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Ministry of Economy of Ukraine

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NGO Center for Environmental Initiatives "Ecoaction" welcomes the development of the National Energy and Climate Plan of Ukraine 2025-2030. We realise that this process is complex and is being carried out in a very short period of time, so it requires prompt involvement and consideration of proposals from many stakeholders. We have read the text of the draft National Plan and would like to draw attention to the following.

KEY RECOMMENDATIONS

Currently, the draft looks like a description of different scenarios that does not provide a general understanding of what goals, policies, and measures will be taken as a basis and implemented by the state by 2030.

Ecoaction believes that priority should be given to the scenario and measures that are compatible with the goal of the Paris Agreement - to **limit global temperature rise to 1.5°C** - **and to meet the minimum energy and climate requirements of the European Union.** Since the possibility of implementing these requirements requires sufficient international financial support, the National Plan should clearly indicate Ukraine's financial needs until 2030 for the implementation of each scenario.

In our opinion, the issue of approximation and compliance of the Ukrainian National Energy and Climate Plan with the EU goals is extremely important. At present, references to Ukraine's accession to the European Union and the need to comply with and implement specific EU policies and regulations are unsystematic and isolated, reflected only in certain goals, but not in the overall approach to planning. Instead, in the coming years, it is the process of integration into the EU that will be the biggest challenge for our country, which will also be a challenge for the development of relevant policies. This is especially true in the climate and energy sectors due to the need to comply with the European Green Deal (EGD), which envisages the decarbonization of the European continent by 2050.

We believe it is necessary to emphasize that all goals, policies and measures of the NECP until 2030 should be in line with the EU's goals and standards as a prerequisite for Ukraine's accession and full integration into the EU.

Currently, the NECP lacks some important provisions that could make it more sustainable and bring it more in line with EU requirements and norms:

1. Section 3.1.1. GHG emissions and absorption, a number of policies and measures are envisaged to reduce emissions in a number of sectors (n.d.: transport, agriculture, waste), but no policies and measures are identified to rebuild infrastructure affected by Russian aggression. According to studies, the reconstruction of civilian infrastructure could result in additional emissions of 54.7 million tons of CO2 eq. and will become one of the largest sources of greenhouse gas emissions as a result of the Russian war. The draft mentions Build Back Better (p. 299) and providing support to citizens (whose homes were destroyed as a result of hostilities) for the construction of residential buildings with near-zero energy

consumption (p. 118). However, such references are rather ad hoc and do not form a comprehensive approach to low-carbon reconstruction.

2. Within the Agriculture sector, we would like to draw attention to additional measures that should be included in the GHG emission reduction measures in this sector, as well as the importance of adjusting the current measures. More details on the proposals for adjusting the measures can be found in Annex 1 to this letter.

- The measure "Implementation of the best technologies and practices for manure storage to prevent nutrient losses and their release into the environment". In this case, we understand that one of the vulnerable issues in Ukrainian livestock production is the storage of manure (animal by-products). Therefore, manure can often be stored without properly equipped sites, which leads to both environmental pollution and greenhouse gas emissions.
- The measure "Promoting gradual changes in consumer behaviour". One of the most important steps to reduce GHG emissions in the agricultural sector is to change consumer behaviour. This should be accompanied by a systemic policy of promoting organic products, products grown using environmentally friendly technologies, and plant-based nutrition.

3. It should be noted that there is no data for the LULUCF sector in Section 4 (Current situation and projections based on existing policies and measures) and Section 5 (Impact assessment of planned policies and measures). The presented draft NECP also does not contain modelling data for the LULUCF sector under the WEM and WAM scenarios. We hope that this is a technical issue at this stage and that these parts will be presented in the near future, although currently, in Sections 4 and 5, there is not even a mention of "[To be planned in the next stages of work on the NECP]" for the sector, similar to other parts that are not yet available in the draft.

4. The LULUCF sector plays a key role in achieving climate neutrality through the potential of carbon dioxide absorption and carbon storage by natural ecosystems, biomass and soils. According to the methodology for calculating greenhouse gas emissions from LULUCF adopted by the UNFCCC, there are 6 categories of land use that fall into this sector: forest land, cropland, steppe and grassland, wetlands, settlements, and other land. Accordingly, **plans in this sector should include not only measures in the forestry sector,** but also measures aimed at preserving existing natural carbon stocks (in soils and ecosystems), increasing carbon stocks through ecosystem restoration, soil protection measures, restoration of degraded lands, implementation of sustainable agricultural practices, etc.

