WIN GLOBAL COP 28 POSITION PAPER

Climate impacts on women and children need meaningful action now — nuclear power can support this action

WHO ARE WE ARE

Women in Nuclear Global (WiN Global) is a non-profit organization of women working professionally in various areas of nuclear energy and radiation applications. Since our foundation in 1992, we have been strong advocates for environmental sustainability, diversity, and gender equality. To power a thriving, inclusive future for all, we are committed to promoting an evidence-based dialogue with the public to raise awareness about the essential contributions of nuclear technology to people and society, especially as part of the solution to the climate crisis and as a key element in achieving the United Nations Sustainable Development Goals (SDGs).

Contact us

Ms. Dominique Mouillot
President
winglobalpresident@gmail.com

Ms. Melina Belinco
Vice-President
melina.winglobal@gmail.com

EXECUTIVE SUMMARY

The world relies on power and energy to survive. Without drastic measures to reduce human energy consumption, effecting the lifestyles we have grown accustomed to and expect, meaningful climate action is required. As part of a sustainable energy solution, nuclear power can support renewable and other carbon neutral energy sources to ensure that energy security, stability and reliability are maintained for generations to come. The nuclear industry is developing breakthrough technologies, notably with the development of micro or small modular reactors associated with the production of carbon-free hydrogen. Developing countries urgently need energy which enables humans to live longer, healthier lives, to monitor health, and to produce medicine to cure illness and relieve pain.

This paper outlines how the climate crisis affects youth and women, how global action has failed to bring about meaningful change, how nuclear as part of a net zero plan can support renewable energy plans and how both nuclear and environmental communities could work together to achieve net zero. Diversity is one of the keys to innovation in confronting our planet's challenges.

The climate crisis has a disproportionate effect on youth and women. So far, global efforts have not managed to reduce carbon emissions affecting some of the world's most vulnerable communities. Adding nuclear power as a net zero option to a renewable grid enables clean, affordable and reliable energy to be provided globally. Both the nuclear and wider global communities need to take steps to build nuclear capacity and, thus, reduce carbon emissions, which include funding and supporting newcomers to nuclear energy.

MEANINGFUL ACTION SUPPORTED BY NUCLEAR POWER

"Energy is central to nearly every major challenge and opportunity the world faces today".
United Nations

The world relies on energy to survive. Without drastic measures to reduce human energy consumption affecting the provision of safety, health and security, meaningful climate action is required. As part of a sustainable energy solution, nuclear power can support renewable and other carbon neutral energy sources to ensure that energy security, stability and reliability is maintained for generations to come. The nuclear industry is developing breakthrough technologies, notably with the development of micro or small modular reactors associated with the production of carbon-free hydrogen, among other benefits. Energy and, in particular, electricity is urgently needed in developing countries to enable humans to live longer, healthier lives, to monitor their state of health, and to produce medicine to cure illness or relieve pain.

This paper outlines how the climate crisis affects youth and women, how global action has failed to bring about meaningful change, how nuclear as part of a net zero plan can support renewable energy plans and how both the nuclear and global communities can work together to achieve net zero. As diversity is one of the keys to innovation in confronting our planet's challenges, the paper presents a wide range of energy solutions and opportunities for women.

Impact of climate crisis on women and youth

Climate change affects young women in various ways, including effects on health, education, food security, domestic stability, economic well-being, and equal opportunity

for leadership. These impacts are closely intertwined with existing gender inequalities. Addressing gender dimensions of climate change is essential for building more resilient and equitable societies. Some progress is noted in gender equality policies globally; however, policies on planned relocation, displacement and migration due to climate change effects are often insufficiently gender-responsive[1]. Data collection and both qualitative and quantitative analysis are essential to facilitate the effective implementation of strategies to reduce structural vulnerabilities and ensure that women can adapt to climate change; even more, the displaced women's well-being is attended to in the context of the adverse effects of climate change. More efforts are necessary to redress unequal access to resources across and within communities hosting displaced women and girls.

