

# Everything You Treasure— For a World Free From Nuclear Weapons

## What do we treasure?

This exhibition is designed to provide a forum for dialogue, a place where people can learn together, exchange views and share ideas and experiences in the quest for a better world. We invite you to bring this "passport to the future" with you as you walk through the exhibition. Please use it to write notes about what you treasure, what you feel and what actions you plan to take in and for the future.



# How do we protect the things we treasure?

**The world is a single system connected** over space and time. In recent decades, the reality of that interdependence—the degree to which we influence, impact and require each other—has become increasingly apparent. Likewise, the choices and actions of the present generation will impact people and the planet far into the future.

As we become more aware of our interdependence, we see that benefiting others means benefiting ourselves, and that harming others means harming ourselves. Just as we cannot obtain all the things we need without the cooperation of others, we cannot protect the things we treasure alone, in isolation, or in conflict with others. We cannot sacrifice the future to the present, or the present for the future.

**Every action has an effect. These effects may be felt in ways and places we cannot imagine.**

**The desire to protect** the things and people we love from harm is a primal human impulse. For thousands of years, this has driven us to build homes, weave clothing, plant and harvest crops...

This same desire—to protect those we value and love from other people—has also motivated the development of war-fighting technologies. Over the course of centuries, the destructive capability of weapons continued to escalate until it culminated, in 1945, in the development and use of nuclear weapons.



*No one is immune.  
Global threats impact us all.*

**Freedom  
from fear,  
freedom  
from want**

Our planet continues to be wracked by violent conflict. People around the world endure unacceptable burdens of poverty and hunger. Human rights violations and discrimination wound human bodies and hearts every day. Natural disasters can strike at any moment, instantly robbing people of their lives, undermining the foundations of entire societies. Economic crises create profound disruption in people's lives, as do environmental degradation and the effects of climate change. The possibility of a deadly global pandemic remains a constant presence.

**Catastrophic humanitarian consequences**

The Stockholm International Peace Research Institute (SIPRI) reports that there were approximately 15,000 nuclear warheads on Earth as of 2017. The longer these weapons continue to exist, the greater the likelihood they will be used. Any use of nuclear weapons will cause catastrophic humanitarian consequences— instantaneously killing vast numbers of people, incinerating population centers and disrupting the global climate.

*Of all the threats facing humankind, that posed by nuclear weapons is the most acute and catastrophic—and the most preventable.*

**A pyramid of violence**

Nuclear weapons—the most destructive by far of all our tools of war—are at the peak of a pyramid of violence. As the pyramid spreads downward it reaches into our daily lives. Conflict and mistrust between communities, crime, domestic violence and abuse—even the biting comment—are all part of the larger culture of violence.

Source: Abolition 2020. Handbook for a World without Nuclear Weapons. SIPRI, 2019.

Threat of Nuclear War

Regional Armed Conflicts

Low-level Conflict

Societal Violence



*“The reason that I hate the atomic bomb is because of what it does to the dignity of human beings.”*

—*Tsutomu Yamaguchi*  
*The only officially recognized survivor of both the Hiroshima and Nagasaki atomic bombings*

**The atomic bombings of Hiroshima and Nagasaki**

On 6 August 1945, an American B-29 bomber dropped a nuclear bomb over the center of Hiroshima, Japan. It exploded about 600 meters above the city with a blast equivalent to about 16 thousand tons (kilotons) of high explosive TNT.

Although that is only a fraction of the destructive power of today's nuclear weapons, by the end of 1945, tens of thousands had died from their injuries and radiation poisoning, bringing the total killed in Hiroshima within the year to perhaps 140,000.

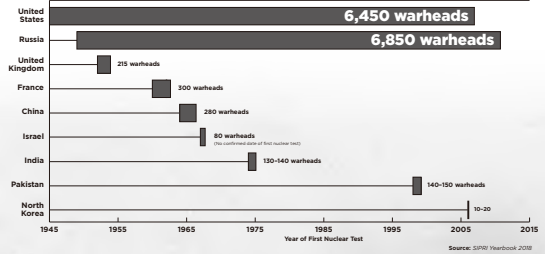
Three days after the first bombing, on 9 August 1945, another B-29 dropped a second atomic bomb on Nagasaki, directly above the industrial city. The resulting explosion had a blast yield equivalent to 21 thousand tons (kilotons) of TNT. An estimated 70,000 people had died by the end of the year.



*The threat posed by nuclear weapons is not a thing of the past—it is a threat we face today.*

Many states are developing nuclear energy capacities that would make it relatively easy for them to build nuclear weapons should they decide to do so. The possibility that terrorist organizations will acquire such weapons is also real. The danger that these apocalyptic weapons will be used—by accident, or deliberately, in an act of madness—hangs over all of us.

**World nuclear forces**



*Everything you treasure could be reduced to ash in a moment.*

## “Cities Are Not Targets!”

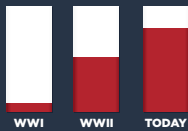
—Mayors for Peace

In every culture, war has its rules and protocols. Among these is the idea that there is a difference between the conditions of war and peace, that wars should be ended in ways that make peace possible, that a distinction will be drawn between soldiers and civilians, that the destruction and death of war should be limited and contained.

The massive destructive force of nuclear weapons makes distinguishing between civilian and military targets impossible. The long-term impacts would undermine the social and ecological foundations of future generations of human society.

### Civilian casualties of war

The history of war in the 20th century was a history of increasing disregard for these traditions. During World War I, 5% of the casualties were civilians; in World War II, almost half were. Today the proportion has reached 75% or more in internal conflicts.



Source: Promotion and Protection of the Rights of Children, 1995, UN



## 80km

Radioactive fallout spreads. Over time, many thousands will die from radiation, sickness and cancers.

## 10km

About half die from trauma and burns. Many succumb soon after to fires and radiation sickness.

## 5km

The vast majority of people die quickly from blast injuries, asphyxiation or (over weeks) radiation sickness.

## 3km

A radioactive fireball hotter than the sun and with the force of 100,000 tons of TNT kills everyone.