5. Since the current draft of the Plan does not contain information on measures in the LULUCF sector, we draw your attention to the declared goals and hope that this information will be taken into account when developing measures. One of the measures to reduce soil degradation and, consequently, to reduce greenhouse gases is the Order of the Cabinet of Ministers of Ukraine "On Approval of the Concept of the National Target Program for Land Use and Protection". According to this Concept, the expected results are as follows: to reduce agricultural development (by 5%) and ploughed land (by 10%); to optimise the structure of the agricultural landscape; to increase the productivity of agricultural land (by 40-50%) through the rational use of organic, organo-mineral and mineral fertilizers and chemical meliorants on acidic and saline soils. Increase the area of land with natural landscapes to a level sufficient to preserve landscape and biological diversity (up to 10.5% of the total area of the country); conserve degraded, unproductive and technologically polluted land.

Annex 2 to the NECP "Assumptions on the main parameters of agricultural development" stipulates that the area of arable land from which crops will be harvested will grow until 2050. Such calculations completely contradict the state's declared goals to reduce the area of arable land by removing slopes,

water protection zones, erosion-prone and other lands not suitable for ploughing from their composition. In particular, such goals are enshrined in the National Action Plan to Combat Land Degradation and Desertification, the aforementioned Concept of the National Target Program for Land Use and Protection, in the decision of the National Security and Defense Council of Ukraine No. 111 of 23.03.2021 "On Challenges and Threats to the National Security of Ukraine in the Environmental Sphere and Priority Measures to Neutralize Them", Order of the Ministry of Agrarian Policy of Ukraine No. 280 of 20.08.2003 "On Approval of the Concept of Balanced Development of Agroecosystems in Ukraine for the Period up to 2025".

Therefore, we ask you to take into account the relevant legislative norms and recalculate the forecasts for the dynamics of arable land, taking into account the need to exclude slopes, lands of water protection zones, erosion-prone and degraded lands.

6. Accordingly, measures to reduce GHG emissions in the LULUCF sector should also comply with the measures set out in the Concept of the National Target Program for Land Use and Protection, in particular: (1) the measure "Promoting conservation of degraded lands"; (2) the measure "Promoting increase in the area of territories and objects of the nature reserve fund and other protected areas"; (3) the measure "Refusal to transfer land plots rich in soil carbon, namely peatlands, steppes and meadows, to other forms of land use, except when such transfer is carried out in case of public need in the absence of other territorial alternatives."

7. In the dimensions of Decarbonisation and Energy Security, there is no mention of the definition of the legal regulation of energy communities in accordance with the provisions of the "Clean energy for all Europeans" package, which Ukraine has to implement as a member state of the Energy Community. Energy communities are a way to "organize" citizens who want to cooperate together in the energy sector on the basis of openness and democracy. They are designed to provide environmental (reducing greenhouse gas emissions), economic (achieving community energy independence) or social (creating new jobs) benefits for the community. In particular, for its shareholders or members, or for the territory where it operates. Involvement of residents in the energy community strengthens the capacity of the community itself, increases the pace of transition to RES and implementation of planned climate change adaptation measures.

Therefore, the development of energy communities will have a direct positive impact on improving the energy security of communities and the development of distributed generation, two priority areas identified in the Energy Strategy 2050 and the draft NECP.

8. Currently, the NECP draft reflects just transition in only one measure in the WAM scenario: the development of the State Target Program for the Just Transition of Ukraine's Coal Regions for the period up to 2030. We welcome this decision and are ready to support and contribute to its development in every possible way. At the same time, we believe that the issue of just transition is much broader, cross-sectoral, and needs to be better reflected at the level of goals and specific policies and measures. For example, we believe that it would be useful to better detail the socio-economic impact of existing goals and measures, especially on employment and the labor market.

In our view, specific policies and measures in the Research, Innovation and Competitiveness dimension, such as modernising educational programs to address the skills gap in the green transition and renewable energy sector; developing exports of climate and renewable energy technologies; and expanding funding for research in renewable energy and climate innovation, can be combined with the issue of just transition of carbon-intensive (including coal) regions and expanded accordingly. The closure of coal mining enterprises will require measures to ensure diversification of the local economy, as well as new educational opportunities (both for retraining laid-off workers and creating new specialties). For example,

localising the production of renewable energy equipment and energy-efficient building materials in coal communities will help reduce the negative socio-economic impact of future mine closures and create new jobs.

