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**PRESENTATION**

**2018-2023**

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| **Plan-programme for comprehensive recovery of the Region of Ukraine.** **Typical development of a comprehensive approach to solving energy efficiency problems in the Region of Ukraine** |

In connection with the destruction caused during military operations of buildings and engineering infrastructure in Ukraine, ongoing work is being carried out to finalize the Plan-program for the comprehensive restoration of the region, the territory of the territorial community and its parts according to the principle of "restoration is better than before"

2023

The program provides for comprehensive thermal modernization of buildings and engineering infrastructure facilities in the Regions of Ukraine:

- certification and thermal modernization of buildings using the Step-by-Step Retrofit to EnerPHIt technology (step-by-step) – 160 objects;

- certification and thermal modernization of objects in accordance with the methods of the Ukrainian standard DSTU 9190:2022, NBV.3.2-3:2014 (and other Ukrainian standards on energy efficiency) - 1,680 buildings and objects.

The estimated cost of the pilot project is 324 mln. Euro (depending on the proposed measures for certification studies of complex thermal modernization facilities).

Practically, in accordance with the Program Plan, 6 pilot works on certification of typical schools in 2 climatic zones of Ukraine - Dnipropetrovsk and Kirovohrad regions have already been carried out.

The Spanish Association of Industrial Enterprises "Sercobe" has prepared the delivery of industrial equipment to facilities that need thermal modernization.

During the implementation of the Plan, the issues of industrial development of the Region, employment of the population and social issues are resolved. Architectural solutions for the development of the Region rise to the European level.

One of the main tasks of the Plan is to raise the level of energy efficiency of the Region to the European level with the help of special low-cost technologies for thermal modernization of buildings and infrastructure facilities at the first stage.

The "Initiative" program plan was developed:

NGO "Energy Alliance"

PE "Standart-C" "Estandar-C"

Comprehensive plan-program "Initiative" Block "Energy efficiency", initiated and developed by NGO "Energy Alliance" (Dnipro). The goal of the "Initiative" program, based on the analysis of the current state and forecasts of the development of the region's economy, is to develop the main directions of the energy saving policy in the field of communal property, private home ownership and construction, which involves the creation of a regulatory and legal framework, the formation of a favorable economic environment, the creation of a coherent and effective management system energy saving of buildings and infrastructure facilities (energy management).

When implementing the "Initiative" program to solve energy efficiency problems, the Solidarity Principle agreement is applied for the first time in Ukraine. **Agreement on the principle of solidarity - mutual responsibility in the field of consistency and in the scope of implementation of thermomodernization measures at heat generation facilities, centralized heat transfer networks and energy-consuming facilities**. The Treaty of the Principle of Solidarity can be applied and be effective to the full extent, with the development of decentralization of relations in the state.

Implementation of the "Initiative" Program in terms of implementation of pilot projects on thermal modernization of buildings using NZEB technology practically solves the issue of implementation of European energy efficiency directives, which must be recognized by our country according to the Association Agreement between Ukraine and the EU.

In the part of the Program for the creation of mass ESCOs for conducting parallel thermal modernization of power generation facilities, heat networks and buildings, the energy of Joint Enterprises that use ADEs and thermal discharges will be used, which will give a rapid increase in energy efficiency indicators in the Regions (communities) of Ukraine with only partial use of conventional energy sources.

Full implementation of the Program Plan, according to its Blocks, will require the supply of energy-efficient equipment and construction materials. The Program provides for the creation of industrial enterprises in the Regions, which will immediately have real orders for the production of energy-efficient equipment for thermal modernization facilities under the Program.

**A new direction in the energy sector of Ukraine will be created based on the use of thermal discharges with the help of heat pumps and cogeneration. NGO "Energy Alliance" PE "Standart-C" "Estandar-C" developed in 2008-2009 the Concept "Creation of a new direction in energy in Ukraine based on the use of heat pumps when using thermal discharges of Nuclear plants." In accordance with the Kyoto Protocol, Ukraine received investments from Japan and Spain, which were used for the start of works on heat supply to the cities of Marganets, Nikopol and Zaporizhzhia from thermal plants at the Zaporizhia NPP.**

As a result of the implementation of the "Initiative" program, energy resources are saved, environmental problems are solved, jobs are created, and social issues are solved.

Proposals and calculations of the "Initiative" program also provide conceptual solutions to energy efficiency problems in the Region of Ukraine. NGO "Energy Alliance", implementing the Program, participates in the implementation of EU Energy Efficiency Directives. For this, the experience of the German Institute of Passive House RNI and "Alliance" in the field of practical work on solving energy efficiency problems in Ukraine and other countries is used. The Spanish Association of Industrial Enterprises "Sercobe" performs practical work on the implementation of the Program's tasks, organizes project financing and interacts with the Spanish government.

The results of the Program implementation contribute to the development of the legislative and regulatory framework for the wide construction of NZEB buildings in Ukraine. The Order of the President of Ukraine dated September 30, 2019 will be implemented. No. 722 "On the goals of the sustainable development of Ukraine for the period until 2030" and the decree of the CMU No. 88-R of 29.01.2020 "On the approval of the Concept of the implementation of state policy in the field of ensuring the energy efficiency of buildings in terms of increasing the number of buildings with close to zero level energy consumption and approval of the National Plan to increase the number of buildings with close to zero energy consumption."

**Plan-Program "Initiative"**

**Block of the Comprehensive Recovery Plan of the Region "Energy Efficiency".**

**Comprehensive solution of energy efficiency problems in the Region of Ukraine. Use of alternative energy sources. Application of European and Ukrainian technologies for thermal modernization of buildings with engineering infrastructure facilities.**

The "Initiative" program is a program of national significance,

Comprehensive program of energy efficiency "Initiative", launched and developed by NGO "Energy Alliance" <www.e-a.org.ua> PE "Standart-C" "Estandar-C". During the development of the Program, the practical experience of work in the field of energy efficiency of the Spanish Association of Industrial Enterprises "Sercobe" of Madrid was used <sercobe.es/en/about-us>. The goal of the "Initiative" program, based on the analysis of the current state and forecasts of the development of the economy of the Region, is to develop the main directions of the energy saving policy in the field of communal ownership, private home ownership, heat generation and construction, which involves the creation of a complete and effective energy efficiency management system of objects that are subject to **thermal modernization** in Regions - **energy management**.