Developing countries still depend primarily on subsistence work such as agriculture as a source of income and food for families and, so the impact of climate change is directly felt on harvests and, therefore, on incomes. If excessive heat or damp, for example, reduce crop yields, livelihoods of families are directly threatened as well as their ability to feed their children. According to a UN review on climate impacts, out of 1.3 billion people living in poverty, 70% are women, with 40% of households headed by women in urban areas[2].

Additionally, women predominate in the world's food production (50-80 per cent), but own less than 10 per cent of the land. Therefore, policies are needed that will facilitate ownership and management of companies and production assets by communities, workers, cooperatives and other collectives that favour women in the forefront. Various nuclear techniques are available to support the health and yield of crops in drought-prone areas. Implementation of these techniques should consider women as primary recipients and users and as means to disseminate information to fight climate change.

Climate change is majorly associated with extreme weather conditions, which induce and exacerbate natural disasters such as floods, tropical cyclones, hurricanes, and drought. These pollute natural clean water bodies in rural areas and disrupt water supply lines in urban areas. The resulting air and water pollution exposes children to infectious diseases, parasitic diseases (transmitted by insects) and contaminated water. These children often also face poor nutrition. Women are the most affected as they carry the burden of caring

1. Harper, A., Vinke, K., Blocher, J. (2022): Gender, Displacement and Climate Change, Genève: United Nations High Commissioner for Refugees (UNHCR) / https://www.unhcr.org/media/gender-displacement-and-climate-change
2. Osman-Elasha, B. (2009) Women...In the Shadow of Climate Change: United Nations Chronicle / https://www.un.org/en/chronicle/article/womenin-shadow-climate-change

for their children and families. In developing countries, women migrate from drought-impacted areas. In addition to displacement and migration, there is a subsequent effect on the UN Sustainable Development Goals 1 and 5, no poverty and gender equality, respectively. These events can disrupt education, and girls are more likely to drop out of school during crises to help their families or due to safety concerns. Women and children are often disproportionately affected by displacement and may face increased risks of violence and exploitation. Women and girls make up half of migrants in the East and Horn of Africa at 50.4 per cent compared to men and boys, a phenomenon and migration trend unique to the region according to a new report by the Regional Data Hub of the International Organization for Migration (IOM)[3].

In addition to political instability, the critical factor contributing to increased migration and displacement in the eastern countries of Africa is drought. Somalia, Ethiopia and Kenya have been experiencing the worst drought in four decades, and conditions are similar to the 2010 -2022 famine and 2016-2017 drought emergency trend.

Moreover, women must be empowered at all economic levels to partake in and benefit from implementing nuclear technology-related projects that aim to mitigate and provide adaptation measures to climate change effects in their home countries. In South Africa, businesses are encouraged to recruit women first, with priority given to previously disadvantaged ethnic groups, and to put them in positions of power. This facilitates a productive business basis for women, and it helps women to participate with support from government in business sectors, the nuclear technology sector.

Lack of global action delays meaningful change

While climate change has disproportionate effects on women and girls, action to combat climate change must be a global endeavour. Countries that are the most affected by climate impacts[4] are not the countries with the largest share of CO_2 emissions[5]. The 2015 Paris Climate Agreement had an overarching goal to limit the temperature increase to 1.5oC

3. International Organisation for Migration (2022) Regional Data Hub for East and Horn of Africa Info Sheet 2022 / https://eastandhornofafrica.iom.int/sites/g/files/tmzbdl701/files/documents/IOM_RDH_EHoA_Info_Sheet_2022.pdf
4. United Nations Office of the High Representative for the Least Developed Countries, Landlocked Developing Countries and Small Island Developing States: On the Frontline of Climate Crisis, Worlds Most Vulnerable Nations Suffer Disproportionately / https://www.un.org/ohrlls/news/frontline-climate-crisis-worlds-most-vulnerable-nations-suffer-disproportionately
5. Evans, S. Carbon Brief: Analysis: Which countries are historically responsible for climate change? 05 Oct 2021 / https://www.carbonbrief.org/analysis-which-countries-are-historically-responsible-for-climate-change/

above pre-industrial levels[6]. Eight years on, this legally binding agreement is already close to being broken with the United Nations World Meteorological Organization predicting that there is a "66% likelihood that the annual average near-surface global temperature between 2023 and 2027 will be more than 1.5oC above pre-industrial levels" with a 98% likelihood that the next five years will be the warmest on record[7].

