thermal protection of buildings"
СНиП 31-01-2003 "residential apartment buildings"
СНиП 32-02-2003 "Subways"
СНиП 23-01-99 * "Building Climatology"
СП 23-101 "Designing the thermal protection of buildings"
ГОСТ 30494 "microclimate parameters in residential and public buildings"
ГОСТ 31166-2003 Structures protecting buildings and facilities. The method of the calorimeter for determining heat transfer coefficient
ГОСТ 31167-2003 Buildings and Structures. Methods for determining the air permeability of the frame structures in the natural environment
ГОСТ 31168-2003 "Residential buildings. The method of determining the specific consumption of thermal energy for heating"
ГОСТ 26254-84 Buildings and Structures. Methods for determining the heat resistance of frame structures
Sub-Federal (Territorial) Documents
ТСН 23-356-2004 Leningrad region. Energy efficiency of residential and public buildings. Standards for energy and heat
ТСН 12-323-2003 Arkhangelsk Region. Acceptance and commissioning of completed construction projects. Main provisions
ТСН 23-333-2002 Nenets Autonomous Okrug. Power and heat shield of residential and public buildings

TCH 23-348-2003 Pskov region. Energy efficiency of residential and public buildings. Standards for energy and heat
TCH 23-350-2004 Vologda region. Energy efficiency of residential and public buildings. Standards for energy and heat
TCH 10-301-2003 SPb. The order of development, coordination, approval and introduction of the local building codes St. Petersburg
TCH 23-359-2006 St. Petersburg (23-01-2006 PBCH). Insolation and solar shield of residential and public buildings in St. Petersburg
TCH 10-301-2005 The system of regional standards for urban design of St. Petersburg. Main provisions
Procedure for issuing permits for construction and restoration works in St. Petersburg. 2004
TCH 12-316-2002 SPb. Acceptance and commissioning of the constructed objects of real estate
TCH 13-301-2004 SPb. Composition and procedure development, coordination and approval of project documents for the repair and technical upgrading of the first large-scale series houses
TCH 13-302-2004 SPb. Repair and technical upgrading of the first large-scale series houses
TCH 23-340-2002 SPb. Energy efficiency of residential and public buildings. Standards for energy and heat
TCH 30-305-2002 SPb. Urban Development. Reconstruction and development noncentral areas of St. Petersburg (instead of WPC 1-89)
TCH 31-324-2002 SPb. Pre-school educational institutions of St. Petersburg
TCH 31-325-2002 SPb. Educational institutions (including boarding schools for disabled children)
TCH 31-330-2005 SPb. Medical institutions in St. Petersburg
TCH 31-332-2006 SPb. Residential and public high-rise buildings (instead of TCH 21-304-2003 in section 7)
TCH 50-302-2004 SPb. Design of foundations of buildings and structures in Saint Petersburg

Annex 7: Technical Annex: Estimate of CO_2 Emission Reductions

Summary

This Annex calculates the CO_2 emission reduction associated with implementation of the present GEF project. The Annex includes the calculation, methodology, description of the direct emission reductions of the project as well as emission reductions achievable through the 3 pilot regions in the North West of Russia.

1. Project direct emission reductions

The full potential associated with all these options was taken into account detailing further the direct emission reductions according to the GEF Manual method. Direct emission reductions of the project are estimated based on the following formula (the GEF Manual):

CO_2 direct = E * L * C, where

E – Annual energy savings, i.e. the difference between baseline energy consumption for heating per square meter in a typical residential building and the targeted level multiplied by the area of pilot building in Archangelsk and Vologda regions.

C – CO2 emission factor, i.e. 0.202 tCO_2/MWh (calculated based on IPCC default CO_2 emission factor for natural gas using for heat for Archangelsk and Vologda regions respectively in the pilot areas)

L – An average useful lifetime of building (the lifetime of the building is longer than that of the project. This is the period of 20 years recommended by the GEF manual for use)

The project expects to save 11,755 MWh/yr and reduce 2,380 tCO_2 a year directly, or nearly 235,013 MWh/yr and 47,535 tCO_2 over a twenty-year period following the implementation of six multifamily residential buildings (see Table C2-1 below) in the Archangelsk region. Table C2-2 shows CO_2 emission reductions from improving the thermal performance of new single-family residential buildings and their lighting systems in the Vologda region. These reductions are estimated at 28 tCO_2 a year and 515 tCO_2 over 20 years. As a result of these project activities, **direct emission reductions totaling 48,050 tons of CO_2eq** will be achieved over 20 years of the building useful lifetime

2. Direct post-project emission reductions

The project does not include GEF activities that would result in direct post-project greenhouse gas emission reductions.

