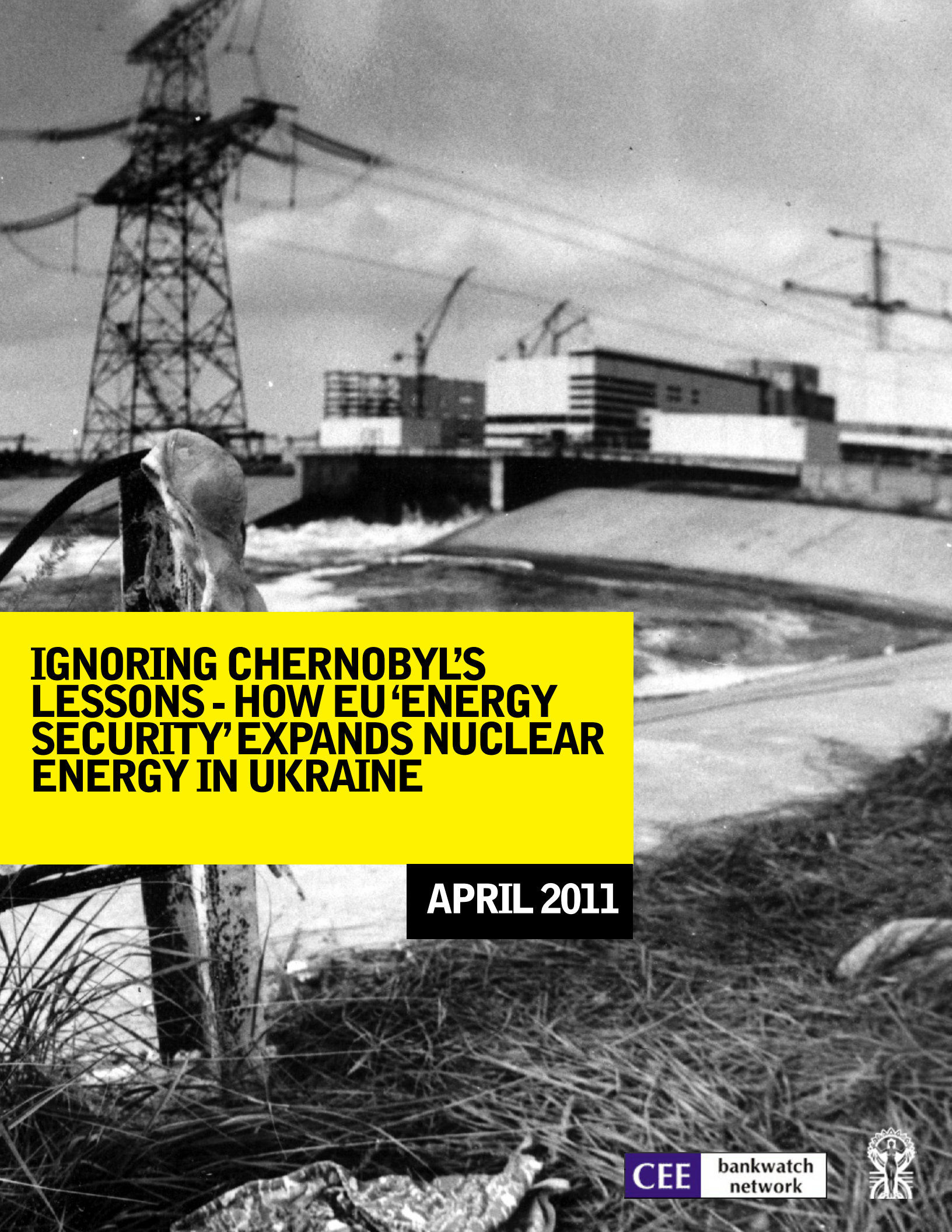

IGNORING CHERNOBYL'S LESSONS - HOW EU 'ENERGY SECURITY' EXPANDS NUCLEAR ENERGY IN UKRAINE

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CEE bankwatch network

INTRODUCTION

In 1986 Ukraine experienced the planet's worst nuclear disaster at Chernobyl. As the world marks the 25th anniversary this April, the social and environmental fallout from the disaster remains nowhere near resolved: the destroyed Reactor 4 is far from being environmentally safe, no suitable storage facility for spent nuclear fuel has been constructed, and the exclusion zone still remains contaminated. Cleanup efforts have proven to be deadly, extremely costly, and technically complicated in combating the consequences of the nuclear accident.