### Effects of a 100-kiloton nuclear bomb

Source: International Humanitarian News, 2012, ICAN

## “The right of belligerents to adopt means of injuring the enemy is not unlimited.”

—The Hague Conventions, 1899

# Treaties banning inhumane weapons

## 2017



Nuclear Ban Treaty

## 2008



Cluster Munitions Treaty

## 1997



Landmine Treaty

## 1993



Chemical Weapons Convention

## 1972



Biological Weapons Convention

## 1925



Poison Gas Protocol

## 1868

St. Petersburg Declaration (the first formal agreement prohibiting the use of certain weapons in war)



## International humanitarian law and nuclear weapons

In 1961, the United Nations General Assembly adopted a resolution declaring that: “Any State using nuclear and thermo-nuclear weapons is to be considered as violating the Charter of the United Nations, as acting contrary to the laws of humanity and as committing a crime against mankind and civilization.”

In 1996, the International Court of Justice issued an advisory opinion stating that the use or threat of use of nuclear weapons would generally be contrary to the principles of international law. In the final document of the Review Conference of the Nuclear Non-Proliferation Treaty in 2010,

States parties for the first time explicitly expressed “deep concern at the catastrophic humanitarian consequences of any use of nuclear weapons,” and reaffirmed “the need for all States at all times to comply with applicable international law, including international humanitarian law.”

In 2017, the Treaty on the Prohibition of Nuclear Weapons (TPNW) was adopted at the UN. It prohibits a full range of nuclear-weapon-related activities, such as developing, testing, producing, manufacturing, acquiring, possessing or stockpiling nuclear weapons, as well as using or threatening to use these

## International Red Cross and Red Crescent Movement



In April 2010, International Committee of the Red Cross (ICRC) President Jakob Kellenberger issued an historic appeal regarding nuclear weapons. In his statement, Kellenberger stressed that the organization’s position on nuclear weapons must go beyond purely legal considerations.

In November 2011, the Council of Delegates of the International Red Cross and Red Crescent Movement adopted a resolution titled “Working towards the elimination of nuclear weapons,” calling for activities to raise awareness of “the need for concrete actions leading to the prohibition of use and elimination of such weapons.”

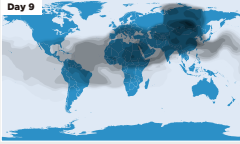


“In the view of the ICRC, preventing the use of nuclear weapons requires fulfilment of existing obligations to pursue negotiations aimed at prohibiting and completely eliminating such weapons through a legally binding international treaty.”

**“Nuclear weapons are the greatest environmental danger to the planet from humans, not global warming or ozone depletion.”**

—Alan Robock

Climate scientist and author of “Climatic Consequences of Nuclear Conflict”



**Fires resulting** from a nuclear exchange between India and Pakistan would generate at least 5,000 kilotons of smoke. Calculations based on weather patterns for an average May 15 show that within 49 days soot particles would blanket the inhabited Earth, creating conditions of perpetual overcast.

Source: Local Nuclear War, Alan Robock and Owen Brian Toon, 2009

While the danger of war between the US and Russia has receded, the threat remains and the risks of nuclear war involving other countries have increased. Using South Asia as an example, experts have estimated that even a limited regional nuclear war involving 100 Hiroshima-sized nuclear weapons—less than 0.1% of the explosive yield of the global nuclear arsenal—would result in tens of millions of immediate deaths and unprecedented global climate disruption.

### Weapons production

The process of producing nuclear weapons, from uranium mining through testing, has polluted vast amounts of soil and water at nuclear weapons facilities all over the world. Many of the substances released including plutonium and uranium, remain hazardous for thousands, some for hundreds of thousands, of years.

### Hanford Nuclear Reservation



The Hanford Nuclear Reservation was created as part of the US government's efforts to develop an atomic bomb during World War II. The 540-square-kilometer site in the 1,400-square-kilometer area in central California was one of the largest and most complex nuclear sites in the world. The US government funded the War Relocation Authority to house the 120,000 people living in the area 20 days to build the bomb. The town and surrounding farms burned, and the Hanford Engineer Works was established. The Hanford site is now the most contaminated site in North America, and represents one of the world's most complex and difficult clean-up projects. Large amounts of highly radioactive waste have leaked into the soil and toward the Columbia River. Estimates of the cost of this cleanup range as high as \$30 billion.

**“Models made by Russian and American scientists showed that a nuclear war would result in a nuclear winter that would be extremely destructive to all life on Earth; the knowledge of that was a great stimulus to us, to people of honor and morality, to act.”**

—Mikhail S. Gorbachev  
Former President of the Soviet Union (1990-91)

Since 2007, climate scientists who worked with the late Carl Sagan in the 1980s—Alan Robock, O. B. Toon, Michael Mills and their colleagues at Rutgers University and the University of Colorado at Boulder—have renewed efforts to estimate the climate effects of regional nuclear war. Their research shows the new reality of the threat posed by even a relatively “limited” nuclear war.

Many individuals and environmental groups are committed to nuclear disarmament. For example, Friends of the Earth and Greenpeace have campaigned against the environmental effects of nuclear weapons development and testing around the world.



Above: Astronomer Carl Sagan speaking about nuclear winter before a US House Science and Technology Subcommittee.

### Opposing a new weapons plant

Protestors in Kansas City opposed the use of public funds to support expansion of a nuclear weapons plant. Instead, they proposed converting the bomb factory into a wind energy plant to make use of the area's abundant wind resources to create “green-collar” jobs that will last long into the future.

### Nuclear famine

The smoke and dust from burning cities ignited by fewer than 100 nuclear explosions would cause an abrupt drop in global temperatures and rainfall by blocking up to 10% of sunlight from reaching the Earth's surface. Sudden global cooling would shorten growing seasons and cause frosts in summer, threatening agriculture worldwide. As many as one billion deaths would result from a nuclear weapon-induced famine, and infectious disease epidemics and further conflict would inevitably follow.



*“Next I was diagnosed as having malignant lymphomas. I had surgery, but the tumors continue to appear twice a year, every year.”*

—Sueko Takada

Survivor of the atomic bombing of Nagasaki

**Radiation damage**

Ionizing radiation has high energy, and thus can chemically alter atoms it strikes. Living cells exposed to high doses of ionizing radiation are severely damaged. The resulting radiation sickness can kill people over the course of days, weeks or months. Production in the bone marrow of red blood cells, which carry oxygen, and white blood cells, which defend against infection, is very sensitive to radiation.

Radiation can also damage the DNA in living cells. The affected cells may die or be altered (causing mutations), and may in time become cancerous.



