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Cover: Tashlyk HPSPP, December 2017 Photo: Oleh Trybukh

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Tashlyk hydro pumped storage plant, Ukraine



n 12 May 2020, the European Investment Bank (EIB) announced that it is considering financing the completion of the Tashlyk hydro pumped storage plant (HPSP) project¹. The Ukrainian state-owned enterprise National Nuclear Energy Generating Company (Energoatom) is the Bank's financial intermediary for the project, which means that it will be the direct beneficiary of the EIB's loan, but will then lend the money to the final recipient, who will undertake the plant's construction. A recent study by Bankwatch and Counter Balance has demonstrated the EIB's insufficient control over the use of public funds, as well as its lack of transparency and assessment of the economic, environmental and social impacts in its intermediated operations². Therefore, it is important for third parties to carefully monitor this project, as it may be environmentally and socially harmful.

¹ 'Completion of Tashlyk HPSPP,' EIB, EIB projects to be financed, 12 May 2020.

² CEE Bankwatch Network, Can the EIB Become the EU Development Bank?, CEE Bankwatch Network, 37, November 2020.

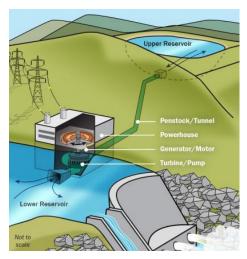


Image 1. Courtesy of The U.S. Office of Energy Efficiency & Renewable Energy

The Tashlyk HPSP project envisages six rotary generator/engine units, each generating 150 MW of electricity in motor mode and drawing 230 MW in pumping mode. Two of these units are currently functioning. In motor mode, water moves down through a turbine and in pumping mode, it recharges to the upper reservoir. The Tashlyk HPSP pumps water from the Oleksandrivske Reservoir (the lower reservoir, located on the Pivdennyi Buh River) to the upper Tashlyk Reservoir when electricity demand is low and in the opposite direction to generate electricity when demand rises. As regards the installed capacity, the Tashlyk HPSP should generate 906 MW, and it will consume 1,378 MW in pumping mode³.

Thus, the power plant will spend 35 per cent of the consumed electricity for its operation, while the integrated energy system losses will reach 308,6 million kWh a year⁴. The Tashlyk HPSP completion project that the EIB plans to finance would triple the plant's peak capacity⁵ and is expected to increase grid flexibility and security⁶. The project is also supposed to contribute to grid stability in southern Ukraine and facilitate integration into the European Network of Transmission System Operators for Electricity (ENTSO-E). However, because the plant was originally

developed in the Soviet era, it does not meet the requirements of the modern energy sector.

History of the project





Image 2. Puhach Rock before and after Tashlyk HPSP construction, 2007 demonstrating the rise in water level

Designed as part of the USSR's policy of nuclear industry expansion, the Tashlyk HPSP was intended to help cover the peak loads of the South Ukraine Nuclear Power Plant (NPP). Construction started in 1981 and came to a halt ten years later due to a moratorium placed as an emergency measure intended to stabilise the economy of Ukraine and overcome the economic crisis associated with the collapse of the USSR⁷. The government of Ukraine lifted the moratorium in 1996⁸. In 2002, the Cabinet of Ministers of Ukraine approved the construction of the Oleksandrivske and Tashlyk reservoirs and pressure

water mains⁹. However, it entailed the flooding of the land in the regional landscape park where the Oleksandrivske Reservoir is located. Based on the resolution of the Cabinet of Ministers of Ukraine¹⁰ of 20 June 2006, followed by the decision of Mykolayiv Regional Council¹¹, Energoatom received the park areas adjacent to the reservoirs for permanent use and raised the water level in the Oleksandrivske Reservoir to 16 metres above sea level¹². In 2006 and 2007, the

³ Cabinet of Ministers of Ukraine, Order, <u>Про затвердження проекту завершення будівництва Ташлицької ГАЕС</u>, по. 1036-р, 21 November 2007.

⁴ <u>Звіт з оцінки впливу на довкілля</u>, Energoatom, 18, 1 April 2021.

