

Nuclear fear

Fear of Fukushima?



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The Chernobyl nuclear disaster in 1986 halted the development of nuclear energy around the world for almost 20 years. Earlier this year we saw another emergency at the nuclear plant in Fukushima. Has the renaissance of nuclear energy reached its end?

The negative fallout of the Fukushima disaster is being felt around the globe: the referendum recently held in Italy returned a vote of over 94% against the construction of new nuclear power plants, and the German government resolved to start gradually phasing out nuclear plants until their complete decommissioning in 2022. Is this collapse of trust in nuclear energy justified? Are we now doomed to abandon this form of generating energy? Can public opinion ever be rational? These and other similar questions need to be addressed, especially in the context of the development of nuclear energy in Poland.

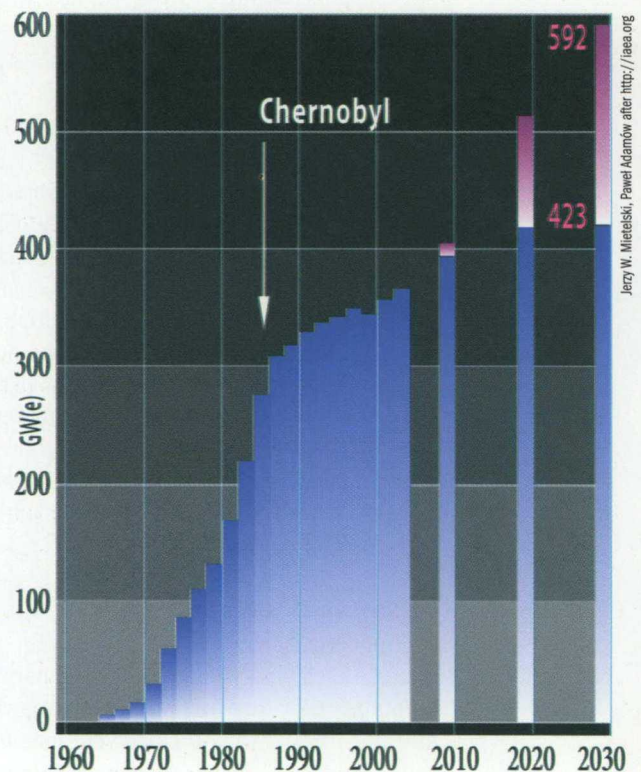
Three Mile Island and Chernobyl

Even though the 1979 accident at the Three Mile Island nuclear generating station involved a reactor core meltdown, the consequences were very minor: an angler fishing nearby was exposed to mild radiation, but no one was seriously hurt. And yet the public response was disproportionately fearful. Of course the accident brought significant material losses - the plant had to be completely and permanently shut down.

The effects of the Chernobyl disaster, on the other hand, cannot be played down.

Almost 50 people died as a direct result of the accident, and hundreds of square kilometers were contaminated. Trace contamination was detected as far as a thousand kilometers or more away. Almost 200,000 local residents were evacuated in order to prevent 30,000-40,000 deaths caused by radiation-induced cancer. The costs of eliminating and reducing the effects of the accident were close to 200 billion US dollars. It could be stated, cynically, that rarely in the history of humanity has a few million dollars been spent on prolonging the life of an anonymous, simple person, and so the billions spent on preventing the deaths of these thousands of ordinary people was completely unprecedented. In this respect, counteracting the effects of the Chernobyl disaster was a major humanitarian achievement and a total refutation of the everyday practicalities of Communism, where the fate of the individual was irrelevant. As such it

Power capacity installed in nuclear power plants and projections for its growth (following the International Atomic Energy Agency, IAEA)





STOCK/CHING

also had a significant political aspect by laying bare the weaknesses of the Communist system and contributing to its eventual collapse. The self-confident arrogance of the ruling authorities was no more, even though just a few decades earlier the very same regime had set about starving millions to death for purely ideological reasons. As a result, the Chernobyl disaster had and continues to have a major media impact.