If humans want to continue living with the connectivity and reliance on the power we have become accustomed to, and if we strive as a global community to try to abolish poverty, famine and disease, then meaningful change is required now by all, not just some. Developed countries can look to reduce their carbon emissions and reliance on large quantities of energy as they transition to carbon free energy sources. This is a simple way for developed nations to take meaningful climate action. A lack of climate action affects developing countries most who are already in a very fragile position. Lack of reliable power, water and resources and an increase in extreme weather events results in an imbalance. This imbalance quickly leads to widespread poverty, pressure on (or the absence of) health care systems, failure of government institutions and civil disorder resulting in security and safety threats. The imbalance spirals, resulting in even greater difficulty in establishing meaningful climate action not just to prevent future climate issues, but to reverse the current global impacts. Therefore, urgent action is needed to preempt an irreversible imbalance.

The 2023 Intergovernmental Panel on Climate Change Synthesis Report highlights that while some progress is being made, it is not enough to keep global temperatures below 1.5oC. Significant gaps and challenges remain in delaying the progress of climate action, and this occurs across all sectors and regions[8]. This continues to signal that the window for global action to combat climate change is closing and urgent action is required to drastically reduce CO2 emissions. Global pressure to prevent or ban new fossil fuel power generation plants and supporting and encouraging investment in net zero energy plans should keep the global community honest and accountable for its contribution to CO2 emissions. Sitting back and allowing countries to replace net zero power facilities (i.e. nuclear power plants) with gas or coal projects significantly undermines global efforts to reduce climate impacts. Additionally, strategies involving green bonds and carbon compensation are artifices that do not address the root cause of the climate crisis and install a false sense of action that yields no significant results.

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6. United Nations Climate Change: The Paris Agreement / https://public-old.wmo.int/en/media/press-release/global-temperatures-set-reach-new-records-next-five-years
7. United Nations World Meteorological Organisation: Global Temperatures set to reach new records in next five years. 17 May 2023 / https://public.wmo.int/en/media/press-release/global-temperatures-set-reach-new-records-next-five-years
8. Intergovernmental Panel on Climate Change 2023 Synthesis Report for Policy Makers / https://www.ipcc.ch/report/ar6/syr/downloads/report/IPCC_AR6_SYR_SPM.pdf

We urge COP 28 delegates to work together, be accountable, be transparent and take urgent and meaningful action to combat climate change impacts NOW. Delaying by five years or more could be detrimental to our planet.

How nuclear can support renewable technologies

Nuclear energy can play a significant role in supporting the transition to a net zero energy system alongside renewable technologies. Nuclear can complement renewables in many ways.

Baseload power

Unlike many renewable sources, nuclear power can provide consistent, uninterrupted power output. Renewables like solar and wind are intermittent, meaning they produce electricity only when the sun is shining or the wind is blowing. By combining renewables with nuclear, a consistent power supply can be maintained, ensuring grid stability[9].

Reduction in fossil fuel for backup

While energy storage solutions (e.g. batteries) are being developed to store renewable energy, they are not yet widespread or sufficient for large-scale grid energy storage. Nuclear power can fill the gaps when renewables are not generating power, reducing the need to rely on fossil fuels for backup.

Decarbonization of heat

Apart from electricity generation, nuclear energy can also provide heat for industrial processes, many of which require high temperatures that renewables cannot easily supply. Furthermore, several reactors in cold climates provide hot water for district heating, without significant penalty in electrical performance. Using nuclear energy for both electricity and heat can contribute significantly to achieving net zero carbon emissions[10].

Hydrogen production

Green hydrogen, produced using renewable energy, is often praised as a future clean fuel. However, the production of hydrogen through electrolysis requires significant amounts of electricity. Nuclear power can be used for high-temperature electrolysis, making the

9. World Nuclear Association (2021), "Renewable Energy and Electricity" / https://world-nuclear.org/information-library/energy-and-the-environment/renewable-energy-and-electricity.aspx
10. World Nuclear Association (2021), " Nuclear Process Heat for Industry". https://world-nuclear.org/information-library/non-power-nuclear-applications/industry/nuclear-process-heat-for-industry.aspx

process more efficient and potentially aiding in the expansion of a hydrogen-based economy[11].

