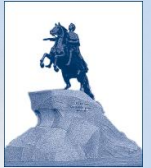
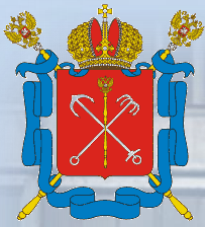


# Energy Efficiency in Housing in Saint-Petersburg: state and perspectives

Реконструкция  
панельных домов  
Reconstruction of  
large-panel housing  
Мастер-класс, Санкт-Петербург  
Masterclass, Saint-Petersburg  
07-2002



## The project

# «The energy efficient block - demonstration area of environmental and climate protection»

Proposals of industrial clusters in the area of rising energy efficiency and resource conservation.

Nominee of the All-Russian contest

«**ENERGIUM-2012**»,

Held on the initiative and with the support of  
Russian Ministry of Economic Development.

**143** Russian energy efficient best practices.

**9** energy efficient best practices in St. Petersburg.

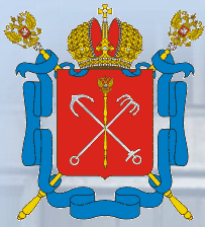


## **The initiator**

**Non-commercial partnership  
«Urban association of homeowners»**

**The partnership was established by the order of the St. Petersburg Governor №1321 by 14.12.1999**

**The founders of the Partnership:  
city and regional associations of homeowners,  
The Committee of City Property Management of St. Petersburg  
Government,  
St. Petersburg Fund of Industry Support.**

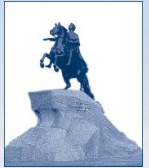
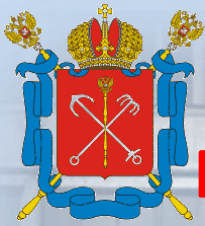


## High social or social-economic efficiency

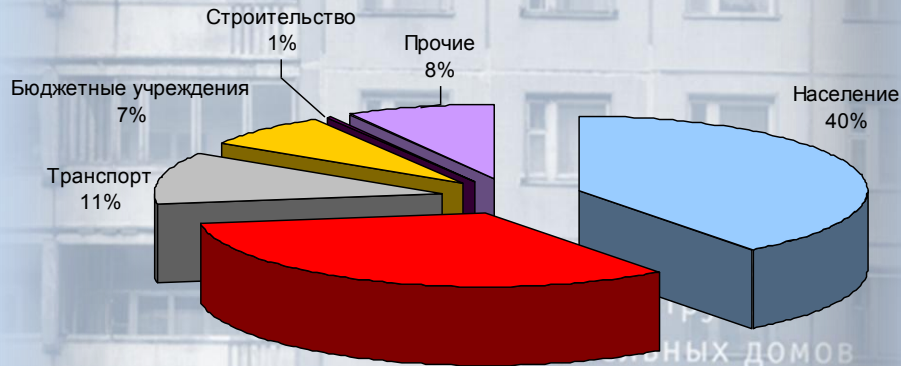
The efficiency of this innovative project is characterized by consequences of the its implementation for the social system, including costs and results in related fields: reduction state subsidies in housing, reduction costs of population for the actually consumed resources, increase level of living comfort in houses.

The project is unique in the fact that the initiator is the organization that accumulates at the city level the interests of all types of ownership in apartment buildings.

The result of its implementation will become standard, organizational, financial and technical solutions of energy efficiency increase of houses drawing on many years of experience in operating of apartment buildings



