Issue description

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Issue of: Atomic energy and sustainable power planning (SDG 7)

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Introduction:

In 2015 the United Nations General Assembly adopted a set of 17 goals, as part of Resolution 70/1 of the United Nations General Assembly: "Transforming our World: the 2030 Agenda for Sustainable Development". That has been shortened to "2030 Agenda". The goals are broad and interdependent, yet each has a separate list of targets to achieve. Achieving all 169 targets would signal to accomplish all 17 goals. The SDGs cover social and economic development issues including poverty, hunger, health, education, global warming, gender equality, water, sanitation, energy, urbanization, environment, and social justice. One of the most important of these goals, the one which our topic concerns, the 7th deals with a sustainable energy source reaching every part of the world. As the goal reads: „Ensure access to affordable, reliable, sustainable and modern energy for all." Targets for 2030 include access to affordable and reliable energy while increasing the share of renewable energy in the global energy mix. This would involve improving energy efficiency and enhancing international cooperation to facilitate more open access to clean energy technology and more investment in clean energy infrastructure. Plans call for particular attention to infrastructure support for the least developed countries, small islands, and land-locked developing countries.

As of 2017, only 57 percent of the global population relies primarily on clean fuels and technology, falling short of the 95 percent target. Despite the slow progression many believe that the goals set forth can be achieved, as for example in 2018 the deficit for reaching the goals exponentially decreased, for example, the global population with access to electricity increased from 78 percent to 87 percent, with the absolute number of people living without electricity dipping to just below 1 billion.

Definition of key terms:

Sustainable Development Goals: A set of goals to be achieved until 2030, adopted by the GA through Resolution 70/1.

SDG 7: The 7th goal, focused on the power planning of the globe and creating a sustainable energy source for all.

Nuclear Fission: In nuclear physics and nuclear chemistry, nuclear fission is either a nuclear reaction or a radioactive decay process in which the nucleus of an atom splits into smaller parts.

GA Res. 70/1: General Assembly's resolution that set forth the Sustainable Development Goals.

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General overview:

Recent advances in sustainable energy are encouraging signs for ensuring access to affordable, reliable and modern energy for all. Access to electricity is outpacing population growth in many countries. In addition, energy efficiency continues to improve, which is offsetting carbon dioxide emissions, reducing energy demand and making energy more affordable. Although renewable energy in the electricity sector has advanced rapidly, accelerated progress is also needed in the areas of transport, heating, and cooling. Despite some steps forward, 41 percent of the world's population still lacks access to clean cooking fuels and technologies. Overall, progress on Goal 7 remains too slow to be on track to meet the global energy targets for 2030. Global energy intensity—the ratio of energy used per unit of GDP—decreased by 2.8 percent in 2015, faster than in any year since 1990 and double the rate of improvement between 1990 and 2010. High-income countries showed consistent declines, but at a slower pace than low- and middle-income countries. Emerging economies in Asia and the Pacific and in Africa have now surpassed the global rate of improvement in energy intensity, but their intensity levels are higher than the world average. Among end-use sectors, the industry made significant progress, reducing intensity by 4.2 percent in 2015. To reach the SDG target, global energy intensity needs to improve at an annual rate of 2.7 percent over the period 2016–2030, requiring sustained momentum and the systematic adoption of energy efficiency policies in countries that are falling behind. From 2000 to 2016, the proportion of the global population with access to electricity increased by almost ten percentage points, reaching 87 percent. This was the first time since 1990 that the absolute number of people living without electricity dipped below the symbolic threshold of one billion. Substantial gains in access rates were achieved in rural areas, in part due to slower population growth, but also aided by an upswing in off-grid solar electricity. Still, access rates to electricity in rural areas (at 76 percent) are much lower than in urban areas (97 percent), and rural residents make up 87 percent of the global deficit in access.

