



Economic Commission for Europe**Committee on Sustainable Energy****Group of Experts on Coal Mine Methane and Just Transition****Eighteenth session**

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Report on implementation of the work plan for 2022-2023**Energy sector in Ukraine: challenges, current situation, perspectives for the future - Identifying opportunities for the involvement of the Group of Experts on Coal Mine Methane and Just Transition****Note by the Secretariat****I. Introduction**

1. The ongoing war has adversely impacted Ukraine's capacity to deliver on the low carbon transition. Nevertheless, the country remains dedicated to modernizing and decarbonizing its energy sector in accordance with the principles of just transition.
2. The post-war Ukraine reconstruction process should be driven by the concept of "rebuild better". Therefore, as many as possible of the country's destroyed or damaged carbon-intensive energy production facilities should be replaced by infrastructure compatible with the requirements of the green economy.
3. The Ukrainian energy sector subject to a post-war reset and reorientation of fundamental premises and objectives is likely to experience a significant systemic change resulting in the loss of many jobs linked to conventional energy production and the creation of others in the domain of clean energy.
4. Such a shift will have an enormous impact on the social strata, the wellbeing of which over the last decades has been associated with the existence and prosperity of legacy industries.
5. To ensure social acceptance of the transition and fairness of the process and its outcome, which are necessary for assuring the sustainability of the proposed environmentally oriented reconstruction strategies, policies focused on alleviating the expected social shocks and providing protective measures for the affected communities must be developed in an inclusive manner and implemented gradually as the transition progresses.
6. In that context, in 2022, the State Commission of Ukraine on Mineral Resources requested the United Nations Economic Commission for Europe (ECE) to develop a study assessing the state of the Ukrainian energy sector before the outbreak of the hostilities, briefly summarizing war damages to the country's energy infrastructure, and identifying the most

appropriate ways to reconstruct the Ukrainian energy sector in accordance with the principles of green economy and just transition.

7. This document summarizes a draft of the study, so that members of the Group of Experts on Coal Mine Methane and Just Transition can familiarize themselves with its content and provide their feedback during the eighteenth session of the Group, serving as guidance for the authors while finalizing the text.

II. The scope and the purpose of the study

8. The goal of the report is to evaluate the pre-war and the current situation of the energy sector in Ukraine, as well as the possible pathways for its development in the future, giving special attention to the social aspects of the process.

III. Actors involved

9. To deliver the requested task, an international consultant was hired by ECE to provide technical expertise, analyse the situation in the country, and draft the document.¹

10. The work of the consultant was monitored, supervised, guided, and assessed by the ECE Secretariat and the Bureau of the Group of Experts on Coal Mine Methane and Just Transition.

IV. Methodology

11. The document was prepared based on a thorough literature review, including analysis of the relevant official Governmental documents and strategies, as well as on information gathered by the consultant during fact-finding missions to different parts of Ukraine.

V. Overview of the final study

A. General overview of the pre-war and the current situation of the energy sector in Ukraine

12. The document analyses the pre-war condition of the energy sector in Ukraine and concludes that it was characterized by:

- (a) a significant level of import dependence;
- (b) a high degree of regulation and a lack of market pricing mechanisms;
- (c) monopolization of certain segments, determining the format of market interaction;
- (d) significant underfunding and a high level of assets depreciation and deferred maintenance;
- (e) a very high level of energy intensity and a low level of efficiency in the use of energy resources;
- (f) a serious negative impact on the natural environment.

13. The study presents the official pre-war plans for the future development of the energy sector. It analyses the *National Emissions Reduction Plan* that was sent for approval by the Energy Community on 31 December 2015, the *Concept of the State target program for the fair transformation of the coal regions of Ukraine until 2030* approved by the Government

¹ Mr. Andriy Shulga

on 22 September 2021, as well as two Governmental strategies for the sector in question until 2030 and 2035, respectively.

14. The document also highlights that the energy infrastructure has been among the primary targets during the ongoing war. It describes the damage caused to the energy facilities, disaggregating the results by the fuel type that the destroyed infrastructure was associated with.²

B. Social problems related to the transition of the Ukrainian energy sector

15. The document focuses on the social challenges that Ukraine will have to address when transforming its energy sector. Since reconstruction of the sector is likely to involve the replacement of the large part of the carbon-intensive energy production facilities with infrastructure compatible with the requirements of the green economy, the Ukrainian energy sector will have to undergo a systemic change heavily impacting the workforce of the legacy industries, as well as the regions the wellbeing of which had until recently been dependent on the prosperity of those industries.

16. The document focusses on the coal mining regions.

1. General overview of the coal mining regions

17. Many Ukrainian regions are characterized by narrow specialization of their economies. They are often built around industrial complexes utilizing outdated, resource- and labour-intensive technologies. The workforce for such complexes is provided by the nearby population centres the fate of which has been determined by the operations of the city-forming industrial enterprises. The latter provide, directly or indirectly, the great majority of the local jobs as well as the municipal revenues necessary for the functioning of the community.