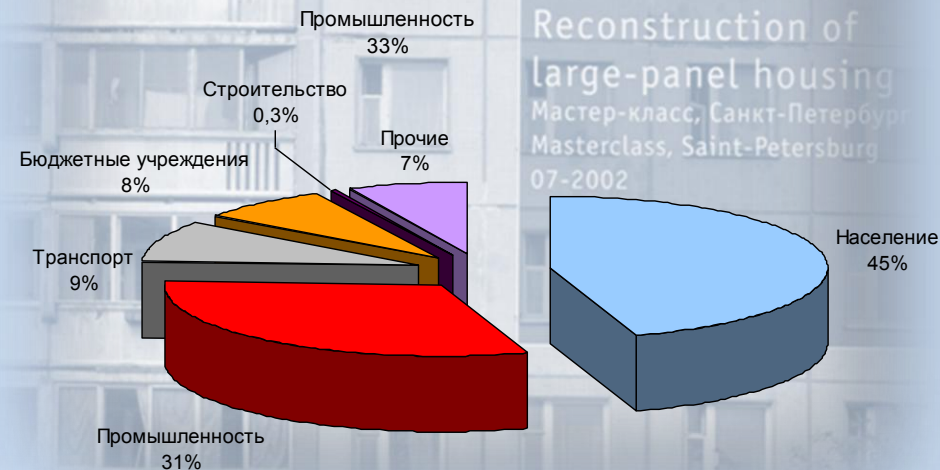
# Regional program of St. Petersburg in the field of energy conservation and energy efficiency increase



The fuel and energy balance of St. Petersburg  
(final consumption)  
The population **40%**

Total consumption of fuel and energy  
resources **15 842 thousands TOE**

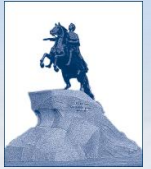
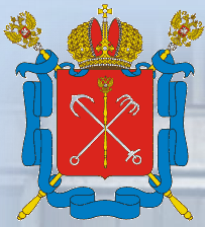
Final consumption of fuel and energy  
resources **12 579 thousands TOE**



The energy saving potential  
(final consumption)  
The population **45%**

Total energy saving potential  
**4 318 thousands TOE**

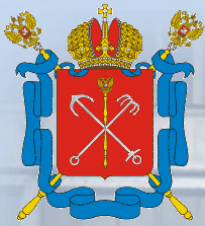
Total energy saving potential  
of final consumers **3 424 thousands TOE**



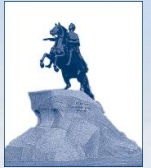
## Regional program of St. Petersburg in the field of energy conservation and energy efficiency increase:

The private sector is a major consumer of thermal energy in the city which accounts 65.3% of the total heat demand and one of the major consumers of electricity in the city. The share of the population accounts 23% of total electricity consumption.

The existing housing stock of St. Petersburg consists of **22000** apartments, **1737000** flats, which residential area is **101432,13** thousands  $M^2$



## Legal basis

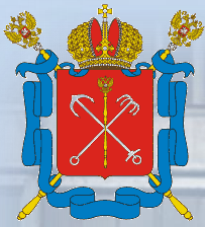


**Order of the Ministry of Regional Development of the Russian Federation of 27.06.2012 № 252 “On approval of the approximate conditions of an energy contract aimed at preserving and (or) increase the efficiency of the consumption of utilities by using the common property in an apartment building”**

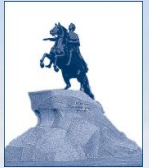
**The condition about the sides of the energy service contract (one of the possible options):**

**the customer - the management company, homeowners, housing, housing-building society or other specialized consumer cooperative in the interests of the owners of the rooms in an apartment house in his own name**

**the performer - resource supplying organization or other organization providing energy services.**



# Legal and regulatory framework of St. Petersburg in the field of energy saving and energy efficiency



## Resolution of the Government of St. Petersburg № 405 of April 28, 2012 "On approval of the list of mandatory measures of energy conservation and energy efficiency of common property of owners of rooms in apartment building"

*The list includes measures which should be undertaken at the same time :*

- installation of shared heat meters,
- installation of devices that provide regulation of heat consumption, depending on the outside temperature,
- installation of shared hot water metering device,
- installation of shared cold water metering device,
- installation of shared electricity metering device,
- replacing incandescent lamps in common areas for energy-efficient lamps,
- insulation of door units at the entrance to the houses, door frames of transition balconies and provision of automatic door closing,