Reducing land footprint

Compared to solar and wind farms, nuclear power plants require less land to produce the same amount of electricity. By using nuclear alongside renewables, it's possible to meet energy demands while preserving more land for other uses or natural ecosystems.

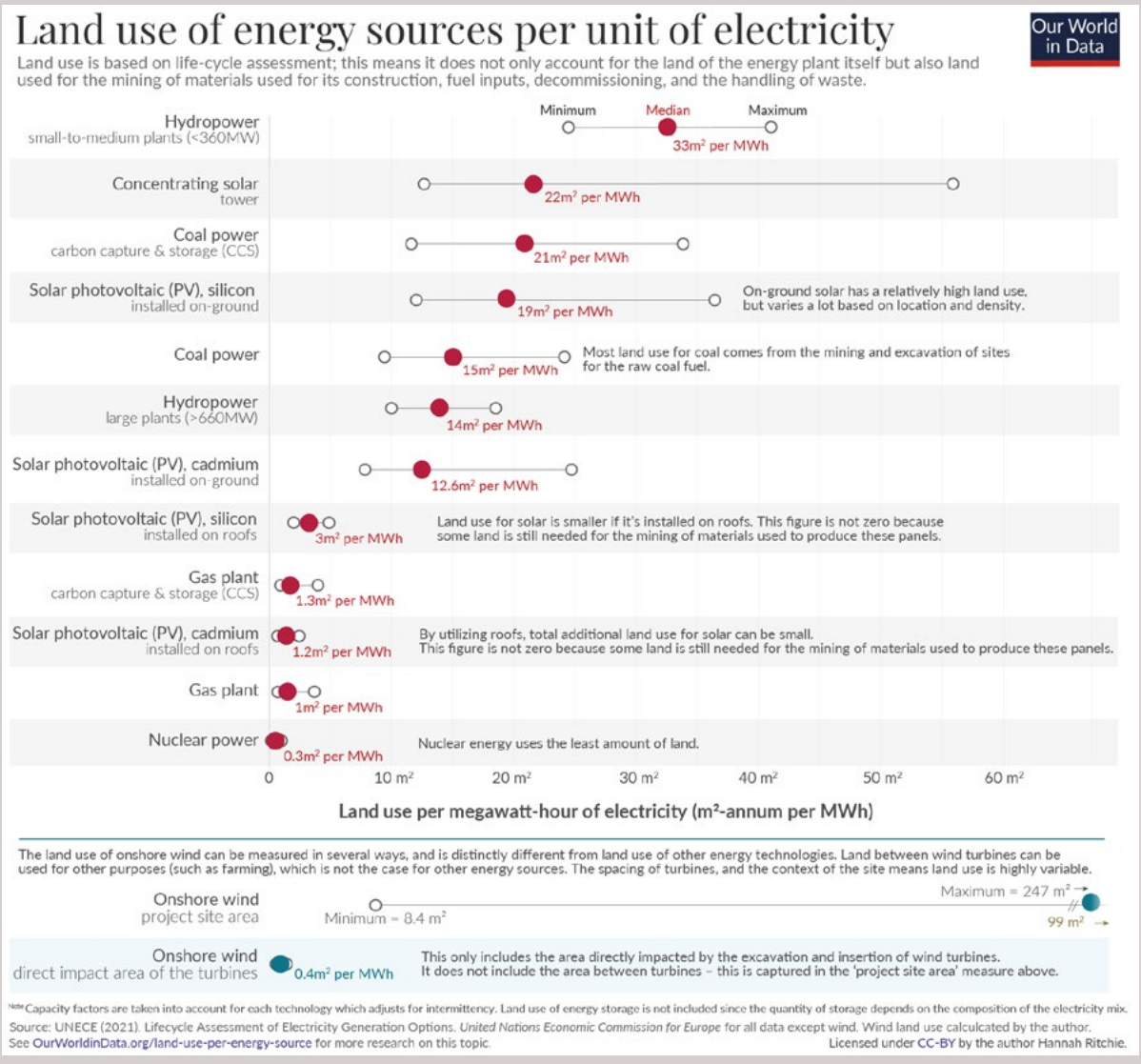

Figure 1: Land use of energy sources per unit of electricity[12].