9. Contributions to the specialised budgetary Fund for accumulation of financial reserves for decommissioning of nuclear reactors are too small. Currently, the lack of sufficient contributions creates risks for future decommissioning and safe shutdown of power units. Resolving this issue is urgent, as the creation of a reliable financial mechanism for decommissioning NPPs is of strategic importance for ensuring the safety and sustainability of the energy sector.

Regardless of the revision of plans for further operation of the power units, we believe it is critically important to start planning for their future decommissioning. For example, in 2022, in the expanded materials of the Energy Security Working Group under the National Council for the Restoration of Ukraine from the Consequences of the War, it was noted that 1 VVER-1000 power unit at the South Ukrainian NPP and 2 VVER-440 power units at the Rivne NPP could be decommissioned by 2035. Even with such a theoretical possibility, the NECP, having a planning horizon until 2030, may include specific preparation measures, since decommissioning does not occur in a short period of time but lasts for decades.

10. In the energy efficiency section of the planned WAM+ policies and activities, it is important to include a clause on the development of criteria for Zero-emission buildings, as the European Parliament adopted the updated Energy Performance of Buildings Directive (EPBD) on March 12, 2024.

In addition, the planned policies and measures do not include the development of a system for monitoring compliance with energy efficiency standards in thermal modernization and new construction.

We also draw attention to the list of rather dubious and even erroneous decisions described in the NECP:

- **Using carbon capture and storage technologies to combat climate change.**

The energy sector does not need carbon capture and storage (CCS) technologies, as there are already more reliable, cleaner and cheaper ways to reduce CO2 emissions, namely, the gradual phase-out of fossil fuels, their replacement with renewable energy sources, and the introduction of energy efficiency measures in production, transportation and consumption of energy. There is a risk that public and private funds invested in support of CCS may reduce the amount of funding for truly climate-neutral solutions and delay their implementation for years. The development of CCS technologies can significantly slow down the energy transition and serve as a "crutch" for dirty industry, which can thus delay the closure of its own facilities.

Economic inexpediency is one of the main factors behind the lack of widespread use of CCS in the energy sector. Equipping new and/or existing fossil fuel power plants with CCS is very expensive and requires additional free space near energy facilities. In addition, this technology is significantly more expensive per ton of avoided CO2 emissions than zero-emission RES technologies. There is currently no indisputable evidence of the effectiveness of CCS. In theory, this process can reduce CO2 emissions from power plants by 90%. In practice, however, these volumes are much lower (~50%) at most plants equipped with CCS technologies. Even a relatively small amount of emissions is incompatible with meeting the goals of the Paris Agreement and keeping global temperature growth at 1.5°C.

The use of CCS at power plants implies an increase in the overall energy demand. That is, more fossil fuels will be burned to produce the same amount of energy. This, in turn, increases costs, emissions of other harmful substances (dust, sulfur, etc.) that pollute the air and the water needs of power plants. CO2 capture at coal and gas-fired power plants can increase freshwater consumption by 20-60% in the absence

of ways to restore its reserves. Ukraine already has major problems with water supply per capita, ranking 32nd out of 40 European countries in this indicator. In the context of climate change, water must be saved. The use of CCS technologies will have a negative impact on the environment that is difficult to tolerate.

It is also expected that carbon storage facilities will be limited and unevenly distributed around the world. At the same time, there is always a risk of CO2 leaks that can occur over a long period of time and make it impossible to achieve climate neutrality goals.

- **Use of hydrogen**

Hydrogen is not a silver bullet for all industries. It should be used only for those processes that cannot be easily electrified and powered directly from renewable electricity, or during hours when renewable electricity is not available. That is, the use of hydrogen should be prioritised only when there are no more practical alternatives. Potentially, hydrogen can play an important role in sectors such as the production of green building materials (steel, cement), long-distance shipping, aviation, and other industries. Hydrogen can be used for selected sectors, but it should be "green" hydrogen (i.e., produced from renewable energy sources). Hydrogen production should be based on additional/surplus renewable energy and should not compete where renewable electricity can be used directly, such as in the heating or land transportation sectors.

No support should be given to fossil fuel-based hydrogen. Hydrogen produced from fossil gas by steam conversion of methane cannot be considered "green" and therefore cannot be a solution to the climate crisis. Hydrogen production associated with nuclear power should also not be supported, given the high risks and environmental impacts of nuclear power.