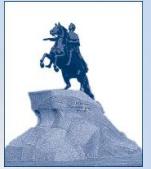
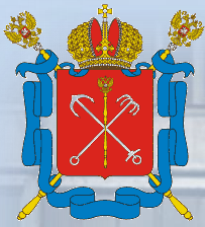
*and undertaken regularly:*

Recovery of pipe insulation of the heating system using energy efficient materials,

Recovery of isolation of heat exchangers and pipelines of hot water system using energy efficient materials,

Sealing and packing of door blocks on the entrance to the house, door blocks of transition balconies, cellars and attics, window units in the entrances.

Masterclass, Saint-Petersburg  
07-2002



# Innovations

Urban association of homeowners highlights the importance of institutional innovation

Innovation is considered as a process of introduction innovation aimed at improving the process and the results

Innovation is divided into technological and institutional

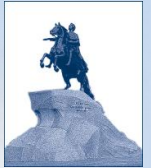
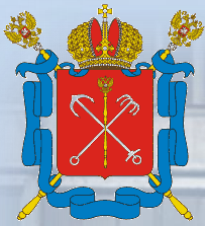
## **Institutional Innovations**

New forms of organization and management

New financing schemes

New forms of investment

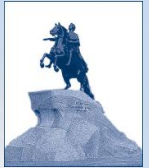
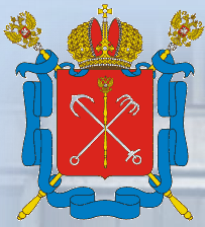
Реконструкция  
панельных домов  
Reconstruction of  
large-panel housing  
Masterclass, Saint-Petersburg



## Technological innovations

In 2010-2013, was formed a list of suggestions from the participants of the project "Energy-efficient district":

- **OOO «Danfoss»** (a full range of produced equipment and solutions of heating systems modernization),
- **ОАО «Izoterm Firm»** (Fast-responding energy-efficient copper-aluminum heaters with thermostatic controls),
- **ЗАО «Shneider electric»** (design and installation of energy-saving systems, including the development and delivery of comprehensive energy efficiency solutions for energy supply system of apartment buildings),
- **ЗАО «The management company of the Holding Company «Teplocom»** (strategic partnership in co-host of the pilot project Teplocom),
- **The consortium «Logica-teploenergomontaj»** (equipment for individual heat point (IHP) and nodes of metering of thermal energy (UUTE),
- **ЗАО «Mineral cotton»** (insulating material ROCKWOOL for insulation of enclosing constructions and pipelines),
- **ЗАО «Engineering Company «Ensonik»** (energy-efficient, resource-saving technology ENSONICtm)
- **ЗАО «RIELTA»** and the Center for Energy Saving Technologies **OOO «INNOCOR»** (integrated solutions for energy savings in the common areas of apartment buildings with using of lighting control systems),
- **ЗАО «Optogan»** **OOO «IRSET-Centre»** управляющая компания **ЗАО «Svetlana-Optoelectronics»** (integrated solutions for energy savings in the common areas of apartment buildings with LED lighting),
- **OOO «Bauer- Voterteknodzhi»** (electromagnetic device for water treatment Bauer PJ and filters).



## Tasks

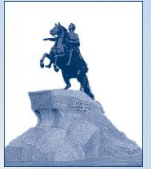
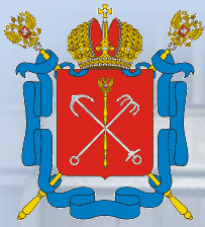
Priority using of competitive Russian and joint research and development, technology and services.

Activities for improving the energy efficiency of buildings:

- thermal protection;
- energy-saving mode;
- energy-saving equipment.

Modernization of district heating systems.