-  **Eyes:** High doses can trigger cataracts months later.
-  **Thyroid:** Hormone glands vulnerable to cancer. Radioactive iodine builds up in thyroid. Children most at risk.
-  **Lungs:** Vulnerable to DNA damage when radioactive material is breathed in.
-  **Stomach:** Vulnerable if radioactive material is swallowed.
-  **Reproductive organs:** High doses can cause sterility. Plutonium concentrates in the gonads, leading to birth defects and miscarriages.
-  **Skin:** High doses cause redness and burning.
-  **Bone marrow:** Radiation can lead to leukemias and other immune system diseases.

*A lethal dose of radiation can involve as little energy as the heat in a sip of hot coffee.*



Left: Many of those incinerated by the intense heat left behind only the charred remains, just at the moment of the blast, Nagasaki, 1945.

**Blast damage**

The blast from a nuclear explosion instantly kills people close to ground zero, from incineration, multiple injuries and high levels of radiation. Internal injuries such as lung injuries, ear damage and internal bleeding occur at much greater distances. Shattered glass, bricks, concrete and wood from destroyed buildings are hurled by the blast, and the people themselves are turned into missiles, killing and injuring more people. The lethal area from the blast of an average strategic weapon of 1 megaton is likely to be over 100 square km.

**Thermal damage**

The explosion also causes severe burns and eye injuries. The heat wave ignites fires that may combine into immense firestorms. Within these areas, even people in underground shelters will die from extreme heat or asphyxiation.

*“Nuclear weapons constitute the greatest immediate threat to the health and survival of mankind.”*

—The World Health Organization (WHO), 1983



Since the atomic bombings of Hiroshima and Nagasaki, physicians, other health professionals and scientists have documented the horrifying medical and humanitarian consequences of nuclear weapons explosions—often based on firsthand experience of treating the victims.



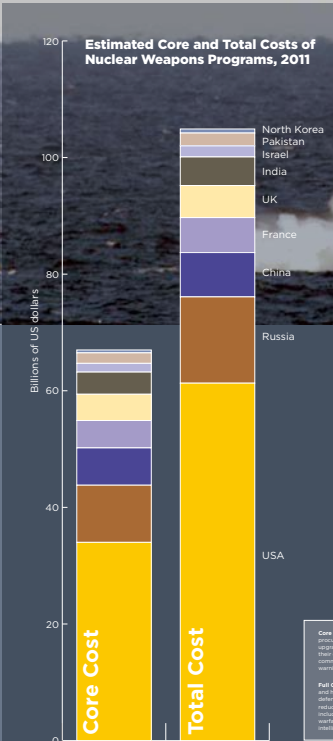
**International Physicians for the Prevention of Nuclear War (IPPNW)** was founded by US and Soviet physicians in 1980. This global federation of physician experts, which was awarded the Nobel Peace Prize in 1985, came together to explain the medical and scientific facts of nuclear war to policy makers and the public, and to advocate the elimination of nuclear weapons—prevention—as the only possible “cure” for nuclear war.



*“Excessive spending on weapons drains resources for sustainable development.”*

—António Guterres  
Secretary-General of the United Nations

Despite renewed commitments by nations to achieve a nuclear-weapon-free world, all of the nuclear-armed powers continue to invest vast sums of money in these weapons. In 2011, they passed a new milestone by collectively spending more than \$100 billion on their nuclear programs.



**Opportunity cost**  
Opportunity cost is a benefit, profit or value of something that must be given up to acquire or achieve something else. What if some of those billions of dollars were spent on other, socially useful purposes? Funding allocated to national disarmament efforts is misallocable by comparison, and the principal UN body responsible for advancing nuclear abolition—the Office for Disarmament Affairs—has an annual budget of just over \$10 million.

**Core Cost** refers to researching, developing, producing, testing, operating, maintaining and upgrading the nuclear arsenal (enrichment and their delivery vehicles) and its key nuclear "enabling" activities: construction and early learning infrastructure.

**Full Cost** also includes deferred environmental and health costs, missile defense designed to defend against nuclear weapons, nuclear threat reduction and incident management, fuel recycling and reprocessing, environmental cleanup and nuclear-weapon testing intelligence and surveillance expenses.

Source: Global Zero Technical Report—Nuclear Weapons Cost Study 2011, Bruce G. Blair and Matthew A. Brown

*“The question is whether the country is earning a good return on its national-security ‘investment,’ for it is clearly an investment in peace and safety, as well perhaps in oil supply and exports. The bottom line is, probably not.”*

—William Nordhaus  
Sterling Professor of Economics, Yale University



**Don't Bank on the Bomb**

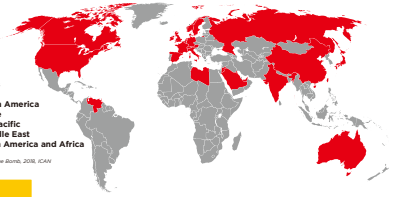
A report released in 2018 by the International Campaign to Abolish Nuclear Weapons (ICAN) identifies 329 banks, pension funds, insurance companies and asset managers in 24 countries with substantial investments in nuclear arms producers.

The study profiles the top 20 companies involved in the production of key components for the nuclear arsenals of France, India, the United Kingdom and the United States. Nuclear disarmament campaigners are appealing to financial institutions to stop investing in the nuclear arms industry. Some have already begun to do so.

**329**  
Financial institutions in  
**24** Countries

- 204 in North America
- 70 in Europe
- 52 in Asia-Pacific
- 3 in the Middle East
- none in Latin America and Africa

Source: Don't Bank on the Bomb, 2018, ICAN



**The International Trade Union Confederation (ITUC)** argues that money spent on nuclear weapons and militarism would be far better spent on creating decent work in socially useful sectors of the economy, and on tackling global poverty and climate change.

**The International Peace Bureau (IPB)** and the **Institute of Policy Studies (IPS)** are jointly organizing a Global Day of Action on Military Spending with the aim of promoting a common awareness of the problems occasioned by military expenditures, suggesting that instead such monies should be used to promote human development.

**Economists for Peace and Security (EPS)** works locally, regionally and internationally to reduce the military burden and to effect policy changes that can build a more just and peaceful future.





**“The production, testing, possession, deployment and use of nuclear weapons should be prohibited and recognized as crimes against humanity.”**

—UN Human Rights Committee, 1984

**Right to life**

The protection of the right to life and bodily security are at the heart of the 1948 Universal Declaration of Human Rights. The very existence of weapons that have the potential to kill millions or even billions of people degrades the value of human life and dignity.