18. The above-mentioned characteristic is typical of the Ukrainian coal mining regions.

19. The state-owned coal enterprises are unprofitable and dependent on Government subsidies. At the same time, the low level of diversification of the local economy significantly undermines their investment attractiveness. Consequently, they face multiple challenges, such as the low quality and high tariffs of housing and communal services, poor condition of the local transport infrastructure, lack of places for cultural recreation and leisure, social tension among the already dissatisfied population, which is additionally threatened by further deterioration of the quality of life expected after the anticipated closure of the local coal enterprises, etc.

20. These problems are aggravated by the unsatisfactory environmental conditions related to mining activities, which are manifested by air and water pollution, presence of mining waste piles (many of which are smouldering with burning coal), increased background radiation, etc.

21. As a result, the demographic situation of the mining regions has becoming gradually more complicated, as their population continues to decrease due to migration of people, in particular the youth, to other parts of the country which offer greater career opportunities and a better standard of living.

2. Available jobs

22. Retirees can rely on pension programmes. The staff of coal enterprises that are not directly involved in the process of extraction such as accountants, mechanics, electricians, or drivers, given the demand for their skills in other sectors of the economy, have job

² The main objective of the document is to identify the social issues that Ukraine will face during reconstruction. To find more information on the damage inflicted by the war, please refer to the assessment being undertaken by the World Bank and the United Nations Development Programme (see e.g., <https://reliefweb.int/attachments/ef17d900-2057-4094-9c37-3f4ff0b0b93b/EN%20full.pdf>)

opportunities not requiring immediate retraining. At the same time, in the event of mine closure the other mining personnel are fully exposed to the risks of prolonged unemployment and loss of income.

23. What further complicate the issue is the fact that miners tend to earn higher wages than employees performing similar jobs outside the coal industry. As a result, offering them an alternative job that would match their already possessed skills and satisfy their financial expectations is a very difficult task.

3. Housing

24. Since housing in the coal mining regions of Ukraine has been typically subsidized by the employers, closure of the coal enterprises leads to serious problems for the occupants of those dwellings. Not only are they deprived of the income that they used to receive from the coal company, they also have to pay higher rents as their ex-employer no longer contributes to covering such charges.

25. A similar problem is encountered by the municipalities. The lack of possibility to continue to rely on the enterprise that has traditionally provided not only a significant share of the local revenues but also a number of crucial communal services, such as transport, housing subsidies, etc., has a significant impact on local authorities, on which those obligations were suddenly transferred, and which need to deliver on them with much smaller resources. As a rule, that typically leads to closing of schools, hospitals, boiler houses, clubs and other social institutions, which in turn significantly lowers the quality of living in those localities.³

26. Another problem is related to poor maintenance of the residential buildings and their exposure to the risks caused by post-mining hazards, such as unstable ground. Subsidence of the land and groundwater that flows from the mines into the subsided zones causing flooding of large areas, damage to buildings, infrastructural networks (such as water supply and sewage, heat and energy, etc.) and communication and transportation systems (roads and sidewalks).

27. All the above-mentioned problems negatively impact the market price of the local real estates, and thus limit the job-mobility of the affected population that becomes *de facto* economically "tied" to the deteriorating industrial cities.⁴ At the same time, those who can afford relocation, oftentimes choose that option, only exacerbating the already very difficult local situation by further diminishing both the local tax revenues and the pool of available skilled labour.

4. Non-economic factors

28. Miners tend to identify themselves with their occupation in general, and with the specific mine in which they work in particular. Therefore, in the case of mine closure they are not only faced with financial challenges, but also exposed to identity and self-value crises. Those in turn have been shown to lead to social problems such as alcohol and drug abuse, suicidal behaviour, violence, etc.

5. Gender issues

29. Coal mining enterprises consist not only of the miners and surface workers directly involved in the process of coal production, but also of the general staff that ensure the smooth operations of the company by providing other administrative services. The latter, as opposed to the former, is composed of both men and women.

30. Being traditionally a male-oriented occupation, coal mining is characterized by a number of gender-related problems that need to be addressed to ensure that the transition of

³ https://pdf.usaid.gov/pdf_docs/PA00XC8J.pdf

⁴ <https://r2p.org.ua/wp-content/uploads/2022/05/analitichnij-zvit-shhodo-doslidzhennya-procesu-dekarbonizaczi%D1%97-u-shidnij-ukra%D1%97ni-povna-versiya.pdf>

the sector is equally fair to all its employees. In coal mining enterprises women tend to earn less for a similar job and have lower chances to obtain managerial or leadership positions.

31. The traditional, patriarchal, model of a family has been preserved by a large part of the Ukrainian society. Typically, in the very male-centered coal mining households the caring work usually rests on women, thus seriously challenging their career-building opportunities.

32. As a result of the above, the coal mining regions are characterized by a problem of feminization of poverty, which is particularly relevant for single mothers and elderly women.

6. Issues related to children and youth

33. The identity and self-value crises already mentioned in subsection (iv), are also experienced by children and youth. The teenage period is a key moment in the process of forming people's self-esteem. At that time the parental influence tends to decrease, while the need for approval of peers, as well as the sense of competition with them increases. In that context, the importance of material situation is oftentimes exaggerated by the youth as a valuation factor. As a result, teenagers who have no access to the resources that they deem necessary for building their social status, frequently feel anxiety, frustration, and discontent, which might lead to either apathy, or to aggressive anti-social behaviour. That problem is very present in the coal mining regions, where the economy is in decline, parental authority is undermined due to self-value crises experienced by the laid-off fathers, and perspectives for the future are plagued with the sense of uncertainty that reigns over the entire community.