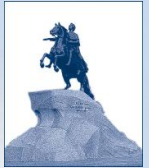
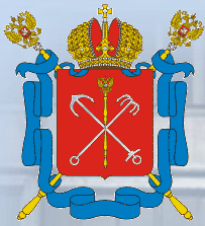
## Tasks

Priority using of competitive Russian and joint research and development, technology and services.

Modernization of lighting systems:

- street lighting system;
- intrahouse lighting system.





## Institutional innovations

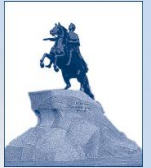
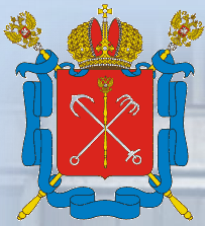
New forms of organizations and management of energy service agreements

### A standard form of energy service agreement

**2010-2011 years.** The analysis of offered at the market energy service agreements about financing of energy efficiency measures about financing energy-efficient arrangements in apartment buildings, a standard form of agreement for homeowners associations of all legal forms was developed. At the moment, energy service agreements are concluded with the homeowners association, with a homebuilding co-operative, with house-hold cooperative and homebuilding operating cooperative.

### Energy service company

**January 2013 year.** Creation of LLC «PPEK» of municipal homeowners association and Russian-Norway LLC «R-Energo» in order to introduce new forms of organization and implementation of the concept of financing projects to improve energy efficiency in apartment buildings in St. Petersburg, relying on the experience of Nordic countries.



## Institutional innovations

### New forms of financing of energy-saving measures

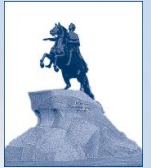
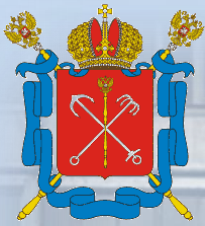
**2010**

A report of concernment with the Nordic Environmental Financial Corporation in loans for the project «Energy Efficient quarter» of up to 5 million Euros.

**2012**

**Investment agreement** with the Center of energy-saving technologies LLC "INNOKOR" to carry out measures of energy conservation and energy efficiency of general building lighting.

**Trust fund of energy efficiency** with the Consortium «Logic - heat installation» for implementation of pilot projects of commercial financing for energy efficiency of households and housing in St. Petersburg with the use of financial credit facilities and agreements of contracting in energy conservation in the existing housing stock up to a total area of 250 thousand sq. m and a total amount of up to 30 million rubles.



## Institutional innovations

### New forms of financing of energy-saving measures

**2013**

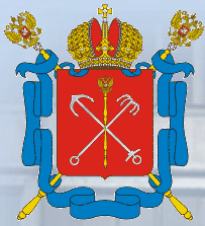
**Investment agreement** with Norwegian financial brokerage company «GREEN ENERGY ONE AS», intending to establish a presence in the area of energy efficiency in St. Petersburg, through participation in the financing of projects with the ultimate aim of reducing the consumption of heat, water and electricity in the residential sector

**10% -15% own investments**

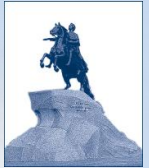
A municipal association of homeowners invests in the energy-saving measures, providing that the functions of the General Customer of Energy Service Contract are fulfilled.

Реконструкция  
панельных домов

Мастер-класс, Санкт-Петербург  
Masterclass, Saint-Petersburg  
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## Tasks



# Development and implementation of standard solutions for improving energy efficiency and resource conservation by the example of an energy service agreement

In order to attract external funding the municipal association of homeowners begin to implement a financial mechanism in 2013, that was offered by the Russian-Norway company «R-Energo» with Norwegian brokerage Investment company «Green Energy Invest».