The "Initiative" program consists of three parts. They can be implemented using the experience of implementing another part of the Program, or they can be implemented only according to the calculations and proposed technologies for thermal modernization of objects of a specific part of the Program being implemented.

The program at the initial stage of implementation (minimum "Basic" program) will make maximum use of all the measures already implemented in the Region to increase the energy efficiency of housing and heat management. **For this purpose, the Energy Management Center is being formed**. Its main tasks are to ensure the maximum benefit from these activities and to support new activities that will be offered by the Program.

The Center implements "Joint Projects" to raise the overall level of energy efficiency in the Region. Enterprises using **ADE (alternative energy sources)** and thermal discharges will be created.

Joint projects will be created with financing from investors, who will coordinate the distribution of energy to all objects of the Program's thermal modernization through the **Energy Management Center** for its optimal and effective use by the customer. The combination of energy consumption from **ADE** and conventional energy sources not only reduces the overall cost of utility services and other payments, but also solves the problem of peak energy loads. This increases the life cycle of the created energy consumption system.

- Certification - audit of buildings according to European NZEB standards in accordance with the **"Concept of the national plan to increase the number of buildings with close to zero energy consumption" (Decree of the Cabinet of Ministers of Ukraine dated 01.29.2020 No. 88-r Kyiv).**

The creation of highly profitable ESCOs in the housing stock, for public buildings and in the thermal management of the Region with the implementation of thermal modernization of facilities at the optimal cost. (Treaties of the Principle of Solidarity)

Designing thermal modernization of buildings with the help of European design programs.

Thermal modernization of buildings using alternative energy sources according to projects developed according to European design programs.

Step-by-Step Retrofits to EnerPNit (step-by-step) thermomodernization technology is applied as needed, according to the developed plans. (plan)

For this purpose, the "PPVKI Initiative" program (section of the "Initiative" program) was developed to carry out joint work with the German Institute of Energy Efficiency RNI on the certification and thermal modernization of NZEB 160 typical buildings. This experience will help in the development of regulatory documents for the implementation of the "**Concept...**" - implementation of the European Directives - 2012/27/EU; 2010/31/EU in Ukraine.

According to the Program, practical work is already being carried out in Ukraine in the city of Synelnikove, school No. 6. The certification of the school building was jointly carried out by the participant of the NGO "Energy Alliance" PE "Standard C" and the German Institute of Energy Efficiency PHI Darmstadt. Certification work was carried out in accordance with the EnerPHIt Step-by-Step certification standard and in accordance with Ukrainian standards in typical schools of the city of Svitlovodsk, Kirovohrad region. This is the beginning of the implementation of the Block of the "Energy Efficiency" Program Plan

The block of the "Energy Efficiency" Plan is a set of measures for environmental expertise (EIA), certification, design, organization of work on thermal modernization and construction of energy-efficient buildings in Ukraine in accordance with the Law of Ukraine "On Energy Efficiency" and other Laws of Ukraine on energy efficiency.

The results of the implementation of the Plan in one Region will be the necessary experience for carrying out such works in Ukraine.

In connection with the fact that the "PPVKI Initiative" program will be implemented not on the basis of already adopted legal and by-laws, but in accordance with the "Concept of the national plan for increasing the number of buildings with close to zero energy consumption" (Order of the Cabinet of Ministers of Ukraine), then the works will have to be carried out under contracts in accordance with the Law of Ukraine **"On Private-State Cooperation and Partnership" dated July 1, 2010 No. 2404-VI** with state institutions that form the policy of energy efficiency development in Ukraine. This will make it possible to immediately, in cooperation with the Ministry of Development of Communities, Territories and Infrastructure of Ukraine, prepare drafts of legal and by-laws and Regulations for the construction and thermal modernization of buildings that will meet the criteria of a building with a near-zero level of energy consumption NZEB.

It is also proposed to apply the latest achievements of EU science and practice in the field of low-cost technologies.

- Certification and thermal modernization of buildings in accordance with the methods of DSTU-N B.V.3.2-3:2014; DSTU 9190:2022 (and others, see Appendix 1 of the Program) – 1,680 buildings and engineering infrastructure facilities.

Step-by-Step Retrofits to EnerPNit (step-by-step) thermomodernization technology is used as necessary, according to the developed plans (Plan)

**The first part of the Comprehensive Recovery Plan of the "Bazova" Region. Block "Energy efficiency"**

**Comprehensive solution of energy efficiency problems in the Region of Ukraine. Use of alternative energy sources. Application of European and Ukrainian technologies for thermal modernization of buildings with engineering infrastructure facilities.**

The Comprehensive Energy Efficiency Program was initiated and developed by the NGO "Energy Alliance" <www.e-a.org.ua> by the PE "Standart-C" "Estandar-C" with the expert partnership of the Energy Efficiency Institute of RNI Darmstadt, Germany <passiv.de>. (certification works on typical school buildings) During the development of the Program, the practical experience of work in the field of energy efficiency of the Spanish Association of Industrial Enterprises "Sercobe" in Madrid was used <sercobe.es/en/about-us>. The "Basic Initiative" program - the "Initiative" aims, based on the analysis of the current state and forecasts of the development of the Region's economy, energy saving in the field of communal property, private home ownership, heat generation and construction, which provides for the creation of a complete and effective energy efficiency management system of objects that are subject to thermomodernization in the Program - **energy management** in the Region.

Implementation of the "Basic Initiative" Program will provide an opportunity to conduct an in-depth analysis of the potential of ADE in the Region with its inclusion in the Thermal Modernization Plan.