- **Development of nuclear energy**

The development of nuclear energy cannot be considered financially sustainable and cost-effective. The global experience in the construction of new nuclear facilities over the past 30 years shows that the projected cost of new nuclear power plant construction projects in practice often increases and is greatly extended in time. One of the most recent examples is the construction of the third power unit at the Flamanville NPP in France. At the end of 2022, EDF announced that the completion of the project was once again postponed, and the total cost increased by an additional €500 million. Construction of Flamanville 3 began in 2007 with a planned start of operation in 2012. The power unit was initially estimated at EUR 3 billion, but the total cost has now increased almost 4.5 times to EUR 13.2 billion. Another illustrative example is the construction of Hinkley Point C in the UK. In January 2024, it became known that the project could ultimately cost £46 billion and start operating no earlier than 2029 (with a potential delay until 2031). At the beginning of construction, the project was estimated at £18 billion and was supposed to start operating in 2025.

At the same time, Ukraine's Energoatom signed a memorandum with Westinghouse Electric Company, according to which it plans to build 9 new large nuclear units in Ukraine using AP1000 technology. Importantly, the experience of Westinghouse construction in the United States has shown a price increase of at least two times (from $14 billion to $30 billion for two units) and a delay of more than 6 years. Therefore, if Ukraine builds new similar power units, it risks losing substantial funds and getting nuclear "long-term construction" that will not be able to produce energy for the country for years to come. Even if Ukraine receives part of the funds from international investment banks, the state of Ukraine will be the guarantor of these loan obligations. In addition, future nuclear reactors will need funds for waste management and decommissioning. Electricity generated by nuclear power plants has been rising in price around the world for years, while cheaper alternatives, primarily renewable energy sources, continue to

develop. Currently, a MWh of nuclear energy costs several times more than the same amount of energy from the sun or wind.

The situation with small modular reactors (SMRs) is no better. At the end of 2023, it became known that NuScale Power's first mini-NPP project in the United States was canceled due to a 53% increase in costs. Energoatom also planned to develop SMR technologies in Ukraine with NuScale Power. In general, the decision to implement a pilot SMR construction project in Ukraine should take into account the data of scientific calculations on their economic feasibility. According to a new international study, SMR concepts may have difficulties with economic competitiveness compared to renewable energy sources. Even with certain advantages of SMRs (such as standardized design and modularity), they face high construction costs. In addition, this technology does not solve the problem of waste produced by the nuclear industry and the need for a mined source (uranium).

Executive Director

NGO "Ecoaction" **Olga Polunina**

Annex No. 1 to the letter No. 46 from 14 March 2024

Extended version of Ecoaction's comments to the National Energy and Climate Plan of Ukraine 2025-2030

SECTION A. NATIONAL PLAN

2. NATIONAL GOALS AND TARGETS

2.1. The "Decarbonisation" dimension

2.1.1. GHG emissions and absorption (ii)

The part on the transport sector states that a new transport strategy is currently being developed, which may set new targets. However, there is no such clarification in the part concerning national climate neutrality targets.

Therefore, the first paragraph of Section 2.1.1. GHG emissions and absorption (ii) should be supplemented with information on the development of the draft Law of Ukraine "On the Basic Principles of the State Climate Policy", which establishes the achievement of climate neutrality of Ukraine by 2050, as well as the "Strategy for the Formation and Implementation of the State Policy in the Field of Climate Change for the Period up to 2035".

2.3 Energy security dimension

The plan to build an export-oriented energy industry, which includes the production of small modular reactors (SMRs) and various components for nuclear generation, carries significant risks and challenges:

1. **Safety:** Although SMRs are touted as safer than traditional nuclear power plants due to their design and smaller size, they still carry risks of radiation leaks, nuclear proliferation, and targeted attacks. Given the experience of a full-scale Russian invasion, these risks require additional security measures and risk minimization strategies.

2. **Environmental impacts:** The use of nuclear power is associated with unresolved problems of waste management, which remains radioactive for thousands of years.

3. **Economic viability:** The development and construction of SMRs are costly and time-consuming processes that require significant investment, in addition to the fact that this technology has not yet been implemented as an industrial project, meaning that the modularity advantage is only theoretically envisaged. There is a risk that the development costs will exceed the economic benefits, especially given the growing competition from renewable energy sources that are becoming cheaper and more efficient. This is what happened to a leading project in the United States. Development was halted due to a 53% increase in costs. Therefore, NuScale Power canceled the construction of a nuclear power plant in Utah due to rising costs

2.4. Dimension "Domestic energy market"

2.4.3. Market integration

Achieving adequate domestic production volumes

In order to decarbonise the energy sector by 2050 and meet the goals of the Paris Agreement, it is important to determine how and in what timeframe the gradual phase-out of fossil fuels (including natural gas and oil) will take place. However, the draft puts more emphasis on the possibility of increasing export

potential and intensifying fossil fuel production (which, in turn, will require additional investments to support them). This approach conceptually contradicts Ukraine's plans to achieve climate neutrality and the need for a global phase-out of fossil fuels with priority use of financial resources for energy efficiency and RES development.

