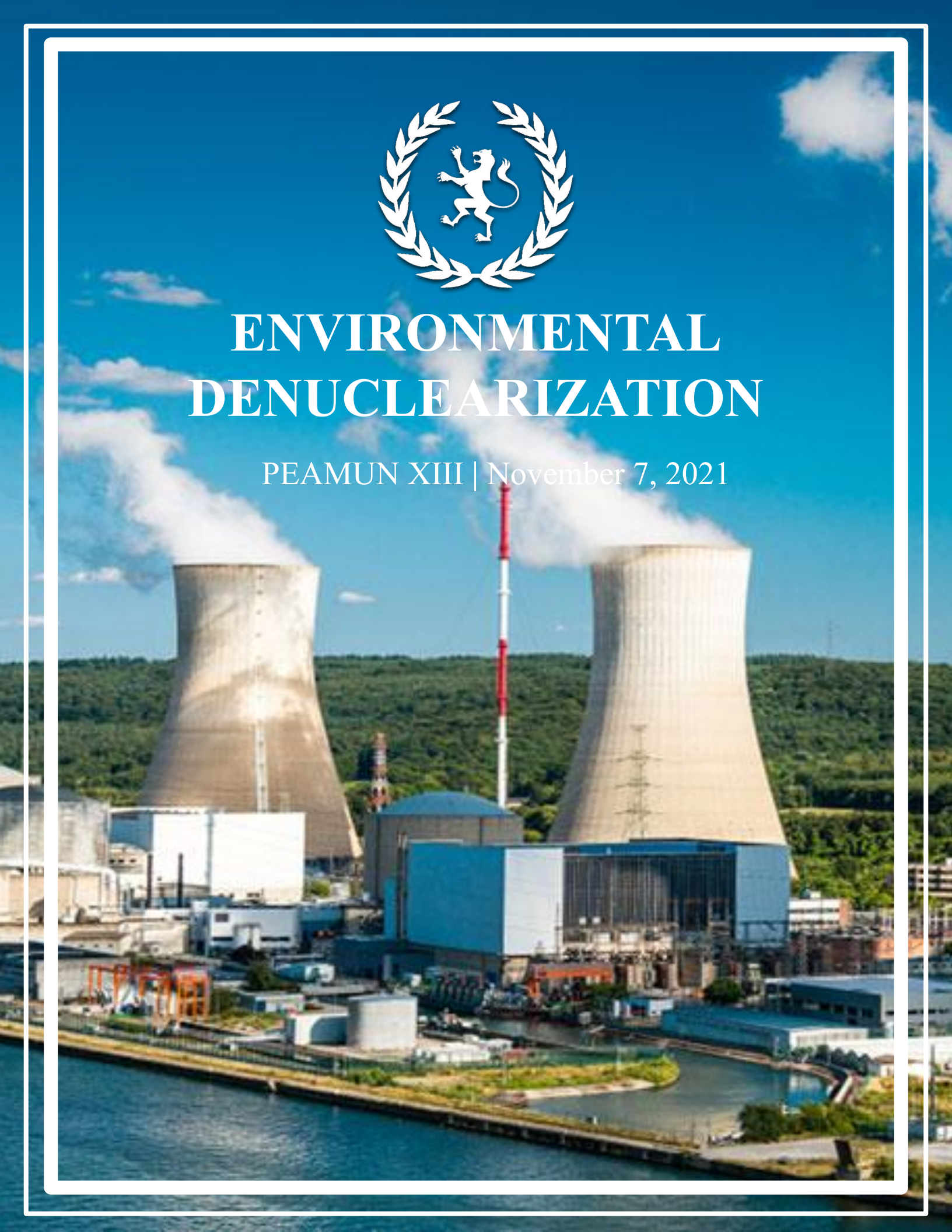
ENVIRONMENTAL DENUCLEARIZATION

PEAMUN XIII | November 7, 2021



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Dear Delegates,

Our names are Anderson Lynch (Chair) and Atishay Jain (Vice-Chair) and we are incredibly excited to welcome you to PEAMUN XIII! Together, we will be running the Environmental Denuclearization ECOSOC. My name is Anderson and I am a junior from San Francisco, California and this is my second year doing Model UN. Outside of MUN, I am the cohead of our school's mock trial team and I help run our school newspaper, *The Exonian*. My name is Atishay and I am a sophomore from New Jersey, and I have been doing MUN for two years. Along with Anderson, we are both members of *The Exonian.* We both use he/him pronouns. This is our first time chairing and vice-chairing a committee and we are super excited to work together!

