

**REACTION ON THE  
SPOSÓB UWZGLĘDNIENIA ZGŁASZANYCH UWAG W  
OSTATECZNYM TEKŚCIE PROGNOZY**

**in the  
SEA PROCEDURE  
for the Polish Nuclear Energy Programme**

under  
**the law of 3 October 2008 for Providing Information on the Environment  
and its Protection, Public Participation in Environmental Protection and  
Environmental Impact Assessment**  
(OJ No. 199, as amended poz.1227.),

**EU Directive 2001/42/EC**  
on the Assessment of the Effects of Certain Plans and Programmes  
on the Environment  
and  
**the Aarhus Convention**  
on Access to Information, Public Participation in Decision-making  
and Access to Justice  
in Environmental matters

by  
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**GREENPEACE**



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**GREENPEACE**

**International**

This is a reaction on the response of the consultant in the public participation procedure in the Strategic Environmental Assessment of the Polish Nuclear Energy Programme.<sup>1</sup>

I have only reacted on the issues raised in response to my submission from 28 March 2011. The delay in reaction has to be explained by the fact that Greenpeace needed to organise translation from the Polish text into English. Because Greenpeace cannot afford to pay for translation, we had to use (professional) volunteers, which takes more time. This illustrates the need for bi-lingual documentation in these planning procedures – otherwise the reasonable and appropriate times for response from the public needs to be adequately prolonged.

The numbering of our reactions follows the numbering of the consultant and the reactions should be read with his response and our earlier submission at hand.

In his comments on our submission, the consultant regularly confirms his pro-nuclear bias. His response is not as much an objective response on sincere concerns, viewpoints and additional information, but a pro-nuclear defensive one. The consultant uses tricks to divert the attention from the viewpoints, concerns and information given in our submission and in several cases shows incompetence in the field he is supposed to assess. None of the consultant's rejections of our submission is justified and we therefore advice the Ministry of Economy to assess our submission on its own merits and not on the biased defensiveness of the consultant. Given the importance of nuclear safety and the many ethical questions raised by nuclear power (responsibility for the unsolvable problem of nuclear waste, assessment of rest-risk, issues of nuclear proliferation, allocation of limited resources), nuclear decision making should not be done by nuclear promoters, but by serious and independent actors.

**We therefore strongly advice the Ministry of Economy to retract this Polish Nuclear Energy Programme and SEA report. It is advisable that the Ministry first works out a new energy policy for Poland, based on state of the art modelling of different energy policy options and including one or more policy options focusing on energy efficiency and a 100% renewable energy provision of electricity production in 2050 and have a serious SEA carried out for that before drawing conclusions about the introduction of nuclear power into the Polish energy mix. The current Programme and SEA do not offer sufficient basis for the justification of such an introduction.**

Prague / Brussels, 17 July 2011

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1 [http://www.mg.gov.pl/files/upload/10960/wyniki\\_konsultacji\\_spol\\_Prognozy.pdf](http://www.mg.gov.pl/files/upload/10960/wyniki_konsultacji_spol_Prognozy.pdf)

## REACTIONS

### 214 – Rejection unjustified.

214.1. – The consultant tries to divert attention from the main assessment in point 214 (point 1 in my submission), by only arguing he was right stating that the (former) use of Westinghouse fuel in the Temelín nuclear power plant in the Czech Republic proves that the nuclear fuel-market does not mean that there exists fuel lock-in. By not acknowledging that the use of the Westinghouse fuel has caused severe problems in Temelín and Westinghouse for that reason at least temporarily, but depending on a next experimental use of Westinghouse fuel in Ukraine, possibly for good retracted from the VVER fuel market, the authors show they are not capable a) to properly analyse the information they drew from the internet, b) take external critical input into account.

214.2. – The consultant may have had problems in understanding English, because his reflection of our submission text is completely inadequate. We allege that the combined texts of the Polish Nuclear Energy Programme and the SEA report do not contain sufficient information to serve as basis for a justification process of the environmental impacts that will be caused by the introduction of nuclear energy in the Polish energy mix. On no occasion does the consultant address this allegation. We furthermore alleged that in case the results of public participation will not be taken into due account within the text of the Polish Nuclear Energy Programme and its SEA report, public participation will not have been taken properly into due account, which would constitute a breach of art. 6(8) of the Aarhus Convention.<sup>2</sup> By dismissing virtually all critical public input, my hopes are low that the consultant will be able to propose changes in the text of the Polish Nuclear Energy Programme and its SEA report. If that he indeed doesn't, he will have acted in breach with the Aarhus Convention, and I will advice Greenpeace to seek legal recourse.

214.3 – Because the consultant did not address the issue of sufficiency of information in the Polish Nuclear Energy Programme and the SEA report to enable enhancement of the quality of decision-making, they acknowledge their dismissal has no basis.

214.4 – The consultant does not deny that the SEA was prepared in a hurry, nor does he deliver facts that would contradict that – which is also difficult, when confronted with the fact that the entire SEA report including annexes was prepared in 30 days, unless the whole exercise was not carried out on the basis of an open tender and the consultant already had been able to work on the SEA report before being granting the contract in the tender procedure and then obviously was part-taking in a corrupted non-market conform tendering procedure.