The largest deficits in electricity are found in Southern Asia and sub-Saharan Africa. However, both regions have made substantial progress. From 2000 to 2016, the electricity access rate increased from 60 percent to 86 percent in Southern Asia and from 26 percent to 43 percent in sub-Saharan Africa. Despite these promising developments, the outlook for electrification shows that the world is not yet on track to achieve universal access by 2030. Some 40 countries have met the target since 2010; another 98 countries will need to intensify their efforts to do so. Over the period 2000–2016, 1.4 billion people gained access to clean cooking fuels and technologies. However, these advancements were mostly offset by population growth during this period. In 2016, 59 percent of the population had access to clean cooking fuels and technologies, an increase of only 10 percentage points since 2000.

The health and well-being of some 3 billion people are adversely impacted by the lack of clean cooking fuels. This is especially true for women and children, who are typically the main procurers and users of household energy. Sub-Saharan Africa, Oceania and many parts of Asia have the largest populations using polluting fuels. In 2016, some 2.8 billion people still used solid fuels with inefficient stoves, leading to high levels of household air pollution. If current trends continue, 2.3 billion people will continue to use traditional cooking methods in 2030. The solution lies in transitioning to cleaner fuels and technologies, like gas and electricity, and improvements in stove efficiency. Addressing issues of affordability, lack of consumer awareness about the benefits of clean cooking, and minimal financing for producers of clean cooking energy technologies are key to accelerate the rate of access to clean cooking.

Nuclear fission is uniquely positioned to help meet this challenge because it has the highest energy density of any power source and its growth potential is not limited by resource

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availability. Nuclear power can also scale up quickly to fulfil high demand with zero carbon emissions. The potential applications are wide-reaching. Not only can nuclear power be harnessed to meet the world's growing demand for electricity, but it could also be used to decarbonize the transportation sector by providing the power and heat necessary to operate electric cars or produce synthetic fuels. While nuclear fission is already a leading source of zero-carbon energy, providing approximately 12 percent of power generation worldwide, progress toward expansion has been stymied by several factors. There are substantial capital costs and regulatory hurdles associated with contemporary reactor designs; rare but serious accidents have exacerbated concerns about plant safety — in spite of the industry's robust safety record, and questions regarding waste and proliferation continue to temper the public's enthusiasm for nuclear energy. CANES (Centre for Advanced Nuclear Energy Systems) aims to address these issues by hastening the development of new and transformative technologies, materials, and methods that will make nuclear fission more affordable and more rapidly and securely deployable. Building upon MIT's already extensive capability in nuclear fission-related innovation, the centre supports work across the entire technology development arc — from basic materials research through reactor design, manufacturing, and the fuel cycle.

The centre also pairs its innovative research with a dedicated technologic, economic, and systems analysis program focused on how to overcome the challenges involved in expanding nuclear power. An MIT team is conducting technology assessments, economic modelling, and analyses of the regulatory, financial, and political aspects of siting, designing, constructing, operating, and decommissioning nuclear facilities.

Public support for nuclear power faded, however. The accidents at Three Mile Island (1979) and Chernobyl (1986) showed that even though the technology worked perfectly most of the time, it also had the potential for rare and dangerous catastrophes. Though the United States still gets about 20 percent of its electricity from nuclear fission, it's built few new reactors since the 1980s. The average nuclear plant in the U.S. is now nearly 40 years old. The decline compared to previous projections is mainly on account of early retirement or lack of interest in extending life of nuclear power plants in some countries, due to the reduced competitiveness of nuclear power in the short run and national nuclear policies in several countries following the accident at Fukushima Daiichi Nuclear Power Plant in 2011. The report analyses the factors which could influence the future of nuclear power, such as funding and financing, electricity markets and public acceptance. If nuclear power's potential as a low-carbon energy source grows in recognition and advanced reactor designs further improve both safety and radioactive waste management, the use of nuclear power could grow significantly, the report says. In some countries, concerns about climate change provide an incentive to support the continued operation of nuclear power plants, or are part of the argument for a new build programme," said Mikhail Chudakov, Deputy Director General and Head of the Department of Nuclear Energy. Over time advanced technologies may become commercially available for consideration as part of a low carbon energy mix. More than 30 advanced water cooled reactors are already under construction worldwide. In the meantime, and in light of increased demand for clean energy, maintaining an operating fleet is necessary in order to bridge the gap between existing and next-generation technologies. The IAEA's projections are developed by world experts taking into account the status and condition of all 447 operating reactors, possible license renewals, planned shutdowns and plausible construction projects foreseen for the next several decades. The low case, designed to produce "conservative but plausible" estimates, assumes a continuation of current market, technology and resource trends with few changes to policies affecting nuclear power. The high case assumes that current rates of economic and electricity demand growth, particularly in Asia, will continue.