 $^{^{5}}$ Cabinet of Ministers of Ukraine, Order, <u>Про затвердження проекту завершення будівництва Ташлицької ГАЕС</u>, no. 1036-p, 21 November 2007.

⁶ Completion of Tashlyk HPSPP, EIB, EIB projects to be financed, 12 May 2020.

⁷ Cabinet of Ministers of Ukraine, Resolution, <u>Про перелік об'єктів, на будівництво яких запроваджується мораторій на період проведення надзвичайних заходів щодо стабілізації економіки України та виходу її з кризового стану, по. 258, 14 October 1991.</u>

⁸Cabinet of Ministers of Ukraine, Resolution, <u>Про внесення змін до Переліку об'єктів, на будівництво яких запроваджується мораторій на період проведення надзвичайних заходів щодо стабілізації економіки України та виходу її з кризового стану, no. 952, 14 August 1996.</u>

⁹Cabinet of Ministers of Ukraine, Order, <u>Про затвердження проекту завершення будівництва Ташлицької ГАЕС</u>, no. 342-p, 17 June 2002.

¹⁰Cabinet of Ministers of Ukraine, Resolution, Про надання земельних ділянок у постійне користування, no. 841, 20 June 2006.

¹¹ Mykolayiv Regional Council, Decision, <u>Про виключення земельних ділянок</u>, no. 10, 6 July 2006.

¹² Ukrainian Nature Conservation group, <u>'Українська природоохоронна група проти підняття рівня Олександрівського водосховища'</u>, UNCG newsroom, 25 March

Tashlyk HPSP commissioned two hydro units, with an installed capacity of 302 MW in generator mode and 433 MW in pumping mode¹³.

In 2006, the international charitable organisation Environment People Law appealed to the Prosecutor General's Office, alleging that the Cabinet of Ministers violated the procedure for allocating land used for nature protection. However, the Prosecutor General failed to conduct a proper investigation, as confirmed by the decision of the Lviv Administrative Court of Appeals in 2009¹⁴. Meanwhile the same organisation appealed to the court to declare the government's resolution invalid. Although in 2010 the court declared **the resolution illegal and annulled**¹⁵, Energoatom has not lowered the reservoir's water level. Quite the opposite, in 2015, the company announced its intention to increase the water level to 20.7 metres above sea level within the EIB-funded project 'Completion of Tashlyk HPSPP'¹⁶. Part of the South Ukraine NPP's cooling pond is planned to be fenced off and transferred to meet the needs of Tashlyk HPSP. To cool the reactors, Energoatom plans to build five spray pools, each consuming 67.5 m³ of water per second, resulting in the discharge of 10.59 million m³ of water from the cooling reservoir annually. These plans threaten the entire ecosystem of the Pivdennyi Buh River¹⁷.

Consequences of the project implementation

Negative social impact

An analysis of the potential economic, environmental and social aspects of the Tashlyk HPSP project has revealed several expected negative consequences.

The Pivdennyi Buh water area, where Tashlyk HPSP is situated, creates a **unique landscape:** a relatively narrow canyon with granite outcrops and numerous ledges, rapids and islands ¹⁸. The area attracts tourists with its breath-taking views and favourable conditions for water tourism and climbing. It has the potential to receive 382,200 tourists every summer ¹⁹, especially since the Buzkyi Gard, located in the area, is one of the Seven Natural Wonders of Ukraine ²⁰. The flooding expected from the increase in the reservoir's water level **will sink recreational tourism into decay**.

Disturbance of the water level

One of the project promoter Energoatom's arguments for the completion of Tashlyk HPSP is that increasing the water level to 20.7 metres above sea level will improve the water supply for households. However, the National Ecological Centre of Ukraine argues²¹ that this could instead cause the flooding of the surrounding area and an increase in irreversible water losses due to evaporation²². Considering that conditions are becoming more arid in this part of the country, this may influence the overall **water balance**, affecting more than 180,000 local people living in the area of influence of the hydraulic structures.

¹³ "Tashlyk Pumped Storage Plant", South-Ukraine Nuclear Power Plant, accessed 15 November 2020.