We have chosen the topic for this committee to be Environmental Denuclearization, focusing on the idea of turning nuclear weapons into nuclear power. Below is a background guide with more information on the topic, as well as laying out a possible solution and what we are expecting to see in committee. While the background guide will give you a good overview of the topic of our committee, it is recommended that you do research on your own, especially on your country's position. The committee will take place during the present day, and will be centered around the large amount of excess nuclear power the United States of America and Russia have. The goal of this committee is to take that excess nuclear waste and turn it into energy as mentioned above. We hope that in your solutions, you consider how to equally share that power throughout the world and help close the electricity gap between developed and developing countries. We can't wait to see the solutions you come up with in committee!

Best,

Anderson Lynch and Atishay Jain: adlynch@exeter.edu and ajain1@exeter.edu

Committee Introduction:

The topic of Environmental Denuclearization – with an emphasis on converting nuclear waste from nuclear weaponry into sustainable nuclear energy – is a part of the ECOSOC (Economic and Social Council) committee for this PEAMUN XIII. ECOSOC is one of the six principal committees part of the United Nations. Delegates represent countries part of the UN to participate in tangible discussion and provide a platform for non-governmental organizations (NGOs) to express recommendations to the General Assembly regarding the topic at hand. ECOSOC committees are an instrumental part of the General Assembly as delegates engage in intensive research about their countries' stances in order to draft potential solutions to their topics. To the extent as to which ECOSOC committees are able to make recommendations to General Assemblies, Article 62 of the United Nations Charter states, "The Economic and Social Council may make or initiate studies and reports with respect to international economic, social, cultural, educational, health, and related matters and may make recommendations with respect to any such matters to the General Assembly to the Members of the United Nations, and to the specialized agencies concerned."[1]

With this ECOSOC committee, we would like you to approach the topic with an open mind – ensuring that with each proposition that you and your fellow delegates propose, you keep the present-day in mind. For the economic portion of this committee – for which the direction will be later explained in committee direction – we would like you to explore the vast discrepancies between developing and developed countries with regard to nuclear supply and

[1] "Chapter X: The Economic and Social Council (Articles 61-72)." *United Nations*, United Nations, www.un.org/en/about-us/un-charter/chapter-10.

wastage. Question yourself and look down below for other questions to consider. But most importantly, have fun!

Committee Description and Background:

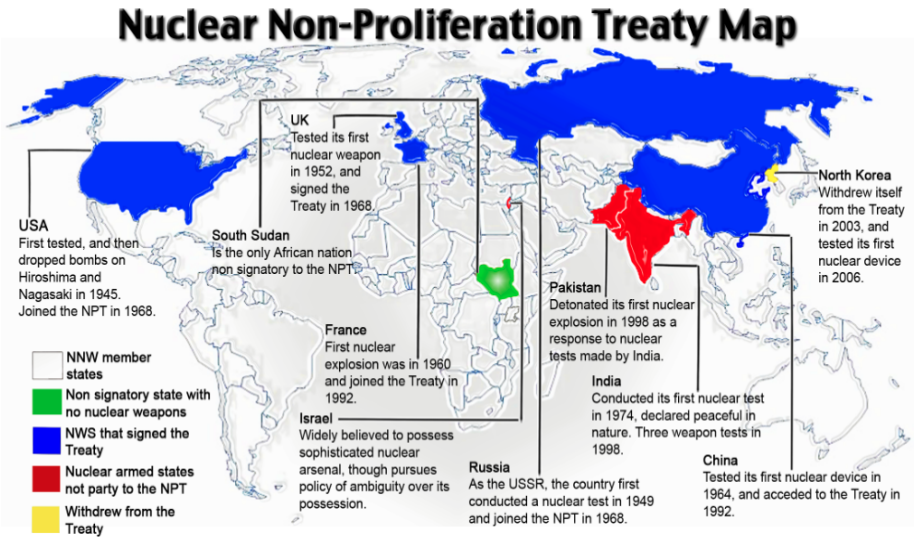
Regarding the issue of turning nuclear weapons of mass destruction and nuclear waste into sustainable energy, it is important to define the term – *denuclearization.* We often have referred to "denuclearization" in context with the nuclear discrepancies between the United States and the Democratic People's Republic of Korea (DPRK). Though there is no "dictionary definition," for the purposes of this committee, it would be best to frame this definition in terms of nuclear disarmament. We can consider this concept as the elimination of nuclear weapons extending to not only military programs, but also for civilian purposes as well – in terms of converting this waste into energy. The term also is a fundamental part of the Treaty on the Non-Proliferation of Nuclear Weapons (NPT). The NPT was signed in 1968 and a total of 191 Member States have entered the treaty. The 191 Member States is inclusive of the five nuclear-weapon States as well – China, France, Russia, United Kingdom, and the United States.[2] According to the United Nations for nuclear disarmament, "The Treaty is regarded as the cornerstone of the global nuclear non-proliferation regime and an essential foundation for the pursuit of nuclear disarmament. It was designed to prevent the spread of nuclear weapons, to further the goals of nuclear disarmament and general and complete disarmament, and to promote cooperation in the peaceful uses of nuclear energy."[3] The NPT – along with its resolutions – was

