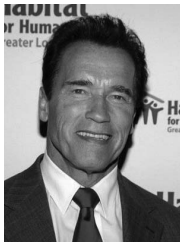
The climate–nuclear nexus

ALYN WARE and **ROB VAN RIET** report on the Climate-Nuclear Nexus project and identify the links between these two great threats to human survival. Working on the two issues together will have many benefits and help develop the co-operative strategies necessary to address both climate change and nuclear disarmament.

A nuclear disaster will not hit at the speed of a glacier melting. It will hit with a blast. It will not hit with the speed of the atmosphere warming but of a city burning. Clearly, the attention focused on nuclear weapons should be as prominent as that of global climate change.



Arnold Schwarzenegger, Governor of California 2007[1]

The threats to our planet – of climate change, poverty and war – can only be overcome by nations and the global community working in cooperation – something not possible while nations maintain large and expensive militaries and threaten to destroy each other.

Co-Presidents, Parliamentarians for Nuclear Non-proliferation and Disarmament, 2008[2]

In the 1980s nuclear weapons were one of the key issue occupying media, public and political attention. Those of us who were also warning about threats to human survival from climate change were ignored. A huge blanket of complacency smothered the climate-change issue. Today, the situation is the reverse. Climate change is in the front seat of the global political vehicle and nuclear weapons are hidden away, forgotten under the carpet in the boot.

The carpet of complacency over nuclear weapons is hard to fathom. There are more nuclear-armed States now than in the 1980s. The possibility of non-State actors (terrorists) acquiring a nuclear explosive device (or manufacturing a crude one) is greater than ever before. There are both hot and simmering conflicts between nuclear-armed States and potential nuclear States, particularly in the Middle East and North-East Asia. Nuclear stockpiles remain sufficient to destroy the world many times over. Thousands of nuclear weapons are still on high alert, ready to be fired within minutes. Use of even a small fraction of nuclear weapons would create catastrophic climatic consequences that would dwarf those produced by carbon emissions.

The Climate-Nuclear Nexus, a project of the World Future Council and the Basel Peace Office, reminds us that the threats of climate change and nuclear weapons are the two greatest threats to human survival, and deserve the highest attention and action by public, media and policy-makers. But there are additional links between these two issues, some of which compound the threats to humanity; others provide opportunities to resolve both threats jointly. The climate-nuclear nexus manifests itself in the following key ways:

- Climate change-induced weather events can impact on nuclear security and safety
- Nuclear war would create catastrophic climatic and environmental consequences
- Conflicts due to climate change could trigger the use of nuclear weapons
- The funding currently devoted to nuclear weapons is sorely needed to combat climate change
- The nuclear deterrence stand-off prevents the global co-operation required to address climate change

Climate impacts on nuclear security

The nuclear disaster in Fukushima in March 2011 has drawn attention to the possible effects of extreme weather events, environmental degradation and seismic activity on the security and safety of nuclear energy plants. Although the tsunami was caused by an earthquake, not by climate change, the impact of the tsunami on nuclear reactors provides a timely warning of the potential for rising seas and storms to impact on nuclear reactors around the world, many of which are situated on low-lying land close to the ocean.

Climate change-induced weather events can impact on nuclear security and safety

In the UK, leading geologist Prof. Rob Duck of Dundee University has warned that if climate change continues it may lead to the erosion of Britain's coast. This in turn will have critical implications for the safety of Britain's nuclear power stations, all but one of which lie on the coast.[3]

But it's not just coastal nuclear reactors we need to be concerned about. Many reactors are situated next to rivers in order to utilize the large amounts of water required for cooling. The 2010 and 2012 floods in Pakistan, which have been attributed to a combination of climate change and other environmental degradation,

heightened anxieties about the safety and security of Pakistan's nuclear power plants as well as nuclear weapons sites and military installations.[4] So far, nuclear sites in this extreme weather-prone country have remained safe, yet there's concern about possible damage from future environmental disasters.

Climate change has other potential impacts on nuclear safety. The wildfires that spread through Russia in the summer of 2010, possibly an effect of climate-change, posed a severe nuclear risk to Russia when they came close to engulfing key sites containing dangerous materials from nuclear weapons programs. There was also widespread concern that radionuclides from land contaminated by the 1986 Chernobyl nuclear disaster could be released and/or rise into the air together with combustion particles, resulting in a new pollution zone.[5]

International destabilization resulting from climate change could provoke conflicts, which could foster nuclear proliferation to non-State actors

Nuclear war's eco consequences

Recent research[6] has revealed that even a limited regional nuclear exchange would eject so much debris into the atmosphere that it could cool down the planet to temperatures not felt since the ice ages, and significantly disrupt the global climate for years to come. This would have disastrous implications for agriculture, and threaten the food supply for most of the planet. In 2012, thirty-four governments led by Switzerland, released a joint statement at the United Nations on the humanitarian consequences of nuclear weapons which claimed that even a 'limited nuclear exchange,' a contradiction in terms, would cause a global climate change with such a serious and long-lasting impact on the environment and food production that it could cause a global famine affecting over a billion people.[7]

The UN Security Council and the European Commission[8] have warned that climate change is a threat multiplier which exacerbates existing tensions and instability, and that climate change over-burdens states and regions, already fragile and conflict prone. Nuclear weapons are particularly worrying in this volatile equation.[9] International destabilization resulting from climate change could provoke conflicts, which, in turn, could foster nuclear proliferation to non-State actors,[10] enhance the chance of a nuclear weapon being used, create more fertile breeding grounds for terrorism, including the nuclear kind, and could feed ambitions of some states to acquire nuclear arms.

