Scientists' appeal to the COP and the UNFCCC

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Scientists' appeal to the COP 23
Nuclear – no solution to climate change

Dear Prime Minister Bainimarama, dear Secretary Espinosa,

we as scientists appeal in this open letter to you as the COP 23 President and Executive Secretary of the UNFCCC not to give in to lobbying by the nuclear industry to give this outdated and dangerous technology access to climate funding mechanisms such as the Green Climate Fund.

Nuclear is no solution to climate change: It is too dirty, too dangerous and also too slow to deploy to be a meaningful answer to global warming. But apart from the known dangers, it is also not carbon free, or even low carbon, or cheap, or reliable.

1) Nuclear power is not carbon-free, or even low carbon

According to the 2014 IPCC report, nuclear energy is considered to be not "carbon free", as the nuclear industry falsely continues to claim[1].

According to IPCC, nuclear is considered to be "low carbon" – about on par with renewables in terms of life cycle CO_2 equivalent emissions – but even this can be debated:

Many scientists disagree with this optimistic IPCC estimate, like Benjamin Sovacool, then at the University of Singapore, now a Professor at the University of Sussex (UK) who ran a meta-analysis of 103 life-cycle studies of the nuclear fuel cycle in 2008 and found that in fact, nuclear power generates about six times more CO_2 than wind energy[2].

J. van Leuwen argues in his study that "the published emission figures of the nuclear industry are not scientifically comparable to those of renewables because of the fact that the nuclear emission figures are based on a very incomplete analysis of the nuclear process chain, for instance the emissions of construction, operation, maintenance, refurbishment and dismantling, jointly responsible for 70% of nuclear CO_2 emissions, are either not taken into account, or use unrealistically low figures." Another reason for the comparably low CO_2 emissions of nuclear power is that the nuclear industry does not include the future energy investments required to finish the back end ("energy debt") in its published

[1] IPCC, Climate Change 2014 – Mitigation of Climate Change, Annex III – Technology-specific Cost and Performance Parameters, Table A.III.2, p 1335

[2] Sovacool BK., Valuing the greenhouse gas emissions from nuclear power: A critical survey, Energy Policy 36 (2008) 2940—53

emission figures. His study comes to the conclusion that "at present nuclear power emits 88—146 gCO2/kWh" [3].

2) The contribution of nuclear power is tiny in terms of global emissions reductions

Nuclear power only produces about 10% of world electricity and less than 5% of global energy. Electricity generation only accounts for 25% of greenhouse gas emissions[4]. That means that under the most positive assumptions nuclear power currently only prevents a tiny amount of global greenhouse emissions from energy production. Even the lofty – and financially unviable – goal of some nuclear lobbyists to triple nuclear power generation worldwide would therefore only reduce greenhouse gas emissions by a comparatively small percentage– and only if the assumption is to replace coal or other forms of electricity generation with high carbon emissions.

3) Nuclear energy blocks renewables – no subsidies for nuclear

Direct and indirect public / taxpayer subsidies for the nuclear sector in terms of research and development, education of nuclear scientists and engineers, construction of nuclear power plants, hidden price subsidies for electricity, reduced insurance liabilities, clean-up and decommissioning costs, waste management, etc., are all drawing away money from the renewable sector. Excess capacity from nuclear plants literally flood the electric grids so that cheaper and cleaner renewables are either not developed or are not fully used.

The ongoing attempts by the nuclear industry to get access to climate funding mechanisms such as the Green Climate Fund have to be stopped, a full cost accountability for nuclear energy has to be implemented.

4) Nuclear energy can't compete with renewables

Among many studies, a recent study by the DIW (German Institute for Economics) shows that nuclear power is not competitive financially:

> "New nuclear power plants are very expensive to build and even at high carbon prices, nuclear power is not competitive. […] Model calculations show that nuclear power would disappear from Europe's power generation mix by 2050 were the decision based on economic factors and cost considerations alone.
> In Western Europe, the UK and France are still determined to implement their plans to build new nuclear power plants. But the model calculations for these two countries indicate that complete electricity sector decarbonisation by 2050 would also be possible without nuclear power." [5]

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[3] Jan Willem Storm van Leeuwen, Nuclear Power and CO_2 emissions, report L21 p 11, 23.10.15 www.wiseinternational.org/sites/default/files/u93/F4%201nuclGHGshare-ED.pdf

[4] Key World Energy Statistics 2015. www.iea.org/publications/freepublications/publication/KeyWorld2016.pdf

[5] Casimir Lorenz et al, Nuclear power is not competitive— climate protection in UK and France also viable without it, DIW Economic Bulletin 44.2016, p 505—512 www.diw.de/documents/publikationen/73/diw_01.c.546408.de/diw_econ_bull_2016-44-1.pdf

5) Hidden costs of nuclear energy are not taken into account

The front-end costs for the mining and production of uranium are kept low by criminally negligent safety and health standards in uranium mines and human rights abuses towards indigenous communities. Examples include the situation of the Cree and other First Nations in Canadian uranium mining regions in Ontario and Saskatchewan, the impact of uranium mining on the Aborigine populations in Kakadu National Park, Radium Hill or Olympic Dam, Australia or the health effects of chemical leeching of uranium in South Africa's Witwatersrand region around Johannesburg.