¹⁴ Lviv Administrative Court of Appeal, Order, case no. 22a-10962/08/9104, 9 November 2009.

¹⁵ District Administrative Court of Kyiv, Resolution, <u>On declaring illegal and revoking the Resolution no. 841 of 20.6.2006</u>, case no. 2a-9770/10/2670, 9 November 2010. See also: Odesa Administrative Court of Appeal, Order, <u>On declaring illegal and revoking the decision of the Mykolayiv Regional Council of 6.7.2006</u>, case no. 2-a-5-615/07/1423, 6 November 2012.

¹⁶ South-Ukraine Nuclear Power Plant, Заява про наміри підвищення нормального підпірного рівня (НПР) Олександрівського водосховища на р. Південний Буг до позначки +20,7 м в рамках реалізації проекту "Завершення будівництва Ташлицької ГАЕС", 2015.

¹⁷ Зауваження та пропозиції громадськості щодо запланованих заходів (завершення будівництва ГАЕС Ташлик у складі гідроагретатів 3-6 з поступовим підвищенням нормального підпірного рівня Олександрівського водосховища на Південному Бузі до позначки +20,7 м), Unified Environmental Impact Assessment Register, 9, 2018.

¹⁸ "National Nature Park Buzk's Gard," Official Park Site, accessed 1 December 2020.

¹⁹ Bandura, I., Poletaeva, L., Екологічно орієнтовані форми рекреаційнотуристичної діяльності на прикладі парку "Бузький Гард", 5, 2018.

²⁰ 'Seven Natural Wonders of Ukraine', Seven Wonders of Ukraine, All Nominations, accessed 1 December 2020.

²¹ Зауваження та пропозиції громадськості щодо запланованих заходів, Unified Environmental Impact Assessment Register, 2018.

²² The Oleksandrivske Reservoir area is characterised by high humidity, which, combined with high temperatures and low wind speeds, can adversely affect the conditions of water cooling.

Nature reserve flooding



Image 3. Dianthus hypanicus Andrz., protected by the Bern Convention Appendix 1

Land that is part of the Granitno-Stepove Pobuzhzhya Regional Landscape Park and the Buzkyi Gard National Nature Park would be subject to increased flooding due to the raised water level in the Oleksandrivske Reservoir at Tashlyk HPSP. These parks contain rich biodiversity and endemic flora species and have a unique geological history and microclimate features. The Law of Ukraine 'On Nature Reserve Fund' prohibits any activity that adversely affects or may adversely affect the condition of natural and historical-cultural complexes and objects or prevents their use for their intended purpose. The Tashlyk HPSP completion will violate this rule.

Part of this territory (6,148 hectares) has belonged to the **Emerald Network site** Buzkyi Gard National Nature Park (UA0000040) since 2016

and is protected by the Convention on the Conservation of European Wildlife and Natural Habitats (the **Bern Convention**)²³. The Bern Convention prohibits habitat destruction, which may happen in the course of the completion of Tashlyk HPSP and could threaten or cause the extinction of species important for biodiversity, e.g. *Lutra lutra*; bird species as *Ixobrychus minutus*, *Circus aeruginosus*, *Hieraaetus pennatus*, *Alcedo atthis*; and the habitats for the endemic plant species *Moehringia hypanica*, *Gymnospermium odessanum* and *Dianthus hypanicus*.



Image 4. Lacerta viridis (Laurenti, 1768), protected by the Bern Convention Appendix 2

Energoatom promises to compensate for the ecological damage²⁴. Nevertheless, compensation will in no way be able to save the rare biological ecosystems in these areas.

Twilight of cultural heritage

The **historical landscape** of Buho-Gardivska Palanka, the historical centre of the administrative area of the Zaporizhzhya Army (1734-1775), is a cultural monument of national importance, protected by law (protection no. 140001-H)²⁵. Many historical artefacts preserved there provide evidence of the location and life of the Cossacks who lived in these areas. The increase of the Tashlyk HPSP reservoir's water level will flood the heart of the historical site, Gard Island. This area is also of great archaeological value due to the Neolithic monuments located there.