In a turn of tragic similarity, the world is now under a new nuclear threat caused by the earthquake and ensuing tsunami that paralysed Fukushima's nuclear facilities in Japan. It is against this backdrop that the plans of the Ukrainian government to construct 22 new nuclear reactors and extend the lifetime of the old Soviet-type reactors look absurdly detached from reality.

Even more surprising, however, is that the European Commission, the European Investment Bank (EIB) and the European Bank for Reconstruction and Development (EBRD) are indirectly supporting lifetime extensions of old Ukrainian nuclear reactors as a means to secure 'cheap' Ukrainian electricity exports to the EU Member States.

Although its policy restricts its activities to nuclear safety and decommissioning, the EBRD, together with the EIB, has already provided EUR 650 million in public money to support several transmission infrastructure projects to provide an outlet for electricity from Ukrainian nuclear power plants (NPPs). Last year two new projects were launched by the EBRD and backed with grants from the EU's Neighbourhood Investment Facility (NIF). These are the "second backbone" ultra high-voltage (UHV) corridor and the NPP safety upgrade project.

By 2018 when it is expected that the "second backbone" could realistically be put into operation, seven of twelve Ukrainian nuclear reactors connected with "second backbone" should already have been closed down. Yet the Ukrainian government plans to extend their lifetimes, and this is where EBRD financing from the NPP safety upgrade project enters the picture. The project makes no sense without the lifetime extensions.

Nuclear power is marked by a wide range of serious risks, most dramatically illustrated by the accidents at both Chernobyl and Fukushima but also relating to economic viability, waste storage, and the dangers of uranium mining. We therefore strongly believe that the EU and international financial institutions should immediately stop the practice of providing back-door subsidies to Ukraine's nuclear sector. Instead EU financial institutions should start to address nuclear safety in Ukraine, focusing on the management of radioactive waste and spent nuclear fuel and the closure and decommissioning of Soviet-era nuclear reactors, while at the same time increasing support for energy efficiency and renewable energy development.

- Managing a nuclear disaster – the example of Chernobyl

- How the EU and public money indirectly support the development of the Ukrainian nuclear industry
  The planned EBRD Nuclear Power Plant safety upgrade
  High-voltage transmission lines projects

- How much nuclear risk is the EU willing to shoulder in its neighbourhood?

- Recommendations

Destroyed Reactor 4 of the Chernobyl NPP in Ukraine, April 1986 (Chernobyl museum)

MANAGING A NUCLEAR DISASTER–THE EXAMPLE OF CHERNOBYL

Since the early nineties, European countries together with the active involvement of the EBRD have supported the Ukrainian government in overcoming the consequences of the Chernobyl disaster. The EBRD makes a visible contribution as an administrator of two international funds – the shelter fund and the nuclear safety account – in which countries contribute money for the shelter implementation project and the spent fuel storage facility to neutralise fuel from the first three Chernobyl reactors. So far contributions from the EU to both funds total EUR 286.2 million, of a total EUR 1.18 billion, and some EU countries have made contributions nearing EUR 370 million. The EBRD has committed to administer both funds and oversee their implementation. The bank has also allocated grants from its own resources, including a EUR 135 million grant in 2009[1]. While international contributions are welcome, these have unfortunately not been entirely successful in ensuring that the Chernobyl plant has been rendered safe or that costly mistakes are avoided.