3. Indirect emission reductions (bottom-up)

As recommended by the GEF Manual, the bottom –up approach was used to calculate the GHG emission reductions. The GEF bottom –up approach implies the replication of the project

methodology and investments to other buildings in the North West of Russia based on following formula:

CO_2 indirect BU = CO_2 direct * RF, where
CO_2 direct – direct emission reductions calculated at the previous step
RF – replication factor

The direct emission reductions were estimated in previous section at **48,050** tCO_2eq: the replication factor, however, requires careful consideration. It was calculated based on the assumption that a quarter of residential and public buildings planned for construction and capital reconstruction in the regions of demonstration sites can directly replicate the project methodology and corresponding emission reductions during the four years immediately following the completion of the project demonstration sites. This gives the replication factor 60 for existing block multy-family residential buildings (50,000m^2 or 5 similar average heat floor units) and 600 for new constructed single-family residential buildings (50 similar heat floor units of the average square at 268 m^2) for 3 regions covered by project in the North West of Russia (Archangelsk, Vologda, Pskov). Table D1 presents the results of the bottom-up indirect emission reductions of the GEF project. According to Table D1, the indirect lifetime project CO_2 emission reductions from improving the thermal performance of buildings and lighting systems in the two pilot regions (Archangelsk and Vologda) are estimated at 520,000 tCO_2 for multy-family residential buildings and 79,000 tCO_2 for single-family residential buildings over 20 years, respectively. Using the GEF *bottom-up* methodology, indirect emission reductions attributable to the project are estimated at **599,000 tCO_2e calculated over the 20-year lifetime of the investments.** This estimate is a conservative one, as more efficient buildings will apply to all regions.

4. Indirect emission reductions (top-down)

Using the GEF *top-down methodology*, indirect emission reductions attributable to the project have been estimated at around **396,600 – 456,000 tCO_2e** over 20 years of useful lifetime of the buildings.

The GEF top-down assesses indirect GHG impacts by estimating the combined market potential for the proposed approach or technology within the 20 years building lifetime and is calculated per following formula:

*CO_2 indirect TD = P20 * CF, where*

- P20 = technical and economic potential for GHG savings with the respective application within 20 years of GEF project influence period;
- CF = GEF causality factor.

The market potential for energy savings and GHG emission reductions has been estimated based on the forecast of the 3 oblasts in the Russian North West building stock dynamics and the following key assumptions. With the GEF support the current building codes and regulations will be enhanced resulting in a **45% reduction in the average energy requirements** for heating from the current level of 160 kWh/m^2/year to 88 kWh/m^2/year by 2015. The more

stringent code requirements are expected to initially bring code compliance up to the following levels by 2012: 25-40% full compliance, 40% minor non-compliance, 20-35% major non-compliance. However, the project-supported capacity building and technical assistance directed at improving enforcement will contribute to subsequent improvements in compliance by 2015 that result in the following levels: 80% full compliance, 10% minor non-compliance, and 10% major non-compliance.

Application of an integrated building design approach in new buildings has been estimated to enable an average of 45% reduction in energy requirement for heating from the current 160 kWh/m^2/year to 88 kWh/m^2/year. Moderate penetration rates have been assumed for IBDA adoption by the different segments:

- *Residential* sector – 188,000 m^2 (0.91% of the total floor stock) in Archangelsk region, 367,000 m^2 (1.61%) in Vologda region and 202,000 m^2 (1.58%) in the Pskov region for new construction annually;
- *Non-residential* sector – 77,000 m^2 (0.80% of the total floor stock) in Archangelsk region, 22,000 m^2 (0.36%) in Vologda region and 22,000 m^2 (1.76%) in Pskov region for new construction annually.