In view of the impacts mentioned above, Tashlyk HPSP violates the following laws: the Laws of Ukraine *On Cultural Heritage, On Archaeological Heritage, On Nature Reserve Fund, On Biodiversity Protection* and *On the Red Book of Ukraine*; relevant articles of the *Land Code*, the *Code of Administrative Offenses* and the *Criminal Code of Ukraine*; and international conventions, e.g. the *UNESCO Convention Concerning the Protection of the World Cultural and Natural Heritage* (1972, ratified by Ukraine in 1988), *Convention on Biological Diversity* (1992, ratified in 1994), *Bern Convention* (1979, Ukraine acceded in 1996), *Bonn Convention* (1979, Ukraine acceded in 1999), *Washington Convention* (1965, ratified by Ukraine in 2000) and *European Landscape Convention* (ratified in 2005).

²³ Standing Committee of the Bern Convention on the Conservation of European Wildlife and Natural Habitats, <u>Updated list of officially adopted</u> Emerald sites, <u>December</u> 2019.

²⁴ Інформаційно-аналітичний огляд матеріалів оцінки впливу на навколишнє середовище (нетехнічний зміст) щодо підвищення рівня Ольксандрівського водосховища до проектної позначки 20,7 м, South-Ukraine Nuclear Power Plant, 30 October 2017.

²⁵ Cabinet of Ministers of Ukraine, Resolution, Про занесення об'єктів культурної спадщини національного значення до Державного реєстру нерухомих пам'яток України, по. 928, 3 September 2009.



Image 5. View of the settlement of the Sabatyn culture of the late Bronze Age, Vineyard, 2006. It is partially flooded now.

Related proceedings

In 2010, the administrative court of Ukraine declared illegal and cancelled the resolution made by the Cabinet of Ministers of Ukraine on 20 June 2006 which provided land plots for Energoatom's permanent use to accommodate the outlet area of the Oleksandrivske Reservoir²⁶. Following this decision, Energoatom partially flooded the Granitno-Stepove Pobuzhzhya Regional Landscape Park. This park belongs to the nature reserve fund, meaning that land there can only be provided for permanent use under a complicated procedure with the parliament's approval. In this case, Ukraine's parliament, the Verkhovna Rada, did not approve the requested allocation of 27.72 hectares of the Regional Landscape Park for permanent use by Energoatom, and the State Department of Ecology and Natural Resources in the Mykolaiv Region ultimately rejected the land management plans for land allocation. Considering the appeals of public organisations, in particular Environment People Law, the court overturned the decision in 2012²⁷.

Consequently, the **initial water level increase of the Oleksandrivske Reservoir was unlawful**, carried out despite the court proceedings ongoing at the time. Yet the South-Ukrainian NPP considered it impossible to reduce the water level, as it would threaten the functioning of Tashlyk HPSP²⁸.

There are also other proceedings ongoing in national and international mechanisms.

National courts

²⁶ District Administrative Court of Kyiv, Resolution, On declaring illegal and revoking the Resolution no. 841 of 20.6.2006, case no. 2a-9770/10/2670, 9 November 2010. See also: Odesa Administrative Court of Appeal, Order, On declaring illegal and revoking the decision of the Mykolayiv Regional Council of 6.7.2006, case no. 2-a-5-615/07/1423. 6 November 2012.

²⁷ District Administrative Court of Kyiv, Resolution, On declaring illegal and revoking the Resolution no. 841 of 20.6.2006., adjudicated by non-appealable judgement of the Supreme Court of Ukraine dated 29.5.2012 case no. 21-6a12, case no. 2a-9770/10/2670, 9 November 2010.

²⁸ 'Environmentalists have recaptured reserved lands from nuclear engineers, but it is impossible to fulfill the court ruling', The Nature in Ukraine, 6 August 2012.

In 2017, the National Ecological Centre of Ukraine filed a lawsuit to declare the country's Hydropower Development Programme invalid.²⁹ It is currently pending before the Court of Cassation³⁰. Because the need to increase the capacity of the existing site reservoirs is based on this Programme, the Court's decision may influence the implementation of the Tashlyk HPSP project.