**Secrecy**

A study by the Stockholm International Peace Research Institute (SIPRI) and the Geneva Centre for the Democratic Control of Armed Forces (DCAF) in 2010 shows that whether a given nuclear-weapon state is democratic, quasi-authoritarian or a dictatorship does not determine the decisions it will take regarding nonproliferation, disarmament or potential use of its nuclear weapons. In short, secrecy in nuclear weapon governance persists even in generally open societies.

**Democratic control**

The potential use of nuclear-tipped missiles is uniquely problematic. The flight time of long-range ballistic missile is between 15 and 30 minutes, giving the political leadership of the targeted country only a few minutes to decide whether to launch a retaliatory strike. In the case of submarine-launched missiles, this decision window would be even shorter.

This makes it impossible for the electorate to participate—either directly or through their chosen representatives—in the most momentous decision that will ever face their society.

**Nuclear testing and minorities**

Nuclear test explosions have often been conducted on the lands of indigenous and minority peoples, far away from those making the decisions. The affected populations have suffered a wide range of health issues, from birth defects to elevated rates of cancer. Their basic rights and freedoms have been sacrificed in the name of national security.



**“Disarmament is preeminently a humanitarian endeavor for the protection of the human rights of people and their survival. We have to see the campaign for nuclear disarmament as analogous to the campaigns such as those against slavery, for gender equality and for the abolition of child labor.”**

—Jayantha Dhanapala

*President of the Pugwash Conferences on Science and World Affairs, former UN Under-Secretary-General for Disarmament Affairs*

In 2003, the International Council Meeting of Amnesty International passed a resolution declaring opposition to the use, possession, production and transfer of nuclear weapons, given their indiscriminate nature.



**“As a result of the nuclear testing, all of these communities have suffered dislocation, in one form or another, from their indigenous way of life. Many have become internally displaced persons who are yet to find durable solutions and expressed that they feel like ‘nomads’ in their own country. Many have suffered long-term health effects.”**

—Calin Georgescu

*UN Special Rapporteur on the human rights obligations related to environmentally sound management and disposal of hazardous substances and wastes*

**“Go back to the surface and take better care of the world than we did. Good luck.”**

—Berit Lundqvist  
 Swedish nuclear expert, responding to a question about what advice she would have for humans who, in the distant future, have entered a deep underground storage site for nuclear waste

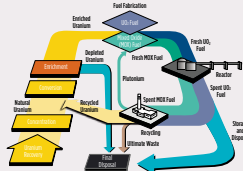
**Nuclear accidents**

In a nuclear reactor, uranium fuel undergoes a controlled fission chain reaction, generating great heat energy, which can be converted to electricity. Controlling this reaction is a complex technical task. If control is lost, the result is a nuclear meltdown, such as happened in the Three Mile Island (1979), Chernobyl (1986) and most recently Fukushima (2011) accidents, potentially releasing large quantities of radioactive pollution into the environment.



**Nuclear waste**

Nuclear reactors also produce plutonium, a fissile material, which can be chemically separated from the highly radioactive spent reactor fuel and used to build a nuclear weapon or radiological dispersal device (“dirty bomb”). A nation seeking nuclear weapons could build a reactor, claiming it was for civilian purposes, and then divert plutonium to weapons use. Such fissile materials could also be stolen by groups seeking to commit acts of terror.



Source: U.S. Nuclear Regulatory Commission

**“Nuclear-energy systems should be deployed that, by design, avoid the use of materials that may be applied directly to making nuclear weapons.”**

—Mohamed ElBaradei  
 Former General Director of the International Atomic Energy Agency (IAEA)

**NPT regime**

The 1968 Nuclear Non-Proliferation Treaty (NPT) commits countries already possessing nuclear weapons and weapons technology not to transfer them to other states; and the states which do not have nuclear weapons not to acquire them. The International Atomic Energy Agency (IAEA) is charged with verifying that the nonproliferation commitments are being fulfilled. On the other hand, there is no process or body under the NPT to implement or verify the disarmament commitment, which is also an integral part of the treaty.



Heiner / iStock.com and China Nuclear Energy Commission  
 workers lift a rack of highly enriched uranium, 18 February, 2010

The NPT also guarantees all states the right to the nonmilitary use of nuclear energy. Repeated attempts have been made, primarily in the framework of the IAEA, to study the possibility of establishing international centers to manage the nuclear fuel chain so that peaceful uses of nuclear energy remain peaceful. Thus far, international control of the nuclear fuel chain has not moved significantly toward realization.

**Securing nuclear materials**

There is an accelerating effort, based on international cooperation, to move existing stocks of highly enriched uranium (HEU) and other materials to more secure locations or to “down blend” this to low-enriched uranium (LEU) which cannot be used in weapons. There remains an estimated 20 tons of HEU in non-nuclear weapon states. In November 2010, the United States worked with Kazakhstan to move 10 tons of HEU to a more secure cask storage facility, in the east of the country.



**Onkalo**  
 Onkalo is Finnish for “hiding place.” It is the name of a site, about 300 km northwest of Helsinki, where a 4.8-km-long network of tunnels is being excavated in the bedrock. Eventually, nuclear waste will be deposited here at a depth of 500 meters. Work on this enormous storage facility was begun in the 1970s and is expected to be completed in the 2020s. After the used fuel rods have been deposited at the bottom of the tunnel, the opening will be sealed with multiple layers of steel and concrete.  
 The European security standard requires that nuclear waste be isolated from all living organisms for a minimum of 100,000 years. (The US minimum isolation period is a million years.) The human species as we know it today is believed to have existed for approximately 100,000 years. The oldest cave paintings date from about 30,000 years ago.

**Warning people away for 100,000 years**

As part of the planning for communicating to distant future generations that they must avoid all contact with the contents of these future storage facilities, governments have organized a number of deep contacts to develop signs and messages intended to last this long. The group has succeeded in communicating life-and-death information to people living after the species and written languages now used on Earth have disappeared.