The annual energy consumption and GHG emissions in the building stock to be built in 2010-2030, with the business-as-usual compared with the GEF project scenarios, is presented in Figure H1 below. The combined impacts of the project-supported interventions and ensuing replication during the 20-year GEF project influence period (2010-2030) are estimated to result in cumulative GHG emission reductions and energy savings in the Russian building sector between **661,000 tCO_2eq** (assuming 25% compliance with the strictest new codes in all three regions) and **760,000 tCO_2eq** (assuming 40% compliance with the strictest new codes in all three regions) calculated over a 20-year lifetime for the buildings constructed over the influence period in the BAU and GEF scenarios.

Thus, the resulting GEF alternative GHG emissions scenario shows a considerable reduction as compared to the baseline (see Figure H2) and is estimated at around **396,600 – 456,000 tCO_2e** of cumulative emission reductions (over 20 years of buildings lifetime), assuming CO_2e emission factor and GEF causality factor of 60%:

661,000 tCO_2eq * 0.6 = **396, 600 tons CO_2e** (25% compliance)

760,000 tCO_2eq * 0.6 = **456, 000 tons CO_2e** (40% compliance)

For the GEF causality factor 3 (60% - the GEF contribution is substantial, but modest indirect emission reductions can be attributed to the baseline), the estimate incorporates exogenous improvements due to other possible stakeholder activities and some degree of improvements in energy efficiency in buildings which has already been taken into account when constructing the baseline for Russian North West building stock and business-as-usual policy developments (e.g., an average annual 1% improvement in code requirements, etc.).

Total emission reductions

Direct Emission Reductions: the project investment in one demonstration building (residential building) during the project's implementation phase will result in direct greenhouse gas emission reductions. As a result of these activities during the project implementation period of four years,

direct greenhouse gas emission reductions totaling **48,050 tCO_2e** will be achieved over 20 years of useful lifetime of the building. In the non-GEF case, these energy needs would be satisfied by heating energy generation capacity with an emission factor for gas fuel of 0.202 tCO_2/MWh. The project does not foresee any activities that would result in direct post-project GHG emissions.

Indirect Emissions Reductions: Using the GEF bottom-up methodology, indirect emission reductions attributable to the project have been estimated at **599,000 tCO_2e** over 20 years of useful lifetime of the buildings. Using the GEF top-down methodology, indirect emission reductions from new buildings constructions over the GEF influence period (2016-2025) attributable to the project are estimated at **396,600 – 456,000 tCO_2e** calculated over 20 years of useful lifetime of the buildings.

The difference between top-down and bottom-up approaches can be explained by the fact that the bottom-up estimate includes only residential buildings, whereas the top-down estimates look at the entire new building stock (to be built over 2010-2030) and inherently reflect impacts from better code compliance, material certification, etc. As a result, *before* the GEF influence factor is incorporated, they are larger (661,000 – 760,000 tCO_2e) than the bottom-up estimate (599,000 tCO_2e).

Indirect Emissions Reductions include energy savings from the improved code, improved enforcement, from EE programs sponsored by the (strengthened) energy efficiency organizations in the 3 regions, and from measures undertaken as a result of the audits program.

Technical Notes:

Notes on Direct Emission Reductions

Table C2-1 Direct project CO2 emissions and energy savings for capital renovation buildings in Archangelsk region

N	Types of the existing residential buildings (for EE renovation) in Archangelsk region	Heated floor area of showcases	Final energy consumption for space heating				CO2 emissions		Lifetime energy CO2 emission	
			Baseline	Alternative scenario	Difference	Annual energy saving	CO2 emission factor (for power-average during 2010 - 2030)	Annual direct emission reductions	Lifetime of the building	Total lifetime energy savings
	Units	m2	kWh/m2-yr.	kWh/m2-yr.	kWh/m2-yr.	MWh/yr.	gCO2/kWh	tCO2/yr.	years	MWh
	Formula	A	B	C	D = B - C	E = A x D	F	G = E x F	H	I = E x
A1	a. Brick -9 store building, serial numbers: 1-528 KP, 1-	5 256	324	59	265	1 393	202	281	20	2785
						2	725	1	12	21