214.5 – Because the consultant – given there were only 30 days to prepare the entire documentation – had too little time, it is understandable he did not look further than general documentation drawn from the internet. Nevertheless, proper preparation of SEA reports requires a more in-depth analysis of used literature, even if that was derived from sources as the OECD. I would like to emphasise, that the OECD is actively involved in the promotion of nuclear energy over its Nuclear Energy Agency, which was also the source of most of the OECD sourced information that the consultant has used. Certainly when using this kind of non-independent information, it is important to make an own analysis of the adequacy of data on the basis of comparison with a wider range of literature – something the consultant did not, and in 30 days also could not, do. In order to balance this inadequacy, instead of rejecting all input from civil society as the consultant did now, he should have included the information given in his assessments, and re-evaluated his conclusions.

214.6 – The consultant does not address any of the remarks made under 214 (our submissions 1 and 2). The facts we brought forward, including that the provided documentation suffers under inadequate priority setting, is based on information from biased sources and uses partly outdated information, therefore cannot be dismissed. Because it now becomes clear that the SEA procedure – and with that the Aarhus Convention prescribed opportunity for public participation in this planning procedure – is severely flawed, I advice the Polish Ministry of Economy to withdraw the Polish Nuclear Energy Procedure and this SEA procedure and concentrate on the update of the Polish energy policy.

<sup>2</sup> Aarhus Convention, art. 6(8): "Each Party shall ensure that in the decision due account is taken of the outcome of the public participation."

**217 – Rejection unjustified.** Although the consultant rejects the remark (our submission point 5) about the availability of the material in English next to Polish, he does not give proper arguments that would justify discrimination of non-Polish-fluent residents in Poland and non-Polish foreigners outside of Poland in a matter that is so far reaching and complex as the introduction of nuclear power in the Polish energy mix. I will advise Greenpeace to seek legal recourse on this point in case there will be no further proposal from the Ministry to improve on this issue in future cases.

**218.1 – Rejection unjustified.** The consultant tries to defend the fact that neither the Polish Nuclear Energy Programme nor the SEA report is based on a proper comparison of alternatives, including proper zero-options. He refers in that respect, as we did, to the Polish energy strategy, but does not realise that this energy strategy itself did not contain comparison of all proper alternatives. The point raised in our submission, that if the energy strategy (in this case the ones until 2025 and 2030) does not include proper alternatives, the burden of comparison comes on the subsequent implementing strategies and plans, as these cannot refer to the basic strategy because it lacks this comparison. If such a comparison is also not included in the implementing strategy, the burden of comparison with alternatives automatically falls on the Environmental Impact Assessment for the actual projects. This is a structural problem within environmental planning, that can be repaired in this SEA procedure. If the Polish energy strategies for 2025 and 2030 would have been based on publicly accessible comparisons of alternatives, it would have been sufficient for the Ministry to quote these comparisons and conclusions in some detail in the Polish Nuclear Energy Programme and for the consultants to refer to that set of data. However, because no publicly accessible comparisons with alternatives were made, the Ministry could not include them in the Polish Nuclear Energy Programme and the consultant cannot – objectively – refer to any comparison with other alternatives. Ergo, the consultant has no data to justify the impacts on the environment from the introduction of nuclear energy in the Polish energy mix, simply on the basis of lack of data. That the consultant does not understand that and tries to mask this clear fact with legalistic blahblah leaves the impression of another interest being served than the public interest. It certainly illustrates the earlier made conclusion that this SEA procedure cannot properly function as a tool to enhance the quality of environmental decision-making.

218.2 – The consultant does not react on any of the content in 218 (our submission point 6). It is unclear whether this means that the consultant agrees with the facts stated and therefore recommends them being reassessed in the Polish Nuclear Energy Programme or whether he simply tries to divert attention of the factual critique put forward by us by ranting about only one of them – an unsympathetic rhetoric tactic used repeatedly in his comments.

**219.1 – Rejection unjustified.** The consultant states that “one of the main orientations of the Polish Energy Policy is to 'diversify the electricity production through introduction of the nuclear energy'”.<sup>3</sup> This statement is not true. Diversification of the electricity production can take place by the introduction of different techniques and applications and there is a choice which ones to include. The Polish Energy Policy proposes only one line of action including nuclear power and there has factually not been a comparison with different energy policy mixes – including non-nuclear ones – leading to different energy mixes leading to different impacts on the environment.

219.2 – The consultant rejects our submission, but at the same time goes to large lengths to explain that not all options are open and with that confirms that the whole procedure is in breach with Aarhus Convention art. 6(4).<sup>4</sup> That an earlier SEA procedure failed to offer that option is not a legally valid reason to repeat that mistake in this case – it merely shifts the burden of comparison to the next level, as argued above. Our conclusion from the argumentation from the consultant is that he agrees with our assessment that public participation should have been enabled in an earlier stage that should have included the full set of alternatives. This, however, does not relieve the consultant to present such a comparison in sufficient detail – whether it has been present in earlier procedures (as is indeed “well-founded in legislation and doctrine” - and which would have enabled the consultant to refer to this comparison within his analysis) or not (as is the case here).

<sup>3</sup> *Jednym z podstawowych kierunków polskiej polityki energetycznej jest: „dywersyfikacja struktury wytwarzania energii elektrycznej poprzez wprowadzenie energetyki jądrowej”.*

<sup>4</sup> Aarhus Convention art. 6(4): “Each Party shall provide for early public participation, when all options are open and effective public participation can take place.”

Because the public has had no possibility to give its input on a proper comparison of alternative policies and the result of such a policy development could not be quoted here to form the basis for justification of environmental impacts by the introduction of nuclear power in the Polish energy mix, I will advise Greenpeace to seek a legal judgement over the issue of lacking alternatives in court, in case the Polish Nuclear Energy Programme will be adopted without a proper analysis of alternative policies, including those without nuclear power, among others on the basis of breach of art. 6(4) of the Aarhus Convention.

