

Alternative Energy Sources

Benefits and Downsides



UTSATeam18

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INTRODUCTION

While there are many alternative sources of energy, unfortunately a lot of them are not feasible on a mass scale or will simply not produce the energy needed to be able to power communities on the scale that we need it. Of course, wind turbines and solar panels are widely used across the US and the world, hydroelectric power is one of the oldest methods of distributing power into the grid, but the best method of renewable energy on a mass scale takes advantage of gravity while keeping the grid in check by powering itself with excess power.

WIND AND SOLAR



The above image was published in *The Independent* in 2015 and was taken in a solar field in England. These fields, as well as fields filled with wind turbines, are widely used in the

small country, but there's one big problem with solar in England: it rains about one out of every three days. That's a lot of overcast skies. While the hilly terrain and wide fluctuations in temperature create lots of wind, the investment wind energy is really paying off. Solar also has "shined" in the country, accounting for 23.7% of the power supplied at 1pm on May 26, 2017 while wind only offered 9.1%. This data, according to a report for England's *The Guardian* newspaper (1), has broken records in the country because of low power use in the summer (they don't need air conditioning!) and sunny spring skies.

UTSATeam18's home state of Texas has been reported as leading the nation in alternative energy with almost 23% of the power produced in early 2017 coming from wind energy (2). Texas's status shouldn't be a surprise with the wide open plains of West Texas and the panhandle paired with the arid and sunny climate are ideal for both wind and solar energy to flourish.

Pros and Cons - Wind and Solar

Pros	Cons
Untapped and unlimited Energy Sources	Some places are not windy or sunny
Technology getting more efficient every year	The efficiency still isn't where we want it to be
Popular field of study	Some people think they're an eyesore
Some people think it's beautiful	No efficient battery to store energy
Can be hooked up to the grid easily	Expensive to construct and upkeep

HYDROELECTRIC POWER



Hydroelectric power is one of the oldest and most reliable forms of renewable energy. Hydroelectric Dams turn the energy created by letting water out of a reservoir into usable power sent to the homes of people nearby. This method of creating energy, however, has recently been criticized by the MIT Technology Review as having more negative an impact on the environment than we previously thought it did. They argue that the reservoirs that store water produce 25% more methane than was initially estimated, having a huge impact on greenhouse gas emission. Not to mention the amount of concrete needed to create these dams. The production of one ton of concrete pumps one ton of Carbon Dioxide into the atmosphere.

Pros and Cons - Hydroelectric power

Pros	Cons
Creates reservoir for natural recreation	Concrete CO2 emissions
Water is a renewable resource	Dry areas cannot sustain the water needed
Better than fossil fuel emissions	Methane release in reservoir

GRAVITY ENERGY STORAGE - THE ONE THAT GETS ME EXCITED!

My favorite idea for renewable and sustainable energy system involves heavily loading a heavy rail car. When there is excess energy created by, say a solar panel or by a wind turbine, that will not immediately be used in the grid, instead of storing the energy in a low-efficiency battery, a generator, powered by the solar panel or wind turbine, will push the rail car up a hill as a way of storing the excess energy created. In times like the evening, when the sun isn't shining, we still need power to run our homes and businesses, so this is where the car comes in. The rail car, now at the top of a gently sloping hill, will begin to roll down the hill generating electricity while doing so through a regenerative braking system. While this technology is just in its infancy, it is beginning to take off in terms of popularity, even being discussed on Bill Nye's new TV show, "Bill Nye Saves the World", on Netflix. We will only know the true upsides and downsides once we see this system in action, but it seems to be a great possibility.

Pros and Cons - Train on a Hill

Pros	Cons
One-time setup with no consumables	Finding the perfect slope
Can be implemented anywhere	Could be a dangerous area
Generates power and acts as a battery	It's not very "pretty"

SOCIAL MEDIA POST



Ashlee Davison

Just now · 🌐

How can we move from fossil fuel energy to renewable green energy? This way is pretty darn good. ****Heavy Nerd Breathing****



Forget Elon Musk's Batteries—Let's Fix the Grid With a Rock-Filled Train on a Hill
wired.com

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CONCLUSION

While it is important for us to realize that depending on only one type of renewable energy for all of our energy needs is unrealistic, I am hopeful and excited that the “Train on a hill” method will become more popular. Now, it isn’t pretty, but it will get the job done most efficiently of all of the types of renewable power that we have while even picking up the slack in terms of battery storage power.

REFERENCES

1. <https://www.theguardian.com/environment/2017/may/26/solar-power-breaks-uk-records-thanks-sunny-weather>
2. <https://www.texasmonthly.com/energy/texas-uses-energy-state/>
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