[2] M.D., Kenneth B. Dekleva, et al. "Stop Trying to Define 'Denuclearization' and Just Start Doing It: 38 North: Informed Analysis of North Korea." *38 North*, 5 May 2020, www.38north.org/2019/12/rjohnson121719/.
[3] "Treaty on the Non-Proliferation of Nuclear Weapons (NPT) – UNODA." *United Nations*, United Nations, www.un.org/disarmament/wmd/nuclear/npt/.

signed to envisage the ever growing "market" – if you will – of nuclear warfare. Thus, as a result, denuclearization has been at the top of several UN Member States agendas as well.

Narrowing our focus down to this committee, we are emphasizing the excess nuclear power that is in the hands of the United States and Russia and how this excess can be converted into energy for countries to use while narrowing the economic gap between countries as well – as we mentioned above.

There is no doubt that the United States government is heavily involved in nuclear power and nuclear testing as well. The United States Nuclear Policy has set certain boundaries for the production of civilian nuclear power with safety and environmental regulations in place. There is persistent funding from the government for R&D – research and development – in the field as well. It states in the World Nuclear Association, "There are lengthy, detailed requirements for the construction and operation of all reactors and conversion, enrichment, fuel fabrication, mining and milling facilities. The review process preceding the construction of new reactors can take 3-5 years."[4] We have also seen how the government engages in national research and "it also promises to provide incentives for building new plants through loan guarantees and tax credits,



[4] "World Nuclear Association – US Nuclear Power ." *US Nuclear Power Policy | Nuclear Energy Policy USA - World Nuclear Association*, world-nuclear.org/information-library/country-profiles/countries-t-z/usa-nuclear-power-policy.aspx.

although owners have to raise their own capital."[5] Though there is considerable funding to build new reactors and for research and development in nuclear warfare as well as environmental regulations, there seems to be a clear and apparent lack of information for how to treat nuclear waste. The World Nuclear Association even admits that the disposal and storage of high-level nuclear waste remains a major unsolved issue.

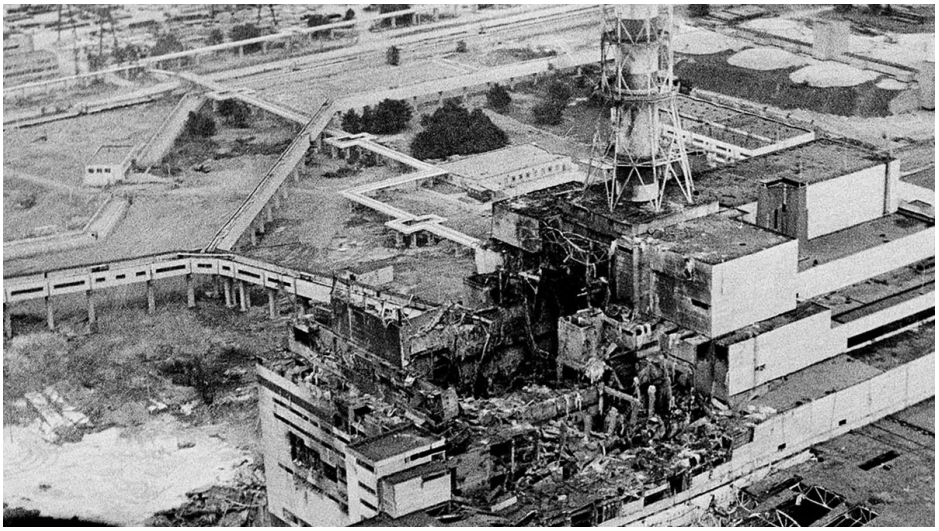
When it comes to the United States for dealing with denuclearization, it is important to consider not only how the federal system imposed by the government has jurisdiction on nuclear policy matters, but also state municipalities as well. For example, when it comes to nuclear waste, an "important role of states is found in the Nuclear Waste Act, which gives individual states veto power on locating a waste repository within their boundaries unless overridden by a vote of both houses of Congress."[5]