219.3 – The consultant quotes the variant analyses performed by ARE S.A. for the purposes of drawing up the Polish Energy Policy Until 2030 (PEP2030): “it is not possible to satisfy the Polish demand for electricity only through improvement of the efficiency of the energy use and through development of the OZE”. It is exactly this conclusion that is put under critique in the studies that we referred to in our submission. These studies show both for the EU market (given the fact that Poland is part of the integrated EU market for electricity) and for the situation of Poland that it **is** possible to satisfy Polish demand for electricity through improvement of energy efficiency and renewable energy sources. Either the consultant did not read the literature provided by us (and therefore has based his rejection on quick-sand) or he should explain why these analyses are wrong. This does illustrate, however, that the consultant has been misled by steadily choosing only one source of information and not reviewing this on a wider basis of literature. It is true, that that would have been impossible within the short time-frames given, but that only supports our allegation that the SEA has been made in a hurry and therefore cannot serve as a proper basis for a justification process for the introduction of nuclear power in the Polish energy mix.

**220 – Rejection unjustified.** See remarks under 219. Stating that achieving a 15% coverage of electricity production with renewable energy sources in Poland in 2020 is “very ambitious” citing costs as reason in a nuclear energy strategy that is to decide about 10 to 24 Billion Euro of nuclear investments in the coming decade is a bit strange. Had the consultant not resigned to repeating his own figures but taken the effort to look into the argumentation and literature delivered in our submission, he would have found clear indications that his cost estimates were debatable, to say the least. By excluding the more recent and higher estimates and refusing to implement them in his estimates, he gives willingly a distorted and biased picture of reality. The recently published study “*Morski wiatr kontra atom – Analiza porównawcza kosztów morskiej energetyki wiatrowej i energetyki jądrowej oraz ich potencjału tworzenia miejsc pracy*” of the Institute for Sustainable Energy for Greenpeace and the Heinrich Böll Foundation<sup>5</sup> comes to the conclusion that investment in off-shore wind in order to deliver the same electricity output as the proposed nuclear investments would be lower and deliver more – and above all more Polish – jobs. Furthermore, such investments could deliver the first electricity to the grid already in 2015, growing gradually to the same total annual output in the year that the first nuclear electricity otherwise would be fed into the grid. Because it is unlikely that the first nuclear block will be up and running in 2020, and because of the fact that development of off-shore wind goes more gradually, this would deliver a net increase in overall local development that far outweighs that delivered by nuclear power. It is exactly for these reasons that a SEA report as well as the Polish Nuclear Energy Programme itself should incorporate a proper analysis of alternatives. Our analysis clearly shows that the environmental detrimental effects of the introduction of nuclear power in the Polish energy mix cannot be justified with costs and employment (regional development) because less costly, more economic beneficial and above all less risky alternatives exist.

**221 – Rejection unjustified.** We have argued before that the Strategic Environmental Assessment public consultation is the only instance in which the public can participate in the decision process for the Polish Nuclear Energy Programme. If the consultant rejects submissions because they address mistakes and issues in the Programme itself (and not in the SEA report), he does not understand the role of public participation within the SEA process. The Aarhus Convention prescribes public participation in the preparation of plans and programmes – not only concerning the SEA. When the only possibility for public participation is the SEA procedure, it follows logically that this public participation concerns all relevant information, including the plan or programme itself.

5 Wiśniewski, Grzegorz, Magdalena Ligus and Katarzyna Michałowska-Knap, *Morski wiatr kontra atom – Analiza porównawcza kosztów morskiej energetyki wiatrowej i energetyki jądrowej oraz ich potencjału tworzenia miejsc pracy*, Warszawa (2011), Instytut Energetyki Odnawialnej / Greenpeace Polska / Fundacja im. Heinricha Bölla; <http://greenpeace.pl/raporty/morski-wiatr-kontra-atom/>

The consultant therefore has to take our submission considering the costs into due account. In his response, the consultant merely describes several sources that use a too low cost estimate for nuclear power. He does not give any argumentation why higher estimates brought forward by us in Annex 1 of our submission would be wrong. If the consultant agrees that these estimates are merited, he should incorporate them in his assessment and draw the proper conclusions, not stick to his own pro-nuclear biased subset of data.

**222 – Rejection unjustified.** It is valuable to repeat here the start of this response from the consultant: “Remark rejected. It is true that the use of new nuclear power plants will not reduce the CO<sub>2</sub> emission in Poland until 2020. However, introduction of nuclear energy is necessary – it will allow to satisfy, at reasonable cost, a growing demand for electricity in Poland.”<sup>6</sup> When, as the consultant confirms, it is true that the construction of nuclear power plants will not reduce CO<sub>2</sub> emissions in Poland by 2020, but rather, as we explained, increase emissions before that time, the consultant cannot reject the submission. This fact has direct implications for Poland's climate targets for 2020 and therefore should be taken into consideration. Especially because viable alternatives would deliver reaching or even overshooting those targets while at the same time fulfil all the other criteria mentioned here.

Secondly, the conclusion that nuclear power is necessary is simply not true, as has been proven extensively in our submission and the literature used. Nuclear power is a choice. A choice that on top of that does not meet the very same criteria set in this sentence and will cause Poland to break its climate target for 2020 by causing extra emissions in the construction phase.

