

Free essay on grand challenges for engineering

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Since the dawn of man, engineering has driven the advance of civilization. Engineering has always been pushing for improvements, from shipbuilders who united the world, to producing agricultural tools, to as simple as producing the mechanical clock to keep track of time. As populations grow, engineers need to be able to sustain civilizations advancements by continuing to produce ground breaking materials for both every day use and large scale use. In the upcoming century, three major focus points to improve life through engineering are to make solar energy economical, to restore and improve urban infrastructure, and to be able to provide access to clean water worldwide.

Restoring and improving urban infrastructure is very important, and there can be great improvements made in infrastructure, specifically in the transportation and energy departments. Infrastructure is the fundamental systems that support the area, and the US infrastructure is aging and failing, leaving us vulnerable to attacks and is also very costly to be constantly repairing. There needs to be major upgrades with the infrastructure in the United States, and improvements need to be done with environment in mind, and improvements also need to incorporate new technology, like internet, television, and the growth of solar energy. Another important improvement that needs to be made in Urban Infrastructure is that the mass transit system needs to be improved, and it has to be made so that is easy to use and also ties in with biking and walking. New buildings that are built must be green buildings, including things like greenroofs, which cause much less water runoff, and permeable surfaces, which is a type of surface that allows water to pass through, like grass, gravel, and even new types of concrete

that allows water to seep through. Also, there needs to be a “master plan” before fixing and repairing, and the future must be accounted for.

Worldwide freshwater is running out, and water is essential for survival, so there must be an improvement to the international freshwater supply. Clean water is becoming an increasingly important issue because of low freshwater supply, and the issue needs to be addressed before it is too late. One issue is that poor countries have more difficulty with freshwater, so people must come together and help them find new ways of acquiring the water necessary for survival. One important piece of engineering is wastewater recycling, which is sewage treated into greywater, which is water that can be used for things like agriculture and toilets. Irrigation must be improved to reduce immense water use, as agriculture worldwide is one of the top users of water, although agriculture is very important. One last major improvement is localized water distillation, which are small, effective units that can be used to distill water to make it drinkable.

Making solar energy economical is crucial to the future of the planet, and it is one way to increase energy while reducing pollution with the use of more solar cells. The Sun is the world’s number one source of energy, but the use of solar power worldwide provides a small amount of the world’s power.

Solar power is a multibillion dollar industry, while providing less than 1% of the world’s power, while 85% comes from oil, natural gas and coal, none of which are sustainable. One crucial step that must be taken regarding solar cells is that engineers must find a way to improve solar cell efficiency while also reducing manufacturing costs. Solar energy can become more economical if we can reduce fabrication costs and if solar panels can be built

requiring less pure materials. Another important part of solar panels is experimenting with other solar surface elements, which can be more cost effective and possibly even more efficient. Storage improvements must also be made, which can range from storing in very large batteries or even fuel cells. Solar power is one of the most important innovations that must be continued for the future of mankind.

A lot of research and implementation needs to be done in the upcoming century, including the implementation of solar power, improvement of infrastructure, and better freshwater purifying techniques, along with distribution methods that need to be introduced. Increases may be costly, but must happen because they will be beneficial for the environment.

This is a good write up. The student demonstrated a good grasp of the topic and the points were succinctly explained and arranged. The introduction provided an insight into what the paper was all about, the body and the conclusion are also good. However, the choice of words and appropriate use of the tenses were a bit flawed. An example is "very costly to be constantly repairing". Also, continuity and flow of the paper was affected with the wrong use of the words "and", "so" and "also".

Also, you did not abbreviate well. See your abbreviation of "US".