

Introduction:

Anthropogenic climate change is a major problem currently facing the world. That climate change is already impacting large parts of the world today. If anthropogenic climate change is not curbed, its effects will reach much greater proportions, and the damage caused by climate change will increase many times over. The energy industry has a major causal role in anthropogenic climate change. Fossil fuels emit greenhouse gases, which leads to the acceleration of global warming. It is therefore necessary to stop those greenhouse gas emissions. However, people still need energy, and so stopping the production of energy is therefore not an option. One potential means of producing energy without emitting greenhouse gases is through the use of nuclear power. Nuclear power reliably delivers energy without emitting any greenhouse gases in the energy generation process. Despite this, nuclear power is a controversial tool, and there are many opponents of it. That opposition has to do with some of the major drawbacks of nuclear energy, for example, the disposal of nuclear waste and the proliferation of nuclear weapons. On the other hand, nuclear energy also has major advantages, like the security of green energy.

Goal:

The research question underlying this thesis is: 'is it morally justifiable to use nuclear energy in the fight against anthropogenic climate change?'

Methods:

The method used is a literature review, in which the relevant factors of the ethical analysis are climate change, energy security, and the technical aspects of nuclear energy that are ethically relevant.

Discussion:

Energy generation has historically been highly polluting, and thus a strong contributor to climate change. Despite increased attention to global warming, humans are currently still deriving still 80 percent of its energy from fossil fuels. This figure has remained unchanged for decades. This is, because despite the negative effects of fossil fuel on global warming, there are also tremendously significant benefits associated with the use of fossil fuel. The major advantage of using fossil fuel is that it has long been a reliable and readily available source of energy, making it an engine of progress. Reliable energy is an engine of progress because an enormous number of tools that make our lives better, easier and more enjoyable require an energy source to work. Think of lighting, medical facilities such as the incubator, efficient food harvesting, a refrigerator or freezer, and a car. In addition, energy is used to manufacture facilities such as a house, a hospital, cabinets, shoes, etc. This creates a correlation between the use of fossil energy and a person's overall well-being, and it is no longer possible to imagine our western society without a constant, reliable source of energy. Outside the West, fossil fuel is also an engine of progress. India and China are two examples where, through fossil fuel (among other things), there has been much progress made on the general welfare of the population. For example, general life expectancy and general income increased proportionally with fossil fuel use. Above this all, experts predict that global electricity consumption will significantly increase, especially in the developing world. The world's population is expected to grow from 6.7 billion people today to more than 9 billion people in 2050, all striving for a better quality of life. As the world's population grows, so does the demand for energy and the benefits that come with it. By simply expanding the use of energy along the same mix of current production options, concerns about climate change and fossil resource depletion are not addressed. This poses a dilemma. On the one hand, a (desirable) increase in global energy demand is predicted, and along the other hand, we have the problem of climate change that is a result of the increasing demand of energy.

One of the main sources of clean energy today, is nuclear power. Taking into account the expected global increase in demand for energy and the growing awareness about global warming, anthropogenic climate change and sustainable development, nuclear energy will be required to meet future global energy demand. Nuclear energy has multiple advantages above the providing of green and constant energy, for example the international implications that nuclear energy has, nuclear energy as a safe energy generator compared to, for example, fossil fuels, or the future of improved nuclear power plants that can be developed. But the most important feature of nuclear energy remains the providing of green and reliable energy. Nuclear energy is a low greenhouse gas emission technology, with a median emission of 16 g CO₂-eq / kWh. This is close to technologies with the lowest total emissions according to the life cycle analysis, such as hydropower and wind. And it scores even better than solar power. However, these comparisons become redundant when gas and coal enter the equation. To make these figures concrete: when one nuclear power plant of 1 gigawatt is replaced by a coal plant of the same capacity, this leads to about 6 million additional tons of emitted CO₂ per year. If the nuclear power plant were to be replaced by a gas power plant of the same capacity, then this would lead to 3 million additional tons of CO₂ emitted per year. There has been calculated that the global use of nuclear power in the period from 1971 to 2009 averted emissions of about 64 gigatonnes of CO₂ equivalent. 64 gigatonnes CO₂ equivalent corresponds to the cumulative CO₂ emissions from coal combustion over the past 35 years in the United States. It is therefore clear that without the application of nuclear power, the challenge of anthropogenic climate change would be even greater. Nuclear energy has made a major contribution to reducing the global greenhouse gas emissions and the fight against anthropogenic climate change.