11. International Atomic Energy Agency (2012), "Hydrogen Production Using Nuclear Energy" / https://www.iaea.org/publications/8855/hydrogen-production-using-nuclear-energy
12. Our World in Data (2022) "How does the land use of different energy sources compare?" / https://ourworldindata.org/land-use-per-energy-source

Support for grid infrastructure

Nuclear power plants can provide essential services to the power grid, such as frequency and voltage regulation, which are crucial for maintaining grid stability, especially as the share of intermittent renewable energy sources increases[13].

Nuclear technology innovation

Advanced nuclear technologies, such as small modular reactors (SMRs), can be more flexible in operation than traditional nuclear plants. They can potentially be used in tandem with renewables, adjusting their output in accordance with the availability of renewable energy[14].

Incorporating nuclear power into a net zero energy plan can provide a flexible and reliable energy system, facilitating the integration and expansion of renewable technologies.

Nuclear community support for countries to adopt net zero

While nuclear bestows multiple benefits on States in reducing carbon emissions as part of a net zero plan, commencement of a nuclear programme can be found daunting and complex by new nuclear nations (especially where financing has been a challenge). Therefore, the International Atomic Energy Agency (IAEA), has a dedicated approach to ensure that States can develop comprehensive nuclear power programmes. This Milestones Approach[15] sets targets and milestones that enable new nuclear power plants to be developed with appropriate infrastructure, national and international policies, and governance and regulation within a 10–15 year timeframe. This allows for the development and expansion of a nuclear power programme.

13. International Energy Agency (2019), "Nuclear Power in a Clean Energy System" / https://www.iea.org/reports/nuclear-power-in-a-clean-energy-system
14. World Nuclear Association (2023), "Small Nuclear Power Reactors" / https://www.world-nuclear.org/information-library/nuclear-fuel-cycle/nuclear-power-reactors/small-nuclear-power-reactors.aspx
15. IAEA Milestones Approach https://www.iaea.org/topics/infrastructure-development/milestones-approach