The consultant repeats the unproven dogma that it is not possible to satisfy the demand in Poland with energy efficiency and renewable energy sources. Repeating a dogma does not make it more true and the consultant is not capable of putting forward arguments for this statement, whereas Greenpeace has shown with the literature provided that this is very well a possibility – a possibility that will be on the mid and long term cheaper, deliver more employment and more energy security than options including nuclear power. The submission 222 (our number 10) can therefore not be rejected but should be taken into account in a reformulation of the Polish Nuclear Energy Programme.

The European Commission's value of CO<sub>2</sub> emissions from nuclear power are contested and we have provided the literature in which that happens. This literature is not challenged by the consultant on its merits and therefore should be taken into account.

The consultant tries to smear Greenpeace by turning around facts. Where Greenpeace points out the lack of data used by the consultant and delivers the literature containing different data, the consultant accuses Greenpeace of closing its eyes for other data. Greenpeace does not do that, but comes to different conclusions because it considers a wider set of data than the consultant is willing to do. Our conclusions are furthermore based on the precautionary principle, which is also the basis for EU environmental policy (see our reaction 229, under): if alternatives exist (and we have proven that they do) and those alternatives can deliver the same services against less environmental risk and less risk in potential cost on the basis of higher – more realistic – estimates, it is in the precautionary principle not wise to gamble on low estimates. After the Fukushima accident, the German Ethics Commission has extensively deliberated about this point and came to the conclusion that for Germany therefore nuclear power cannot be justified. It may be wise for the Polish government to take the report of the German Ethics Commission into consideration.<sup>7</sup>

When the consultant writes that nuclear power stations work without interruptions, it is time he returns to planet Earth. Based on historical experience, current nuclear power stations have an availability factor of around 80%. The for Poland proposed designs are advertised to have an availability factor of around 90%, but as none of them has already been finalised, this is still to be proven. Nuclear power stations are switched off for fuel change, maintenance, technical problems or because of emergencies, including emergencies caused by natural events (storms, floods, etc.), technical events and man-made events. When a nuclear power station is switched off, it takes up to 2 days to restart it. The EPR design has been advertised as being able to load-follow (i.e. to reduce part of its capacity when low demand would require that). However, because of technical

6 *“Uwaga odrzucona. Prawdą jest, że budowa elektrowni jądrowych nie przyczyni się do redukcji przez Polskę emisji CO<sub>2</sub> do 2020r.. Wdrożenie energetyki jądrowej jest konieczne dla pokrycia po racjonalnych kosztach rosnącego zapotrzebowania polskiej gospodarki na energię elektryczną.”*

7 English: <https://docs.google.com/viewer?a=v&pid=explorer&chrome=true&srcid=0B-sE0e8tdNZVjizZWRhMjMtN2I4NC00MmU1LThkZjktZjZkZGY0MjFkODRh>

German original: [http://www.bundesregierung.de/Content/DE/\\_Anlagen/2011/05/2011-05-30-abschlussbericht-ethikkommission.property=publicationFile.pdf](http://www.bundesregierung.de/Content/DE/_Anlagen/2011/05/2011-05-30-abschlussbericht-ethikkommission.property=publicationFile.pdf)

risks, the French nuclear regulator ASN has forbidden load following for the Flamanville 3 EPR. For the Olkiluoto 3 EPR in Finland, load-following has not been foreseen and permission for that has not been requested.

The literature delivered in our submission describes the necessary development of storage and grid in order to integrate high loads of up to 100% renewable energy sources into a 24/7/365 energy system with the same delivery quality as the current grid.<sup>8</sup> Obviously the consultant has not taken the time to read this literature. The inclusion of further inflexible capacity from nuclear (or coal) into a system with increasing renewable capacity (and there is no doubt that renewable capacity will strongly increase within the coming 60 to 80 years of projected lifetime of a new nuclear power station) is a serious problem that has not been addressed in either the Polish Nuclear Energy Programme nor in the SEA report.

**223 – Rejection unjustified.** The consultant proves with his reaction that he has not read the quoted literature mentioned in our submission. There **is** a growing conflict between centralised and decentralised grid development because of the inflexibility of the existing structure. We have given one example of such a potential conflict in the case of construction of nuclear power in Northern Poland and pointed out that the remarks made about necessary grid development will undermine the potential of off-shore wind development in the same region. The report of Wiśniewski e.a. (2011) mentioned on page 5 furthermore clearly shows that when the conflict will be resolved by a choice for nuclear energy, this will result in higher costs and less employment in the region. The remarks about large scale and small scale energy consumers illustrate the fact that the consultant has insufficient competence on the issue. Whether it is large scale consumers or small scale consumers that are connected to the grid does not matter. What is important is that the grid delivers both of them reliable availability of electricity. This grid-reliability can be delivered by a grid based on the 20<sup>th</sup> century paradigm of base-load and peak-load (large centralised inflexible units delivering an inflexible base and small flexible units delivering the peak demand) or by a more sophisticated paradigm based on modern grid management (preference for low marginal cost input, balancing by high marginal cost input). Both paradigms cannot exist next to one another, as the developments in Denmark, Northern Germany and Spain are illustrating. A shift towards a modern grid management paradigm is of uttermost importance and the introduction of further inflexible centralised capacity introduces further barriers to that.

When the consultant does not understand the engineering problems delivered by load-following of nuclear power stations, he should say so and not say the submission is incomprehensible. Nuclear reactors age faster because of capacity changes (when the capacity is lowered by insertion of regulation rods, fast neutrons streams increase with a negative influence on the crystalline structure of welding seams and reactor vessel steel). In spite of a lot of hype about the possibility to load-follow, most operators and nuclear regulators therefore advice against it.