	528 KP-41, 1-528 KP-80 in Archangelsk, number of the tenants - 220									
A2	b. Panel - 12 store building, serial number 137 in Archangelsk, number of tenants - 280	7 557	259	48	211	1 595	202	322	20	3189
						2	725	2	12	28
A3	c. Panel - 17 store building, serial number P-44 in Archangelsk, number of tenants - 2160	43 602	253	85	168	7 325	202	1479	20	14650
						3	725	2	12	37
A4	d. Panel - 10 store building, serial number 1LG 504, 1LG 504D in Archangelsk, number of the tenants - 190	2 392	354	74	280	670	202	135	20	1339
						2	725	1	12	24
A5	e. Brick -5 store building, individual project in Archangelsk, number of the tenants - 95	1 814	218	102	116	210	202	42	20	4208
						1	725	1	12	12
*A6	f. Brick -5 store building, serial number I-511 in Archangelsk, number of the tenants - 190	3 300	214	47	167	551	202	111	20	1102
						1	725	1	12	14
A1-A6	**Total (heating)**	**63 921**				**11 744**		**2 372**		**234 8**

A1-A6	**Total (lighting)**					**11**		**8**		**137**

Figure C2-1 above attests that taking into account the international energy prices, almost all energy efficiency options are cost effective for demo sites over the project lifetime (payback period is 2-3 years). As a result, some renovated buildings are passing from categories E, D to next categories of energy efficiency “high B and very high A”. That all are compliant to current codes of efficiency

Table C2-2 Direct project CO2 emissions and energy savings for new buildings in Vologda region

N	Types of the new residential buildings will be planned to built during project (2010 - 2014) in Vologda region	Heated floor area of showcases	Final energy consumption for space heating				CO2 emissions		Lifetime energy savings and CO2 emission reductions		
			Baseline	Alternative scenario	Difference	Annual energy saving	CO2 emission factor (for power-average during 2010 - 2030)	Annual direct emission reductions	Lifetime of the building	Total lifetime energy savings	Total lifetime emission reductions
	Units	m2	kWh/m2-yr.	kWh/m2-yr.	kWh/m2-yr.	MWh/yr.	gCO2/kWh	tCO2/yr.	years	MWh	tCO2
	Formula	A	B	C	D = B - C	E = A x D	F	G = E x F	H	I = E x H	J = G x H
B1	a. Wood -1 store building (cottage), individual project in Vologda, number of the tenants - 4 (for 1 family)	96	207	52	155	15	202	3	20	298	60
						0	725	0	12	5	4
B2	b. Wood -2 store building (cottage), individual project in Vologda, number of the tenants - 4 (for 1	150	217	67	150	23	202	5	20	450	91
						1	725	1	12	10	7

	family)										
B3	c. Brick -2 store building (cottage), individual project in Vologda, number of the tenants - 6 (for 1 family)	196	166	36	130	25	202	5	20	510	103
						1	725	1	12	18	13
B4	d. Brick -3 store building (cottage), individual project in Vologda, number of the tenants - 8 (for 2 families)	300	109	49	60	18	202	4	20	360	73
						2	725	2	12	26	19
B5	e. Brick -3 store building (3 block town house), individual project in Vologda, number of the tenants - 12 (for 3 families)	600	54	8	46	28	202	6	20	552	111
						4	725	3	12	48	35
B1-B5	**Total (heating)**	**1 342**				**108**		**22**		**2 169**	**438**

B1-B5	**Total (lighting)**					**9**		**6**		**107**	**77**

Residential buildings in the pilot regions of the North West of Russia		Heated floor area of show-cases	Final energy consumption for space heating			Annual direct energy savings and CO2 emission reductions		Lifetime energy savings and CO2 emission reductions		Replication factor				BU lifetim savings a emission replicated	
			Baseline	Alternative scenario	Difference	Energy saving	Emission reductions	Energy savings	Emission reductions	Years: 2011-2015	Units/region/yr. (ap. a quarter of planned activities)	Regions covered	Final factor	Total lifetime energy savings	
Units		m2	kWh/m2-yr.	kWh/m2-yr.	kWh/m2-yr.	MWh/yr.	tCO2/yr.	MWh	tCO2					GWh	
Average retrofitted (EE renovation) residential buildings	Space heating	10 654	270	69	201	2143	433	42 863	8 657	4	5	3	60	2 572	
	Lighting					2	1	23	17	4	5	3	60	1	
Average new (EE new practices) residential buildings	Space heating	268	151	42	108	29	6	581	117	4	50	3	600	348	
	Lighting					2	1	28	15	4	50	3	600	17	