This Nuclear Waste Act was passed in an attempt to clearly cut down the amount of nuclear waste in the country. A survey also conducted in 2012 – the Bisconti survey – indicated that the public thought "on nuclear wastes, while 62% are confident that used fuel is

[5] "World Nuclear Association – US Nuclear Power ." *US Nuclear Power Policy | Nuclear Energy Policy USA - World Nuclear Association*, world-nuclear.org/information-library/country-profiles/countries-t-z/usa-nuclear-power-policy.aspx. *Nuclear Non-Proliferation Treaty Map* . www.cdn77.pressenza.com/wp-content/uploads/2015/05/NPT-map.png.

stored safely at their local plant, 82% believe that it should be consolidated at regional storage facilities while the Department of Energy develops a permanent repository, and 90% agree that the government should develop such a repository as long as the site meets NRC requirements."

The lack of environmental awareness in its storage has led to several hazards. "More than a quarter million metric tons of highly radioactive waste sits in storage near nuclear power plants and weapons production facilities worldwide, with over 90,000 metric tons in the US alone."[6] Since this nuclear waste –is radioactive, this can cause detrimental effects for the surrounding environments as well. For example, health complications can be caused if drinking water becomes contaminated from improper storage of excess nuclear radioactive waste.



According to a study conducted to combat the effects of nuclear waste disposal, "Drinking water can become contaminated, too, which is absolutely disastrous for locals and residents close to the epicenter of the disaster. Even if nuclear waste just seeps into the ground, it can eventually get into reservoirs and other water sources and, from there, can reach the homes of people who unwittingly drink high radioactive material."[7]

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[6] *C&EN*, cen.acs.org/environment/pollution/nuclear-waste-pilesscientists-seek-best/98/i12.
Chernobyl Disaster Picture,
https://www.gannett-cdn.com/presto/2019/06/11/USAT/f1123d6d-f46f-4b0d-bd61-eb0f72be75dc-XXX_CHERNOBYL_DISASTER_1986.JPG?auto=webp&crop=1999,1124,x0,y356&format=pjpg&width=1200

[7] "Dangers and Effects of Nuclear Waste Disposal." *Conserve Energy Future*, 25 Dec. 2016, www.conserve-energy-future.com/dangers-and-effects-of-nuclear-waste-disposal.php.

In contrast, the Russian government has consistently been looking to expand their usage of nuclear energy through the avenue of new reactor technologies. According to the World Nuclear Association, there are currently 38 operable nuclear reactors in Russia as of now and "over 20 nuclear power reactors are confirmed or planned for export construction. Foreign orders totalled $133 billion in late 2017."[8] Not only does Russia have the funding for building development, they also have the potential, money, and manpower for producing nuclear warfare – with an inevitable amount of resulting waste as well. With the production of nuclear power comes the possibility of nuclear meltdowns and disasters as well. Just a few countries over, in Ukraine, the Chernoybl disaster took place in 1986 causing Russia to become the country in the European continent which suffered the most radioactive contamination.

Russia also produces nuclear weaponry for non-nuclear Member States of the UN, such as India. The World Nuclear Organization states, "Russia's policy for building nuclear power plants in non-nuclear weapons states is to deliver on a turnkey basis, including supply of all fuel and repatriation of used fuel for the life of the plant…" They continue, "Evidently India is being treated as a weapons state, since Russia will supply all the enriched fuel for Kudankulam, but India will reprocess it and keep the plutonium."[8] It is clear that Russia has not only expanded its nuclear capability, but also the capability of allied countries, such as India.