According to the Plan, an environmental assessment of the possibility of carrying out such works will be conducted. The ecological factor is dominant in the implementation of the Program. Further energy certification of thermomodernization facilities provides an opportunity to develop technical tasks for the design and construction of Joint Enterprises for obtaining energy from AEDs and thermal discharges of the Region.

Optimum use of energy from ADE by objects subject to thermal modernization will make it possible to carry out their thermal modernization without bankruptcy of heat generating enterprises and reduce the consumption of conventional energy in the Region. According to the special agreements concluded between the subjects of thermal modernization in the Region, stimulating measures will be taken for the interest of heat-generating enterprises in carrying out thermal modernization (**Solidarity Principle Agreements**). This will be facilitated by the single plan for thermal modernization of the Region, the concluded Agreements and the presence of a single group of financiers and executors of all Blocks of the Program, adopted in advance.

This will also be facilitated by the use of a special technology of certification and thermal modernization of buildings for a low-budget customer at the first stage of Step-by-Step Retrofis EnerPHit thermal modernization. A plan for thermal modernization of the object (Plan) is being developed. (economic conditions of Ukraine)

It makes it possible to stop work on thermal modernization without negative consequences: humidity, fungus, etc.

4. The "Basic Initiative" program will develop the main areas of development of energy efficiency based on the use of all unused reserves of energy production from ADE (alternative energy sources), heat discharges, cogeneration and recovery in the Region.

The development of the Thermal Modernization Plan of the Region will be coordinated in cooperation with the volumes of energy received in the future from the Joint Projects.

The basic program provides for the construction of joint projects in accordance with the already developed Thermal Modernization Plan of the Region.

Joint projects will be created with financing from investors, who will then coordinate the distribution of energy to thermal modernization objects of the Program for optimal and efficient use of energy consumed by customers through the **Energy Management Center**. The combination of energy consumption from ADE and conventional energy sources not only reduces the total cost of utility services and other payments, but also solves the problem of peak loads. This increases the life cycle of the created Energy Consumption System.

An energy management system will be implemented to obtain the maximum increase in energy efficiency from the already implemented measures for thermal modernization of facilities.

After the implementation of the Basic Program, the **Center for Energy Management** will continue work on optimizing financial and energy costs while implementing all activities of Blocks of the "Initiative" program.

According to the provisions of the Program, ESCOs will be created in the Region on the basis of condominiums and heating enterprises. Certification will be carried out according to the methods of DSTU B.V.3.2-3:2014, DSTU 9190:2022 (and other standards for building certification in Ukraine, see Appendix 1 of the Program) of buildings and enterprises under the Thermal Modernization Program of the Region and certification of buildings, respectively Step-by- Step Retrofis to the EnerPHit standard.

These works are preparatory for the implementation of the Plan for the Comprehensive Restoration of the Region.

In the modern global science of energy efficiency problems, there is no single main measure that solves the problem of energy saving as a whole. For example, passive house standards put the importance of the indicator of heat release by electrical appliances and radio equipment in the room on the same level as the problem of the possibility of protecting it from losses due to poor wall insulation. The problem of energy efficiency is solved only comprehensively - the smallest factors of influence on the thermal balance of the object of thermomodernization or reconstruction with thermomodernization are taken into account.

In order to increase the profitability and improve the investment attractiveness of the entire Project, the receipt of thermal and electrical energy of the Joint Projects is taken into account. When concluding special contracts, the income from the generated energy will go to incentive measures for thermal modernization of heat-generating enterprises and centralized distribution networks. (**Treaties of the Principle of Solidarity**). The main reason for the lack of interest and, in general, the possibility of thermomodernization by the thermal economy of the Region (energy-generating enterprises and centralized heat distribution networks) is eliminated. There is no need to raise tariffs for the production and transfer of coolants.

Funding schemes and technologies for thermal modernization are selected based on the financial capabilities of the Region. An in-depth analysis of the possibilities of using thermal discharges of low-potential heat and other alternative energy sources in the Region is being conducted. Such information and proposed measures are included in the Thermal Modernization Plan of the Region.

According to the Thermal Modernization Plan of the Region, special agreements should be concluded between ESCO, heat generating enterprises, heat networks, the leadership of the Region (community) and the executor-financier of works according to the Blocks of the "Basic Initiative" Program on mutually beneficial cooperation on the implementation of Joint Projects on the use of alternative energy sources, heat discharges and sale of completed apartments in reconstructed buildings. (**Treaties of the Principle of Solidarity**).

Contracts must specifically indicate the value of the reduction of utility and other payments for energy carriers after the implementation of all measures specified in the Blocks of the Program, the Plan for thermal modernization of the Region's facilities and the implementation of Joint Projects.

Joint projects on obtaining energy from ADE and thermal discharges will optimally provide thermal modernization facilities with heat and electricity. Enterprises of Joint Projects must be self-supporting.

The use of ADE will not only increase the profitability of the Project, but will also help to solve the problem of peak loads of energy supply to objects.

Joint projects will include:

- obtaining high-potential heat with the help of heat pumps from heat discharges of various sources;

- receiving heat and electricity from general solar stations;

- sale of completed attic apartments in buildings subject to thermal modernization and reconstruction;

- obtaining electrical energy from reserve SPPs to solve the problems of lack of electricity for operation of pumping stations for pumping, purification and extraction of water. Energy-efficient water production.

The development of such a system of Agreements should be facilitated by the use of already known indicators of economy and obtaining heat energy using heat pumps from heat discharges of various sources. From the practice of already implemented technologies, indicators of heat return during cogeneration and recovery at heat management enterprises are taken. Such indicators can be immediately included in the feasibility study of projects for the investor with further minimal clarification after conducting General energy audits of thermal modernization facilities.

The program provides for the supply of industrial equipment components by the "Serkobe" Association for its assembly at the assembly plants created by the program.