'Cleaning up' after the accident has proven costly and technically complicated. To date EUR 1.18 billion has been collected to secure the ruined Reactor 4 and isolate spent fuel from the other three reactors. Though these provisions aim to ensure safety for the next 100 years, still more money is needed. EUR 740 million should be raised to complete these two aspects alone[2]. While the Ukrainian government expects the international community to commit to more contributions, international donors already seem tired of having to foot this 'nuclear bill'.

The main difficulty in safely transforming the Chernobyl site and nuclear technology more generally is that these projects are both costly and so technically complicated that the nuclear industry cannot implement them efficiently. The new safe confinement construction has rightly been labelled by the EBRD as 'an unparalleled project in the history of engineering'[3]. It took the twelve years between 1997 and 2010 to move from the design of a shelter implementation plan to actually start construction on the new safe confinement.

The spent fuel storage facility financed by one of the EBRD administered funds also confronted a series of difficulties related to the facility's design. A consortium led by French firm Framatome started the construction of the interim storage facility according to terms of references provided by Ukrainian authorities, but the facility appeared technically incompatible with the spent fuel to be stored in it and works were suspended in 2003 officially due to "discrepancies between the Contractor's technical decisions and the technical specification requirements"[4] While EUR 56 million from the nuclear safety account was used[5], the facility has yet to become operational. Between 2006 and 2010 a different company – the American firm Holtec International - assessed what Framatome had done and then later proposed and agreed with Ukrainian officials its own project for the interim storage of the spent fuel.

Both the international community and Ukraine are investing significant efforts to make sure the site of the Chernobyl disaster will not endanger Europe again. However the experience so far does not suggest that those involved are an effective and truly capable team that knows how to solve existing problems caused by the 'peaceful atom'. Bearing this in mind, it is an opportune moment to rethink the seemingly harmless investments that may contribute to a nuclear-based scenario for the future development of the Ukrainian power sector.

Grave near the Khmelnitsky NPP (Petr Hlobil)

AFTER CHERNOBYL AND FUKUSHIMA, WHAT NEXT?

After the Chernobyl catastrophe, many preferred to take solace in the thought that such a tragic event could never happen again. Unfortunately the situation unfolding in Fukushima shows that history repeats itself, even in the most disastrous instances. Though varied in context, continents and cultures, the parallel between these two nuclear disasters is evident. In both cases reactors were destroyed, liquidators severely irradiated, an exclusion zone established with a high radiation level, people evacuated and food and water contaminated.

Both accidents should teach that nuclear power cannot be entirely safe no matter how advanced the technology– there will always be factors beyond control, human and natural, unpredicted and unmanageable, that can lead to a catastrophe. There is no future for developing such a dangerous technology, especially when there are readily available alternatives today.

Destroyed Reactor 3 of the Fukushima Dai-ichi NPP in Okumamachi, Japan, March 2011

HOW THE EU AND PUBLIC MONEY INDIRECTLY SUPPORT THE DEVELOPMENT OF THE NUCLEAR INDUSTRY IN UKRAINE

The integral role of the EU and the EBRD in the process of overcoming the consequences of the Chernobyl catastrophe is widely known. But not many are aware that they are at the same time indirectly supporting the further development of the Ukraine nuclear sector, by contributing to a nuclear safety upgrade project that includes lifetime extension of outdated Soviet-era reactors and financing transmission lines projects that have excessive capacity to allow for the construction of new NPPs and the export of their electricity to the EU as per the Ukrainian Energy Strategy till 2030.

In December 2000 the EBRD approved EUR 215 million for the completion of the Khmelnitska 2 and Rivne 4 (K2/R4) nuclear reactors, which were supposed to compensate for the already closed Chernobyl plant. Even when the Ukrainian government failed to meet conditions attached to this first loan, in 2004 the EBRD together with Euroatom approved new loans totalling EUR 150 million for the post start-up safety and modernisation programme at K2/R4. The approval of these loans enabled the Ukrainian government to borrow from Ukrainian banks and then complete these reactors in 2004.[6]

Since then the EBRD has improved its policy on the nuclear sector by avoiding support for the construction and operation of NPPs and instead restricting its activities to nuclear safety and decommissioning. However there are still gaps in the policy that enable indirect support for nuclear plants, as evidenced by a series of projects outlined below.