International proceedings

The Secretariat of the Bern Convention is processing another **complaint**³¹ in which the Ukrainian Nature Conservation Group said that the project violates Articles 2, 3, 4, 5, 6, 7 and 10 of the Bern Convention³². The territory affected by the project (254 hectares in the Pivdennyi Buh River Valley, including natural landscapes) is important for 12 plant species and 25 animal species listed on national and international red lists and in conventions, such as the Red Data Book of Ukraine, European Red List, IUCN Red List and Bern Convention. This proceeding is also relevant for the environmental impact assessment which is currently under the Cabinet of Ministers appraisal and will influence the HPSP's completion.

Pumped storage plants part of a dubious strategy

In August 2017, the Cabinet of Ministers of Ukraine approved the *Energy Strategy through* 2035³³. The document suggests that the pumped storage plant should act as a balancing capacity for the nuclear baseload. The Strategy raises many concerns, as it does not take radioactive waste management into account, overvalues the role of nuclear power engineering for which Ukraine still depends on Russia, and displays exceptionally low power effectiveness. The Strategy does not meet the objectives of Ukraine's *National Energy and Climate Plan* 2030³⁴ and *Green Energy Transition* 2050 *Concept*, which commit to reduce nuclear power generation to the level of 20 to 25 per cent³⁵ of total generated energy in Ukraine. Therefore, the Strategy should be reviewed³⁶ to ensure consistency with Ukraine's international energy obligations, notably the Paris Agreement, the EU Association Agreement (AA), the Energy Community Treaty and the Sustainable Development Goals (SDGs)³⁷.

Questionable profitability

In 2020, Energoatom suffered a loss of UAH 7.6 billion, according to the company's report³⁸. As the state has control over Energoatom, it uses the company's artificially low tariff as a means to lower the final electricity price for consumers. The other reason for the company's financial losses was the guaranteed buyer's³⁹ failure of timely and full payment for the supplied electricity⁴⁰. For comparison, in the first quarter of 2019, Energoatom had a profit of UAH 2.36 billion; throughout 2019 – a profit of UAH 3.8 billion, and in 2018 – a profit of UAH 4.6 billion⁴¹. Obviously, due to the lack

²⁹ Cabinet of Ministers of Ukraine, Order, Hydropower Development Program of Ukraine for the period up to 2026, no. 552-p, 13 July 2016.

³⁰ Administrative Court of Cassation of the Supreme Court, <u>Order</u>, case no. 826/1077/17, 24 October 2019.

³¹ Standing Committee of the Bern Convention on the Conservation of European Wildlife and Natural Habitats, <u>Register of Bern Convention</u> Complaints, 2020.

³² Standing Committee of the Bern Convention on the Conservation of European Wildlife and Natural Habitats, Complaint, <u>Presumed threat to Emerald site "Bugzkyi Gard National Nature Park" (UA0000040) (Ukraine)</u>, no. T-PVS/Files, 18 June 2020.

³³ Cabinet of Ministers of Ukraine, Resolution, Про схвалення Енергетичної стратетії України на період до 2035 року "Безпека, енергоефективність, конкурентоспроможність", no. 605-р., 18 August 2017.

³⁴ Stavchuk, Iryna, <u>Ukraine's Energy Strategy through 2035 may be revised to integrate National Energy and Climate Plan 2030</u>, Ministry of Energy and Coal Industry of Ukraine official website, 11 October 2019.

³⁵ Ministry of Energy and Environmental Protection of Ukraine, Презентовано проект Концепції «зеленого» енергетичного переходу України до 2050 року, Government portal, 21 January 2020.

³⁶ President of Ukraine, Decree, Про рішення Ради національної безпеки і оборони України від 2 грудня 2019 року "Про невідкладні заходи щодо забезпечення енергетичної безпеки, No. 874/2019, 2 December 2019.

³⁷ OECD, Monitoring of the Energy Strategy of Ukraine until 2035, OECD, 14, 20 February 2020.

³⁸ Energoatom, <u>Фінансова звітність НАЕК «Енергоатом» за 9 місяців 2020 року</u>. Energoatom official website, September 2019.