In the future, already working under the contracts of Toling, they will become independent enterprises in which the assembly of equipment for thermal modernization of objects will be carried out, including from Ukrainian components.

The "Basic" program also solves the environmental problems of the Region by means of thermal modernization of buildings using biogas for their heating. The production of biogas will be carried out using special waste processing technologies Geiserbox Active Hygienization.

The European energy efficiency program "Green Deal" considers financial support for countries that reduce CO2 emissions into the atmosphere.

The "Basic" program is carried out with the participation of the leading European Institute of Energy Efficiency RNI Darmstadt. With its help, the basic indicators of energy efficiency and ecology in the Region will be determined.

The Program specifies the executors and financiers of the Plan. Legislative and scientific substantiation of the implementation of all measures specified in the main Plan has been carried out.

The "Basic" program briefly outlines the parameters of the Plan and is part of it (the "Work Sequence Plan" lists the works of the "Basic" program, pages 40-43 of the Program).

The main thing: The plan consists of three sections - Programs. (the Plan for achieving NZEB thermal modernization facilities is set out) Each section defines the main tasks of the Plan and their solutions in interaction with other sections.

The end result of the implementation of the Plan is an increase in the energy efficiency of the Region and, as a result, the ecological cleanliness of the human living space.

**Guaranteed calculation results of the "Basic Initiative" program**

- organization of assembly plants for assembly and adjustment of energy-efficient equipment used for thermal modernization of buildings under the Program: 5 workshops in the cities of Dnipro, Zaporizhzhia, Kharkiv and Kramatorsk;

- creation of heating plants for receiving heat from thermal discharges with the help of heat pumps at Joint Enterprises (Joint Projects);

- construction of enterprises for obtaining electricity and heat from solar energy (Joint enterprises);

- energy-efficient production of water;

- construction of protective structures;

- creation of NZEB training centers in Kyiv, Dnipro, Kharkiv, Zaporizhzhia and Kramatorsk;

- creation of specialized NZEB architectural bureaus in expert partnership with the Passive House Institute (PNI) in the cities of Kyiv, Dnipro, Kharkiv, Zaporizhia and Kramatorsk;

- organization of workplaces in assembly enterprises according to tolling agreements for 520 workplaces at the first stage of work (work experience - participant of the NGO "Energy Alliance" corporation "Teploenergo", Kyiv. <www.teploenergo.com.ua>);

- organization of workplaces in NZEB training centers – 130 workplaces;

- organization of workplaces in expert architectural bureaus NZEB – 65 workplaces;

- training of architects, construction engineers, workers in construction professions and, most importantly, community leaders. At the first stage of implementation of the goals of the "Basic Initiative" program, the training of Ukrainian specialists will be conducted by leading specialists in the field of energy efficiency of buildings from the Passive House Institute PHI Germany;

- implementation in the field of building certification of several technologies of this process for low-budget thermal modernization of buildings at the first stage, applying the method of the EnerPHit standard (Step-By-Step Retrofits, step-by-step) and using DSTU B.V.3.2-3:2014, DSTU 9190:2022 and others (see Appendix 1) – 160 certification works;

- the goal of certification of buildings according to the NZEB Standard - reduction of energy consumption after thermal modernization to 25 (kW x hour / m2) x 1 year;

- the purpose of certification of buildings in accordance with DSTU B.V.3.2-3:2014, DSTU 9190:2022 and others (see Appendix 1) – 1,680 certification works;

- reduction of energy consumption after thermomodernization to 70 (kW x hour / m2) x1 year.

**Section of the Program for practical implementation of the "Concept of the national plan to increase the number of buildings with close to zero energy consumption" "PPVKI Initiative" (the second section of the Comprehensive Recovery Plan of the "Initiative" Region. Block "Energy Efficiency")**

**Comprehensive solution of energy efficiency problems in the Region of Ukraine. Use of alternative energy sources. Application of European and Ukrainian technologies for thermal modernization of buildings with engineering infrastructure facilities.**

**The start of work on the "PPVKI Initiative" program - the first international NZEB certification of model school No. 6 in Synelnikovo, Dnipropetrovsk region. Certification of 5 typical schools in the city of Svitlovodsk, Kirovohrad region, for compliance with the step-by-step EnerPHIt Step-by-Step standard.**

The program of practical implementation of the **"Concept of the national plan to increase the number of buildings with close to zero energy consumption" (Order of the CMU #88-Р of January 29, 2020).**

Further, "PPVKI Initiative" is an integral part of the Comprehensive Recovery Plan of the Region "Initiative" to solve the tasks set in the **"Concept..."** regarding the implementation of EU Directives 2012/27 and 2010/31 in Ukraine. Gaining work experience in certification and thermal modernization of buildings according to the EnerPNit standard. Development of by-laws and legal acts for thermal modernization of buildings according to the NZEB standard.

The Comprehensive Energy Efficiency Program was initiated and developed by the NGO "Energy Alliance" <www.e-a.org.ua> by the PE "Standart-C" "Estandar-C". During the development of the Program, the practical experience of work in the field of energy efficiency of the Spanish Association of Industrial Enterprises "Sercobe" of Madrid was used <sercobe.es/en/about-us>. The goal of the "PPVKI Initiative" program, based on the analysis of the current state and forecasts of the development of the economy of the Region, is to develop the main directions of the energy saving policy in the field of communal property, private home ownership, heat generation and construction, which involves the creation of a complete and effective energy efficiency management system of objects that are subject to **thermal modernization** in the Region - **energy management**.

"PPVKI Initiative" is implemented with the help of the Law of Ukraine **"On Private-State Cooperation and Partnership" dated July 1, 2010 No. 2404-VI** with organizations that determine the policy of energy efficiency development in Ukraine.

The experience gained in solving the tasks of the Program will be used in the implementation of the entire scope of work under the Plan for the Comprehensive Restoration of the Region.