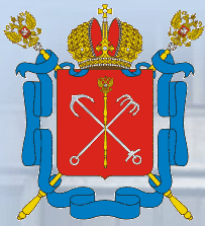
### Обзор денежных потоков

- ❑ Объем энергопотребления будет сокращен после вложения инвестиций, а размер энергосбережения будет задокументирован в тексте отчетов и отражен в счетах за энергию
- ❑ ТСЖ направляет поступающие платежи за энергию на два разных счета, один для оплаты услуг энергоснабжающей организации, другой – для выплат банку и ППЭК (Проектный Счет), последний из которых открывается исключительно для целей управления сбережениями и выплаты займа

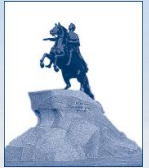


- ❑ ТСЖ будет погашать кредит банку, а остальные средства будут храниться на проектном счете
- ❑ После того, как кредит был возвращен, счета за электроэнергию будет снижена
- ❑ Первые владельцы и собственники квартир, получают преимущества экономии после того, как кредит будет выплачен
- ❑ Таким образом, домовладельцы получают более низкие счета в будущем без собственных инвестиций денежные средства

**Р-ЭНЕРГО**

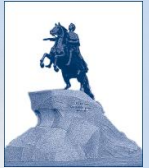
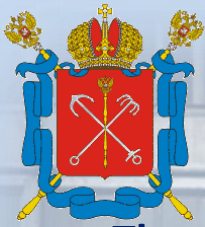


## Tasks



The implementation of standard solutions for improving energy efficiency level and resource conservation by the example of an energy service agreement.





## Energy service companies

The Center for Energy Efficient Technologies LLC «INNOKOR» works at the market of energy saving and energy audits since 2009 and has completed more than 300 lighting projects in the field of housing in St. Petersburg and the Leningrad region.

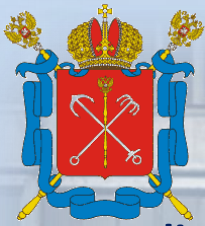
### 2012

**September.** Energy service agreement. Customer Homeowners Association «On shore», 3 residential buildings: St. Petersburg, Kolpino, Anisimova Street, 5. The total area of buildings is 17,171.5 sq. m. Installation of 86 lamps CA-18 with optical-acoustic switches.

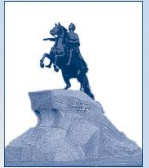
**December.** Energy service agreement. Customer Housing construction and operational cooperative «Grafit–ZHSEK»: St. Petersburg, Kolpino, Zavodskoy avenue, 56. The total area of building is 12389,2 sq. m. Installation of 166 lamps CA-18 with optical-acoustic switches.

### 2013

The plan is to install 5000 units of energy-saving equipment - intelligent lighting systems in apartment buildings.



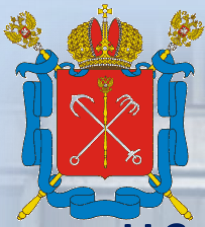
## Energy service companies



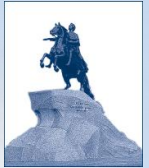
A list of works carried out by LLC «INNOKOR»:

- Analysis of information about energy consumption and payments during the last three years;
- Conducting energy monitoring, reporting for rapid energy audit including the act establishing the basic level of energy resources consumption and operating costs;
- Scheduling average consumption of electricity per month in volume and value terms ;
- approval of method of calculation of the documented savings;
- coordination plan for energy saving measures;
- conducting energy saving measures, installation of energy-efficient lighting equipment;
- facility commissioning;
- guarantee maintenance.

December 2012 – March 2013. Homeowners Association «On shore» gets **50%** energy savings per month.



# Energy service companies



LLC «The First Petersburg Energy Service Company» (LLC«PPEK») was established in January 2013 by the City homeowners association and LLC "R-Energo" in order to implement a Norwegian-Russian model of financing energy-saving measures for large-panel 137 series.

## 2011

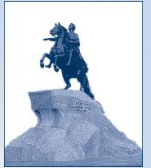
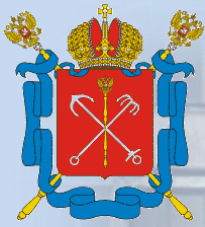
**May.** Energy service agreements, the customers were :

- homeowners association №1160: St. Petersburg, Industrialny avenue, 11, building 1. The total area of building is 10758 sq.m. Building volume 47759 cu. m.