³⁹ The 'guaranteed buyer' is a state-owned company which buys the electricity under the feed-in tariff from renewable energy producers and then sells it on the market.

⁴⁰ Kosatka.Media, 'Energoatom filed a lawsuit against Guaranteed Buyer to recover UAH 3 billion', Kosatka.Media, 26 March 2020.

⁴¹ Energoatom, Фінансова звітність НАЕК «Енергоатом» за 9 місяців 2020 року, Energoatom official website, September 2019.

of funds, it will be difficult for Energoatom to repay the loan it plans to receive from the EIB for the Tashlyk HPSP completion project.

A number of studies show that nuclear sector measures may be cost-inefficient for meeting sustainability objectives⁴². Furthermore, the South-Ukraine NPP, which shares its site with Tashlyk HPSP, has operated beyond its service lifespan. The determined lifetime operation for the NPP's units 1, 2 and 3 expired in 2012, 2015 and 2019, respectively⁴³. The State Inspectorate for Nuclear Regulation of Ukraine licensed the units to operate for 10 years beyond their original design lifetime, but they may not get a license extension beyond that. Given that the Tashlyk HPSP is closely linked with the operation of the NPP, after the expiration of the nuclear power units' service life, the Tashlyk hydraulic units might no longer be needed. The EIB should consider this option when evaluating the profitability of the project. Given the company's debts, Energoatom is unlikely to repay the expensive bank loan.

Alternatives to the Tashlyk HPSP project

The project has alternatives which could solve the problems of peak loads in Ukraine's overall power network in a more efficient way from the economic, energy, ecological and strategic points of view. It is possible to implement a combination of demand response⁴⁴ measures to deal with this issue.

Demand response is a reduction in demand designed to reduce electricity usage at the critical peak load times or avoid system emergencies. For example, the utilities can use simple off-peak metering, making power cheaper during peak hours, and smart metering to communicate explicit requests or price changes to customers. Another opportunity for the customers is to install on-site solar panels and batteries that can cover customers' demands at certain times of the day. According to the findings of ENTSO-E, demand response can be a more cost-competitive alternative than adding generation capabilities to meet the peak and occasional demand spikes⁴⁵. Thus, developing demand response will be more beneficial to ensuring Ukraine's integration into ENTSO-E than will the completion of Tashlyk HPSP.

At the same time, Ukraine should decrease the unnecessarily high share of non-manoeuvrable nuclear capacity operating beyond its design lifetime in its energy production.

Modern electricity systems design emphasises a distributed energy system with smaller energy sources. The EIB continues to assert the need to increase power efficiency and to develop renewable energy sources; however, financing Tashlyk HPSP will delay the process of transforming the Ukrainian electricity sector to a modern, sustainable system and might contradict the new energy strategy that the Ukrainian government will propose in 2021.

⁴² OECD, Monitoring of the Energy Strategy of Ukraine until 2035, 31.

See also: Diachuk, O., Podolets, R., Yukhymets, R., Pekkoiev, V., Balyk, O., & Simonsen, M. B., <u>Long-term Modelling and Forecasting in Ukraine: Scenarios for the Action Plan of Energy Strategy of Ukraine until 2035</u>, 18, 2019.

⁴³ Life-time operation extension, South-Ukraine Nuclear Power Plant, Activities, accessed 15 November 2020.

⁴⁴ Savytskyi, Oleh, <u>Вперед у минуле. Чи потрібні Україні нові великі греблі,</u> *Ekonomichna Pravda*, 5 May 2017.

⁴⁵ ENTSO-E, Demand Side Response Policy Paper, ENTSO-E official website, 15 September 2014.

Recommendations

The completion of Tashlyk HPSP can negatively affect people and the environment and is associated with financial risks for investors and a delay of the energy transformation in Ukraine. National and international judicial proceedings on the project cast additional doubt over its future.

We recommend that the government of Ukraine remove massive, outdated HPSP projects from the list of priority projects for funding.

The EIB should drop its consideration of the project and make it clear to the government of Ukraine that it is instead looking forward to financing projects that will benefit the development of a modern and sustainable energy sector.