

GERMANY MISINFORMS ABOUT THE NUCLEAR ENERGY. DIW'S REPORT UNDER CRITICISM [ANALYSIS]

Last week, German Institute for Economic Research (DIW) published its report referring to nuclear power as high-priced and dangerous. However, the publication is full of other mistakes and manipulations, which significantly undermine its credibility.

[Its](#) comprehensive analysis was quite a challenge. The title itself may perplex. The authors of the report state that nuclear power is “high-priced and dangerous” and that it “is not an option for the climate-friendly energy mix”. This thesis contradicts the [findings of the Intergovernmental Panel on Climate Change \(IPCC\)](#). Pursuant to the [report](#) of IPCC, the United Nations body for assessing the science related to climate change, nuclear power [is essential for saving the Planet](#) from the climate change impacts – in the vast majority of IPCC scenarios the share of nuclear in the world energy mix is rising. The IPCC findings constitute basis for scientific research on relationship between climate and power industry all over the world, thus, it seems quite strange that the DIW's publication makes no references to IPCC, its report and that the conclusions of the former were not contrasted against the findings of the latter. It is even stranger as one of the authors of the DIW's report, [Claudia Kemfert](#), acted as an external expert for IPCC.

It is worth stressing that effective programme to combat climate change through stable, low-emission energy sources available to as large proportion of the world population as possible is currently a top priority of the world power industry. Pursuant to IPCC, nuclear power may play this role, thus the fact that IPCC findings were omitted in the report on nuclear power should be considered as highly unprofessional.

Essentially, the analysis of the DIW's publication could be limited to comparison with IPCC report – that would be enough to undermine the statement that nuclear power is unprofitable (it seems unbelievable that the technology that could save the world from inestimable cost of climate change is “high-priced”) or climate-unfriendly. However, the German report is full of mistakes which cannot be left without comment.

One of the key statements made in the report is that nuclear power is uneconomical. The authors claim that “In recent years, further studies have confirmed that nuclear energy is not competitive”. To support this thesis they quote the analysis carried out by Paul L. Joskow and John E. Parsons „[The Future of Nuclear Power After Fukushima](#)”.

However, these conclusions are not present in the document. In the conclusions, the authors state only that “primary determinants of the future path of operation of existing nuclear plants and investments in new nuclear power globally continue to be economic considerations, perceived energy security considerations, environmental considerations, and public acceptance”. It is stressed in the

document that further investment in nuclear power plants after the accident at Fukushima will be made in new economic environment, which may affect their level of profitability. Nevertheless, researchers “are surprised that public acceptance [of the atomic energy] has not been shaken more by the accident at Fukushima”. By the way, Joskow and Parson admit that the profitability of nuclear power is affected by, inter alia, “lavish subsidies and goals for renewable energy”. They argue that if the countries resigned from financial support, the market conditions for nuclear power would become favourable.

The document assumed that countries like Germany, Switzerland and Japan will be affected significantly in their support for nuclear power. Practically, these predictions turned out to be true for Germany only. The German Parliament declared to phase out nuclear plants by 2022. Meanwhile, Japan is gradually restarting nuclear plants closed after 2011, whereas Switzerland allows its existing reactors to continue operation. In the analysis, carried out immediately after the Fukushima accident, it was difficult to predict nuclear investments to be made in [China](#), Russia, [India](#) or [Saudi Arabia](#) (although it stated that these countries would develop nuclear programmes).

Moreover, the authors of the report published by DIW neglect [only a 3 years older analysis](#) carried out by the same scientists (Joskow and Parsons), which proved that nuclear power, in certain, easily accessible circumstances, is competitive versus other sources of energy. “New nuclear plants are competitive with natural gas-fuelled CCGT technology only at very high gas prices. The imposition of significant prices on CO2 emissions makes nuclear competitive with coal-fuelled generating technology under all fuel price scenarios, and with gas-fuelled CCGT technology when gas prices are at moderate or high levels (...). This suggests that with significant CO2 prices, economic considerations alone would lead to a mix of new nuclear and new CCGT plants with gas prices at moderate to high levels”.

Pursuant to Joskow and Parsons “at the charge of \$25/tonne of CO2, in a moderate coal-price scenario nuclear would be competitive with coal. At the higher charge of \$50/tonne of CO2, nuclear power is cheaper than coal even at the low-coal price scenario (...).

At the higher charge of \$50/tonne of CO2, nuclear power is cheaper than gas in both the moderate and high gas-price scenarios, although not in the low gas-price scenario”.

Currently, the price of CO2 emissions in Europe is approximately at \$31 and shows a marked upward trend. The price is to rise with the decreasing pool of free-of-charge certificates. It means that despite the DIW’s opinion, nuclear power may be competitive.