The program offers comparative values of the results of certification and thermal modernization of buildings between Pokrokova and the currently used technology of certification and thermal modernization of buildings in Ukraine. (The experience of the Energy Efficiency Institute of RNI Darmstadt is used to implement the Program). (see appendix 1)

Also, Appendix 8 of the Program provides a complete presentation of the step-by-step certification and thermal modernization of buildings in the "PPVKI Initiative" program.

Carrying out work on the Program and solving other tasks set in the "Concept..." will speed up the implementation of the Provisions of the **"Concept..."** in 2 years

This will make it possible to fulfill all provisions of the **"Concept..."** on the implementation of EU Directives 2012/27/EU and 2010/31/EU in Ukraine. This means that in Ukraine, the NZEB (passive building) standard will be used during the certification, thermal modernization and construction of buildings, and energy consumption in housing and communal services will decrease to the energy consumption indicators of buildings in the EU (when solving the tasks of the Regulations of the "PPVKI Initiative" program, it is envisaged to reduce the energy consumption of the building to 25 kW • year / m2 per year).

**The tasks set in the "PPVKI Initiative" program can be solved without the construction of Joint Enterprises with full financing of the Project with the help of the Energy Efficiency Fund, grants and investments.**

**Implementation of the Program with financing only by export-technical credits using the energy potential of Joint Projects in the Region.**

The main vector of energy efficiency development in the EU is aimed at the use of ADE (alternative energy sources), cogeneration, recovery and thermal discharges (Directive 2010/31/EU; 2012/27/EU).

Implementation of the Program "PPVKI Initiative" will provide an opportunity to conduct an in-depth analysis of the potential of ADE in the Region with its inclusion in the Thermal Modernization Plan. Calculations and data from the "Basic" program will be used

According to the Plan, an environmental assessment of the possibility of carrying out such works will be conducted. The ecological factor is dominant in the implementation of the Program. Further energy certification of thermomodernization objects makes it possible to develop technical tasks for the design of Joint Enterprises for obtaining energy from AEDs and thermal discharges of the Region, as well as design for thermal modernization of buildings.

 A single plan for thermal modernization of the Region will be developed in advance, **Contracts based on the principle of Solidarity** will be concluded, and a single group of financiers and executors of all Blocks of the Program will be created.

This will also be facilitated by the use of a special technology of certification and thermal modernization of buildings for the low-budget customer Step-by-Step Retrofis EnerPHit. A plan for thermal modernization of the object (Plan) is being developed.

Such technology can be applied with small initial financing of the Project (economic conditions of Ukraine)

It makes it possible to stop work on thermal modernization of objects without negative consequences: humidity, fungus - movement of the dew point along the section of the wall and the insulated layer.

Thermomodernization will be carried out step by step and the money saved on utility and other payments, after already implemented measures, will be invested in other steps to implement the following measures under the Thermomodernization Plan.

The European energy efficiency program "Green Deal" considers financial support for countries that reduce CO2 emissions into the atmosphere.

The program "PPVKI Initiative" also solves the environmental problems of the Region by means of thermal modernization of buildings using biogas for their heating. The production of biogas will be carried out using special waste processing technologies Geiserbox Active Hygienization.

In the process of implementing the Program with the expert participation of the PHI Institute and APP "Sercobe" Madrid, real results of reducing CO2 emissions into the atmosphere during the implementation of the Program will be presented to the European Commission.

This will make it possible to attract further financing for the more comprehensive implementation of the Plan for the comprehensive recovery of the "Initiative" Region.

The "PPVKI Initiative" program will develop the main directions of the energy efficiency policy based on the use of all unused reserves of energy from ADE (alternative energy sources), heat discharges, cogeneration and recovery in the Region.

European technologies of certification and thermal modernization of buildings will be used. The development of the Thermal Modernization Plan of the Region will be carried out in cooperation with the planned acquisition in the future of the energy volumes of the Joint Projects.

The "PPVKI Initiative" program provides for the construction of Joint Enterprises in accordance with the already developed Thermal Modernization Plan of the Region.

 Joint projects will be created with financing by one investor, who will then coordinate the distribution of energy to thermal modernization objects of the Program for optimal and efficient use of energy consumed by the customer through the **Energy Management Center**. The combination of energy consumption from ADE and conventional energy sources not only reduces the total cost of utility services and other payments, but also solves the problem of peak loads. This increases the **life cycle** of the created Energy Consumption System.

The implemented energy management system provides the maximum increase in energy efficiency from already implemented thermal modernization measures.

After the implementation of the "PPVKI Initiative" program, the **Energy Management Center** will continue work on optimizing financial and energy costs during the implementation of all measures of the "Initiative" Region Comprehensive Recovery Plan Blocks.

The "PPVKI Initiative" program briefly outlines the parameters of the "Initiative" program and is part of it (the Work Sequence Plan lists the works of the "PPVKI Initiative" program, pages 59-61).

The Program specifies the performers and financiers of the "PPVKI Initiative" program. Legislative and scientific substantiation of the implementation of all measures specified in the main Program has been carried out. The final result of the implementation of the Program is a general increase in the energy efficiency of buildings in the Region and, as a result, ecological cleanliness of human living space.

The main thing: The plan for the comprehensive recovery of the "Initiative" Region consists of three sections - Programs. Each section defines the main tasks of the "Initiative" Plan and how to solve them in cooperation with other sections.

**Guaranteed calculation results of the implementation of part of the PPVKI Program**

**The research section of the "Initiative" program is "PPVKI Initiative". The program of practical implementation of the Concept of the national plan to increase the number of buildings with close to zero energy consumption**

The final result of the implementation of the Program is an increase in the energy efficiency of the Region due to the widespread use of ADEs and thermal discharges and, as a result, ecological cleanliness of human living space.