THE PLANNED EBRD NUCLEAR POWER PLANT SAFETY UPGRADE

In November 2010 the EBRD announced a NPP safety upgrade project for Ukraine. Most of Ukraine's nuclear reactors will reach the end of their lifetime by 2020. Two reactors are already licensed to operate beyond their projected lifetimes – one of them is already doing so since last year - and a further ten of the total 15 reactors will have reached the end of their lifetime by then.

At first glance this initiative looks very positive and timely, particularly when the world's attention is focused on issues of nuclear safety. However the road to hell is paved with good intentions and a deeper evaluation of the proposed project raises more questions than answers. The important point is that this upgrade project makes sense only in the context of lifetime extensions, otherwise there is no reason to finance costly upgrades for facilities that will anyway close in a couple of years. Ukraine's NPP operator Energoatom clearly links the safety upgrade and lifetime extensions but the EBRD is attempting to separate the two[7].

In October 2010 the Ukrainian Energy Ministry approved the "complex (consolidated) nuclear power plants safety upgrade programme in Ukraine" (SUP), to be developed by the state nuclear company Energoatom. According to an Energoatom press release[8] "SUP determines the amount of safety improvement measures which should be implemented at each nuclear power unit. Given that the implementation of safety improvement measures is indispensable for the lifetime extension of operating nuclear reactors, the implementation of SUP measures is also particularly relevant for the implementation of tasks defined by the Energy Strategy of Ukraine till 2030." In other words the safety upgrade enables the extension of the lifetimes of the units.

Meanwhile the EBRD management does not acknowledge the fact that public money will be used to prolong the life of the outdated nuclear units in Ukraine. "If the operator considers applying for extension of licenses beyond their current deadlines he (sic) will have to do so in line with Ukrainian rules and procedures. The bank will not support any activities in this process."[9] Yet the EBRD must be aware that the safety upgrade programme under consideration prioritises the upgrade of expiring reactors:

"The implementation of the planned SUP activities depends on their priority: The activities of higher priority must be done before activities with a lower priority. Priority I activities are planned for implementing, as a rule, before the end of the reactor's designed life term. Priority II activities are planned as part of the lifetime extension preparatory programme with the possible completion of the project after the end of operation... When designing step-by-step schedules in order to optimise the allocation of financial and technical burden of SUP implementation, the programme's activities will be primarily implemented by Energoatom at power units RNPP-1, 2, SUNPP-1, 2, ZNPP-1, that should be prepared for the extension of operation earlier than other units.[10]"

As Rivne-1 has already started to operate beyond its foreseen lifetime and the other plants prioritised are also those whose planned lifetime soon expires, it cannot be denied that the safety upgrades directly enable the lifetime extensions.

There is another critical aspect of the EBRD's involvement in nuclear safety in Ukraine. In 2004 the EBRD approved financing for post-construction upgrades of the K2/R4 reactors. At that time the EBRD promised that one of the outcomes of the project would be Energoatom's ability to mobilise financing for safety measures at other reactors: "The safety level of 13 operating VVER units will be upgraded over the next six to seven years using K2 and R4 as a benchmark. The safety upgrades of these units will be performed in accordance with the Upgrade Package developed by Ukrainian and Western experts, reviewed and agreed by Riskaudit and approved by the State Nuclear Regulatory Committee of Ukraine. The financial provisions for the Upgrade Package will be annually reflected in the electricity tariff."

Seven years later most of those upgrades are still pending and Energoatom has yet to raise money in Ukraine for them. This is a clear sign that the EBRD has failed in one of the most crucial aspects of its involvement in nuclear safety.

Bankwatch protest against construction on K2/R4, Budapest 1998.

Present state of Khmelnistky NPP Reactor 3. The Ukrainian government now plans to complete the construction that began in the eighties (Arthur Denisenko, NECU)

HIGH VOLTAGE TRANSMISSION LINE PROJECTS

Between 2005 and 2010 the EBRD and EIB invested approximately EUR 650 million in a number of high voltage transmission line projects of the Ukrainian state-owned utility Ukrenergo.

