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A Nuclear Reaction

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After years of damaging our environment, we're finally starting to realise that we have to change. It is time to rethink the way we're living, and look at the impact we're making on the world around us. Revelations that burning fossil fuels releases 'greenhouse gases' into the atmosphere have shocked us all. The physical impacts of global warming taking hold have woken us up to a huge problem. And reports that immediate action must be taken in order to avoid devastating effects, have caused us to frantically search for a solution to this crisis.

We are looking for an alternative fuel source; one that is 'economically optimal in the long run' (http://www.iaea.org/NewsCenter/PressReleases/2004/prn200405.html: 25 May 2008) — and one that can supply us with our energy needs without harming the environment. People have searched the world for solutions, and one that has had massive amounts of coverage (both good and bad) is nuclear energy. Some say that nuclear power is extremely dangerous and just too risky, while others claim that it is powerful enough to support our energy demands and is safer than perceived. So is our own environment — slowly deteriorating because of our current lifestyle — worth the risk of this radical change? When comparing the advantages and disadvantages, as well as its contribution to sustainability and quality of life, it is clear that though the dangers of nuclear power are frightening, it is the only viable solution for renewable energy in the 21st century. The environmental damage cannot go on.

First, why is there a need for alternative fuel sources? What has caused this sudden chaotic search for a replacement? Scientific evidence shows that our current method of converting fossil fuels to energy is resulting in extreme harm to our environment such as: air pollution, water pollution, thermal pollution, accumulation of solid waste, land degradation and human illness. Because of carbon-dioxide emissions, we have seen the 'Greenhouse Effect', with impacts such as an increase of 0.3-0.6 degrees Celsius of the global average surface temperature.

We have brought global warming on ourselves, with scientists from the Intergovernmental Panel on Climate Change reporting 'evidence suggests that there is a discernible human influence on global climate' (http://www.ucsusa.org/clean_energy/fossil_fuels/the-hidden-cost-of-fossil-fuels.html: 15 May 2008).

People all over the world are coming up with crazy new ideas for alternative fuels; however, many of the ideas need further investigation or alterations and are not yet ready to become a replacement source. One method has already been fully developed, set up in places all over the world, fully investigated and safety updated — nuclear power. So is that our solution?

Nuclear energy has a number of big advantages, the most important being that it releases no emissions of CO_2, so has very little impact on global warming. Nuclear energy is also more powerful than our existing methods, with levels unreachable by other alternative such as solar, wind or hydro-electric. United States Congressman Michael Burgess states 'nuclear power will help provide the electricity that our growing economy needs without increasing emissions. This is truly an environmentally responsible source of energy' (http://www.brainyquote.com/quotes/quotes/m/michaelbur288596.html: 25 May 2008). With power like this, it's hard to believe the prices.

Economically, nuclear power is certainly viable. Construction costs up to $5000 per KW; however, taking into account the productivity of a single plant, the price evens out. Current operating costs are extremely low, cheaper than the major current fuel methods and other alternative sources (that cannot be properly priced as yet).

The other major cost is the waste disposal, with costs for transportation and safe removal. Specific steps have been taken in plants around the world to ensure that the operations are safe, notably

Sweden, which has had safe nuclear power for over 30 years now. Safety expenses are factored into the price, which remains economically feasible, and we get peace of mind knowing that there isn't a disaster waiting to happen.

Nuclear power is supported by basic economic theory. It is in line with the Precautionary Principle, as nuclear power could be used to avoid the damage of climate change. It also contributes to Intergenerational Equity, as the use of nuclear will allow our future generations to use the same levels of power as we do, but not at the expense of their environment. Looking at these facts, nuclear power seems like the best option. However, it isn't that simple.

Nuclear power is heavily scrutinised in the public eye, with many claiming that it is unnatural and dangerous. Nuclear power produces radiation, which can have horrific effects on the environment. In events such as the Three Mile Island accident and Chernobyl, large sites were exposed to deadly radiation after badly designed reactors went into meltdown. Chernobyl caused over 50 deaths; whether from radiation poisoning, thermal burns, or subsequent deaths due to radiation exposure, and parts of the area are still contaminated and blocked off.

The leftover waste can also be extremely dangerous, as plutonium can stay active for thousands of years. In 1957, a nuclear dump site in Russia's Ural Mountains mysteriously exploded, killing dozens of people. These disasters showed exactly what could happen when nuclear power goes wrong. So are the dangers worth it? Public figure Donna Reed doesn't think so, stating 'I'm not willing to gamble with the health and safety of my family' (http://www.brainyquote.com/quotes/quotes/d/donnareed186056.html: 25 May 2008),

There is also the threat of terrorism, plants being potential targets because of a catastrophic impact. Unstable explosives can also be manufactured from nuclear energy. They can explode prematurely or be used to bomb enemies as we saw in World War II. It really comes down to weighing up the goods and the bads, and how nuclear power will affect our sustainability (the ability to maintain this method) and quality of life (its impact on the degree of enjoyment in everyday life).

When it comes to sustainability, it is clear that our current fuel methods are certainly not contributing. While nuclear power is not

technically 'renewable', it is recyclable. Spent nuclear fuel retains 95% of its energy content and can be reproduced and reused. France, Japan and Britain have already started using this method, with India using a similar method with leftover plutonium. It is clear that nuclear energy beats our current methods in this area; the World Nuclear Association confirming 'Nuclear power can contribute significantly to sustainable development' (http://www.world-nuclear. org/info/inf09.html: 24 May 2008).

Of course, there are other alternative fuel sources that have the same positive impact on the environment — solar power, wind power, hydro-electric and a host of others. However, although these alternatives are ecologically sustainable, they are not economically or socially sustainable. Unlike nuclear energy, these sources are projected to be quite expensive and they also cannot meet our current energy needs. Therefore, nuclear energy is the most sustainable source.

As goes with sustainability, our quality of life is also affected; through the areas of power generation, medical services, agriculture and industry. More efficient power will be available, and a decrease in coal production means that greenhouse-gas emissions will be avoided — therefore leaving a better impact on our environment. Better medical care will be provided and research and development furthered with nuclear technology.

Money will be brought into economies through sales of uranium, heavy water, reactor fuel and isotopes, and there will be direct and indirect employment because of nuclear set-ups. All these factors contribute to an increased standard of living, increased economic and environmental sustainability, and better overall quality of life. So should we make it happen? Is the world ready for nuclear and all it has to offer?

While many groups, lobbies and individuals around the world are opposed to nuclear power, it may be time for them to back down and accept that using nuclear energy in the future is inevitable. Current fuel sources are quickly running out and the search for an adequate alternative seems hopeless. The only source that is already developed and ready to go is nuclear.

There is no doubt that nuclear energy can have devastating effects, as we witnessed in Chernobyl and other circumstances. And there is no doubt that with a new technology there are risks. But they

are risks that we must overcome. Nuclear energy has the potential to become our leading energy supplier because of its economic and environmental suitability. Because of this, and because of the seriousness of our global climate situation, it is my recommendation that we start to implement plans for safe nuclear plants, structured similar to those in Sweden, to be placed around Australia. It is clear that though the risks of nuclear energy are frightening, it is the only solution for renewable energy in the 21st century. It took a long time to realise the harm that was being done to the environment; let's not wait that long to realise that nuclear is the cure.

Tess-Anna Gilfedder wrote this in 2008 when she was in Year 11 at Pine Rivers State High School in Queensland.