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[8] "World Nuclear Association – Russian Nuclear Energy." *Nuclear Power in Russia | Russian Nuclear Energy - World Nuclear Association*, world-nuclear.org/information-library/country-profiles/countries-o-s/russia-nuclear-power.aspx.

Note: Committee Direction

Addressing the problem of nuclear waste is crucial – especially focusing on the backgrounds of the United States' and Russia's nuclear waste. Now, it is for us to consider how this waste can be turned into a form of power – or sustainable energy – and where this type of energy is useful.

Nuclear energy at the end of the day is just another way to power several businesses, homes, hospitals, schools, etc. as a source of electricity. It is important to discuss why nuclear waste is sustainable or "clean." While there are several controversial outlooks, it is evident that the waste that nuclear weapons produces – if stored properly – can actually be recycled and reused in several forms of energy. The Office of Nuclear Energy of the United States points out, "Some advanced reactors designs being developed could operate on used fuel. The NICE Future Initiative is a global effort under the Clean Energy Ministerial that makes sure nuclear energy will be considered in developing the advanced clean energy systems of the future." The NICE Future Initiative refers to the sustainable usage of nuclear energy. Additionally, another initiative which we will be focusing on in this committee is the "Megatons to Megawatts" program which we write about below.

To the extent at which environmental denuclearization forms a disparity between developed and under-developed countries, we can consider economic discrepancies. Since developed countries like the United States have the funding and manpower to find ways to convert nuclear waste into energy, they generate much of a higher gross domestic economic value in nuclear energy sales and revenue. According to a study conducted by Stanford University, the United States generates over $40-$50 billion each year just from the 104 nuclear reactors in the country. There are also over 100,000 workers working in the factories in the United States. Not only are nuclear plants expensive to build, developed countries where there is already a surplus of plants, they are producing an over-abundance of waste.

In this committee, we would like you to explore the economic disparities between countries which have several plants and what they are doing to combat their nuclear waste just to frame your country's stance. However, we want your primary focus to be on the Russian/United States nuclear waste and research your country's policies to take in nuclear waste or for nuclear energy in general. Best of luck with your research and onward in the background guide! Hint: look for helpful resources down below.

Past Action: Megatons to Megawatts Program

A single nuclear warhead has the potential to kill hundreds of thousands of people, if not more. Now imagine 18,000 nuclear warheads. That amount of nuclear power could wipe out the human species. But if utilized correctly, those warheads could also power 10% of the United States of America's energy for 20 whole years. Something with the power to make us all extinct, also has the power to pull humanity up, and help us power the world through nuclear power. That

was the main idea behind the Megatons to Megawatts Program. It was designed to take old Russian weapons grade uranium that was no longer in use, and sell it to America, where it was used to power their nuclear power plants.

When the Soviet Union collapsed, so did a lot of its infrastructure. With large amounts of nuclear waste from old warheads, and very little space to store it, weapon grade uranium seemed to be everywhere, and America was looking for ways to establish diplomatic relations and trade with Russia after the Cold War. Phillip Sewell, an employee for the United States Department of Energy, visited Russia and realized that the excess uranium was a valuable resource. Seeing this, Sewell proposed the Megatons to Megawatts Program (MMP), which gave the extra uranium to American nuclear power companies and in return gave billions of dollars to an unstable Russia. At first Russia was unwilling to give up so much of their uranium, but as NPR reporter Geoff Brumfiel said, "in the end they did let go. For one reason: money."[9] The United States gave them around 17 billion dollars, in exchange for 500 tons of low enriched uranium. For reference, 500 tons of uranium is equivalent to about 18,000 nuclear warheads. Not only did this deal give America more nuclear energy and Russia more money, but it helped to restore relations between the two countries. The USEC [United States Enrichment Corporation] President and Chief Executive Officer William Timbers said in a press statement, "We are proud of our excellent working relationship with Russia and the fact that Soviet-era nuclear warheads once aimed at American cities are now lighting and powering our country from coast to coast."[10] While this