The EBRD claims that the transmission lines projects aim to increase the overall stability of the grid system in Ukraine, as well as the quality, efficiency and reliability of the electricity supply in the Odessa and Kyiv regions. Yet such claims gloss over important elements about how these projects will indirectly support NPP lifetime extensions and as well as new NPP construction.

In October 2010, the EBRD indicated its interest in supporting the "second backbone" ultra high-voltage corridor[11], which is to connect the substations at Kakhovska and Primorska with the Dnistrovska pumped storage plant and the Khmelnitska NPP. On 4 November 2010, the EBRD announced a procurement notice for preparation of an environmental and social impact assessment and a feasibility study for the 330 kV Novoodesskaya - Artsyz transmission line, which had been stopped in 2009 due to the constructor's plans to cross a Ramsar site and the problematic implementation of the Adjalyk - Usatovo project (see Map).

The EU also has had a role in supporting this transmission corridor for nuclear power. The EU-owned EIB is financing projects in Ukraine's energy sector in parallel with the EBRD, and two recent projects received direct support from the NIF to the tune of EUR 2.8 million in grants. Currently the NIF provides grants for environmental impact assessments and other technical assistance for projects proposed by IFIs. But the determination of such support is based on very brief documentation provided by banks to the European Commission managing the NIF, so it is very difficult to imagine the EU having a robust picture about the context of these transmission lines projects.

Once all planned transmission lines projects are completed, a continuous transmission corridor from east to west will connect three Ukrainian NPPs (totalling twelve nuclear reactors) and two hydro pumped storage plants.

Shouldn't developing the necessary infrastructure to export Ukrainian electricity to the EU be positively welcomed? Indeed the EU secures an extra source of electricity and Ukraine collects revenues from its sales. But the reality is that this scheme encourages further lifetime extensions for outdated Ukrainian NPPs.