It must be noted that the consultant does not challenge the fact that the French nuclear regulator ASN has forbidden load-following by the Flamanville 3 EPR.

**224 - Rejection unjustified.** For most of the issues raised here by the consultant, see above under 219. Concerning subsidies of renewable energy sources, nuclear power is an established technology that has highly benefited from subsidies and market regulation in the past, as have fossil energy sources. After market liberalisation, new entrance technologies therefore rightly have received an exemption on the ban of state aid, in order to create a level playing field. Furthermore, fossil fuels and nuclear energy have high external costs that are not internalised in the cost-price for electricity. For fossil fuels, climate related costs are now partly (but far from fully) integrated in the form of carbon prices. Nuclear power continues to receive high direct and indirect subsidies for research and development (in Europe many times more than renewable energy sources and energy efficiency), externalisation of liabilities (for emergencies in Poland under the Vienna Convention and the upcoming ratification of the Brussels Protocol, but there are also uncovered / state covered liabilities for decommissioning and waste fund development), budget money for nuclear PR (among others in Poland), and others. The current support schemes for renewable energy sources are used to make up for these inequalities and give those sources a fair chance to develop a market. The numbers quoted by the consultant are taken

8 Van De Putte, Jan, Rebecca Short, *Battle of the Grids – How Europe can go 100% renewable and phase out dirty energy*, 2011 (Brussels) Greenpeace; <http://www.greenpeace.org/eu-unit/press-centre/policy-papers-briefings/battle-of-the-grids>

Tröster, Eckehard, Rena Kuwahata, Thomas Ackermann, *European Grid Study 2030/2050*, Langen (2011) Energynautics GmbH; [http://www.energynautics.com/downloads/europeangridstudy2030-2050/energynautics\\_EUROPEAN-GRID-STUDY-2030-2050.pdf](http://www.energynautics.com/downloads/europeangridstudy2030-2050/energynautics_EUROPEAN-GRID-STUDY-2030-2050.pdf)

completely out of context and the conclusions based on them are therefore false. It is true, however, that there are more and less efficient support schemes to help the introduction of renewable energy sources. The most successful scheme is probably the German one, which was instrumental to the enormous cost reductions we have seen in the wind energy and solar energy markets in the last decade.

Concerning the study of Gabriel Calzada Alvarez on the Spanish green job creation, the consultant has referred to a non-peer-reviewed and highly contested study<sup>9</sup> – and where it received a lot support from the more radical fringe of the US climate sceptics movement, it did not from academic circles. In contrary, there is a whole series of studies that show that one of the crucial parts of the success story of the Spanish renewable energy development is exactly job creation – an important issue in a country that is faced with a large economic crisis based on a construction bubble. Also experiences in Germany have sufficiently shown that the development of renewable energy is creating more jobs than business as usual. The earlier mentioned recently published study comparing off-shore wind with nuclear development in Poland also illustrates the positive employment effect of renewable energy sources.<sup>10</sup> Greenpeace in Spain has published a series of reports describing a pathway to 100% renewables, including full grid stability, in 2050.<sup>11</sup>

As already argued above, the consultant is using too low cost estimates for nuclear energy and his ideological statement that nuclear power grants access to low-cost energy could become an expensive liability for Poland. As stated earlier, repetition of a faulty dogma does not make it more true. The Polish government is well advised to analyse the risks if the consultant's and the Programme's cost estimates indeed appear to be too low.

With his rant about the British wind-low, the consultant shows he has not read the literature we referred to in our submission. The calculations in the 24/7 study take even extreme weather conditions into account and deliver the standard grid reliability currently available in the EU.

**225** – The statement that Greenpeace has had sufficient influence on the discussion on nuclear liability would be hilarious, if the reality in Fukushima and after Chernobyl would not have shown us the seriousness of the issue at hand. Nuclear liabilities cannot be fully covered by the normal insurance systems, because the amounts we talk about are too large. Also the risk-assessments usually used to establish liabilities are insufficient. It is impossible to assess full liability for an issue that according to probabilistic calculations would happen once every 10.000 years (a core meltdown) and has in fact happened 15 times already in the 65 years that nuclear energy is used, from which 6 times in commercial nuclear power stations, 2 times of which resulted in huge emissions of radioactivity into the environment with potentially hundreds of Billions of Euro in damages. Greenpeace has always made clear that neither the Vienna Convention, nor the Paris Convention, nor the Brussels protocol offer sufficient coverage for the liabilities of nuclear energy. The consultant shows his lack of understanding of social processes by implying that Greenpeace should not bring up the subject because politicians have done everything to grant nuclear energy an unacceptable financial advantage above safe production methods of electricity.