**Alternative, sustainable energy**

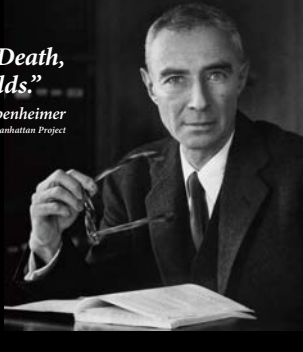
Alternative energy refers to such energy sources as biomass, wind, solar, geothermal, hydro, wave and tidal energy technologies. These sources have the advantage that they do not produce large volumes of climate-altering emissions or leave a legacy of long-lasting radioactive waste.



Photo: iStock.com

*“Now, I am become Death,  
the destroyer of worlds.”*

—Robert Oppenheimer  
Technical director of the Manhattan Project



In the 20th century, discoveries in physics regarding the essential nature of energy and matter offered new understanding of the universe we inhabit. At the same time, they made possible the unleashing of forces of previously unimagined ferocity.

The Manhattan Project, which culminated in the destruction of the two cities of Hiroshima and Nagasaki in 1945, represented a new level of collaboration between scientific and military interests. There was now a direct line from basic scientific research to its application in producing devastation on an unprecedented scale.

Below: Most of those involved in the Manhattan Project have not returned about the nature or objective of their work. Clancy Dorn, the second reader in the background of the far left photo, did not realize what she had been doing until seeing this photo in a public book of the facility for years later.



## Manhattan Project

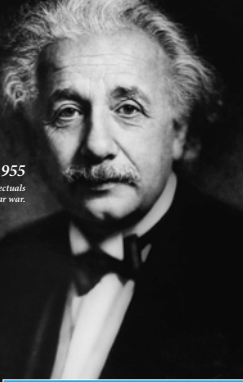
In August 1942, motivated by fear that Nazi Germany would develop a weapon based on newly discovered principles of atomic physics, the United States and its Allies launched the Manhattan Project, which brought together many of the world's leading scientists to develop an atomic bomb.

- 1896** Radioactivity discovered by Henri Becquerel.
- 1898** The first radioactive elements, radium and polonium, discovered by Marie and Pierre Curie.
- 1905** Albert Einstein theorizes the relationship of mass and energy ( $E=mc^2$ ), proving the theoretical basis for understanding the power of nuclear reactions.
- 1932** The atom is split by British physicist John Cockcroft and Ernest Walton.
- 1933** Hungarian physicist Leo Szilard realizes the possibility of a nuclear chain reaction.
- 1934** The first nuclear fusion is achieved by Enrico Fermi of Italy.
- 1939** Albert Einstein and Leo Szilard write to President Franklin Roosevelt suggesting the US should start researching an atomic weapon.
- 1941** Roosevelt signs the plan for the development of an atomic weapon and initiates the Manhattan Project.
- 1942** The first controlled nuclear fission reaction is produced by Enrico Fermi at the University of Chicago.
- 1943** Japan becomes the primary target for any future atomic bombs according to the Military Policy Committee of the Manhattan Project.
- 1943** April: The Special Committee of the Manhattan Project selects four cities as possible targets for the atomic bomb: Kyoto, Hiroshima, Nagasaki and Kokura.
- 1945** July: The world's first atomic detonation takes place in the "Trinity Test" at Alamogordo, New Mexico.
- Aug 6: Little Boy uranium bomb, is detonated over Hiroshima, Japan.
- Aug 9: Fat Man, a plutonium bomb, is detonated over Nagasaki, Japan. Originally scheduled to be dropped at Kokura, the target was missed by Nagasaki because of poor weather.



*“We appeal as human beings to  
human beings: Remember your  
humanity, and forget the rest.”*

—The Russell-Einstein Manifesto, 1955  
Written and signed by leading scientists and intellectuals  
seeking to awaken people to the dangers of nuclear war.



## Pugwash Conferences

The Pugwash Conferences on Science and World Affairs is an international organization that brings together scholars and public figures to work toward reducing the danger of armed conflict and to seek solutions to global security threats. The inaugural gathering of the group was held in July 1957 and was attended by 22 scientists, including those from the US, the Soviet Union, Japan, China and France.

## Technological expertise

Although physically ridding the world of nuclear weapons is a prerequisite to freeing humanity from the nuclear threat, the nuclear technologies that have been invented will remain. Experts are capable of dealing with such sensitive technologies will have a key role in the processes and verification of disarmament and in eliminating and safeguarding fissile materials. They will also be required for nuclear safety and security even after the last nuclear weapon has been decommissioned.

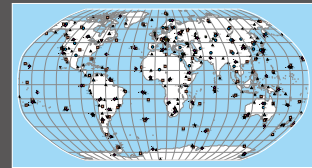
## The Comprehensive Nuclear-Test-Ban Treaty (CTBT)

The Comprehensive Nuclear-Test-Ban Treaty (CTBT) was adopted by the UN in 1996; it bans nuclear explosions by everyone, everywhere. Although the treaty has not entered into force, it has been key in promoting a de facto moratorium on nuclear testing. The Comprehensive Nuclear-Test-Ban Treaty Organization (CTBTO) is charged with overseeing the implementation of the treaty, working with scientists and experts from a wide range of disciplines—from nuclear physics to seismology and atmospheric science.

## International Monitoring System (IMS)

The International Monitoring System (IMS) is a worldwide network of observational technology that will help to verify compliance with and detect violations of the CTBT. When complete, the IMS will consist of 337 monitoring facilities. It will be

complemented by an intrusive on-site inspection regime applicable once the treaty has entered into force. The CTBTO's experts are confident that their system can aid in the detection and identification of nuclear explosions anywhere on the planet.



- Seismic primary array (PS)
- T Hydroacoustic (T-phase) station (HA)
- ▲ Seismic primary wide-component station (PS)
- Incoherent neutron (IN)
- Seismic auxiliary array (AA)
- Radiochemical station (RS)
- ▲ Seismic auxiliary wide-component station (AA)
- Radiochemical laboratory (RL)
- ★ Hydroacoustic (hydrophone) station (HA)
- International Data Centre (IDC) to PrepCom, Vienna



Above left: Arrays of infrastructure station (IAS). Above right: Hydroacoustic station (HAS). Source: CTBTO

*“With nuclear weapons the failure of deterrence means that there is no hope of recovery or recuperation. It is totally final and therein lies the dilemma that I felt to the depth of my being.”*

—Gen. Lee Butler

Former Commander-in-Chief, United States Strategic Command (1992–94)



The modern concept of security has often been centered on the idea of the sovereign state, independent and in competition with other states. The overriding goal of security efforts has been to protect the integrity of states' borders and ensure the continuity of their political structures.