3. POLICIES AND MEASURES

3.1 Decarbonisation dimension

3.1.1. GHG emissions and absorption

This section envisages a number of policies and measures to reduce emissions in a number of sectors (n.d.: transport, agriculture, waste), but does not specify policies and measures to rebuild infrastructure affected by Russian aggression.
According to studies, the reconstruction of civilian infrastructure could result in additional emissions of 54.7 million tons of CO2 eq. and will become one of the largest sources of greenhouse gas emissions as a result of the Russian war. The draft mentions building back better (p. 299) and providing support to citizens (whose homes were destroyed as a result of hostilities) for the construction of residential buildings with near-zero energy consumption (p. 118). However, such references are rather ad hoc and do not form a comprehensive approach to low-carbon reconstruction.

PM_D_WAM_03 National Greenhouse Gas Emissions Trading System

The use of the phrase "Donbas" should be amended. In the text "According to preliminary estimates of the Ministry of Environment, the number of such installations decreased by 40% [A4] as a result of the destruction of industrial facilities in Donbas and other regions of Ukraine by Russian invaders." the word "Donbas" should be changed to "in the territories of Donetsk and Luhansk regions", as the word "Donbas" is not terminologically correct.

Policies and measures to reduce GHG emissions in agriculture

Within the NECP, the authors envisage the implementation of a number of policies and measures to stimulate the reduction of GHG emissions in the agricultural sector, in particular:

- PM_D_WAM_05 Promoting the use of minimum tillage technologies
- PM_D_WAM_06 Promotion of organic crop production
- PM_D_WAM_07 Use of nitrogen fertilisers with slow or controlled release of nutrients
- PM_D_WAM_08 Use of information and telecommunication technologies in crop production
- PM_D_WAM_09 Use of food additives that will reduce GHG emissions from intestinal fermentation of farm animals

Below, we would like to draw your attention to the caveats and suggestions for improvement:

1. Regarding PM_D_WAM_05 Promoting the use of minimum tillage technologies

This technology is considered to be better than traditional ploughing. However, it also raises concerns due to the likely increase in the use of pesticides and other pest control agents, which will affect emissions and, consequently, product quality. In addition, there are other technologies that may be more environmentally friendly and contribute to emissions reductions, such as regenerative agriculture.

Therefore, we propose to expand this list of technologies, in particular, "Promoting the spread of regenerative agriculture technologies, minimum or strip tillage"

2. Regarding PM_D_WAM_06 Promotion of organic crop production

In this case, we would like to draw attention to the importance of expanding the development of organic crop and livestock production. Therefore, we propose to expand the measure "Promotion of organic agriculture" to include both crop and livestock production.

3. Regarding PM_D_WAM_07 Use of nitrogen fertilisers with slow or controlled release of nutrients

According to the European Green Deal, as well as the EU Nitrate Directive, it is an important issue to reduce nutrient losses in agriculture, which mainly depends on the application and storage of fertilisers (both chemical and organic). In this case, the proposed measure is a rather pointed one that does not take into account the entire process of storage, transportation, and application of fertilisers. Therefore, it is important to expand this measure to include a more comprehensive approach to the issue, in particular, "Promoting the efficiency of fertiliser use to reduce nutrient losses and environmental pollution." This measure should focus not only on the use of nitrogen fertilisers with a slow or controlled release of nutrients, but also on measures such as promoting agrochemical soil analysis, fertiliser scheduling, providing storage space for fertilisers that does not cause nutrient losses, etc.

4. Regarding PM_D_WAM_09 Use of food additives that will reduce GHG emissions from intestinal fermentation of farm animals

As part of the work on livestock, we would like to draw attention to additional measures that should be included in the measures to reduce GHG emissions in the agricultural sector:

- The measure "Implementation of the best technologies and practices for manure storage to prevent nutrient losses and their release into the environment"
    - In this case, we understand that one of the vulnerable issues in Ukrainian livestock farming is the storage of manure (animal by-products). Therefore, manure can often be stored without properly equipped sites, which leads to both environmental pollution and greenhouse gas emissions.
- The measure "Promoting gradual changes in consumer behaviour"
    - One of the most important steps to reduce GHG emissions in the agricultural sector is to change consumer behaviour. This should be accompanied by a systemic policy of promoting organic products, products grown using environmentally friendly technologies, and plant-based nutrition.