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[9] Brumfiel, Geoff. "Megatons To Megawatts: Russian Warheads Fuel U.S. Power Plants." *NPR*, NPR, 11 Dec. 2013, www.npr.org/2013/12/11/250007526/megatons-to-megawatts-russian-warheads-fuel-u-s-power-plants.
Grafenrheinfeld Nuclear Power Plant (from page 9):
https://upload.wikimedia.org/wikipedia/commons/thumb/3/34/Kernkraftwerk_Grafenrheinfeld_-_2013.jpg/1200px-Kernkraftwerk_Grafenrheinfeld_-_2013.jpg

[10] Nartker, Mike. "U.S.-Russian 'Megatons to Megawatts' Program Has Eliminated Equivalent of 9,000 Warheads." *Nuclear Threat Initiative - Ten Years of Building a Safer World*, 6 Oct. 2004, www.nti.org/gsn/article/us-russian-megatons-to-megawatts-program-has-eliminated-equivalent-of-9000-warheads/.

program seemed to be a major win for both parties involved, there were also many difficult problems to solve in terms of how to actually get the Russian weapon grade uranium into American power plant uranium.

Weapon grade uranium is highly enriched uranium (HEU), which is at least 90% enriched, while the uranium that goes into power plants is low enriched uranium (LEU), which is closer to 5% enriched.[11] The process of turning HEU to LEU is called downblending, and to oversimplify it, is basically just mixing HEU with natural uranium and spent uranium to reach the target 5%. In the MMP, "The conversion and dilution of highly enriched uranium took place in Russia. The resulting low enriched uranium was then shipped to the company's facilities in Paducah, Kentucky."[12] This meant that Russia was downblending the uranium before selling it to America, giving them power plant uranium, not weapons grade uranium. That uranium was then sent directly to American nuclear power plants where it was converted to electricity and used to power American cities. It's also important to note that once the LEU is used in a power plant, it can no longer be used in nuclear weaponry.

The MMP was not a one time deal, but was ongoing for 20 years, from 1993 to 2013. During this time, "10 percent of all the electricity consumed in the United States came from Russian nuclear warheads."[13] That is a huge supply of energy, especially considering that America is one of the largest consumers of electricity in the world. According to USEC [United

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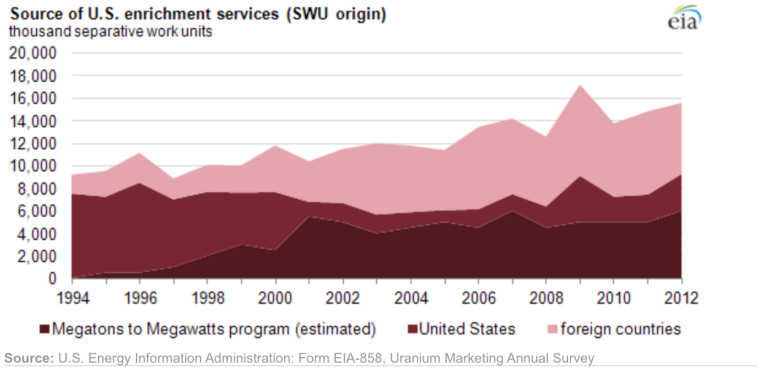
[11] World Nuclear Association. "Military Warheads as a Source of Nuclear Fuel." *Military Warheads as a Source of Nuclear Fuel | Megatons to MegaWatts - World Nuclear Association*, Feb. 2017, www.world-nuclear.org/information-library/nuclear-fuel-cycle/uranium-resources/military-warheads-as-a-source-of-nuclear-fuel.aspx.

[12] Centrus Energy Corp. "Megatons to Megawatts." *Centrus Energy Corp*, Centrus Energy Corp, 28 June 2016, www.centrusenergy.com/who-we-are/history/megatons-to-megawatts/#:~:text=The%20Megatons%20to%20Megawatts%E2%84%A2,for%20American%20nuclear%20power%20plants.

[13] Brumfiel, Geoff. "Megatons To Megawatts: Russian Warheads Fuel U.S. Power Plants." *NPR*, NPR, 11 Dec. 2013, www.npr.org/2013/12/11/250007526/megatons-to-megawatts-russian-warheads-fuel-u-s-power-plants.