### Mutual Assured Destruction

The doctrine of countervailing threats persisted throughout the period of the Cold War, as both Eastern and Western blocs developed massive nuclear arsenals. The ultimate form of deterrence was “Mutual Assured Destruction”—or MAD—in which the people of the competing blocs were forced to live a button-push from annihilation. The continued existence of nuclear weapons holds all states and their people hostage to the ultimately fragile proposition that they will never be used.

The 1962 Cuban Missile Crisis brought the United States and Soviet Union to the brink of war. It became clear that the unparalleled destructive capacity of nuclear weapons threatened not only the combatant states, but human civilization itself and all people on Earth.



*“Force will be met by force. If the US wants war, that is its problem. The calamities of a war will be shared equally.”*

—Nikita Khrushchev

Premier of the Soviet Union (1958–64)

*“We endorse setting the goal of a world free of nuclear weapons and working energetically on the actions required to achieve that goal.”*

—George Shultz, William Perry, Henry Kissinger and Sam Nunn  
Former high-level US security officials



The overwhelming threat posed by nuclear weapons has brought the dawning realization that states operating under the traditional assumption of complete independence and sovereignty cannot ensure their own security.

Political cooperation has come to be recognized as a necessary condition for survival. The result has been a series of agreements, both bilateral and multilateral, seeking to reduce the threat of nuclear war and facilitate cooperation to that end.

### Political efforts for nuclear disarmament

- 2017** The Treaty on the Prohibition of Nuclear Weapons is adopted at the UN and opened for signature.
- 2010** New START is signed by the United States and the Russian Federation, limiting the number of deployed strategic nuclear warheads to 1,550 each.
- 2007** Former high-level US security officials George Shultz, William Perry, Henry Kissinger and Sam Nunn publish an editorial “A World Free of Nuclear Weapons,” acknowledging the limitations of deterrence theory and calling for the elimination of nuclear weapons.
- 2007** The International Convention for the Suppression of Acts of Nuclear Terrorism enters into force.
- 2005** The IAEA and its head, Mohamed ElBaradei, win the Nobel Peace Prize for their efforts to prevent nuclear energy from being used for military purposes.
- 2000** The NPT Review Conference adopts a final document which includes steps to nuclear disarmament and the unequivocal promise to eliminate nuclear arsenals.
- 1996** The Comprehensive Nuclear-Test Ban Treaty (CTBT) is adopted by the United Nations General Assembly, although it has not entered into force, the treaty has encouraged a facts moratorium on nuclear testing.
- 1995** The states agree to extend the Nuclear Non-Proliferation Treaty indefinitely.
- 1991** The Strategic Arms Reduction Treaty (START I) is signed by the United States and the Soviet Union.
- 1989** The Berlin Wall falls as East Germany opens its borders with West Germany, marking the end of the Cold War.
- 1988** The Intermediate-Range Nuclear Forces (INF) Treaty, signed by the United States and the Soviet Union, eliminates an entire class of nuclear weapons, nuclear missiles with a range between 500 and 3,000 km.
- 1987** A law adopted by New Zealand prohibits the stationing of nuclear weapons on its territory and the entry into its waters of nuclear-armed or powered ships.
- 1978** The United Nations General Assembly's Special Session on Disarmament is held.
- 1970** The Nuclear Non-Proliferation Treaty (NPT), the key treaty to prevent the spread of nuclear weapons, enters into force.
- 1967** The Treaty of Tlatelolco creates a Latin American nuclear-weapon-free zone, the first nuclear-weapon-free zone in an inhabited area.
- 1963** To prevent contamination from nuclear fallout, the Partial Test Ban Treaty (PTBT) restricts all nuclear testing to underground testing.
- 1961** The first Nuclear-Weapon-Free Zone treaty, the Antarctic Treaty, enters into force.
- 1957** The Statute of the International Atomic Energy Agency (IAEA) enters into force.



2010



1987



1957

The corrosive effects of nuclear weapons permeate all societies. They force us to live under the shadow of potentially catastrophic destruction. They embody the obscene proposition that there is some overarching value that can justify the mass slaughter of innocents. Their use would not only erase the past fruits of all human civilization, but would leave present and coming generations confronting a mutilated future.

Representatives of the world's ethical and spiritual traditions have spoken out—whether in the language of religious tenets or from a more secular appreciation of what it means to be human—to condemn nuclear weapons. They make clear that we bear a shared and universal responsibility to protect our fellow humans, our planet and the future from this direct and unacceptable threat.

*“All religions agree about the dignity of the human person, the peaceful settlement of disputes, protection of the environment and the preservation of the rights of future generations.”*

—Christopher Weeramantry  
Former International Court of Justice vice-president

*“Simply transferring the world’s nuclear weapons to a museum will not in itself bring about world peace. The nuclear weapons of the mind must first be eliminated.”*

—Mātā Amṛtānandamayī Devī  
Hindu spiritual leader

*“While we know you will continue in the future to deal with the legacy of radioactive, toxic waste, we are committed to leave to you a legacy of strength. The battles we fight to protect our land, our future, and our lives will in some way reduce the threat you are exposed to.”*

—Jacqui Katona  
Aboriginal woman who led a campaign against a uranium mine in the Northern Territory, Australia

*“By far the greatest single danger facing humankind—in fact, all living beings on our planet—is the threat of nuclear destruction.”*

—Tenzin Gyatso  
The 14th Dalai Lama

*“From the prophets’ dreams of the time when nations would beat their swords into plowshares to today’s aspirations of a nuclear-weapons-free world, we have sought to avoid armed conflict and not yield to despair in the search for universal peace.”*

—Rabbi David Saperstein  
Religious Action Center of Reform Judaism

*“Nuclear abolition is the democratic wish of the world’s people, and has been our goal almost since the dawn of the atomic age. Together, we have the power to decide whether the nuclear era ends in a bang or worldwide celebration.”*

—Archbishop Desmond Tutu  
South African Council of Churches

*“We need a massive global uprising against nuclear weapons as was done to abolish slavery, to save humanity from annihilation.”*

—Ibrahim Ramey  
Muslim American Society (MAS) Freedom Foundation

*“As people of faith, we advocate for the right of all people to live in security and dignity. ... The horrific destructiveness of nuclear weapons makes their abolition the only path to authentic human security.”*