The consultant falls in the rest of his reaction into intolerable nuclear PR talk. When he states that “The radiation itself has not caused a single death” in Fukushima, he shows he is nothing more than pawn in a nuclear PR game and not an objective assessor of the potential environmental effects of the implementation of the Polish Nuclear Energy Programme. It will be difficult to establish the exact economic, social and indeed

9 As example: Lantz, Eric and Suzanne Tegen, *NREL Response to the Report - Study of the Effects on Employment of Public Aid to Renewable Energy Sources from King Juan Carlos University (Spain)*, Golden, Colorado (2009) National Renewable Energy Laboratory; <http://www.nrel.gov/docs/fy09osti/46261.pdf>

10 Wiśniewski, Grzegorz, Magdalena Ligus and Katarzyna Michałowska-Knap, *Morski wiatr kontra atom – Analiza porównawcza kosztów morskiej energetyki wiatrowej i energetyki jądrowej oraz ich potencjału tworzenia miejsc pracy*, Warszawa (2011), Instytut Energetyki Odnawialnej / Greenpeace Polska / Fundacja im. Heinricha Bölla; <http://greenpeace.pl/raporty/morski-wiatr-kontra-atom/>

11 English summary: Garcia Ortega, Jose Luis and Alicia Cantero, *100% Renewables – A renewable electricity system for mainland Spain and its economic feasibility – summary of conclusions*, Madrid (2010) Greenpeace; [http://www.greenpeace.org/espana/Global/espana/report/cambio\\_climatico/resumen-conclusiones-100-reno-3.pdf](http://www.greenpeace.org/espana/Global/espana/report/cambio_climatico/resumen-conclusiones-100-reno-3.pdf)

Cantero, Alicia and Jose Luis Garcia Ortega, *100% Renewables – Comparison of costs – A renewable electricity system for mainland Spain and its economic feasibility – summary of costs*, Madrid (2010) Greenpeace; <http://www.greenpeace.org/espana/Global/espana/report/other/resumen-costes-100-renovables.pdf>

Full study (in Spanish): <http://www.greenpeace.org/espana/es/reports/informes-renovables-100/>

health-consequences of the Fukushima catastrophe, but there is scientific consensus about the linear exposure-effect relation of radiation postulated by the ICRP, which means that with the extra exposure levels we have seen for large parts of the population in Northern Japan, many will have to suffer health consequences as a result, and that could well include premature deaths. This is backed up by numerous studies concerning the health effects after the Chernobyl disaster.<sup>12</sup>

Concerning the potential for a large possible beyond design accident in Poland: During the preliminary stress tests of nuclear power stations in Germany, it became clear that none of the reactors there was sufficiently robust against terrorist attack. Robustness against acts of war is even lower. This is not different for Generation III reactors, even where their safety features are of a higher level than that of Generation II. There is no 100% safe reactor and not all circumstances can be completely foreseen. Generation III reactors furthermore contain a larger core with a higher burn-up and therefore a larger source-term in case of a beyond design accident. A country running nuclear power stations – no matter what generation they are from – has to face the possibility of large releases. What that means in practice for a modern society can at the moment be seen in Japan. The results of a beyond design emergency in Ziańowiec for the population of Gdynia, Sopot and Gdansk should be taken into account when assessing the potential environmental effects and liabilities of nuclear power. That the consultant refuses to do so is disgusting. A government is badly advised by nuclear groupies.

**226 – Rejection unjustified.** The ExternE material indeed has become reference material for many experts, but that does not mean it is uncontested. The consultant furthermore does not contest with arguments the fact that he has left out more critical literature and in his reactions has shown that he also did not analyse the literature brought forward by us in our submission.

**227 – Rejection unjustified.** The consultant's responses become increasingly shocking in their lack of concern for the negative sides of nuclear power. The complete dependency on one series of studies (the ExternE studies) which, as we have shown earlier, are contested (and one study contesting the findings of the ExternE study was referred to by us), makes the entire assessment extremely vulnerable. The consultant could have justified his choice by the short time available for the assessment and taken into account the extra information delivered by Greenpeace and other respondents, but he chose for a defensive position. In more detail, the fact that the Polish Nuclear Energy Programme and its SEA do not take into account the potential environmental impacts of uranium extraction, fuel production, transport, and completely insufficiently address the issues around spent nuclear fuel and nuclear waste, makes clear that neither can be used to justify a choice for the introduction of nuclear energy in Poland. It is also clear that with that, the whole exercise of the Strategic Environmental Assessment fails the basic standards set in the Aarhus Convention, the Espoo Convention and the SEA Directive. The insufficient coverage of potential environmental impacts creates a process that cannot lead to enhanced quality of decision making.

The cost estimates of decommissioning and radioactive waste management are insufficient and the description of how these will be integrated into the electricity price is insufficiently clear, leaving a large potential (financial and environmental) risk on the table. Poland is not the only country struggling with these issues. More advanced countries like the UK, Germany and France also lack this clarity. There is nothing wrong with acknowledging that, but the financial and environmental uncertainties have to be taken into account in the decision-making process.

That there are no exposures to radioactivity from transport of, especially, high-level radioactive waste, but also of uranium ore, yellow-cake or depleted uranium is simply wrong. For illustration sake, the Polish government could follow what happens around the annual waste transports from la Hague in France to Gorleben in Germany. One more illustration to make the point: radioactive waste transports regularly cross bridges higher than 9 meter. A terrorist attack on a nuclear waste train on such a bridge could easily result in a fall of more than the 9 meter the containers are tested for and lead to a large spread of radioactive substances. Similar issues play a role for fire (collisions with LPG trucks and trains, shipping fires and others have in the past regularly led to higher temperature levels than the casks have been tested for).

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12 For an overview, see: Yablokov, A., I. Labunska and I. Blokov (eds), *The Chernobyl Catastrophe – Consequences on Human Health*, Amsterdam (2006) Greenpeace;  
<http://www.greenpeace.org/international/Global/international/planet-2/report/2006/4/chernobylhealthreport.pdf>

To illustrate that uranium mining does have negative consequences, I refer to a recent report concerning Areva's practices in Niger, where the local population is exposed to higher radiation levels on places where this is not expected.<sup>13</sup>

I furthermore clearly stated that the time given in the public participation period was too short for an in-depth analysis of all the consequences of the omission of the full chain analysis, so the accusation by the consultant that I did not sufficiently provide concrete examples is not a fair one. It is furthermore not the task of the public to do this analysis, but it was the task of the consultant, who has failed to do so because of his pro-nuclear bias.