In the Figure 4.2. Total GHG emissions from agriculture in Ukraine in 1990-2022, thousand tons of CO2-eq, it is indicated that N2O is one of the largest greenhouse gases from agriculture. According to the information on p. 230 of the NECP, the source of N2O is the application (and, accordingly, their storage), leaching of fertilisers, and cultivation of soils, so the issue of increasing the efficiency of fertiliser use and storage is important for reducing GHGs.

Policies and measures to reduce GHG emissions in the LULUCF sector

The LULUCF sector plays a key role in achieving climate neutrality through the potential of carbon dioxide absorption and carbon storage by natural ecosystems, biomass and soils. According to the methodology for calculating greenhouse gas emissions from LULUCF adopted by the UNFCCC, there are 6 categories of land use that fall into this sector: forest land, cropland, steppe and grassland, wetlands, settlements, and

other land. Accordingly, **plans in this sector should include not only measures in the forestry sector,** but also measures aimed at preserving existing natural carbon stocks (in soils and ecosystems), increasing carbon stocks through ecosystem restoration, soil protection measures, restoration of degraded lands, implementation of sustainable agricultural practices, etc.

Currently, in the forestry sector, the draft Action Plan for the implementation of the NDC provides for planning measures to restore forests damaged and destroyed as a result of the armed aggression of the Russian Federation, reforestation to increase the forest area by 1 million hectares by 2030, the use of forestry methods close to nature, etc. It is necessary to enshrine in the NECP that when carrying out works to increase the forest area by 1 million hectares by 2030, priority should be given to the inclusion of existing self-forested areas on agricultural land in the forest fund, and reforestation by planting forest crops should be carried out using only native species that are climate-resistant for a particular region, with the prohibition of the use of invasive tree species and reforestation of valuable non-forest ecosystems (steppe, meadow and marsh).

In order to **preserve existing natural carbon stocks and support the future carbon storage capacity of ecosystems, it is necessary to protect the most valuable natural areas.** Ukraine needs to accelerate the pace of creation of nature reserve areas, as well as increase the area and legislate the status of the Emerald Network. Currently, the share of protected areas is only 6.9% of Ukraine's territory and should be increased to at least 30% by 2030 in accordance with international obligations (Kunming-Montreal Global Biodiversity Framework Agreement) and in line with the goals of the European Green Deal. These measures are important within the LULUCF sector, as they are in line with the commitments of countries under the United Nations Framework Convention on Climate Change and the Paris Agreement to protect and sustainably use "all greenhouse gas sinks and reservoirs [...] including biomass, forests, oceans and terrestrial, coastal and marine ecosystems [...]".

It should be noted that there is no data for the LULUCF sector in Section 4 (Current situation and projections based on existing policies and measures) and Section 5 (Impact assessment of planned policies and measures). **The presented draft NECP also does not contain modelling data for the LULUCF sector under the WEM and WAM scenarios. We hope that this is a technical issue at this stage and that these parts will be presented in the near future, although currently, in Sections 4 and 5, there is not even a mention of "[To be planned in the next stages of work on the NECP]" for the sector, similar to other parts that are not yet available in the draft.**

In Section 4, for the Agriculture sector, the Agricultural Soils category has the worst performance and reflects the growth of greenhouse gas emissions since 1990 (see Table 4.7. "Dynamics of contribution of agricultural activity categories to greenhouse gas emissions, %"). In addition, both the WEM scenario (see Table "Main results of modelling in the field of GHG emissions in Ukraine under the WEM scenario") and the WAM scenario (see Table 5.1. "Main results of modelling GHG emissions in Ukraine under the WAM scenario") for the Agriculture sector instead of reducing emissions from this sector contains forecasts that predict an increase in emissions by the middle of the century. That is, instead of contributing to an increase in carbon sequestration, the sector causes an increase in emissions, in particular due to changes in land use and an increase in the amount of arable land from pastures, steppes, water protection zones, etc. One of the measures to reduce soil degradation and thus greenhouse gas emissions is the Order of the Cabinet of Ministers of Ukraine "On Approval of the Concept of the National Targeted Program for Land Use and Protection". According to this Concept, the expected results are:

- reduce agricultural development (by 5%) and ploughed land (by 10%);
- optimise the structure of the agricultural landscape;

- increase the productivity of agricultural land (by 40-50%) through the rational use of organic, organo-mineral and mineral fertilisers and chemical meliorants on acidic and saline soils;
- increase the area of land with natural landscapes to a level sufficient to preserve landscape and biological diversity (up to 10.5% of the total area of the country);
- to conserve degraded, unproductive and technologically contaminated lands;
- and other measures.