States Enrichment Corporation] President and Chief Executive Officer William Timbers, "The Megatons to Megawatts Program (MMP) is one of the most successful nonproliferation efforts worldwide,"[14] Mr. Timbers believes that the MMP was extremely successful for two main reasons. From an American stand point, the program not only took a large number of Soviet Union nuclear warheads out of play, but it also contributed a significant amount of energy to the



United States nuclear power program. In the graph to the left, starting shortly after 1993 when the program started to 2013 when it ended, the source of uranium for the United States nuclear power plants became half from the MMP. In fact, as reported in *The Bulletin of Atomic Sciences,* "While nearly half of the uranium burned in US power plants during the past 20 years came from decommissioned Russian weapons, only 5 percent came from American weapons."[15] This large source of uranium clearly benefited the United States of America, as it gave them a large, reliable source of clean energy for twenty years. This deal was also in part through a private American company, and stimulated the economy with no cost to American taxpayers. Additionally, NPR reported that the Russians were just as pleased with the deal saying "Khlopkov [Anton Khlopkov, the director of the Center for Energy and Security Studies outside Moscow] says it was a win-win. 'This is the only time in history when disarmament was actually

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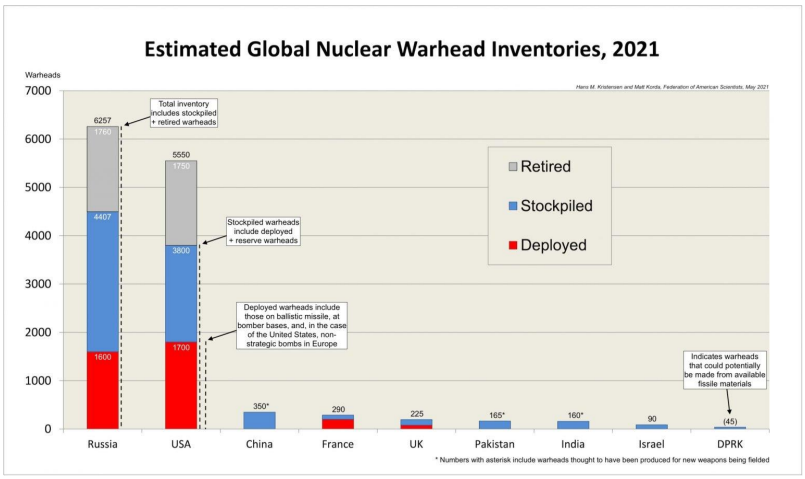
[14] Nartker, Mike. "U.S.-Russian 'Megatons to Megawatts' Program Has Eliminated Equivalent of 9,000 Warheads." *Nuclear Threat Initiative - Ten Years of Building a Safer World*, 6 Oct. 2004, www.nti.org/gsn/article/us-russian-megatons-to-megawatts-program-has-eliminated-equivalent-of-9000-warheads/.
[15] Stover, Dawn. "More Megatons to Megawatts." *Bulletin of the Atomic Scientists*, The Bulletin, 28 June 2018, thebulletin.org/2014/02/more-megatons-to-megawatts/.
Megatons to Megawatts Program Picture, EIA, https://www.eia.gov/todayinenergy/images/2013.09.24/source.png

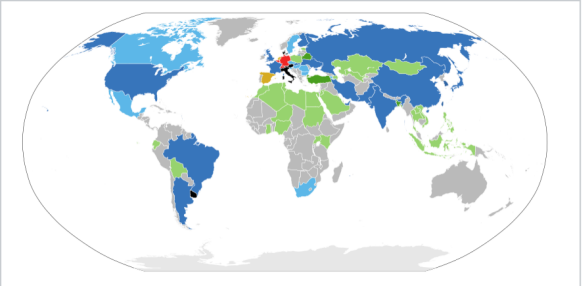
profitable,' he says."[16] At the time, it seemed like it was a deal that took out three birds with one stone: getting rid of a large number of nuclear weapons, increasing the nuclear power supply of the United States of America, and giving monetary aid to a then unstable Russia.