The economic advantages of nuclear are evident in Germany itself. [Pursuant to the Fraunhofer Institute](#), in 2018 the energy generated by nuclear power plants was cheaper on the day-ahead market in Germany from the generation from hard coal, lignite and gas and only slightly more expensive from biomass. Low cost of wind and solar energy should be increased by so-called EEG Umlage, i.e. a German feed-in tariff designed to accelerate investment in renewable energy, thanks to which German renewable energy sources cover capex and fixed cost. Moreover, German nuclear power industry was subject [to nuclear fuel tax](#), which significantly affected its economic efficiency.

The economic efficiency of nuclear was confirmed also in the report [published by the OECD, translated by the Polish Ministry of Energy](#). Pursuant to the Ministry of Finance “The report points out that assuming the cost of capital (3%) and grid costs, the median of the costs of electricity generated over an electricity generator’s lifetime is: \$53/MWh for a nuclear plant and \$175/MWh for an off-shore windfarm (if the share of one source in the energy mix is 30%)”.

It is worth stressing that the key parameter for calculating power generation cost is the lifetime of a

given source. DIW experts shortened drastically the lifetime of reactors (read more below). Janne M. Korhonen and Rauli Partanen in their book "Climate gamble" point out that the lifetime of currently constructed nuclear power stations is approximately 60 years, whereas the lifetime of wind farms is just 20-30 years. At the same time, the DIW's report experts made a series of other biased mistakes, which Korhonen and Partanen warn against: they ignored the quality of energy, omitted to translate the installed capacity into the amount of actually generated energy and ignored the external costs (e.g.: grid management costs, which are high in case of exploitation of unstable sources).

DIW experts concluded in their report that "still [there are] no reasons for the private economy to invest in commercial nuclear power today". The excerpt listed three investments in the nuclear blocks, which exceeded their budget and were cancelled due to high costs.

This somewhat libertarian approach of the authors towards the investment in nuclear power industry is difficult to grasp. Resignation from the state-aid during construction of such units seems illogical taking into account that, for example, development of cost-efficient renewable technologies required creation of governmental support programmes (a significant free-market bias), which allowed to generate profit from these sources. In Germany, every year the government drains from the pockets of citizens over €20bn to be earmarked for the renewable energy sources sector. Pursuant to Peter Altmaier, German Minister of Economy, by 2022 the total support for RES in Germany will have achieved €680bn. This amount would be sufficient to construct 61 Olkiluoto-3 nuclear power plants, which in the report is presented as highly expensive (€11bn). It is worth mentioning that at present 54 nuclear reactors are being constructed all over the world.

In other words, if DIW experts were to take the same measure for renewables as for nuclear power, they would find out that RES are permanently unprofitable and cannot develop without state aid. Yet [there are studies](#) which show that European renewable sources will need subsidies long after 2020.

The authors' forecasts concerning the decline of nuclear energy in Europe may also raise concerns. In line with their scenario, in 2050 the nuclear will be present only in 3 countries of the Old Continent (France, Finland and Slovakia). Such predictions may, however, break down into investment plans, e.g. for Poland, or into problems with the extinguishing of German nuclear power plants. It is also worth noting that DIW took for granted the drastic reduction of nuclear energy in France (which would involve a significant increase in carbon dioxide emissions).

The choice of sources also leaves a great deal to be desired. DIW experts quote in their report, among others, Nuclear Information and Resource Service, an anti-atomic organization (sic!) which has been criticized many times for hiring people without competence (members of this organization have no education in the field of nuclear reactor physics or engineering; the director of NIRS for radioactive waste has no education in radiological medicine or physics). Significant factual errors of the organisation were revealed by, among others, David Bradish from the Nuclear Energy Institute. The DIW's report also refers to studies by Jan Haverkamp, Greenpeace expert, [who is "known for his campaign against the construction of nuclear reactors"](#).

Haverkamp's arguments are quoted to prove that "nuclear power plants are designed to last 30-40 years". In the meantime, the common approach is to extend the lifetime of these entities. [The French share this approach](#). Uncertainty about the lifetime of nuclear power plants was due to a lack of knowledge about the effects of irradiation on individual elements of their design. Today, it is clear that the original fears were premature and that nuclear power plants can operate freely for up to [80 years](#). Such a thesis is confirmed by [many specialists](#).

Another quoted author who had links to the anti-atomic Greenpeace is Andy Stirling ([a former Greenpeace member](#)).

The authors of the reports also quote the studies of Mycle Schneider, referred to as "[anti-nuclear activist](#)".

It is also controversial to rely on the work of Benjamin K. Sovacool to estimate emissions from individual energy sources. [This researcher was criticized for the method](#) he used to assess the emissions. The Sovacool way was reviewed by Simon Tudiver in "The Yale Journal". "Sovacool studied 103 cycles of greenhouse gas production by nuclear power plants. Only 19 of these studies passed through his criteria (...); he did not explain how he composed the initial list of 103 cycles Sovacool has found a wide range of estimates in the literature: from 1.4g CO₂e/kWh to 288g CO₂e/kWh (...).It achieved a result of 66g CO₂e/kWh. Sovacool suggested a number of explanations for the significant differences between the estimates (...)"