Table D1 Indirect project CO2 emissions and energy savings (replicated according to Bottom – Up Approach)

Definition of the baseline and alternative scenarios for the Top-Down Estimates

The project will produce some influence on the local market development for a few years, i.e. non-baseline investments that happen within this period after the project can be counted toward indirect impact. It was decided that the project influence period is 20 years.

Building Codes That Apply Specifically to Residential Buildings in the Russian Federation[9]

Code	Title of Building Code	Latest revision
SNiP 02.01.94	Residential (private) and public buildings	1994
SNiP 23.02.99	Single family Residential buildings	1999
SNiP 31.01.03	Multifamily Residential Buildings	2003
SNiP 23.02.03	Thermal Performance of buildings	2003
SNiP 23.10.04	Design of Thermal Performance of high – rise buildings	2004

GEF Project Scenarios

As opposed to the business-as-usual baseline, eight alternative scenarios, which take place in case of the GEF project implementation, were developed. The anchor assumptions of the GEF scenarios are:

1. The speed and the significance of national energy-efficiency building codes improvement. Whereas the demonstration projects illustrate that an average thermal efficiency improvement of existing and new buildings could be as high as 50%, this is possible only in case if the efficiency technologies and the necessary expertise are available throughout the whole North West Region. Based on this consideration, two groups of scenarios are assumed - **GEF25%** and **GEF40%** which will consider 25% and 40% efficiency improvement of the code in 2010 as compared to the 1999/2003 codes, respectively. In the next 20 years after 2010. this code will be updated with the business-as-usual speed and magnitude; i.e., 10% every 5 years.
2. High compliance rate in the **GEF25%/40% Optimistic Scenarios**. Another principal difference of the GEF project from the business-as-usual case is that it suggests a set of measures aimed to result in a high rate of compliance to the building codes if the project is successfully implemented. A review of worldwide experience attests that compliance rates could theoretically be as high as 80% (e.g., selected cities in China). Based on this experience, the GEF Optimistic Scenario relies on the 80% compliance rate. In case of non-compliance, energy consumption of new buildings is the same as in the business-as-usual case; i.e., it improves by 1%/yr.
3. Low compliance rate in the **GEF25%/40% Pessimistic Scenario**. The GEF Pessimistic Scenario describes a case where the building codes would be developed in the frame of the present project in 2010 and beyond as discussed above, but the enforcement and monitoring programs would not bring about the anticipated effect. In this Scenario, the compliance rate for the building codes is assumed to be the same as in the business-as-usual baseline.

[9] In addition, there are few regional norms that apply to all construction that apply to these buildings: 1) TCH 12-323-2003 Arkhangelsk Region. Acceptance and commissioning of completed construction projects. Main provisions; 2) TCH 23-348-2003 Pskov region. Energy efficiency of residential and public buildings. Standards for energy and heat 3) TCH 23-350-2004 Vologda region. Energy efficiency of residential and public buildings. Standards for energy and heat

4. The application of energy-efficiency requirements to existing buildings undergoing reconstruction in the **GEF25%/40% Ambitious Optimistic/Pessimistic Scenarios**. During the project preparation phase, it was concluded that the largest absolute potential is in the stock of existing buildings rather than in those which are being constructed (due to long building lifetime). Since the building lifetime (the time before reconstruction when energy-efficiency requirements will be valid for a building) is 50-100 years, the largest effect may be achieved if the energy-efficiency requirement will be included into the capital renovation process (капитальный ремонт). According to construction guidelines, a building should undergo capital renovation every 10 years, including energy saving measures to bring existing buildings in categories D and E up to the level of A and B-rated buildings. The ambition is to include energy-efficiency requirements into the capital renovation illustrated in the GEF 25%/40% both Optimistic and Pessimistic Scenarios.