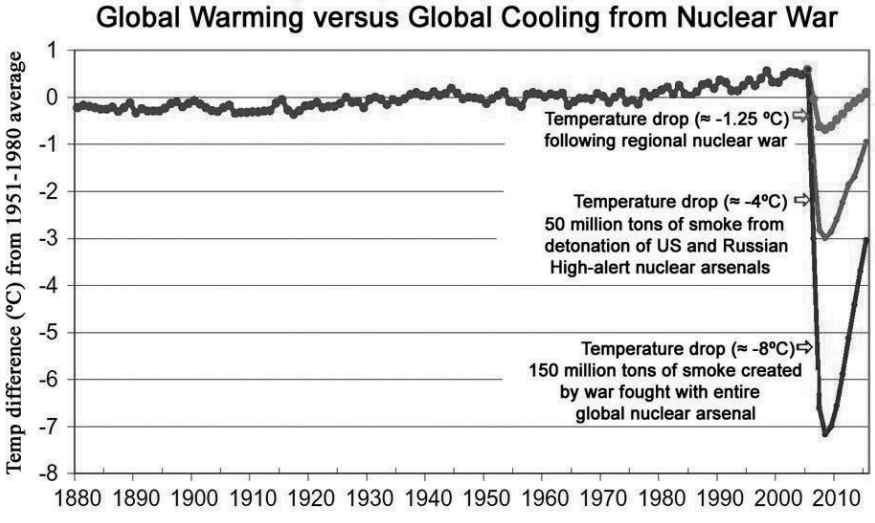
Redirecting nuclear budgets

Replacing fossil fuels with renewable energies requires investments in renewable energy research and development and in suitable infrastructure. Just 20-30% of the $100 billion global nuclear-weapons-budget would be sufficient to support renewable energy investment needs. UN Secretary-General Ban Ki-moon emphasized this point in his speech on UN Day 2008 when he released his Five-Point Plan for Nuclear Disarmament.[11]

In 2010, the Bangladesh Parliament adopted a resolution on nuclear disarmament stating:

the $100 billion spent annually on nuclear weapons should be channeled instead towards meeting the UN Millennium Development Goals as well as the urgent climate change adaption funding needs of the most vulnerable countries.[12]

Global co-operation is vital in order to implement core measures to address climate change. This includes developing universal emission standards and goals, ensuring the use of appropriate renewable energy technologies, maximising the effectiveness and sharing of research, and ensuring effective grid development and 'energy sharing' to minimize energy wastage. Global co-operation is difficult, if not impossible, when countries continue to threaten each other with massive retaliation by nuclear weapons, which is the current core security framework of countries possessing nuclear weapons and those countries under extended nuclear deterrence doctrines.[13]



Global average surface air temperature changes for small, moderate, and large nuclear wars in the context of the change in climate of the past 125 years. Predicted temperature drops from the three nuclear conflicts are shown as three separate V-shaped curves, each progressively deeper (Source: S Starr, Catastrophic Climatic Consequences of Nu-clear Conflict, INESAP Information Bulletin (28) April, 2008.)

Mutually reinforcing solutions

Both the climate change and nuclear threat issues require and stimulate regional and global co-operation. As countries come together in regions to establish regional nuclear-weapon-free zones, and internationally to build the framework for a nuclear-weapons-free world, they are developing relationships and co-operative security mechanisms that are useful in strategies required to address environmental issues including climate change.

One example is the Comprehensive Nuclear Test Ban Treaty Organisation, which has established a global network of seismic and radionuclide monitoring stations to verify the treaty. This system is now providing core real-time seismic data to the *Global Tsunami Early Warning System* which enables evaluation and warnings of potential tsunamis within minutes of an earthquake. The CTBTO system is also able to monitor radionuclide-spread patterns following nuclear accidents and provide data to assist in protective action, as it did following the Fukushima accident.[14]

As co-operative security mechanisms for a nuclear-weapons-free world are being built and implemented, they will reduce the role of militaries in national and regional security. This will bring tangible benefits for climate change and other environmental issues, on top of the potential to divert military financial and personnel resources towards combating climate change (see *above).* The world's militaries are the single largest contributor to climate change through excessive fossil fuels consumed by the military forces in planes, ships and other vehicles.[15] Weapons production and military conflicts are also excessively damaging to the environment in other ways.[16] Reducing military activity will reduce carbon footprints and other environmental degradation.

A primary role of Western militaries has been to protect oil sources, a role which has stimulated numerous wars. As climate-change solutions shift energy consumption from fossil fuels to renewable energies, this role for militaries will reduce and could eventually die out altogether, if climate-change solutions are successful.[17] There are mutually reinforcing benefits to working jointly and simultaneously on climate change and nuclear weapons issues. Greater collaboration between the environmental and anti-nuclear movements would enhance the success of both movements.

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For more information see: Climate-Nuclear Nexus: **www.baselpeaceoffice.org/article/climate-nuclear-nexus** and **www.worldfuturecouncil.org/5210.html**

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