—Public Statement Submitted to the 2018 UN General Assembly First Committee  
Faith Communities Concerned about Nuclear Weapons

*“More than any other manifestation of patriarchy, the compulsive acquisition and excessive use of weaponry demonstrate the abuse of power by the male-dominated state system. Like all addictions, the addiction to weaponry wrecks negative results on the systems in which it occurs.”*

—Betty Reardon  
Pioneer of peace education



**“Women, in professional and military settings, have related experiences of realizing that something terribly important is being left out.**

**“What is it that cannot be spoken? What gets left out is the emotional, the concrete, the particular, human bodies and their vulnerability, human lives and their subjectivity—all of which are marked as feminine in the binary dichotomies of gender discourse.”**

—Carol Cohn  
with Felicity Hill and Sara Ruddick

**Birth defects from nuclear testing**

On 14 November 1995, Lijon Eknikang, a quiet, unassuming woman from the Pacific island of Rongelap, spoke at the International Court of Justice in The Hague when it was hearing testimony regarding the legality of nuclear weapons.

“Women have experienced many reproductive cancers and abnormal births. In privacy, they give birth, not to children but to things we could only describe as ‘octopuses,’ ‘apples,’ ‘turtles’ ...

“The most common birth defects on Rongelap and nearby islands have been jellyfish babies. These babies are born with no bones in their bodies and with transparent skin. We can see their brains and hearts beating. The babies usually live for a day or two before they stop breathing.”



*“When it comes to the military and questions of nuclear disarmament, the gender gap becomes the gender gulf.”*

—Eleanor Smeal  
Former President of the National Organization for Women

*“Every woman is free to take the initiative, take risks, be angry, shout, sing, disobey police and be adaptable. We are always looking for unexpected and unpredictable actions...”*

—Di McDonald  
Anti-nuclear activist



**Greenham Common**

At Greenham Common in the UK, over a 19-year period, women camped out to protest US nuclear Cruise missiles being stationed there.

In December 1981, 30,000 women from all over the UK turned up to join “Embrace the Base.”



**Women have consistently been at the forefront** of grassroots efforts to abolish nuclear weapons. They have used techniques of nonviolence to protest the hideous destructive power nuclear weapons represent. They also often reject the vast investment of resources which could otherwise be constructively used to address social issues.

**Women’s International League for Peace and Freedom (WILPF)**

Since the founding of the Women’s International League for Peace and Freedom (WILPF) in 1915, it has sought total and universal disarmament as one of its goals. Through the Reaching Critical Will and Peace Women projects, WILPF continues empowering women to participate in this necessary work.

In the disarmament field, WILPF also has been calling for implementation of Resolution 1325 on women, peace and security, unanimously adopted by the United Nations Security Council on 31 October 2000. Resolution 1325 has been taken as an inspiration and basis for increased activism by women’s peace groups around the world.



2020 marks the 75<sup>th</sup> anniversary of the Hiroshima and Nagasaki bombings. How many survivors will be alive five or ten years from now?

**The voices of survivors**

No group of people have been more dedicated to communicating the realities of nuclear war than the hibakusha, the survivors of the atomic bombings of Hiroshima and Nagasaki. Through their words and actions, in art and in writing, they have confronted and conveyed a past whose horrors most would prefer to forget. In doing so, they have been driven by a commitment to the future, the determination that no one anywhere should ever experience the terror and sufferings they have undergone.



Above: Atomic bomb survivor calls on US leaders to visit Hiroshima and Nagasaki, Washington, 2015

*“Every second of every day, nuclear weapons endanger everyone we love and everything we hold dear. We must not tolerate this insanity any longer.”*

—Setsuko Thurlow

Hiroshima Survivor Who Delivered Nobel Peace Prize Speech for 2017



**Hibakusha Stories**

Hibakusha Stories is a disarmament education initiative that began in October 2008, which passes the legacy of the atomic bombings of Hiroshima and Nagasaki to a new generation, empowering them to build a world free of nuclear weapons.

**Youth attitude**

A survey conducted by Soka Gakkai Student Division in 2018 showed that 84.9% of Japanese students in Hiroshima and 93.4% in Nagasaki believed that a nuclear weapon might be used at some point in the future. Only 24.1% of the students in Hiroshima and 15.0% in Nagasaki believed the elimination of nuclear weapons would be possible.



**Q. Will nuclear weapons be used at some point in the future?**

Source: A Survey on Public Awareness of Nuclear Weapons in Japan, 2018, Soka Gakkai Student Division

*“We are looking ahead to make every decision that we make relate to the welfare and well-being of the seventh generation to come.”*

—Oren Lyons  
Chief of the Onondaga Nation

**IPPNW Medical Students**

Through the Nuclear Weapons Inheritance Project (NIWP), medical student members of International Physicians for the Prevention of Nuclear War (IPPNW) seek to raise awareness about humanitarian consequences of security policies relying on military power and nuclear weapons. NIWP workshop organizers also focus on empowering younger generations to undertake disarmament activities on local, regional and international levels.

**Amplify**

Amplify is a global youth network for nuclear weapons abolition, growing out of an international youth summit held in Hiroshima in 2015. Amplify has organized one other international youth summit and brought youth delegations to various conferences and multilateral disarmament negotiations, including those on the Treaty on the Prohibition of Nuclear Weapons in 2017. It also advocates for youth participation in nuclear disarmament discussions, and promotes peace and disarmament education.

**James Martin Center for Nonproliferation Studies (CNS)**

The James Martin Center for Nonproliferation Studies (CNS), established in 1989, strives to combat the spread of weapons of mass destruction (WMD) by training the next generation of nonproliferation specialists and disseminating timely information and analysis. CNS at the Monterey Institute of International Studies is the largest nongovernmental organization in the United States devoted exclusively to research and training on nonproliferation issues.







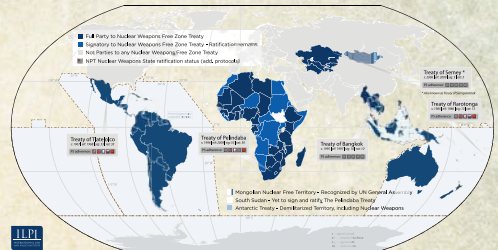
## Nuclear-Weapon-Free Zones (NWFZs)

A Nuclear-Weapon-Free Zone (NWFZ) is generally defined as an area in which the manufacture, production, possession, testing, acquisition and receipt of nuclear weapons is banned. More than 50% of the Earth's surface today comprises nuclear-weapon-free zones, including 99% of all land in the southern hemisphere. Of the world's approximately 195 states, 119 now belong to a nuclear-weapon-free zone, and 1.9 billion people live in them.