- homeowners association №1161: St. Petersburg, Nastavnikov avenue, 41, building 1. Building volume 182685 cu. m.

**August.** Energy service agreement, the customer was the housing savings cooperative №4: St. Petersburg, Tverskaya street, 45. The total area of building 14646,7 sq.m. Building volume 39107 cu. m.

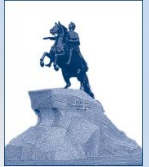
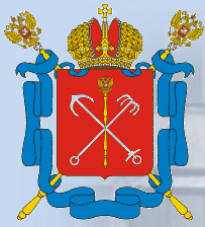
**September.** Conducting an open tender by requesting quotations of subcontractors to carry out the energy saving measures, including the supply of energy-efficient equipment and materials, installation and maintenance services.



## Energy service companies

**A list of works carried out by LLC «PPEK»:**

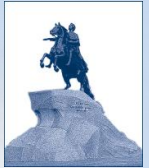
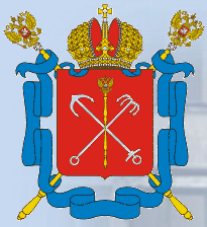
- The choice of standard buildings of standard construction (large panel 137 series is 17% of the housing stock of St. Petersburg);
- Energy survey implementation of the infrastructure of a residential area in Krasnogvardeiskiy district of St. Petersburg on the example of 3 apartment buildings;
- Preparation of preliminary reports on the possibility of implementing the Pilot project of energy efficiency level increase in residential houses in terms of energy service contract;
- Conclusion of energy service contracts with the General Customer Municipal homeowners association and customers from homeowners associations;
- Conducting an open tender by requesting quotations of subcontractors to carry out the energy saving measures, including the supply of energy-efficient equipment and materials, installation and maintenance services.



## Energy service companies

The list of standard energy-saving measures as a part of energy agreement with calculated 30% energy savings on the example of the homeowners association №1160 : St. Petersburg, Industrialny avenue, 11, building 2, The total area of building is 10544,6 sq. m. for a total of **5037588 Rubles**:

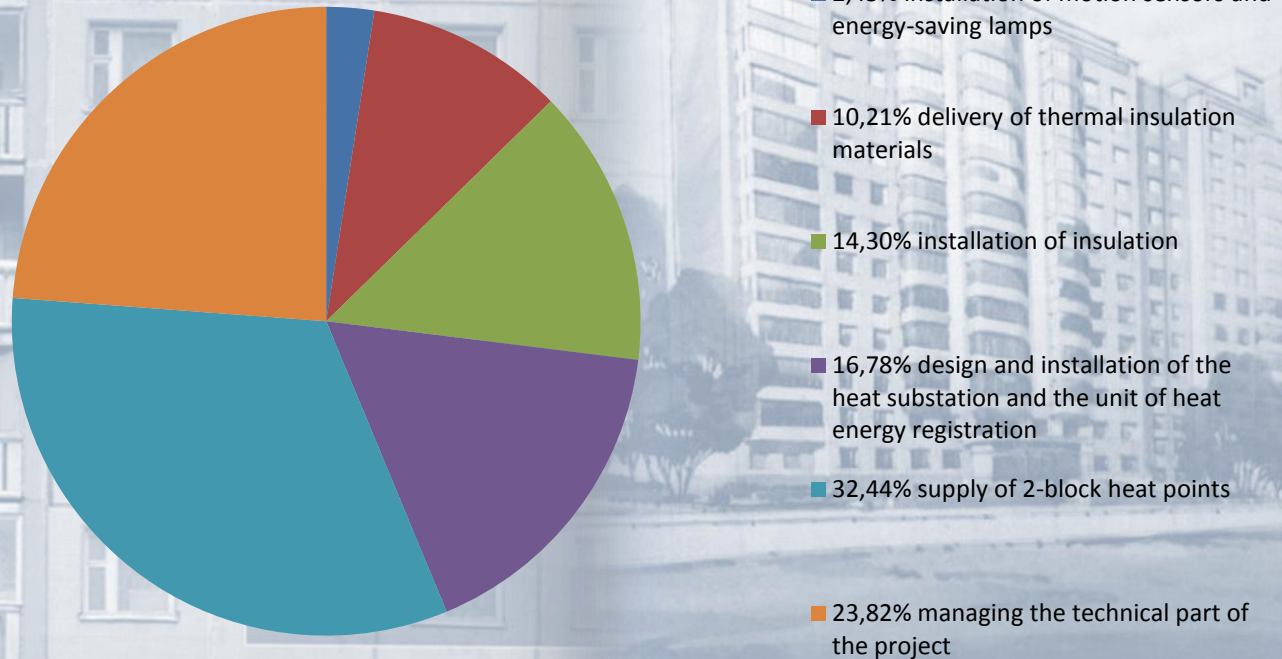
- installation of motion sensors and replacing incandescent light bulbs with energy saving bulbs;
- delivery of acoustic insulation materials manufactured by «ROCKWOOL» (Denmark) for thermal insulation of pipes; - installation of pipes heat insulation with soundproof materials manufactured by «ROCKWOOL» (Denmark);
- design and installation of the heat supply substation and the unit of heat energy registration, subcontractors;
- supply of 2-block heat points manufactured by «Danfoss» (Denmark) in the amount of 2 pcs. And 40 balancing valves AB-QM DN 25 ;
- installation of residential meters of hot and cold water;
- managing the technical part of the project.

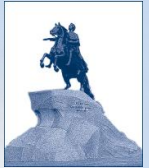
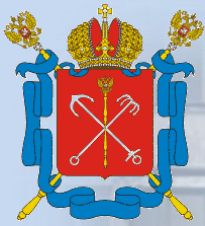


# Energy service companies

The structure of financial costs of saving measures by the type of work for a typical apartment house of 137th large-panel series.

## Energy saving measures





## **Recommendations for a participant of energy service contract**

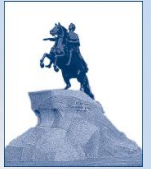
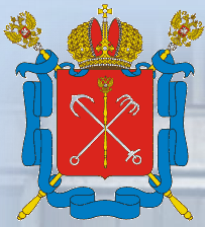
**Rapid analysis of homeowners association balances during 3 years with the calculation of financial stability indicators, standard measures of liquidity for the current and the absolute values and of the index of financial autonomy in order to assess the ability to pay for long-term period.**

**The analysis of monthly consumption data during 3 years in order to form a list of energy saving measures.**

**Evaluation of construction, repair and financial costs.**

**Checking credit financing opportunities taking into account savings of homeowners association/ housing construction cooperative / housing savings cooperative and individual financial capacity of owners.**

**Studying the conditions of state and municipal support for energy-saving measures for the apartment building.**



## **The future of energy-efficient development in Saint-Petersburg:**

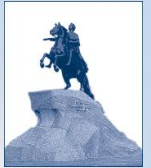
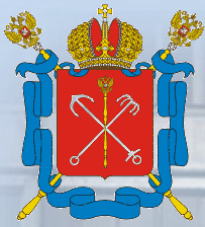
A typical large-panel building in St.Petersburg is about 53% of the housing stock.

Predictive value of reducing carbon dioxide emissions as a result of the complex energy-saving measures will reach **65 %**.

The number of apartments in the typical panel houses is 724,620 with a total living area of 89260.27 sq. m.

The annual economic effect of reducing the cost of energy-efficient heating after renovation will be about 4 billion Euro per year.

Presented economic impact is the theoretical potential of reducing costs of heating with simultaneous reconstruction of prefabricated buildings.



**Thank you for attention!**

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