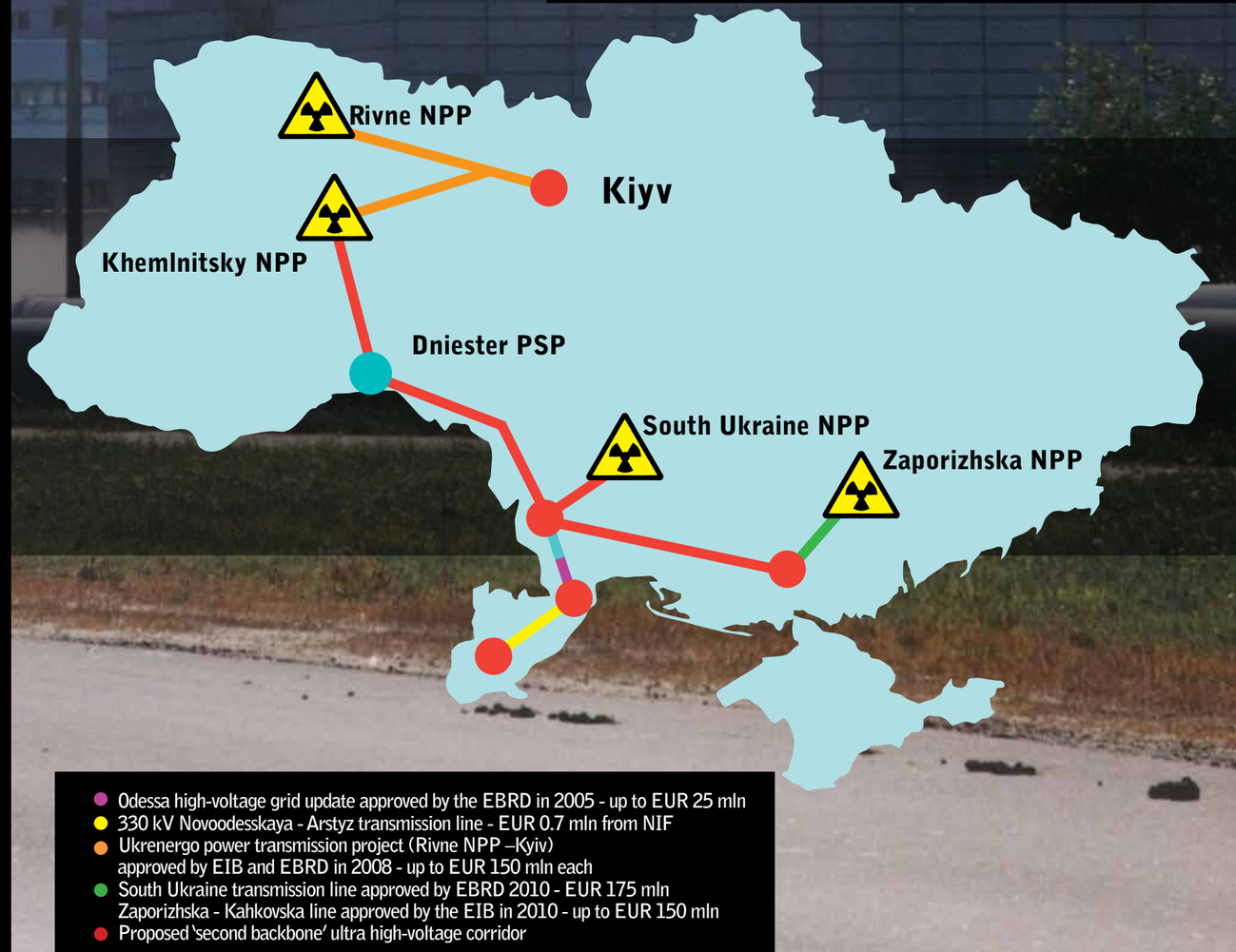
Giving the length of the project cycle for the transmission line projects so far (the Rivne NPP-Kyiv transmission line project took about five years to start construction), projections are that the "second backbone" corridor could be operational by 2018. By that time seven of the twelve reactors connected by the "second backbone" will have reached the end of their projected lifetime, but the Ukrainian government plans for these to be upgraded and continue running. By providing financial resources for the construction of new transmission infrastructure for a system facing the end of its lifetime, the EU and EBRD should understand that they are in fact prolonging the existence of that very same system. In Ukraine this means that EU financial support will prop up old nuclear reactors operating in the EU's immediate neighborhood for another 20 years in spite of the risks posed to people and planet.

Moreover the technical specifications of some transmission lines will allow for more output than present nuclear capacities can generate, suggesting that the ground is being laid for connecting new reactors to the grid. Ukrenergo claims that the South Ukraine transmission line project is necessary to overcome a lack of output capacity of roughly 700 MW for the Zaporizhska NPP. However the designed capacity of the transmission line project is two to three times greater than required, so it can be inferred that these lines would enable the expansion of the Zaporizhska NPP from six to eight reactors.

There is little question that in their current design, these transmission lines are primarily for increasing electricity exports to the EU. The Ukrainian Energy Strategy until 2030 highlights how the "second backbone" and Rivne-Kyiv-Donbass corridors will "create conditions for the integration of the Ukrainian grid into the European network and significantly increase electricity exports"[12]. According to the strategy's base scenario, electricity exports will triple, from 8.3 TWh to 25 TWh by 2030. Moreover, while the official justification for the Novoodeska-Artsyz transmission line is to provide remote parts of the Odessa region with a secure electricity supply, Ukrenergo plans to install electricity towers for two circuits of 330 kV, essentially enabling the amount of power capable of being transmitted to the region exceeding demand in the area several times over. The EIB also has never been bashful about the objectives of the separate transmission projects forming "important component[s] of the future connection to the Trans-European Energy Networks (TEN-E)." There are also plans to expand at some point the Rivne NPP – Kyivska line, forming a corridor in the north and enabling also the transit of electricity from neighbouring Russian NPPs.