Additionally, the **GEF-Demo Scenario** was developed to illustrate the case if the demonstration phase of the project will be successfully implemented but the building code developed by the GEF project will not be approved. In this case, anyway some efficiency improvement will take place – some buildings similar to the demo-sites buildings especially commissioned by the same constructors as those which implemented the demo-sites will be replicated. Assuming that approximately a quarter of residential and public buildings planned for construction and capital reconstruction during 2010 – 2030 in the regions of demonstration sites will directly replicate the project methodology, gives approximately 2% of the total new floor area of such highly efficient buildings.

Energy consumption and CO_2 emissions of scenarios defined and gap analysis

Figure E4-1 and Table E4-2 present the impact of the GEF Scenarios modeled as compared to the business-as-usual baseline (for the detailed methodology and assumptions behind the calculation of emission reductions see Annex F). The results illustrate that the impact of the GEF projects depends on the level of its ambitions. Thus, in case of high compliance of new and reconstructed buildings to the building codes, space heating requirement of -25% and -40% as compared to the current building code will reduce CO_2 emissions of the whole sector of residential and public buildings in 2030 by 3% and 4% respectively. The best result can be expected from the extension of the building codes to the buildings undergoing capital renovation. Since the stock of existing buildings is large, even in case of low compliance (i.e. pessimistic scenario) and 25% efficiency improvement of the new building code as compared to the current level will result in 50% -61% of CO_2 emission reduction in 2030 assuming that a building is renovated every 10 years. In case of high compliance, 40% efficiency improvement in 2010 of the current building codes will reduce CO_2 emissions in 2030 by 67%.

Table E4-1 Summary of scenarios: space heating requirements (kWh/m^2/yr.) and building code compliance rates (share of the stock)

Business-as-usual scenario		2009	2015	2020	2025	2030
Existing						
Residential buildings	kWh/m2-yr.	220	220	220	220	220
Public buildings	kWh/m2-yr.	245	245	245	245	245
Building code (compliance case) for new and reconstructed buildings						
Residential buildings	kWh/m2-yr.	120	108	97	87	79
Public buildings	kWh/m2-yr.	155	140	126	113	102

Compliance to building code						
All	Stock share	20%	20%	20%	20%	20%
Non-compliance case - energy consumption taking into account an average world autonomous efficiency improvement of the buildings sector (for reconstructed buildings)						
Residential buildings	kWh/m2-yr.	119	113	107	102	97
Public buildings	kWh/m2-yr.	153	146	139	132	126
Non-compliance						
All	Stock share	80%	80%	80%	80%	80%
New Buildings						
Residential buildings	kWh/m2-yr.	119	112	105	99	93
Public buildings	kWh/m2-yr.	154	145	136	128	121

GEF Scenario: No building code approved based on the GEF project (i.e. building code will come as in BAU in 2015) but the demo projects will be built

Existing		**2009**	**2015**	**2020**	**2025**	**2030**
Residential buildings	kWh/m2-yr.	220	220	220	220	220
Public buildings	kWh/m2-yr.	245	245	245	245	245
Building code (compliance case)						
Residential buildings	kWh/m2-yr.	120	108	97	87	79
Public buildings	kWh/m2-yr.	155	140	126	113	102
Compliance						
All	Stock share	18%	18%	18%	18%	18%
Non-compliance case - energy consumption taking into account an average world autonomous efficiency improvement of the buildings sector						
Residential buildings	kWh/m2-yr.	119	113	107	102	97
Public buildings	kWh/m2-yr.	153	146	139	132	126
Non-compliance						
All	Stock share	80%	80%	80%	80%	80%
Replicated buildings						
Residential buildings	kWh/m2-yr.	119	65	65	65	65
Public buildings	kWh/m2-yr.	153	84	84	84	84
Replicated builings, share						
All	Stock share	2%	2%	2%	2%	2%

New Buildings

Residential buildings	kWh/m2-yr.	119	111	105	99	93
Public buildings	kWh/m2-yr.	154	144	135	128	120