Implementation of pilot projects for the certification and thermal modernization of buildings in the "Initiative" program - 160 buildings (decided by the Ministry of Reconstruction, Regional Development and Infrastructure) together with the German Institute of Passive House RNI according to the **NZEB standard (EnerPНit)** to solve the practical tasks set in the state **Concept of the National Plan increasing the number of buildings with close to zero energy consumption. Order of the Cabinet of Ministers of Ukraine dated January 29, 2020 No. 88-R, Kyiv.** Gaining practical experience.

Research works are carried out jointly with organizations that shape energy efficiency policy in Ukraine with the expert participation of the German Passive House Institute of the RNI. The results of such works will allow to reduce the time of implementation of the **Decision of the CMU No. 88-R from 01.29.20** to two years.

The works will be carried out in accordance with the Law of Ukraine **"On Private-State Cooperation and Partnership" dated July 1, 2010 No. 2404VI).**

Attracting investments: 48,800,000 € (1,993,875,280 UAH; 1.0 €= 40.8581 UAH)

The amount of technical loans subject to co-financing: €48,800,000 (1,993,875,280 UAH; 1.0 €= 40.8581 UAH)

The total amount of funds involved in the thermal modernization of **NZEB (EnerPHit)** buildings: €97,600,000 (3,987,750,560 UAH; 1.0 €= 40.8581 UAH)

Solving social, energy and economic problems of the Region:

- energy consumption for heating / cooling of a thermally modernized building according to the **EnerPНit** standard - 25 (kW x hour / m2) x 1 year;

- reduction of heat losses in housing and communal services buildings by 80-90% (depending on the number and volume of thermal modernization measures implemented in accordance with the **EnerPNit Plan**);

- total reduction of CO2 gas emissions (see Calculation in the "PPVKI Initiative" program, pages 46-48)

- reduction of the cost of communal services in houses that have undergone thermal modernization under the "Initiative" Program;

- creation of Joint Enterprises;

- creation of **NZEB training centers** in Kyiv, Dnipro, Kharkiv, Zaporizhzhia and Kramatorsk;

- creation of specialized architectural bureaus in expert partnership with the Passive House Institute (PNI) in the cities of Kyiv, Dnipro, Kharkiv, Zaporizhia and Kramatorsk;

- organization of workplaces in assembly enterprises according to **tolling contracts** for 520 workplaces at the first stage of work (work experience - participant of NGO "Energy Alliance" corporation "Teploenergo" Kyiv <www.teploenergo.com.ua>);

- organization of workplaces in **NZEB training centers** – 130 workplaces;

- organization of workplaces in expert architectural **bureaus NZEB** – 35 workplaces;

- training of architects, construction engineers, workers in construction professions and community leaders. At the first stage of achieving the goals of the Training Plan for Ukrainian specialists, leading experts in the field of energy efficiency of buildings from the Institute of Passive House PHI Germany will be conducted.

**The tasks set in the "Initiative" program (research section) can be solved without the construction of Joint Enterprises with full financing of the Project with the help of the Energy Efficiency Fund, grants and investments.**

**Part of the Program for thermal modernization of buildings using the potential of ADE (alternative energy sources) and thermal discharges of the Region, in accordance with DSTU B.V.3.2-3:2014, DSTU 9190:2022 (and other standards for certification and thermal modernization of buildings and infrastructure facilities in Ukraine) "PTADE Initiative" (the third section of the Comprehensive Recovery Plan of the Region, Block "Energy Efficiency")**

**Comprehensive solution of energy efficiency problems in the Region of Ukraine. Use of alternative energy sources. Application of European and Ukrainian technologies for thermal modernization of buildings with engineering infrastructure facilities.**

 "Program of certification and thermal modernization of buildings using the potential of ADE and thermal discharges of the Region in accordance with DSTU B.V.3.2-3:2014, DSTU 9190:2022 (and other standards for certification of buildings in Ukraine)" (see appendix 1 of the Program)

Further, the "PTADE Initiative" is a component of the Plan for the Complex Recovery of the Region, the Block "Energy Efficiency" "Initiative".

The Comprehensive Energy Efficiency Program was initiated and developed by the NGO "Energy Alliance" [www.e-a.org.ua](www.e-a.org.ua%20) by the PE "Standart-C" "Estandar-C". During the development of the Program, the practical experience of work in the field of energy efficiency of the Spanish Association of Industrial Enterprises "Sercobe" of Madrid was used <sercobe.es/en/about-us>. The purpose of the "PTADE Initiative" program, based on the analysis of the current state and forecasts of the development of the economy of the Region, is to develop the main directions of energy saving policy in the field of communal property, private home ownership, heat generation and construction, which involves the creation of an effective energy efficiency management system of objects subject to **thermal modernization** in the Region - energy management.

The main vector of energy efficiency development in the EU is aimed at the use of ADE (alternative energy sources), cogeneration, recovery and thermal discharges (Directive 2010/31/EU; 2012/27/EU).

Implementation of the "PTADE Initiative" Program will provide an opportunity to conduct an in-depth analysis of the potential of ADE in the Region with its inclusion in the Thermal Modernization **Plan**.

According to the Plan, an environmental assessment of the possibility of carrying out such works will be conducted. The ecological factor is dominant in the implementation of the Program. Further energy certification of thermomodernization objects makes it possible to develop **technical tasks** for the design of Joint Enterprises for obtaining energy from AEDs and thermal discharges of the Region, as well as carrying out design for thermomodernization of buildings.

A single **plan** for thermal modernization of the Region will be developed in advance, **Contracts based on the principle of Solidarity** will be concluded, and a single group of financiers and executors of all Blocks of the Program will be created.

A special technology of certification and thermal modernization of buildings for a low-budget customer Step-by-Step Retrofis EnerPHit will be applied (at the request of the customer). A plan for thermal modernization of the object (**Plan**) is being developed.

Such technology can be applied with small initial funding of the Project (economic conditions of Ukraine)

It makes it possible to stop work on thermal modernization of objects without negative consequences: humidity, fungus - movement of the dew point along the section of the wall and the insulated layer.