Annex 2 to the NECP "Assumptions on the main parameters of agricultural development" stipulates that the area of arable land from which crops will be harvested will grow until 2050. Such calculations completely contradict the state's declared goals to reduce the area of arable land by removing slopes, water protection zones, erosion-prone and other lands not suitable for plowing from their composition. In particular, such goals are enshrined in the National Action Plan to Combat Land Degradation and Desertification, and the aforementioned Concept of the National Target Program for Land Use and Protection, Decision of the National Security and Defense Council of Ukraine No. 111 of 23.03.2021 "On Challenges and Threats to the National Security of Ukraine in the Environmental Sphere and Priority Measures to Neutralize Them", Order of the Ministry of Agrarian Policy of Ukraine of 20.08.2003 No. 280 "On Approval of the Concept of Sustainable Development of Agroecosystems in Ukraine for the Period up to 2025".

Therefore, we ask you to take into account the relevant legislative provisions and recalculate the forecasts for the dynamics of arable land, taking into account the need to exclude slopes, water protection zones, erosion-prone and degraded lands from their composition.

Accordingly, measures to reduce GHG emissions in the LULUCF sector should also be in line with the measures set out in this Concept of the National Target Program for Land Use and Protection, in particular:

- The measure "Promoting the conservation of degraded lands"
- The measure "Promoting the increase in the area of territories and objects of the nature reserve fund and other protected areas"
- The measure "Refusal to transfer land plots rich in soil carbon, namely peatlands, steppes and meadows, to other forms of land use, except when such transfer is carried out in case of public need and in the absence of other territorial alternatives."

3.1.3. Other measurement elements

PM_D_WAM_20 State Target Program for the Just Transition of Ukraine's Coal Regions for the Period up to 2030

In addition, it is important that the already set phase-out dates (such as the phase-out of coal by 2035) are made possible by a number of measures and not dependent on circumstances such as the end of the war. Energy transition measures should be accompanied by programs to create new "green" jobs, training, retraining and professional development, and hiring workers from industries that will lose their relevance.

For a gradual coal phase-out and just transition, it is important to provide concrete and consistent measures:

- Coordinating national just transition policies with local and/or regional just transition strategies/plans, it is important to determine how these policies will be aligned.

- Measures/programs should be envisaged to restore coal mining areas and flooded mines.
- For effective planning of just transition and reconstruction of coal communities, it is important to have a program of measures for reforming the coal industry and an action plan for the phased closure of mines.
- The development of the State Targeted Program for Just Transition should also include measures differentiated according to the consequences of the war and taking into account the territorial aspect, to enable the development and implementation of the Program regardless of the military situation and access to the territories to be transformed.

3.3 Energy security dimension

The Energy Security dimension, which covers the expansion of installed NPP capacities and the actual production of fuel assemblies, requires careful consideration of potential risks and challenges:

- **High cost and long construction time:** The construction of new nuclear power plants is a very expensive and time-consuming process. This means significant capital investment and a long period during which the invested funds do not generate income. In comparison, renewable energy projects can be implemented faster and with lower upfront costs, and will mostly be privately owned and not require significant investments from the state, as is the case with nuclear power.
- **Safety**: The expansion of nuclear capacity and domestic fuel production require enhanced nuclear security measures. Given the experience of a full-scale Russian invasion, these risks require additional security measures and risk minimisation strategies.
- **Environmental risks**: Uranium ore mining and processing has a significant environmental impact, including radiation contamination and destruction of natural landscapes. The development of nuclear power increases the amount of radioactive waste. Long-term plans are needed for the safe storage and disposal of this waste, as well as strategies to minimise its impact on the environment.
- **Dependence on technological partnerships:** Plans to produce fuel cassettes using Westinghouse technology and develop in-house technologies reduce dependence on a single supplier, but create new dependence on specific technologies and foreign partners. Additional diversification of sources is needed in addition to not cooperating with Rosatom.
- **Economic viability:** In order to justify the economic viability of investments in uranium production, a comprehensive analysis should be conducted, including an assessment of all possible costs, potential revenues, risks, and a comparative analysis with alternative power generation options, including the use of renewable energy sources. This includes an analysis of the cost of generating electricity from solar, wind and other sources, taking into account the downward trend in the cost of renewable energy technologies. It is also important to take into account the risks associated with the project, such as construction delays, cost increases, changes in the regulatory environment, technological risks, and risks of reduced demand for uranium.
- **Decommissioning.** Fifteen nuclear power units with VVER reactors are operating in Ukraine. All of them were designed, and most of them were built, in Soviet times. Currently, the design lifetime has expired for 13 out of 15 nuclear power units. Despite the fact that during 2011-2023, a number of units received licenses to continue operating for an additional 10-20 years, they will eventually all have to be shut down in the future. Shutting down and safe decommissioning of nuclear power plants requires significant funds that must be accumulated over the lifetime operation of the plants. Therefore, the issue of preparing for the safe decommissioning of Ukraine's operating NPPs, in particular, in terms of accumulating a sufficient financial reserve for