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Major Parties Involved:

***United States of America**:* As one of the most powerful countries in the world, paired with a huge and robust economy, the USA could be one of the countries leading the efforts, in order to complete the goals. However these facts, the Trump Administration only supports their close allies, such as the State of Israel, and they emphasized that they lost hope in the UN. President Trump also mentioned the IAEA not being efficient and effective – while quitting the JCPOA (Joint Comprehensive Plan of Action) – in spite of this, full commitment is hard to imagine, but President Trump frequently surprises everyone with his statements, we hope a change of ideas may come, as it would be ideal for the international community.

***People's Republic of China**:* The PRC has shown great interest in supporting Less Developed Countries, mainly in Africa, with investing in local businesses, building power plants and infrastructure. In spite of this and the PRC being an economic powerhouse, it is highly possible that they may take a leading role in popularizing Atomic energy and creating a sustainable energy source. However, the efforts may be set back, due to the ideological differences between the PRC and the other P5 nations; another factor that must be considered is the trade war between the US and the PRC.

Less Developed and Un-Developed Countries: These countries are in the greatest need of international help concerning a sustainable energy source and an effective infrastructure. Building such an infrastructure is no easy job, and requires an enormous amount of financial input, but is required if we want to solve the issue at hand. The PRC has already started such investments, however, a full monopoly status of countries in this region shall be avoided as it may influence the development of these countries.

The European Union and the United Kingdom: These countries are included in one paragraph, due to Brexit, as it may greatly weaken both parties economically, which may prevent them from taking a leading role in international co-operation. However, both the major countries of the EU – France and Germany – and the EU have great expertise in the field of nuclear power plants and training a well-qualified staff, in which they may help the Less-Developed Countries.

The Russian Federation: The Russian Federation has one – if not the – biggest expertise in building and sustaining nuclear power plants, and their willingness to help other countries in doing so – for example Hungary, where the new block of the Paks power plant is being built by a Russian state firm – is welcomed. Despite their help, it is recommended to make sure, that the Russian Federation will not establish sphere of influences, such as the PRC.

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Timeline of events:

From 2000 to 2016, the proportion of the global population with access to electricity increased from 78 percent to 87 percent, with the absolute number of people living without electricity dipping to just below 1 billion.

In the least developed countries, the proportion of people with access to electricity more than doubled between 2000 and 2016.

2011, the core breach at Fukushima nuclear power plant in Japan, contaminating huge percentage of the Pacific Ocean.

The share of renewables in final energy consumption increased modestly, from 17.3 percent in 2014 to 17.5 percent in 2015. Yet only 55 percent of the renewable share was derived from modern forms of renewable energy.

Global energy intensity decreased by 2.8 percent from 2014 to 2015, double the rate of improvement seen between 1990 and 2010.

In 2015 the General Assembly of the UN adopted the Sustainable Development Goals through GA Res. 70/1.

In 2016, 3 billion people (41 percent of the world's population) were still cooking with polluting fuel and stove combinations.

Previous attempts to solve the issue:

Many scientists and experts believed that the power need of the world could be covered by green energy sources, however, the increased population and necessity for power made it clear that we need something more efficient, as quickly as possible. In spite of this, many countries started collaborating to create a fusion reactor, however, the technology is still years ahead of us, possibly decades. That is why many countries started favoring nuclear power plants, although some experts pointed out that if we are to advertise nuclear plants, that technology shall be made safer to the civil population.

Possible solutions and approaches:

Building nuclear power plants in less developed countries and non-developed countries may be a solution, however, the deficiency of infrastructure and the problem of funding is not a problem we could evade. Also, the length of building such facilities is problematic, as it could take years, if not a decade. A factor that also must be pointed out is that these facilities cannot sustain themselves, as other facilities are needed, such as heavy water producers and qualified employees, who either could be brought from abroad or educated there, possibly both, as we could also help to decrease unemployment.

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