**228 – Rejection unjustified.** The consultant falls back in a “yes-no” game instead of taking the suggested information, concerns and viewpoint into due account and with that he threatens the procedure to become in breach with Aarhus Convention art. 6(8).

**229 – Rejection unjustified.** The consequences of implementation of the the precautionary principle and the principle of prevention would mean that Poland would take the existence of alternatives to nuclear power more seriously and attempt to come to a full justification of the environmental impacts of nuclear power – including that of the production of an unsolvable radioactive waste problem – before taking a decision on the issue. Given the fact that no proper comparison has taken place with alternative energy policies, this justification does not exist. The the principle of repairing the damage at the source would imply that the rest-risk posed by nuclear power would not be taken when economically, socially and environmental viable alternatives are available. The polluter pays principle would imply that all liabilities – and not only capped liabilities – would be included in the electricity price and that all funds, including provisions for potential escalations, would be available for waste management at the moment the waste is created, i.e. at the moment that the first nuclear criticality is reached in the reactor. This is not the case.

Although the issues raised by the consultant in his response do relate to these principles, they have not been raised by me. Nevertheless, the consultant illustrates his incompetence in the matter so blatantly, that I will give my response on his statements in some more detail.

When the consultant thinks that nuclear waste can be neutralised (*unieszkodliwianie*), he is wrong. Only time can do that – and that time is for some waste decades or centuries (needing human oversight during that time) up to several hundred thousand years. There is no solution in practice for the problem of high-level radioactive waste, and the safe management of low- and middle radioactive waste is depending on a high level of political stability decades to centuries into the future. Because there is no functioning system of final storage or disposal of high-level radioactive waste anywhere in the world, it is impossible to determine at this stage whether the nuclear sector is indeed capable of raising sufficient funds. There are already cases in which insufficient funds were available – e.g. recently in the United Kingdom and Slovakia. In general, a lot of the fund-creation depends on capital increase because of interest over time – a practice that can also lead to lack of funds at the moment they are necessary. This is especially the case when nuclear power stations need to be closed before the end of their projected life-time. This can happen because of technical reasons, accidents, political reasons (society not willing to carry the risks of nuclear power any longer), or other reasons. When not all the funds for decommissioning, spent fuel and nuclear waste management are present on the moment of first criticality, this risk exists and is in practice currently silently covered by the state.

Comparing the issues around management of radioactive waste from nuclear power production with that of scientific reactors is comparing one apple with a ship of apples. The amounts of radioactive waste in all categories produced by nuclear power stations dwarf that produced in the far smaller scientific reactors. Therefore, the challenges currently posed by radioactive waste in countries with nuclear power stations – even in those with smaller nuclear programmes, let alone in countries with middle-large programmes like the Polish government's ambition is – are immense. Furthermore, for nuclear power stations there are viable alternatives. This is true also for some of the research done in scientific reactors and for some of the isotope production, but for some there exists indeed sufficient justification.

**230 – Rejection unjustified.** We have stated clearly that for an in-depth analysis of PSAs and spreading models as used in the Polish Nuclear Energy Programme and the SEA, the time allowed was insufficient. We therefore

13 Dixon, Andrea A. (ed.), *Left in the dust - AREVA's radioactive legacy in the desert towns of Niger*, Amsterdam (2010) Greenpeace; [http://www.greenpeace.org/international/Global/international/publications/nuclear/2010/AREVA\\_Niger\\_report.pdf](http://www.greenpeace.org/international/Global/international/publications/nuclear/2010/AREVA_Niger_report.pdf)

compared the used data in the SEA chapter 7 with more extensive data used during the EIA of the Temelín and Visaginas nuclear power plant projects to highlight qualitative (not quantitative) inadequacies of the approach used. The consultant confirms in his comment his bias towards the information submitted by the construction companies Areva and Westinghouse to the UK nuclear regulator. The consultant furthermore fails to argue why no meteorological spreading models were used. The statements the consultant makes about the potential of terrorist attack and about potential pathways of terrorist attack are highly insufficient. The consultant furthermore does not include acts of war as a potential pathway to damage leading to a large release of radioactive material. The consultant does not give any information about potential impacts on the population and environment after such a beyond design accident. Simply hoping that such an accident will never take place is not sufficient, as Fukushima has clearly demonstrated.

The claim from the consultant that burn-up and the use of MOX do not add to potential impact after a beyond design accident is false. Because of higher burn-up, the caesium and iodine inventory of the power station is higher in later stages of the fission process than compared to current designs. Because of the use of MOX, the emissions of plutonium and plutonium daughter isotopes will be higher.

Where we do not deny the usefulness of publicly available data from different regulatory bodies in different countries, we have stressed that there is further information available that has not been reviewed by the consultant – possibly because of the lack of time, but if that is so, the consultant should clearly state that and not try to defend the lack of depth of the analysis by insisting that the used data are sufficient.

The claim that sophisticated meteorological models have been used in the SEA is simply false. The models described in chapter 7.2 of the SEA documentation contain simplified general spreading models and not the state of the art meteorological modelling that for instance the Austrian government uses for the assessments of risk in the EIA procedures for Visaginas (Lithuania) and Temelín (Czech Republic) and that the Austrian meteorological service uses for existing nuclear power stations and when following the emissions from the Fukushima catastrophe (<http://www.zamg.at>). We referred to these analyses under point 16 of our submission – obviously the consultants have not taken the effort to look into these references. This means that essential localised information about potential impacts of large beyond design accidents is missing in the analysis, as we claimed in our submission.