Despite these advantages, nuclear power has some serious drawbacks. These disadvantages make nuclear energy a controversial means of providing green energy. The disadvantages attached to nuclear energy are the unsafety of using nuclear power, the problem of nuclear waste, and the risk of nuclear proliferation. Nuclear power has a reputation for being a very dangerous technology. Since the introduction of nuclear power in the 1950s, there has always been opposition to the use of nuclear energy. Nuclear energy accidents such as Chernobyl, Fukushima and the Three Mile Island are therefore notorious and knowledge of those accidents is widespread. Due to the specifics of nuclear power, the risks are high. If a nuclear accident occurs, it has major consequences for a very long time. Thus, strict regulation is needed. However, that regulation is very complicated, because of the degree of secrecy required due to the relationship between the production of nuclear energy and the possibility of building nuclear weapons. In the end, this amounts to the nuclear power industry regulating itself. In short, it has proven almost impossible to establish an independent, transparent and accountable regulatory body for nuclear energy, which is problematic in achieving a safer nuclear energy industry. In addition to the safety risks inherent in the use of nuclear power, you also have the risks surrounding waste disposal. Currently, more than a quarter of a million tons of high-level nuclear waste exists worldwide that is still not been processed. Storing high level waste involves several risks and ethical issues. The most important ethical issue that the management of high level nuclear waste poses, is that it has significant implications for responsibility to future generations. Radioactive waste has an enormously long life span. The waste generated today will be around for many years after this generation and future generations are gone, still exist. This implies that there is an ignorance of the risks that nuclear waste poses. The risks may either be unknown, that is, we simply do not know what the risks of storing high level radioactive waste are in the distant future, or the risks may be undetermined, this means they are known, but it is impossible to determine their probability. The risk may depend on the actions of future generations, for example. As a result of this, a number of ethical issues are raised, and these have often been collectively been categorized under the term "intergenerational equity"; a term intended to convey the view that there are

obligations and rights that the current generation owes to, or projects onto future generations. Another drawback to nuclear power is that conventionalizing and building out global nuclear power plants also spreads the knowledge and infrastructure of and for nuclear weapons technology. The spread of nuclear energy in the fight against global warming can thus be a stepping stone to producing nuclear weapons, and a nuclear war would be many times more catastrophic for planet earth than anthropogenic climate change. If nuclear energy is considered a serious option in the fight against anthropogenic climate change, then it would lead to a major dilemma. The knowledge of and infrastructure for nuclear energy would have to become widespread, which would make the global warming could be greatly combated, while the likelihood of the development of nuclear weapons also greatly increases. The danger of nuclear war is thus a very strong argument against the use of nuclear energy in the fight against anthropogenic climate change.

Conclusion:

Climate warming is becoming the greatest challenge of the century, and if not addressed, it will have enormous negative consequences. Therefore, pragmatism is recommended, because there are no miracle solutions. We cannot afford to dismiss a series of remedies in advance, and any greenhouse gas emissions that can be avoided are a step in the right direction. Therefore, in my opinion, the research question underlying this thesis, namely 'is it morally justifiable to use nuclear energy in the fight against anthropogenic climate change?' should be turned around. The question that is really relevant is: 'is it morally justifiable to exclude nuclear energy as a means of combating global warming?' The answer to that seems to me to be a resounding no. Climate change is such a problem that every possible means must be used to counteract catastrophic climate change.