Political games

One side effect – a price to pay for this terrible event being utilized in the political games of global superpowers – was the collapse of the development of nuclear energy around the globe. That price turned out to be high, perhaps even too high. From the perspective of the politicians responsible for maintaining growth in their countries, nuclear energy is undoubtedly a solution with numerous ben-

efits. It helps create a stable basis for the country's economic development, which has to ultimately have an impact on how people vote, even if – due to the long investment cycle – it is not in the elections just around the corner but at some point in the future.

Political centers, such as think-tanks that focus together expert advisors and political analysts, look to the future beyond the nearest election and have undoubtedly noted the negative aspects of the Chernobyl disaster, threatening to slow down the development of Western countries, in particular the US, and making the world plunge ever deeper into its dependence on the producers of crude oil

Initially, attempts were made to influence public opinion by promoting the radiation hormesis hypothesis. Claiming that low doses of ionizing radiation are supposedly beneficial, the hypothesis was to provide a remedy for the fear of low radiation doses

The meltdown of the reactor core at the Three Mile Island plant in 1979 started a decline in public trust for nuclear energy

Nuclear fear

from trace post-Chernobyl contamination. The hypothesis itself remains controversial, has a very weak empirical basis, and turns out not to have been very convincing. Furthermore it tried to speak to people's rationality, which - as has been shown numerous times - is a very ineffective method of influencing public opinion (instead, it is emotions that are the decisive factor). As a result, after a few years of endorsement, it has all but disappeared from the pages of the popular science press.

Incidentally, a fear of very low radiation doses is itself an extremely important paradigm in the modern world. It lies behind the commonly held view that nuclear weapons must not be used in armed conflicts, even those taking place far from the more influential regions of the world - because the radioactive fallout will cause significant harm to friendly troops, and even to all the inhabitants of the very faraway state which deployed the weapons in the first place. It is difficult not to appreciate the stabilizing role of this principle: it is the reason why nuclear weapons were not used in the Korean, Vietnam and Middle East wars, and why nuclear weapon tests have

been abandoned, bringing improved global security. As such, no one in a position of responsibility should try to reduce this public fear, however irrational; this may have been a reason behind the abandonment of the promotion of the radiation hormesis theory.

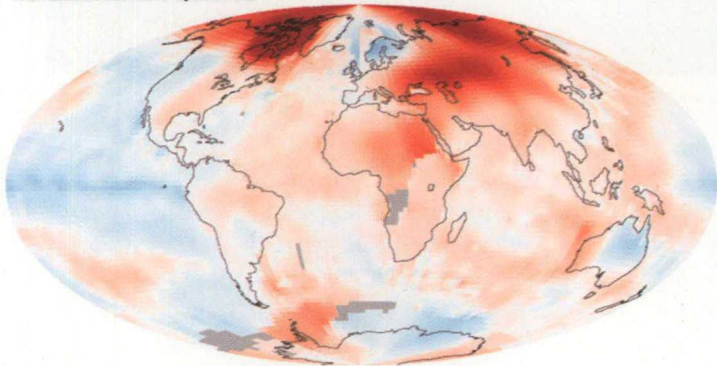
To rescue nuclear power

After this campaign collapsed, it became necessary to find different means of changing public opinion. A new phenomenon had to be sought, ideally one appealing directly to human emotions. According to one of Polish humorist Stanisław Lec's quips, the collision of two myths can create fact. And so the myth of the effects of nuclear power was to be defeated using a different myth. The choice fell on CO₂ emissions and the greenhouse effect. It was necessary to engage someone of Al Gore's charisma to make it work - and it worked. A new myth was spun, helping swing public opinion to notice the benefits of nuclear energy. Notably, most countries have been taken in, with the exception of the major players: the US, Russia, and China. For many people who are aware of this great manipulation, its benefits justify turning a blind eye to its detachment from fact and stretching of the truth. Those people have become hostages of their beliefs, and do not expose the myth.