GEF Scenario 25%: optimistic case (successful enforcement-high compliance)/

GEF Scenario: optimistic (successful enforcement-high compliance) and ambitious

(inclusion of the efficiency requirement to building renovation) case

Existing		**2009**	**2015**	**2020**	**2025**	**2030**
Residential buildings	kWh/m2-yr.	220	220	220	220	220
Public buildings	kWh/m2-yr.	245	245	245	245	245
Building code (will be valid for building renovation for the 2nd scenario)						
Residential buildings	kWh/m2-yr.	90	81	73	66	59
Public buildings	kWh/m2-yr.	116	105	94	85	76
Compliance						
All	Stock share	80%	80%	80%	80%	80%
New buildings (non-compliance case) - energy consumption taking into account an average world autonomous efficiency improvement of the buildings sector						
Residential buildings	kWh/m2-yr.	119	113	107	102	97
Public buildings	kWh/m2-yr.	153	146	139	132	126
Non-compliance						
All	Stock share	20%	20%	20%	20%	20%

New Buildings

Residential buildings	kWh/m2-yr.	96	87	80	73	67
Public buildings	kWh/m2-yr.	124	113	103	94	86

GEF Scenario 25%: Pessimistic case (unsuccessful enforcement - low compliance)

Existing		**2009**	**2015**	**2020**	**2025**	**2030**
Residential buildings	kWh/m2-yr.	220	220	220	220	220
Public buildings	kWh/m2-yr.	245	245	245	245	245
Building code						
Residential buildings	kWh/m2-yr.	90	81	73	66	59
Public buildings	kWh/m2-yr.	116	105	94	85	76
Compliance						
All	Stock share	20%	20%	20%	20%	20%

New buildings (non-compliance case) - energy consumption taking into account an average world autonomous efficiency improvement of the buildings sector						
Residential buildings	kWh/m2-yr.	119	113	107	102	97
Public buildings	kWh/m2-yr.	153	146	139	132	126
Non-compliance						
All	Stock share	80%	80%	80%	80%	80%
New Buildings						
Residential buildings	kWh/m2-yr.	113	107	101	95	90
Public buildings	kWh/m2-yr.	146	138	130	123	116

GEF Scenario 40%: optimistic case (successful enforcement-high compliance)/ GEF Scenario: optimistic (successful enforcement-high compliance) and ambitious (inclusion of the efficiency requirement to building renovation) case

Existing		**2009**	**2015**	**2020**	**2025**	**2030**
Residential buildings	kWh/m2-yr.	220	220	220	220	220
Public buildings	kWh/m2-yr.	245	245	245	245	245
Building code (will be valid for building renovation for the 2nd scenario)						
Residential buildings	kWh/m2-yr.	72	65	58	52	47
Public buildings	kWh/m2-yr.	93	84	75	68	61
Compliance						
All	Stock share	80%	80%	80%	80%	80%
New buildings (non-compliance case) - energy consumption taking into account an average world autonomous efficiency improvement of the buildings sector						
Residential buildings	kWh/m2-yr.	119	113	107	102	97
Public buildings	kWh/m2-yr.	153	146	139	132	126
Non-compliance						
All	Stock share	20%	20%	20%	20%	20%
New Buildings						
Residential buildings	kWh/m2-yr.	81	74	68	62	57
Public buildings	kWh/m2-yr.	105	96	88	81	74

GEF Scenario 40%: Pessimistic case (unsuccessful enforcement - low compliance)

Existing		**2009**	**2015**	**2020**	**2025**	**2030**
Residential buildings	kWh/m2-yr.	220	220	220	220	220

Public buildings	kWh/m2-yr.	245	245	245	245	245
Building code						
Residential buildings	kWh/m2-yr.	72	65	58	52	47
Public buildings	kWh/m2-yr.	93	84	75	68	61
Compliance						
All	Stock share	20%	20%	20%	20%	20%
New buildings (non-compliance case) - energy consumption taking into account an average world autonomous efficiency improvement of the buildings sector						
Residential buildings	kWh/m2-yr.	119	113	107	102	97
Public buildings	kWh/m2-yr.	153	146	139	132	126
Non-compliance						
All	Stock share	80%	80%	80%	80%	80%
New Buildings		**2009**	**2015**	**2020**	**2025**	**2030**
Residential buildings	kWh/m2-yr.	109	103	98	92	87
Public buildings	kWh/m2-yr.	141	133	126	119	113