dismantling the plants and disposing of all radioactive waste, is becoming increasingly important. However, over 12 years, UAH 3,525.668 million has been accumulated (as of the end of 2017). However, this amount is not enough to decommission even one nuclear power unit.

3.5. Dimension "Research, Innovation and Competitiveness"

PM_RIC_WEM_01 Modernisation of educational programs to cover the skills gap in the field of green transition and renewable energy

Post-war green reconstruction and closing the "skills gap" should be carried out in close cooperation with the Ministry of Environmental Protection and Natural Resources of Ukraine, and its positioning as one of the main stakeholders in the process. Close cooperation cannot be limited to the involvement of the Ministry of Energy, the Ministry of Education and Science, and the Ministry of Digital Transformation, as this approach will not ensure proper comprehensive and cross-sectoral changes.

SECTION B. ANALYTICAL FRAMEWORK

4. CURRENT SITUATION AND FORECASTS, TAKING INTO ACCOUNT EXISTING POLICIES AND ACTIVITIES

4.2 Decarbonisation dimension

4.2.1. GHG emissions and absorption

GHG emissions in agriculture

This section states that "The full-scale invasion of Russia, which began on February 24, 2022, led to significant changes in the agricultural sector, in particular, a decrease in the number of farm animals, and a change in the ratio of manure management systems. **Please note that the reduction in the number of farm animals did not occur for all types of animals, in particular, the number of poultry increased. It is also unclear what is meant by "the ratio of manure management systems has changed", so please clarify this issue in the process of finalisation.**

ii. Forecast of sectoral changes, taking into account existing national and allied policies and measures until 2050 (including 2030)

Greenhouse gas emissions in the Agriculture sector (p. 236)

This section states that "the WEM scenario, which is based on the current (limited) level of implementation of existing legislation, which implies a significant delay between policy formulation, adoption and implementation, will *provide a slight increase in greenhouse gas emissions.* Compared to the base year of 1990, the projected greenhouse gas emissions in 2030, 2040 and 2050 will be *50.9, 56.4 and 60.9%,* respectively."

This approach is not ambitious and does not contribute to reducing GHG emissions. In particular, according to Figure 4.4. Forecast of emissions from agricultural activities in Ukraine under the WEM scenario, thousand tons of CO2-eq, emissions from agricultural soils are expected to be even higher in 2050 than in 2020. Accordingly, it is necessary to take into account the additional measures we proposed above to actually reduce emissions. Also, the Agriculture sector is closely related to the LULUCF sector, with agricultural land being one of the largest contributors to GHG emissions. Accordingly, it is necessary to implement mandatory measures to conserve degraded land and increase protected areas.

Therefore, we draw your attention to the importance of including additional measures for real emission reductions in agricultural land, recalculating the scenario and emission projections.

5. EVALUATING THE IMPACT OF PLANNED POLICIES AND MEASURES

Greenhouse gas emissions in the Agriculture sector

Accordingly, Figure 5.2. Forecast of emissions from agricultural activities in Ukraine under the WAM scenario, thousand tons of CO2-eq, the situation with emissions from agricultural soils is also not reduced, and accordingly, in 2050, the volume of emissions will correspond to the level of 2021.

Therefore, more measures to reduce GHG emissions from agricultural soils should be taken into account within the emission reduction measures described above in Section 3. We have proposed relevant measures in the Agriculture and LULUCF policies and measures that should be taken into account.