Khmelnitsky NPP unit 1 (Olexi Pasyuk)

UKRAINIAN TRANSMISSION LINE PROJECTS FUNDED OR PLANNED TO BE FUNDED WITH EU PUBLIC FINANCES



HOW MUCH NUCLEAR RISK IS THE EU WILLING TO SHOULDER IN ITS NEIGHBOURHOOD?

Recent EU communications have called for a more coherent and integrated external energy policy. In November 2010 the EU "Energy 2020: A strategy for competitive, sustainable and secure energy" listed strengthening external dimensions of the EU energy market among its five key priorities[13]. Also in November last year, **European Parliament president Jerzy Buzek openly called for the joint purchase of nuclear electricity from Ukraine and Russia**[14]. In its drive to secure and diversify power supply sources, the EU must not ignore the risks posed by unsustainable energy systems operating in its neighbourhood. Neither radioactive spills nor carbon dioxide emissions respect borders, and EU decision makers must be accountable for promoting the use of such resources.

The principles and priorities on cooperation in the energy sector are set in the 2005 Memorandum of Understanding (MoU) on Energy signed between the EU and Ukraine. Regarding nuclear energy the MoU states that, "In order to strengthen public confidence and for the EU to reinforce the role of Ukraine as a trading partner in the electricity market, Ukraine must meet internationally recognised nuclear safety and environmental standards. Hence, the safety of nuclear installations is a primary objective for both parties, who will continue to promote in Ukraine an efficient nuclear safety culture in line with the principles of the Convention on Nuclear Safety." This is where the EU and European public banks should start. Nuclear safety issues must form the core of cooperation in the energy sector, yet **there are still large gaps in the assistance from the EC and IFIs to help Ukraine address safety measures** eg. little has been done to prepare for the closure and decommissioning of old reactors approaching the end of their lifetimes or the long-term management of spent nuclear fuel.

Despite its notoriety as the scene of the world's worst nuclear accident, Ukraine has for decades had a political class driving ambitious plans to develop the nuclear industry while paying little regard for safety measures and impacts on the environment.
When a nuclear reactor has been in operation for more than 20 years, the risk of accidents involving radioactive emissions significantly increases with every year of operation. Almost all of Ukraine's nuclear reactors were constructed in the 1970s and 1980s and by now are old and outdated. As a result of the ageing of nuclear reactors, increases in the number of failures occur such as minor emissions and leaks, the appearance of cracks in the covers of reactor vessels and short circuits[15].

One example comes from January 2011, when an accident occurred at the Rivne NPP Reactor 1, which was then subsequently taken down to 50 percent power output. Though its lifetime had already expired, Reactor 1 had its operations extended for another 20 years by official permit in December 2010. Just one month after the nuclear industry had spent nearly EUR 200 million and declared that the reactor now was almost completely upgraded the accident took place. While the State Inspectorate for Nuclear Regulation later confirmed that the accident posed no radiation threat and the nuclear facility remained in a safe condition, the situation highlights how investments in upgrades cannot guarantee the safe operation of outdated reactors.

There is also very little capacity among Ukrainian regulatory bodies to respond rapidly and with authority in cases of crisis. The international community conditioned its support for the Chernobyl recovery efforts on the creation of an independent regulatory agency. However the State Nuclear Regulatory Committee of Ukraine was only later established in 2000 to fulfil conditions attached to one EBRD loan. Then the Committee was downgraded to 'agency' status in 2006 and by 2010, it had became an Inspectorate, whose actual influence is illustrated by the Rivne case. In September 2009, the primary cooling circuit broke and coolant leaked at the Rivne NPP, yet plant management simply kept secret the accident from the public. While the State Inspectorate for Nuclear Regulation demanded that the responsible staff be punished, the operating company simply ignored this demand.