Table E4-2 Summary of CO_2 mitigation potential associated with the GEF Scenarios, 2010-2030

	Unit	2010	2015	2020	2025	2030
BAU Baseline	1000 tCO2/yr.	9 125	9 005	8 888	8 779	8 673
GEF Demo	1000 tCO2/yr.	9 125	9 002	8 881	8 767	8 655
GEF 25%: High Compliance (Optimistic)	1000 tCO2/yr.	9 116	8 949	8 783	8 619	8 455
GEF 25% Including Capital Renovation: High Compliance (Optimistic)	1000 tCO2/yr.	8 637	6 094	3 979	3 686	3 413
GEF 25%: Low Compliance (Pessimistic)	1000 tCO2/yr.	9 123	8 989	8 860	8 737	8 617
GEF 25% Including Capital Renovation: Low Compliance (Pessimistic)	1000 tCO2/yr.	8 716	6 533	4 740	4 521	4 321
GEF 40%: High Compliance (Optimistic)	1000 tCO2/yr.	9 110	8 915	8 723	8 535	8 350

GEF 40% Including Capital Renovation: High Compliance (Optimistic)	1000 tCO2/yr.	8 572	5 714	3 379	3 128	2 902
GEF 40%: Low Compliance (Pessimistic)	1000 tCO2/yr.	9 121	8 981	8 845	8 716	8 590
GEF 40% Including Capital Renovation: Low Compliance (Pessimistic)	1000 tCO2/yr.	8 699	6 439	4 590	4 384	4 195
Emission reductions, absolute	Unit	**2010**	**2015**	**2020**	**2025**	**2030**
BAU-GEF Demo	1000 tCO2/yr.	0	3	7	12	18
BAU-GEF 25% opt	1000 tCO2/yr.	9	55	105	160	218
BAU-GEF 25% opt+cap ren	1000 tCO2/yr.	488	2 911	4 909	5 094	5 260
BAU-GEF25% pes	1000 tCO2/yr.	2	15	28	42	56
BAU-GEF25% pes+cap ren	1000 tCO2/yr.	410	2 471	4 149	4 258	4 352
BAU-GEF 40% opt	1000 tCO2/yr.	15	90	166	244	323
BAU-GEF 40% opt+cap ren	1000 tCO2/yr.	554	3 290	5 509	5 651	5 771
BAU-GEF40% pes	1000 tCO2/yr.	4	24	43	63	83
BAU-GEF40% pes+cap ren	1000 tCO2/yr.	426	2 566	4 298	4 395	4 478
Emission reductions, BL share		**2010**	**2015**	**2020**	**2025**	**2030**
BAU-GEF Demo	BAU %	0%	0%	0%	0%	0%
BAU-GEF 25% opt	BAU %	0%	1%	1%	2%	3%
BAU-GEF 25% opt+cap ren	BAU %	5%	32%	55%	58%	61%
BAU-GEF25% pes	BAU %	0%	0%	0%	0%	1%
BAU-GEF25%pes+cap ren	BAU %	4%	27%	47%	49%	50%
BAU-GEF 40% opt	BAU %	0%	1%	2%	3%	4%
BAU-GEF 40% opt+cap ren	BAU %	6%	37%	62%	64%	67%
BAU-GEF40% pes	BAU %	0%	0%	0%	1%	1%
BAU-GEF40%pes+cap ren	BAU %	5%	28%	48%	50%	52%

Definition note

Based on the national building practice, the above analysis distinguishes between the following two terms:

1. **Capital reconstruction** (капитальная реконструкция здания) – a set of the measures aimed to restore and to improve a building, often due to its physical deterioration, but also to enlarge it or to use for other purposes; these measures may change technical characteristic of a building.

2. **Capital renovation** (капитальный ремонт) – a set of the measures aimed to cure the physical deterioration; these measures typically do not change of the main technical characteristic of a building.