It is worth noting that in 2016 another work of Sovacool was officially withdrawn from the scientific journal, just as it happened to a famous publication of Andrew Wakefield. The story has been described [here](#).

The second pillar of DIW's criticism of the nuclear [is security issues](#). The authors of the report try to prove, inter alia, that in the case of the construction of a nuclear power plant, "economic considerations have never played a role" and only military benefits were taken into account. Such a formulation contradicts the facts - while several decades ago there was a close link between military technology and nuclear power, nowadays this link is insignificant. Is it possible to assume that Finland, Hungary, Slovakia or Bangladesh are building their nuclear power stations to become military nuclear powers? Moreover, countries such as North Korea are proving that there is no need to build power stations to experiment with nuclear arsenals. The separation of civil and military nuclear technology is a clear and, paradoxically, the greatest guarantor of control over nuclear proliferation is the states already possessing such weapons. In more than 30 countries with nuclear reactors, only 7 % have nuclear weapons.

It is worth quoting the views of [Kenneth Waltz](#), an American scientist and lecturer at the University of California in Berkeley, who claimed that the existence of nuclear-weapon states reduces the likelihood of war. "This likelihood decreases with increasing deterrence and defence capabilities. Nuclear weapons, used responsibly, make wars difficult to start. Nuclear-weapon states also have serious arguments for using nuclear weapons wisely," wrote Waltz.

Moreover, the authors of the German report do not seem to notice that a much more real threat than atomic bombs (no such payload has been used for war purposes since 1945) are the so-called "dirty bombs", i.e. conventional explosives armed with radioactive materials that can be obtained from hospitals or research institutions. Such a weapon is incomparably easier to construct and detonate than an atomic bomb.

DIW experts, threatening with the nuclear power, also forget about the calculations of doctor James L. Conca, an environmental scientist, who determined mortality rate for individual energy sources. [In line with his calculations](#), producing one trillion kilowatt hours of energy through nuclear technology (even including the Chernobyl disaster) will cost less lives than producing the same amount of energy from wind turbines, photovoltaic panels, natural gas, biomass or coal. These calculations are one of many proofs that nuclear energy is the safest source of energy. Another proof of such a thesis is the study by [Professor Anil Markandy and Paul Wilkinson entitled "Electricity generation and health"](#).

To sum up: taking into account the striking selectivity of the sources, which consists in the total omission of studies which undermine the report's thesis (i.e. primarily the IPCC documents), as well as quoting people and institutions which are openly anti-atomic in nature, while at the same time omitting studies beneficial to the nuclear (such as the OECD report) and drawing erroneous

conclusions from the analyses quoted, it is impossible to resist the impression that the DIW's report is a blatantly biased material, written to support the thesis that there is a need for a rapid departure from the energy sector. This impression is even stronger when the reader realizes that the German federal government plans to abandon the atomic energy soon (German nuclear power plants are to be shut down in 2022, as protested, among others, [by Polish scientists](#)).

DIW experts' manipulation of the cost-effectiveness of nuclear power plants is the last drop of bitterness.

The fact that such an unreliable study spreads across the media (even the industry-specific ones), which did practically nothing to verify the truthfulness of the information provided by the Germans, may cause great concern.

What is still worse, in discussions on social media, opponents of nuclear power put forward the following thesis: "German scientists have proven that the nuclear power is unprofitable." Why is such a statement unjustified? First, a number of errors and simplifications have been identified above, as well as a questionable selection of quotations which demonstrate the low level of scientific robustness of the DIW study. Secondly, are such analyses capable of proving anything? In the book "Evidence, arguments and persuasion in the political process", the prominent American political scientist Giandomenico Majone draws quite strict boundaries between evidence and arguments explaining that analyses such as the DIW's report are an argument in the debate, but not a proof of the truthfulness of the theses of one side. Majone wrote: "Argumentation differs from formal demonstration in three important respects. First, demonstration is possible only within a formalized system of axioms and rules of inference. Argumentation does not start from axioms but from opinions, values, or contestable viewpoints; it makes use of logical inferences but is not exhausted in deductive systems of formal statements. Second, a demonstration is designed to convince anybody who has the requisite technical knowledge, while argumentation is always directed to particular audience and attempts to elicit or increase the adherence of the members of the audience to the theses that are presented for their consent. Finally, argumentation does not aim at gaining purely intellectual agreement but at inciting action, or at least at creating a disposition to act at the appropriate moment." Of course, reports such as the work of DIW are "the truth itself" for people who are convinced about the advantage of one or other tool for climate solution. However, it is worth confronting your beliefs with the facts and encouraging each other to conduct a critical analysis, especially when the proverbial authorities in white aprons tell us exactly what we want to hear.

The text was written in cooperation with Adam Błażowski, a nuclear energy specialist at FOTA4Climate, and Juliusz Kowalczyk, a specialist in regulatory policy in the energy sector