**231** – It is refreshing to see that the consultants agree that more attention should be given to nuclear safety. They repeat, however, their blue-eyed vision on safety, instead of describing the margins that need to be taken into account in the justification of the introduction of nuclear power in the Polish energy mix – and the resulting potential risks for people and environment. They do not give any argument countering our concerns.

**232** – The authors try to divert the attention from our concern that recent literature re-evaluating the impacts of Tritium on health as well as recent literature finding a correlation between childhood leukaemia and distance to nuclear power stations was not reflected in the SEA. They do this by restating what they did include instead of analysing what the impact on risk assessment is from these recent findings.

**233.1** – Interesting to see that the consultants position the French reprocessing plant for spent nuclear fuel in the port-town of Le Havre, which is 140 km ENE from La Hague, where it is actually situated. The consultant completely destroys his credibility further by stating that the reprocessing plant in France does not generate any negative environmental impacts, where we have referred to studies revealing such impacts. Again, the consultant seems to have been too lazy to download these studies (links were given in our submission) and read them. The consultant tries to divert the attention from our remarks and the literature given by us by referring to cases we have not mentioned and taking a lot of space in commenting those. This is a rhetorical trick in order not to have to deal with the issues we did raise.

**233.2** – High-level radioactive waste (HLW) management: Final management of HLW has not been proven anywhere in the world. Denying this fact dents the credibility of the consultant. In Finland and Sweden, research is currently undertaken to the option of deep geological disposal in granite, using engineered copper and bentonite canisters for extra shielding. This research is still ongoing as is the assessment of the research results and design documentation by the respective nuclear regulatory authorities. There are a number of open questions, which are highlighted in the literature we have provided in the references, but we have already seen before that the consultant has not taken the effort to indeed study the literature provided by us. The consultant furthermore mixes the management of spent nuclear fuel (SNF) by reprocessing with management of SNF as waste. Reprocessing is proven to be a non-economic and heavily polluting process in France, the UK and

Russia. Management of spent nuclear fuel as HRW is indeed nothing else than speculation as no final management method has been implemented anywhere in the world.

**234 – Rejection unjustified.** The consultant basically restates our conclusion that only information may be left out that *reasonably* does not play a role in the assessment on the level of a programme. The waste resulting from nuclear power production cannot be considered to be an issue that *reasonably* can be left out of the assessment. Our reference to a pig-stable was meant to illustrate that point, not to claim that this SEA process was an EIA. The consultant obviously tries to mask the trick of salami-slicing.

**235 – Rejection unjustified.** Repeating the statement that impacts from largest possible accidents were covered, where we have clearly demonstrated they are not, does not make it true. We refer in this respect to the issues raised above under points 222, 225, and 230. We have analysed the whole programme documentation as presented by the Ministry on its website – including the Polish Nuclear Energy Programme as well as the SEA documentation and have clearly demonstrated that the mentioned issues are not covered.

**236 – Rejection unjustified.** The consultant simply repeats unjustified claims and does not take the issues raised from our side into account. Adoption of the Polish Energy Strategy 2030 by the Polish government in itself is not a prove of the quality of this strategy. Because this strategy was not based on a comparison of different policy alternatives (including a non-nuclear alternative based on the development of energy efficiency and renewable energy sources) and therefore no proper public participation has taken place that took such a comparison into account in the development of the Energy Strategy 2030, the consultant cannot refer to this strategy as one of sufficient quality. The Polish Nuclear Energy Programme has so far only reached the status of a draft and not a final Programme, as it still is undergoing a SEA and should take public participation still into due account.

The remark “The radioactive waste storage technologies currently used [in Poland?] ensure full security.” is simply of no interest in this discussion, as these technologies either deal only with low and intermediate level waste or with temporary storage.

For the rest, the consultant simply repeats the argumentation we have already addressed earlier.

It is not clear to me why the consultant addresses the issue of education and propaganda under point 236, as these are only addressed under point 237 (or point 22 of our submission). We will return to that under point 237.

**237 –** The response from the consultant seems to be out of place and is factually not right as already stated above.

**Rejection unjustified.** The response on the issue of propaganda from the consultant under 236 is trying to cover up the reality in the SEA report and the Polish Nuclear Energy Programme. The claim that all positions are fairly covered is simply untrue, as we have demonstrated in our submission. Falling back on a “yes-no” discussion level does not add anything to this debate. I have quoted the Programme and the SEA – further quotes that are not propaganda do not undo the quotes that are and I have referred to. Critical opinions are not only silenced in the documentation. The consultant simply “rejected” virtually all critical concerns, viewpoints and data are in his response to public participation and he is obviously incapable of these into due account. By using a pro-nuclear biased consultant, the Ministry has continued its campaign of pro-nuclear propaganda by other means. The allegations that opponents of nuclear power are anonymous is ridiculous and false, and shows the consultant is not up to date with the social debate in Poland. That the consultant had to resort to the internet to trace down opposing views illustrates the suppression of critical debate in the Polish media in the last years as a result of the PGE and government led pro-nuclear propaganda campaign. The consultant does not take our fundamental critique into account that education of nuclear issues implies education about advantages **and disadvantages**.

**238 – Rejection unjustified.** The response of the consultant does not address the issues raised in point 238 (point 23 of our submission), but tries to divert the attention from them.