Thermomodernization will also be carried out step by step, and the saved funds for utility and other payments, after already implemented measures, will be invested in other steps to implement the following measures under the Thermomodernization **Plan**.

Implementation of the "PTADE Initiative" program will provide an opportunity to develop the main directions of the energy efficiency policy based on the use of all unused reserves of energy production from ADE (alternative energy sources), heat discharges, cogeneration and recovery in the Region.

European technologies of certification and thermal modernization of buildings will be used. The development of the Thermal Modernization **Plan** of the Region will be carried out in cooperation with the planned energy production of the Joint Enterprises in the future.

The "PTADE Initiative" program provides for the construction of Joint Enterprises in accordance with the already developed Thermal Modernization Plan of the Region.

Joint projects will be created with financing by one investor, who will, through the **Energy Management Center**, then coordinate the distribution of energy to thermomodernization objects of the Program for optimal and efficient use of energy consumed by the customer. The combination of energy consumption from ADE and conventional energy sources not only reduces the overall cost of utility services and other payments, but also solves the problem of peak energy loads. This increases the **life cycle** of the created Energy Consumption System.

The introduced energy management system will make it possible to obtain the maximum increase in energy efficiency from the planned and already implemented measures for thermal modernization of facilities.

After the implementation of the "PTADE Initiative" program, the **Energy Management Center** will continue work on optimizing financial and energy costs while implementing all measures of the Blocks of the "Initiative" program.

The "PTADE Initiative" program is unique based on several factors:

1. The program is an integral part of the "Initiative" Region Comprehensive Recovery Plan, which is partly of a research nature. When carrying out research and practical work on the certification and thermal modernization of NZEB buildings in the Comprehensive Recovery Plan of the Region, Block "Energy Efficiency" "Initiative", the Provisions of the "**Concept of the National Plan for Increasing the Number of Buildings with Close to Zero Energy Consumption**" will be implemented (**Order of the CMU No. 88-Р from January 29, 2020**), which will accelerate the implementation of directives 2012/27/EU, 2010/31/EU in Ukraine. By solving the "**Concepts ...**" task, we will receive legalized technologies for certification and thermal modernization of NZEB buildings, which will be applied to the implementation of the "PTADE Initiative" program. Such work is being carried out for the first time in Ukraine and requires the participation of organizations that shape energy efficiency policy in the country. Cooperation according to the Law of Ukraine **"On Private-State Cooperation and Partnership" dated July 1, 2010 No. 2404-VI.**

2. The "PTADE Initiative" program includes joint production enterprises that supply cheap energy to thermal modernization facilities, and surpluses are sold at auctions in accordance with the Law of Ukraine on ADE. The following results are achieved:

a) with large volumes of energy production at the Joint Enterprises, its cost when supplied to thermal modernization facilities will be low. And most importantly, it will be possible to lower the price level for low-income customers in accordance with the Agreements of the principle of solidarity;

b) the implementation of the "PTADE Initiative" program, in combination with the implementation of other components of the "Initiative" program, will give a greater effect of increasing the energy efficiency of thermally modernized objects in comparison with other proposed projects for thermomodernization of objects in Ukraine that do not have research, and have only a commercial direction.

Such a state will attract additional funding for the Project in the form of grants from European financial structures.

Example: German Society for International Cooperation **GIZ**.

The implementation of the program will be facilitated by the **German GIZ** fund, which has already financed the creation of the Hub in the city of Dnipro. (The task of the "PTADE Initiative" program defined in Block 5.1. Program is being solved with the help of **GIZ Germany**). The hub will participate in the establishment of the NZEB training center. The center will train architects, managers of construction organizations, workers in construction professions who will take part in solving the tasks of the Program.

c) Using cheap energy from Joint Enterprises and fulfilling the Program Provisions under the **Solidarity Principle contracts**, the issue of interest in implementing energy-efficient measures at heat supply and heat generation enterprises is resolved.

3. The program provides for the processing of garbage in the Region using the Geiserbox® Active Hygienization ® technology and in universal solid fuel heat generators-utilizers, which makes it possible to produce gas for heating buildings that are subject to thermal modernization.

The organization of the complex of works under the "PTADE Initiative" program is carried out by the enterprises of the Spanish Association of Industrial Enterprises "Sercobe" in Madrid. If necessary and under the condition of co-financing, for the implementation of such works, financing of the Project is provided - expert-technical lending.

**The "PTADE Initiative" program can be implemented in two variants:**

**1. Implementation of the Program using the standards of DSTU B.V.3.2-3:2014, DSTU 9190:2022 and others (see Appendix 1 of the Program) (for certification and thermal modernization of buildings in Ukraine), as well as already developed technologies for certification and thermal modernization of buildings NZEB in another component of the "Initiative" program - step-by-step thermomodernization technology in the "PPVKI Initiative" program - Step-by-Step EnerPНit.**

**2. Implementation of the "PTADE Initiative" program for certification and thermal modernization of buildings using the standards and methods of DSTU B.V.3.2-3:2014, DSTU 9190:2022 and others (see Appendix 1 of the Program) for comprehensive thermal modernization of buildings.**

**The technology for certification and thermal modernization of buildings in the Program is selected based on the readiness for application (implementation) of the NZEB standard in Ukraine and is specified in the Agreement with ESCO.**

**Guaranteed calculations for the implementation of the thermal modernization program of buildings according to the standards of DSTU B.V.3.2-3:2014, DSTU 9190:2022 (and others for thermal modernization of buildings in Ukraine). (see appendix 1) - "PTADE Initiative" Program for thermomodernization of buildings using the potential of ADE (alternative energy sources) and thermal discharges of the Region.**

The final result of the implementation of the Block of the "Energy Efficiency" Plan-program is an increase in the energy efficiency of the Region due to the widespread use of ADEs and thermal discharges and, as a result, ecological cleanliness of human living space.