## States that have relinquished nuclear weapons

Nuclear states can—and have—given up the development or possession of nuclear weapons. States that have done so include Canada, which was involved in efforts to develop the first atomic bomb but later gave up the nuclear option. Brazil and Argentina abandoned their nuclear weapon development programs. South Africa dismantled its nuclear weapons and joined the ranks of non-nuclear-weapon states. Belarus, Kazakhstan and Ukraine inherited a massive stockpile of nuclear weapons when the Soviet Union broke up. They gave up their weapons in exchange for security guarantees and economic assistance from the United States, Russia and elsewhere.

## Areas Designated as Nuclear-Weapon-Free



Source: C-PT



## Landmines ban

The Mine Ban Treaty was drafted by Austria and developed outside of traditional diplomatic channels in a series of meetings in Vienna, Bonn, Brussels and Oslo over the course of 1997. A group of like-minded governments worked in close cooperation with the NGOs of the International Campaign to Ban Landmines (ICBL) and international organizations such as the International Committee of the Red Cross (ICRC) to steer what became known as the Ottawa Process. The Mine Ban Treaty was signed by 122 states in Ottawa, Canada, on 3 December 1997. It entered into force less than two years later, more quickly than any treaty of its kind in history.

## Cluster weapons ban

The Convention on Cluster Munitions entered into force on 1 August 2010. The cluster munitions ban process, also known as the Oslo Process, began in February 2007 in Oslo, Norway. At that time, 46 nations issued the Oslo Declaration. Meetings were subsequently held in Lima and Vienna, and, in February 2008, 79 countries adopted the Wellington Declaration, setting forth the principles to be included in the Convention. Delegates from 107 nations agreed to the final draft of the treaty at the end of a 10-day meeting held in May 2008 in Oslo.

## Denuclearization of the Northern Hemisphere

There are five NWFZs existing today, with four of them covering almost the entire Southern Hemisphere. This process of denuclearization needs to be expanded to the Northern Hemisphere. NWFZs have been proposed for: South Asia, the Middle East, Northeast Asia and Europe.

## The Comprehensive Nuclear-Test-Ban Treaty (CTBT)

The CTBT was adopted and signed by 71 states, including the five nuclear-weapon states, in 1996. It has not become legally binding as it must be ratified by all 44 states with nuclear power or research reactors. There are eight countries outstanding: China, Egypt, India, Iran, Israel, North Korea, Pakistan and the United States.

## Fissile Material Cut-off Treaty (FMCT)

An FMCT would represent a binding international prohibition against the production of fissile material for nuclear weapons purposes, thus strengthening nuclear nonproliferation efforts. While negotiations have not commenced, the idea has been repeatedly discussed in the Conference on Disarmament in Geneva.

*"It is time for all governments to come together—with the support of civil society around the world—to chart our course to a nuclear free future by beginning the negotiation of a comprehensive treaty banning the use, production, transfer and stockpiling of nuclear weapons. Now. Not in years or decades. Now."*

—Jody Williams  
The founding coordinator of the  
International Campaign to Ban Landmines (ICBL)



*“A world without nuclear weapons will make a good base camp for continuing the climb. As any climber will tell you, the destination and the journey are equally important. Nuclear disarmament is both a destination and a process.”*

—Rebecca Johnson

*Executive Director and Co-founder of the Acronym Institute*

### **The Power of “Zero”**

A world without nuclear weapons should not be thought of as our present world—wracked by violence and injustice—with this one particularly hideous aspect removed. The struggle to abolish nuclear weapons is an opportunity to fundamentally alter our relationship among ourselves and with the world. Consider a person struggling with a terrible addiction: to alcohol, drugs or gambling, for example. For such a person, getting to zero—having no further engagement with their addiction—is the key step. And taking that step necessarily involves a deep review and renewal of past behaviors, habits and ways of thinking about life.

This does not mean that nuclear weapons can only be eliminated after human nature has changed for the better. But they will be eliminated through the cumulative power of individual choices—choices made by each of us.

*We should view the struggle for nuclear abolition first and foremost as an opportunity—a chance to transform humankind’s deep-seated impulse to destruction, including self-destruction.*

*“We cannot hope to build a better world without improving the individual.”*

—Marie Curie

*(1867–1934) pioneering researcher in the nature of radioactivity*

### **Moral vision**

The moral vision and spiritual qualities required to eliminate nuclear weapons do not exist in some distant, lofty realm. They are, rather, the qualities of decency, dialogue, sharing and caring that form the fabric of daily life.

It has been said that war could be eliminated if political leaders could act on the basis of the morality taught to small children by mothers everywhere: tell the truth; respect people; do not hurt them or take what isn't yours; clean up after yourself...

### **Self-mastery**

The abolition of nuclear weapons means demonstrating self-mastery as a species—showing that we can wisely choose to protect ourselves against the threat posed by these weapons. It will be proof that humans are not the passive victims of our own technology.

If humankind can come together to eliminate this existential threat, this will lay the foundations for shared efforts to meet other challenges, such as ensuring ecological integrity and realizing a world where all people can live in dignity.





*By coming together for the future we want and deserve, we can protect the things each of us treasures.*

We all care, usually very deeply, about the people and things in our lives. Our values, the things that matter to us, guide our actions. All our waking efforts—to work, to learn, to develop ourselves—are directed at protecting, preserving and passing on the things that we value and treasure.

- What is the future you want?**
- How would you put it in words?**
- How will you put it into action?**

### **Interdependence and collaboration**

When we become aware that our lives are fundamentally interdependent, it becomes clear that we cannot harm others without harming ourselves. We understand that it is impossible to construct our happiness and security on the fear and suffering of others.

In a nuclear age, the only viable path to security is through shared effort. Just as, in daily life, we cannot achieve the things we want alone, the goal of security on a global scale will only be achieved when we all—governments and civil society, “realists” and “dreamers” alike—work for it together. This will be even more true in a nuclear-weapon-free world.

*“We have to face the fact that either all of us are going to die together or we are going to learn to live together, and if we are to live together we have to talk.”*

*—Eleanor Roosevelt  
(1884–1962) former US First Lady*