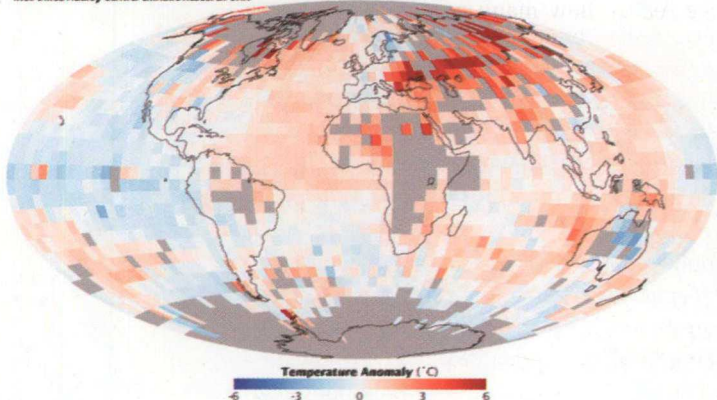
Unfortunately, the renaissance of nuclear energy that followed is under threat. The unexpected nuclear disaster in Fukushima has once again swung fickle public opinion, and may have ruined those efforts. Although no one died as a result of the Fukushima disaster, and even though the explosion was caused by a major and rare natural disaster - an extremely powerful earthquake followed by a massive tsunami - the retreat from nuclear power has already begun. Although around 20,000 people died in the earthquake that directly preceded the Fukushima disaster, work on minimizing the effects of similar natural disasters in the future is not the subject of media discourse. Instead public opinion focuses on what happened in the nuclear plant. Nuclear fears in Italy, itself subject to earthquakes, are not entirely unfounded; however, the decisions regarding nuclear power in Germany which does not experience significant earthquakes are much more difficult to comprehend.

NASA recently announced that 2010, alongside 2005, was the hottest year since recordkeeping began 131 years ago. Only a dense network of measuring stations around the globe can supply sufficiently accurate data. Will global warming work as an antidote to nuclear fear?

NASA Goddard Institute for Space Studies



Met Office Hadley Centre/Climatic Research Unit



NASA Earth Observatory/Robert Simmon

In fact, the justification for further development of nuclear energy should not be influenced by fear or an absence of it, but rather by hard, purely rational facts. Nuclear power has provided us, as a civilization, with a stable energy source guaranteeing the ongoing growth of global economies. Importantly, although it does consume a

opment of all human civilizations. However, out of all the means of obtaining energy that are currently known, nuclear energy has the lowest environmental impact. All other energy sources carry with them overt or covert environmental costs. Even seemingly clean energy sources, such as wind power, have a greater negative impact on



TEPCO

The emergency at Fukushima Daiichi in March 2011 once again shook the public's trust in nuclear energy around the globe

natural non-renewable resource, that resource does not have any other applications. Developing nuclear energy allows us to protect other non-renewable resources, such as carbon and hydrocarbons, which have a huge significance as raw materials for the chemical and pharmaceutical industries now and for the coming generations. This aspect should not be underestimated. Nuclear energy as a power source provides significant independence and stability to countries that have it. In Poland's case this aspect should be treated as a vital interest for the country.

Safety and the environment

Just like all forms of energy generation on a national scale, nuclear power affects the natural environment – as has the devel-

opment of all human civilizations. However, out of all the means of obtaining energy that are currently known, nuclear energy has the lowest environmental impact. All other energy sources carry with them overt or covert environmental costs. Even seemingly clean energy sources, such as wind power, have a greater negative impact on the environment, when you take into account the space required, the observed impact on animals such as birds in the area, and other modifications to the ecosystem. Another benefit of nuclear energy is its high safety. This becomes clear as soon as we realize how many human lives are lost every year during the extraction of coal, or how many people have died in hydroelectric power plant disasters. It is sad that in order to swing public opinion we cannot be direct, speaking rationally of the benefits, and the only effective method is the manipulation of collective fear... Will the greenhouse effect continue to be successful in this role? Only time will tell. ■

Further reading:

Mietelski J.W. (2007). Radioactivity Around Us. *Academia*, 11, 20-24.