Moreover **Ukraine has yet to create a unified national system for dealing with radioactive waste and spent nuclear fuel** as required by nuclear legislation "On Radioactive Waste Management". Today Ukraine does not invest in infrastructure for the long-term safe isolation of spent fuel and radioactive waste. The spent nuclear fuel from Ukrainian NPPs is transported for treatment in Russia, and Ukraine is also reliant on Russia for fuel production. Beginning in 2013, processed fuel must be returned to Ukraine for deposit, but construction on the necessary radioactive waste storage facility has yet to commence, though it was supposed to already in 2009 according to Ukrainian legislation. Ukraine does not have the necessary financial resources for decommissioning old nuclear reactors, and so it appears the government thought of no better solution than to simply extend their lifetime.

This is a recipe for making nuclear energy appear inexpensive – operational reactors are inherited, and then the final electricity price neither includes the full costs of spent fuel treatment and isolation nor closure and decommissioning. The EU and its financial institutions should not tolerate such an outrageously short-sighted approach from Ukrainian officials. But this will indeed be the result should the Ukrainian government proceed with the further development of the nuclear industry without first addressing a host of safety problems. This transfer of nuclear risk to the neighbourhood of the EU goes against the principles of sustainable development, environmental protection and solidarity enshrined in EU treaties. The EU mustn't aim to reach its ambitious goal for greenhouse gas emissions reductions by at least 80 percent by 2050[16] at the expense of Ukrainian citizens and environment. Moreover the massive import of nuclear and coal-based electricity from Ukraine will reduce incentives for developing truly energy efficient and renewables based economy within the EU.

RECOMMENDATIONS

The EU should ensure that **no European public money supports the lifetime extension of old Ukrainian reactors or the construction of new ones.** Specifically:

- NIF should not provide financial support for projects proposed by the EBRD without first the preparation of a strategic environmental assessment.

- Should the EBRD proceed with the Ukrainian NPPs safety upgrade project, the loan agreements should specify that reactor lifetime must not be extended beyond the original projected closure.

- The focus of EU and IFI support in the Ukrainian nuclear sector should centre solely on safety issues that have till now been overlooked – the preparation for closure and decommission of old reactors approaching the end of their lifetime, as well the long-term management of spent nuclear fuel.

Additionally the EU and European public money should concentrate efforts on increasing assistance to the development of safe alternatives, including energy efficiency measures and renewable energy sources, that both have potential in Ukraine and are in line with the EU's own priorities for environmental and social sustainability in the development of energy sectors.

Notes:

1.http://www.ebrd.com/pages/news/press/2009/090216.shtml
2.http://www.ebrd.com/downloads/research/factsheets/chernobyl25.pdf
3.http://www.ebrd.com/downloads/research/factsheets/chernobyl25.pdf
4.http://www.chnpp.gov.ua/eng/news.php?lng=en&id=13
5.http://www.ntc.kiev.ua/download/en/sn3-21.pdf , page 36
6.For more information see: http://www.bankwatch.org/project.shtml?w=147579&s=153988
7.According to the EBRD "Together with the European Union, [EBRD] is potentially considering financing the Ukraine Nuclear Power Plant Safety Upgrade Programme, a long-term safety improvement programme of nuclear power plants (NPPs) in Ukraine."
8.http://www.energoatom.kiev.ua/ua/news/nngc?_m=pubs&_t=rec&_c=view&id=27974
9. EBRD's response to NECU letter: http://www.necu.org.ua/wp-content/uploads/0110-denysenko.pdf
10. Complex (Consolidated) Nuclear Power Plants Safety Upgrade Programme in Ukraine, page 14.
11.By publishing a procurement notice on its website — a usual sign that the bank is considering a project but has not yet approved the financing.
12.The Energy Strategy of Ukraine for the period until 2030: 3.1.5. Present state and further development of electricity networks.
13.http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2010:0639:FIN:EN:PDF
14.http://www.eib.org/attachments/general/events/warsaw_26112010_buzek_en.pdf
15.Increase in the number of fails is caused by the gradual decline in the strength of reactor materials and other related factors. See for instance http://atom.org.ua/?p=1008
16.European Council conclusions, February 4 2011, Brussels.

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