34. There is also a problem with child-labour, which the less economically fortunate families can resort to in order to increase their income. According to the results of the National Survey of Child Labour in Ukraine 2014–2015, at that time there were 264,100 children involved in child labour (of which 164,900 were boys and 99,200 were girls). Furthermore, 76,400 of them were employed in hazardous work (20,100 of them girls and 56,300 boys).⁵ A significant number of cases of child-labour were reported in private mines and pits in coal mining localities.

7. Environmental issues

35. Mining operations destabilize ecosystems and have an important negative impact of on the natural environment. As a result of excavation work, the local air quality deteriorates, the risk of subsidence of the earth's surface increases and large waste areas are created, not only polluting the surroundings, but also reducing land availability for other purposes (such as e.g., agriculture). Since most of the coal industry facilities in Ukraine have a 500-metre sanitary and protective zone, the opportunities for economic use of adjacent land plots are significantly limited.⁶

36. Coal mining's impact on the environment is also manifested in serious changes in the regime and state of surface and underground waters ensuing from flooding closed mines, infiltration of toxic substances into the soil through dumps and tailings, and the resulting contamination of groundwater drained by the local rivers.⁷

37. Another problem is the migration of mine gases to the surface, i.e., to the atmosphere, as well as man-made structures, which might follow closure of a mine if it is not properly sealed. The released gas not only pollutes soil and ambient air but might also accumulate in certain closed spaces thus creating the risk of suffocation and methane ignition.

38. Coal mining activities' harmful impact on the natural environment also negatively affects public health. In the Ukrainian coal mining regions, the public health costs incurred by the population of those localities are very high. According to estimates, the health of the residents of such regions in the Eastern part of the country is more than 70% determined by

⁵ <https://www.unicef.org/ukraine/media/14771/file>

⁶ <https://r2p.org.ua/wp-content/uploads/2022/05/analitichnij-zvit-shhodo-doslidzhennya-proczesu-dekarbonizaczi%D1%97-u-shidnij-ukra%D1%97ni-povna-versiya.pdf>

⁷ *Ibidem*

the state of the local natural environment. The world average scale of such impact ranges between only 20 and 30%.⁸

C. Impact of the war on provision of public services

39. Ukraine is experiencing the most difficult time in its modern history. The ongoing war has forced millions of people to flee their homes. As a result, territories of the regions where the battles did, do, or are likely to take place, have experienced a significant population outflow. That is the case of the mining regions in the Eastern parts of the country.

40. According to a survey conducted in the communities located in the war zone, due to physical danger which among other things has led to the closure of various local public offices, in 40% of them provision of certain crucial public services has been stopped.

41. Lack of such services, extensive outbound migration, and the decline in economic activity has led to a significant drop in tax revenues. The diminished income has been reported from both the personal income tax and the excise taxes. For the latter, the important factors are the zero rate on gas and its considerably decreased consumption resulting from the population outflow and the seriously reduced income of those who stayed.

42. Since the local authorities have fewer instruments to finance the deficit than the Government, they tend to respond to the growth of the deficit by reducing expenditures. The most common spending categories affected by the cuts are education, housing, general administrative expenses, capital expenditures for construction and modernization, and the salaries of public employees. As a result, the quality of life that, as discussed in the previous sections, was already relatively low, has deteriorated even further because of the war, which brought destruction, depopulation, and suspension of the key public services.

VI. Conclusions and recommendations

43. The reconstruction of the Ukrainian energy sector must not focus on simply rebuilding the pre-war facilities, but on constructing the new system and infrastructure based on technologies compatible with the requirements of the green economy.

44. The study recommends maximum decentralization of the Ukrainian energy capacities and its corresponding infrastructure. It advocates for prioritizing renewable energy sources (including hydrogen) and development of smart electricity distribution systems (smart grid).

45. Destruction of the former energy infrastructure, while extremely costly and regrettable, provides Ukraine with an opportunity to reorient its energy strategy and turn to fundamentally new technological solutions. Missing such a chance by dedicating an overly large share of the reconstruction funds and efforts to reestablishment of the old energy system and to restoration of the legacy, carbon-intensive, industries will in the near future make the country's energy sector vulnerable and render the local products characterized by the high carbon footprint uncompetitive on international markets.

46. The systemic change that the Ukrainian energy sector should go through in the aftermath of the war must be prepared and delivered in accordance with the principles of just transition, taking into account the opinions, ambitions, and capabilities of all stakeholders.

VII. Next steps

47. The Group of Experts on Coal Mine Methane and Just Transition stands ready to support Ukraine's efforts related to the reconstruction and modernization of its energy sector in accordance with the principles of just transition and green economy and welcomes any opportunity to cooperate with the Government and other local stakeholders on other projects addressing those matters.

⁸ *Ibidem*