The back-end costs are also not adequately taken into consideration: decommissioning of nuclear reactors, clean-up as well as storage and security of nuclear waste cannot be calculated precisely yet and, despite of some funds being collected in several countries with nuclear plants, a substantial portion of these costs will have to be paid for by taxpayers for generations to come. For example, just recently the UK government had to admit that there will be a cap on the amount of money the nuclear industry will pay for waste storage - costs which in all likelihood will spiral out of control in the coming centuries[6].

6) Nuclear power is not reliable

All nuclear power stations are subject to tripping out for safety reasons or technical faults within seconds – and do so: "That means that a 3.2GW nuclear power station has to be matched by 3.2GW of expensive 'spinning reserve' that can be called in at a moments notice."[7]

The older nuclear power stations get, the more accident-prone, but also the more unreliable the aging components will become: with an average operating age of 29 years and rising, these kind of tripping events will happen more often – and put more strain on the electricity grid[8].

An even more drastic example of nuclear unreliability is France in January 2017, where decades of falsifications by the forge Le Creusot led to the nuclear regulator ASN taking nine reactors offline for security reasons – documentation of the strength of the forged steel and carbon anomalies had been systematically falsified for decades. As a result, France had to import electricity not only from Germany, but also from Spain, Switzerland, Belgium – and the UK, and just about managed to survive the cold snap without blackouts (as every degree centigrade less in the winter months means an additional demand of 1000 MW in France where quite inefficient electric heating is still widespread)[9].

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[6] Jamie Doward, Secret government papers show taxpayers will pick up costs of Hinkley nuclear waste storage, The Guardian, 30.10.16 www.theguardian.com/uk-news/2016/oct/30/hinkley-point-nuclear-waste-storage-costs

[7] Mark Diesendorf, Dispelling the nuclear 'baseload' myth: nothing renewables can't do better!, The Ecologist, 10.3.16

[8] Mycle Schneider, Antony Froggatt, The World Nuclear Industry Status Report 2016 www.worldnuclearreport.org/The-World-Nuclear-Industry-Status-Report-2016-HTML.html

[9] France's nuclear-energy champion is in turmoil, The Economist, 1.12.16, www.economist.com/news/business/21711087-electricit-de-france-has-had-shut-down-18-its-58-nuclear-reactors-frances-nuclear-energy

7) Nuclear energy is bad for your health

Various steps needed for producing nuclear energy which we call the 'nuclear chain' beginning with uranium mining and the transportation of "Yellow Cake", followed by its use for nuclear power or nuclear bombs, the reprocessing of used fuel rods to make plutonium, and ending in nuclear waste or fallout from nuclear explosions, produce long lasting health effects like cancer and leukaemia, non-cancer diseases and genetic effects and teratogenic effects like congenital malformations. Numerous medical studies show the enormous bad health effects of uranium mining to workers and locals where women and children are especially sensitive to low level radiation[10].
During operation, the radioactive releases of nuclear power plants cause child cancer and child leukemia in the surrounding population[11].
The INWORKS study, published in Lancet Hematology in 2015 showed a direct correlation of the radiation dose in bone marrow to excess leukemia rates in nuclear workers with more than 300,000 workers included in the analysis, 147,000 from the UK[12].
Nuclear energy production thus continuously puts people's the human right for health at risk.

For all these above reasons we, the undersigned as scientists, urge you not consider the false solution nuclear energy for the real global threat climate change.

[10] Grosche B et al., Lung cancer risk among German male uranium miners: a cohort study, 1946—1998, Br J Cancer, 2006 Nov 6;95(9):1280—7; Zaire et al., Unexpected Rates of Chromosomal Instabilities and Alterations of Hormone Levels in Namibian Uranium Miners, Rad Res 1997 May;147(5):579—84; Rachel et al., Mortality (1950–1999) and Cancer Incidence (1969–1999) in the Cohort of Eldorado Uranium Workers, Radiation Research, December 2010, Vol. 174, No. 6A

[11] Kaatsch P et al., Leukaemia in young children living in the vicinity of German nuclear power plants, Int J Cancer. 2008 Feb 15;122(4):721-6. https://www.ncbi.nlm.nih.gov/pubmed/18067131; see also Epidemiologische Studie zu Kinderkrebs in der Umgebung von Kernkraftwerken (KiKK-Studie), Abschließende Stellungnahme des Bundesamtes für Strahlenschutz, September 2009, http://nbn-resolving.de/urn:nbn:de:0221-20100317939 and for the discussion around publication and interpretation of the KiKK-Studie Dr. med. Winfrid Eisenberg, Atomkraftwerke machen Kinder krank, Fragen und Antworten zum Krebsrisiko rund um Atomanlagen, IPPNW, April 2009

[12] Leuraud K et al., Ionising radiation and risk of death from leukaemia and lymphoma in radiation-monitored workers (INWORKS): an international cohort study, The Lancet Haematology, Volume 2 , Issue 7 , e276–e281.

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