PGC2017 - Day 5 - Greener Clean Energy

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WASTE TO ENERGY

"the combustion of waste and conversion to electricity and usable heat in waste-to-energy plants"

PROS

-"Waste-to-energy plants create energy that might otherwise be sourced from coal- or gas-fired power plants."

-" It has a positive impact on emissions"

-"It can help move us away from fossil fuels in the near-term" -Reduces waste volume by 87 Sources: Drawdown Solutions, U.S. Energy Information Administration

CONS

Although Waste to energy presents a multitude of problems, research and refinement are key to making this process more accessible and present in the future. As of right now, waste-to-energy presents high environmental costs yet is still significantly

percent -Great alternative for landscarce countries

cleaner than other sources of fuel.



HYDROGEN FUEL CELLS

What if the most abundant element in the universe - one that powers nuclear bombs, could be perhaps be harnessed?

PROS

Hydrogen is an abundant

Hydrogen energy is created through obtaining hydrogen from sources of energy and combining it with oxygen. The hydrogen energy movement has been gaining momentum in recent years, expanding its future possibilities. Like any other source, hydrogen energy needs more research and development to drive down current costs. Nevertheless, its potential is enormous as long as society continues to invest in its efforts.

CONS

This space-age technology is

element; its sheer quantity gives it the classification as a renewable energy source. Currently, it is being explored in the automotive industry.

There are many advantages that come with hydrogenpowered vehicles. No emissions are made other than water vapor. The fuel economies of these vehicles are equivalent to about twice that of gasoline vehicles. expensive. The acceptable range requires extremely-highpressure, on-board hydrogen storage. Few places to refuel. Hydrogen is very expensive to transport and there is no infrastructure in place yet. Currently hydrogen fuel is made from nonrenewable natural gas in a process that creates enormous CO2 emissions.

SUSTAINABLE FUTURE

Which energy source do you think is the most sustainable long-term? Why?

After doing some preliminary research, we believe the energy source that is most sustainable in the long-term would be wave and tidal energy. As long as our Moon continues to orbit around our planet, waves will always be present in our oceans and can sustainably be taken advantage to harness the mechanical energy and movement of natural wave flows to produce electrical energy. Harnessing wave and tidal energy reminds us of harnessing wind energy via wind turbines, as water turbines are placed at the bottom of our oceans, working in the same way as wind turbines to passage energy. Another reason that wave/tidal energy will be valuable in the future is the very low cost per unit of energy produced.

WAVE & TIDAL ENERGY

"Wave- and tidal-energy systems harness natural oceanic flows—among the most powerful and constant dynamics on earth—to generate electricity" (Draw Down)

An estimation by the BOEM government organization reveals that the amount of recoverable wave energy on Alaska's shorelines amount to upwards of 620 Twh per year, enough to 58.2 million average U.S. homes annually.

Advantages

- No combustion is necessary for energy to be produced, saving on the greenhouse gas emissions
- Cost per unit of energy produced is very low
- Amount of available energy that can be obtained via tidal plants
- Since waves also oscillate, there have been many contraptions developed, some

Drawbacks

- Since this field is more uncharted and undeveloped compared to other energy sources, its developmental cost is very high
- Installing such a contraption miles off the coast can be expensive
- Maintenance can be difficult
- exploiting the forward motion of the waves, others taking advantage of the oscillation between crests and troughs.
- By absorbing energy from waves, they will no longer have as much power to erode away at the shorelines, protecting coastal ecosystems
- Floating energy plants can create obstacles for marine and coastal life that swim through these areas.





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INNOVATIVE FUTURE

What is one innovative way to produce energy that totally inspires you and explain why you feel so strongly about it.

Hydrogen fuel cells are the next generation renewable energy source. Although research and development of hydrogen fuel cells and the logistics of implementing them to power dynamic devices are still in early stages, we believe this source of energy has so much potential in the future. It's only byproduct is water, and thus produces absolutely zero emissions. In fact, another reason why hydrogen power is so innovative is that it is using excess or "waste" hydrogen from sources of electric power. It's no wonder than many call Hydrogen Fuel "a dream energy of the future". A simple combustion reactions occurs between oxygen and hydrogen to produce great amounts of energy that has been already implemented in various spacecraft in the form of a fuel cell. Even Tokyo is attempting to power the entire 2020 Olympic Games using solely hydrogen energy. While we develop more efficient and effective ways to carry out this process, we move one step closer

to a truly zero-emissions future.





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ecohawks2017 A Hydrogen fuel cells are the NEXT GENERATION renewable energy source. This is because, as seen in the first image, excess electric power that would otherwise be wasted is used in a chemical reaction along with oxygen to create hydrogen fuel to potentially powering millions of vehicles and other areas in need of sustainable, clean energy. But how do hydrogen fuel cells work? Swipe right, and see that electrolysis \neq is used to combine hydrogen (that is extracted or taken as excess from other energy sources) and oxygen to produce energy via hydrogen gas. Water is the one and only byproduct, and this is why hydrogen energy is so clean, despite being in preliminary stages of research and development 🔬 . Unlike other sources of energy, it produce absolutely no emissions. @turninggreenorg **#PGC2017 #renewableenergy #thefuture**

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