Creation of highly profitable **ESCOs** with subsequent thermal modernization of public buildings, housing and communal services, heat networks and heat-generating enterprises (1,680 buildings and objects) in accordance with construction methods according to the standards of DSTU-NB B V.3.2-3:2014, DSTU 9190:2022 (and others for thermal modernization of buildings in Ukraine). (see Appendix 1).

The list of thermal modernization objects will correspond to the **Thermomodernization Plans** in the Regions of Ukraine. (In accordance with the Resolution of the CMU 1159, each OTG must develop a Plan for the comprehensive recovery of the Region in order to organize financing)

- investment attraction for the second part of the Program:

€124,320,000 (5,079,478,992 UAH; €1.0= UAH 40.8581)

- the amount of technical loans under the condition of co-financing (without taking into account the amount of co-financing):

€124,320,000 (5,079,478,992 UAH; €1.0= UAH 40.8581)

- the total amount of funds involved in the implementation of the second part of the Program:

€248,640,000 (10,158,957,984 UAH; €1.0= UAH 40.8581)

- reduction of heat losses of housing and communal services buildings by 30-70% (depending on the number and volume of thermal modernization measures implemented);

- reduction of the cost of utility services in houses that have undergone thermal modernization under the "Initiative" program;

Energy consumption for heating/cooling of a building thermally modernized according to the standard DSTU-Н B V.3.2-3:2014, DSTU 9190:2022 and others (see Appendix 1). - 70 (kW x hour / m2) x 1 year.

Total reduction of CO2 gas emissions. (see Calculations in the "PTADE Initiative" program, page 41).

- creation of Joint Enterprises:

- creation of heating plants for receiving heat from thermal discharges with the help of heat pumps at Joint Enterprises;

- construction of enterprises for obtaining electricity and heat from solar energy (Joint enterprises);

- organization of workplaces in assembly enterprises according to **tolling contracts** for 520 workplaces at the first stage of work (work experience - participant of NGO "Energy Alliance" corporation "Teploenergo" Kyiv <http://www.teploenergo.com.ua>);

- organization of workplaces in **NZEB** training centers – 130 workplaces;

- creation of **NZEB training centers** in the cities of Kyiv, Dnipro, Kharkiv, Zaporizhia and Kramatorsk;

- creation of specialized architectural offices of the NZEB in expert partnership with the Passive House Institute (PNI) in the cities of Kyiv, Dnipro, Kharkiv, Zaporizhia and Kramatorsk - 65 jobs.

- training of architects, construction engineers, workers in construction professions and community leaders. At the first stage of the implementation of the goals of the Plan, the training of Ukrainian specialists will be conducted by leading specialists in the field of energy efficiency of buildings from the Institute of Passive House PHI Germany;

- implementation in the field of building certification of several technologies of this process for low-budget thermal modernization of buildings, applying the methodology of the **Step-By-Step Retrofit EnerPHit standard, (step-by-step)** and the use of DSTU-Н B V.3.2-3:2014, DSTU 9190:2022, and others (see Appendix 1).

**Regulatory and Legislative documentation for certification, energy management and thermal modernization of buildings and infrastructure facilities:**

- Decree of the President of Ukraine dated September 30, 2019 No. 722 "On the Sustainable Development Goals of Ukraine for the period until 2030"

- Law of Ukraine "On Regulation of Town Planning Activity" "On Architectural Activity".

- Law of Ukraine "On Energy Efficiency of Buildings" dated June 22, 2017 No. 2118-VII;

- Law of Ukraine "On Amendments to Certain Laws of Ukraine Regarding Creation of Conditions for the Introduction of Complex Thermal Modernization of Buildings"

- Resolution of the Cabinet of Ministers of Ukraine dated 04/11/2018 No. 265 "On approval of the list of industrial and agricultural buildings, energy, transport, communication and defense facilities, warehouses, which are not subject to the minimum requirements for the energy efficiency of buildings and which are not are subject to certification of the energy efficiency of buildings";

- Resolution of the Cabinet of Ministers of Ukraine dated July 26, 2018 No. 602 "On approval of the Procedure for exchanging information between central executive bodies, attestation commissions in the process of independent monitoring, professional attestation and maintaining databases of certificates, specialists and reports";

- Resolution of the Cabinet of Ministers of Ukraine dated June 9, 2021 No. 600 "On approval of the Procedure for conducting professional attestation of persons who intend to carry out energy efficiency certification and inspection of engineering systems";

- order of the Ministry of Regions dated 11.07.2018 No. 169 "On approval of the Methodology for determining the energy efficiency of buildings";

- order of the Ministry of Regions dated July 11, 2018 No. 170 "On approval of the Methodology for determining the economically feasible level of energy efficiency of buildings";

- order of the Ministry of Regions dated July 11, 2018 No. 172 "On approval of the Procedure for conducting energy efficiency certification and the form of an energy certificate";

- order of the Ministry of Regions dated 11.07.2018 No. 171 "On approval of the Procedure for the application of calculation elements of software for determining the energy efficiency of buildings";

- order of the Ministry of Regions dated 11.07.2018 No. 173 "On approval of the Methodology for the inspection of engineering systems of the building";

- order of the Ministry of Regions dated 06.10.2017 No. 267 "On defining buildings that are often visited by citizens";

- order of the Ministry of Regions dated 18.10.2018 No. 274 "On the approval of the Procedure for independent monitoring of reports on the results of inspection of engineering systems";

- order of the Ministry of Regions dated October 18, 2018 No. 275 "On approval of the Procedure for reviewing reports on the inspection of engineering systems";

- order of the Ministry of Regions dated October 18, 2018 No. 276 "On approval of the Procedure for independent monitoring of energy certificates".

- The Law of Ukraine "On Amendments to Certain Legislative Acts of Ukraine Regarding the Improvement of the Procedure for Providing Administrative Services in the Field of Construction and Creation of the Unified State Electronic System in the Field of Construction" established that the holder of the electronic system is the Ministry of Regions.

**Organization of the execution of works by the "Serkobe" APP in Madrid, "Energy Alliance" in Dnipro.**