This being said, the MMP still had flaws and was not completely effective. There are still a large number of nuclear weapons in the world today, mostly held by the United States of America and Russia. While it is unrealistic to ask Russia and America to simply get rid of their nuclear weapons, it is far more realistic to propose a program similar to the Megatons to Megawatts program, focused on turning the excess weapons into power. In the graph above, it shows how America and Russia combined could have more retired nuclear weapons, than the rest of the world combined. These retired nuclear weapons are mostly just sitting unused, waiting to be dismantled, and have enough potential electricity to power cities around the globe.



In 1993, nuclear power plants were rare, and only the most developed and powerful countries had them. Now, nuclear power is becoming more and more accessible around the world. As shown below, many countries have begun plans to build new nuclear power plants,

[16] Brumfiel, Geoff. "Megatons To Megawatts: Russian Warheads Fuel U.S. Power Plants." *NPR*, NPR, 11 Dec. 2013, www.npr.org/2013/12/11/250007526/megatons-to-megawatts-russian-warheads-fuel-u-s-power-plants. Estimated Global Nuclear Warheads in 2021, https://fas.org/wp-content/uploads/2021/03/WarheadInventories2021-scaled.jpg



Global status of nuclear deployment as of June 2020 *(source: see file description)*

- Operating reactors, building new reactors
- Operating reactors, planning new build
- No reactors, building new reactors
- No reactors, planning new build
- Operating reactors, stable
- Operating reactors, considerin
- Civil nuclear power is illegal
- No reactors

whether that is in addition to existing ones, or the country's first plants. While the MMP was only enacted between two major countries, the ability to now spread the benefits globally is available.

Questions to Consider:

1. What is your country's policy on nuclear weaponry and nuclear power?
2. How can we safely get rid of the excess nuclear waste from the United States of America and Russia in a way that benefits all parties?
3. How can we turn these weapons of mass destruction into a clean energy source for the entire world?
4. How do we help developing countries build and utilize nuclear power plants, while also upholding international security and safety standards?
5. What do developed countries, such as the United States of America and Russia, get in return for giving up some of their nuclear power?
6. What international norms and agreements, pertaining to the safety and security of extremely dangerous nuclear material being moved globally, need to be established?

7. How should the international community address the lack of adherence of Member States to international norms and pre-existing agreements on nuclear safety?

Helpful Resources:

_____We recommend that each delegate try to do research on their countries policies regarding Nuclear Power and Denuclearization. To do so, we recommend looking back at what treaties your country has ratified in relation to denuclearization, which can usually be found on the United Nations website. The CIA factbook can also help you get some basic information on your country which can help you understand its policies better. It is also always good to try to find your country's government website if you can, but this doesn't always work. If you wish to do some more research on the Megatons to Megawatts Program, we recommend looking through the bibliography below, as we have already found several trustworthy and thorough sources that you can look through.

List of Member States:

1. Russia
2. Democratic People's Republic of Korea
3. Venezuela
4. United Arab Emirates
5. United States of America
6. Saudi Arabia
7. Iran
8. Canada
9. Brazil
10. People's Republic of China

11. Mexico
12. Russia
13. Algeria
14. Angola
15. Republic of Congo
16. Ecuador
17. Italy
18. Gabon
19. Iraq
20. Kuwait
21. Libya
22. Nigeria
23. Qatar
24. France
25. United Kingdom
26. India
27. Pakistan
28. South Korea
29. New Zealand
30. South Sudan
31. Bolivia
32. Slovakia
33. Slovenia
34. Sweden
35. Uruguay
36. Vietnam
37. St. Vincent and the Grenadines
38. Zambia
39. Turkey
40. Turkmenistan
41. Norway
42. Bulgaria

This committee's Member States are all present on the party list for the Treaty on the Non-Proliferation of Nuclear Weapons. You must research your respective countries' position on the treaty – whether or not the country resulted in the accession of the treaty or the ratification of the treaty and research the reasons which lead to the country's decision. As of now, a total of 191

States have ratified the treaty including the five nuclear-weapon states as mentioned above. Researching what the nuclear-weapon states have in common will suit you well and help provide a background for the topic.

Position Paper Information:

It is not required to submit a position paper at PEAMUN, but if you wish to do so and would like feedback, please feel free to send us your paper at adlynch@exeter.edu and ajain1@exeter.edu. Also please feel free to reach out to us with any questions you may have, about the committee or preparation or anything else you need help with. You can also visit our website, peamun.org, for helpful information and resources. We are excited to see you guys in committee!

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