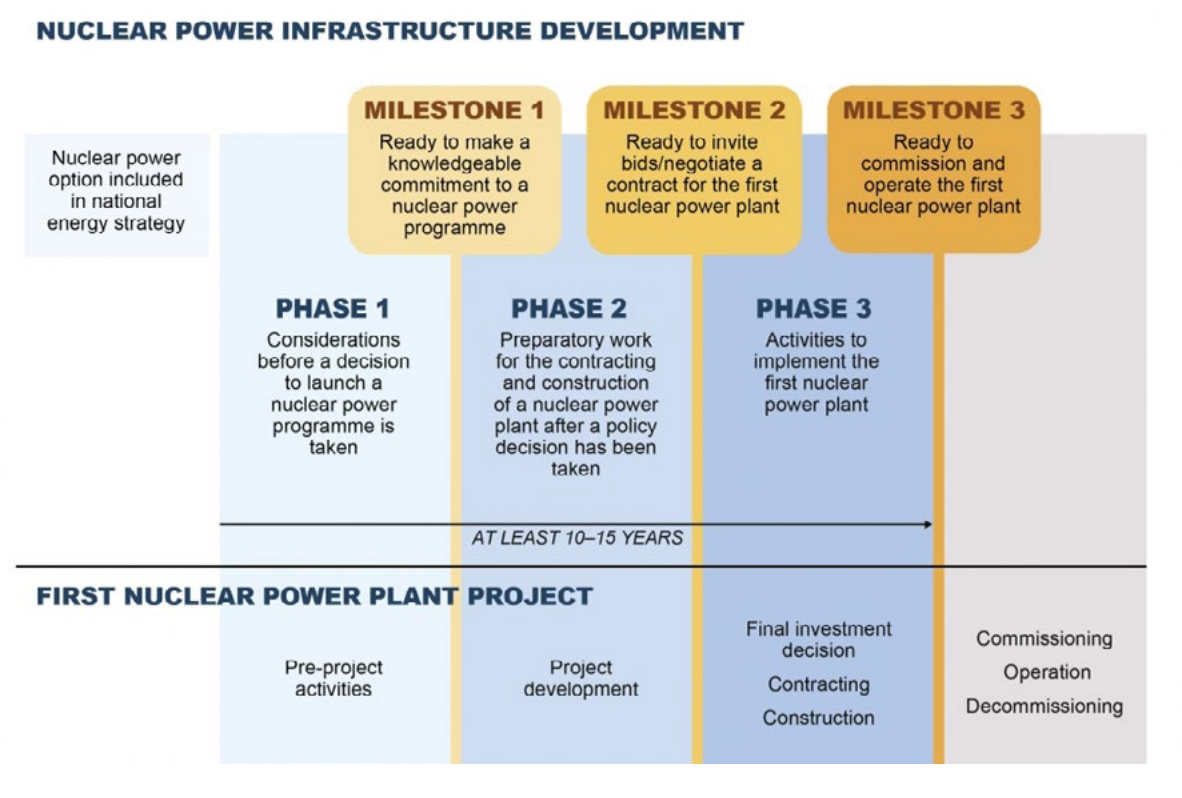

Figure 2: IAEA Milestone Approach - three phases and three milestones[16].

In achieving success in the development of a nuclear power programme, three key stakeholders need to be proactive. First is the government, second is a regulator and third is the plant owner/operator. With these aligned stakeholders, a safe, reliable and secure programme can be developed. This milestone approach also highlights the 19 key nuclear infrastructure considerations that need to be understood across the three phases. The IAEA programme has taken world best practice and lessons learned to ensure that newcomers to nuclear power are learning from this and are able to be effective and efficient in their development of a nuclear power programme, enabling their reduction of global carbon emissions.

16. Ibid.

Figure 3: IAEA Milestones Approach nuclear infrastructure issues[17].

WiN Global has created Groups of Expertise and a Young Generation Group accessible worldwide to help stimulate networking, strengthen innovation, present a positive perception of nuclear power, and construct solid regional exchanges. WiN Global's continued commitment maintains cooperation in each region and allows the implementation of initiatives with diverse perspectives, which is crucial to achieving lasting impact. Thus, women of influence gain visibility, and young women train and progress thanks to support from our partners. Rapid empowerment is crucial to making a lasting impact in today's changing world.

Global community support for development of net zero with nuclear

Global finance incentives. To achieve net zero, it is crucial for nations to channel funds towards climate and development initiatives. Central roles will be assumed by multilateral development banks (MDBs) and international financial institutions (IFIs), promoting funding for a wide spectrum of sectors to decrease emissions. In this context, global nuclear energy capacity is anticipated to become increasingly significant in a

17. Ibid.

net zero framework, with expectations of at least twice the current installed capacity. Notably, the expansion of nuclear energy is predicted to be primarily influenced by non-OECD economies. In this context, MDBs and IFIs should offer financial support to countries integrating low-carbon solutions, such as nuclear energy, into their sustainable energy portfolio.

Investment in social acceptance of nuclear power. For nuclear power to be successful in a country, social acceptance is key. All States and, especially those considering nuclear power production or having prohibited nuclear power generation, require investment and dedicated strategies to educate, inform and build social acceptance for nuclear power production, not just locally, but the global benefits of nuclear as part of a net zero energy mix. This requires transparency and also clear and inclusive communication.

CONCLUSION

The climate crisis has a disproportionate effect on youth and women. Global changes have not had the required impact to reduce carbon emissions, which is affecting some of the world's most vulnerable communities. The benefits of adding nuclear power as a net zero option to a renewable grid enable clean, affordable and reliable energy to be provided globally. There are steps both the nuclear and wider global communities need to take to build nuclear capacity and reduce carbon emissions, which includes funding and supporting newcomers to nuclear energy.

Together with renewable energy sources, nuclear power can provide safe, affordable and reliable power to global communities whose prosperity and security is reliant on access to clean power and energy.

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