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ENG 2140

Prospectus For White Paper and Annotated Bibliography

Introduction

Overview

My goal for this whitepaper assignment is to investigate a possible solution for making the United States electric grid more reliable and capable for renewable power generation. Currently, our electric grid is vulnerable to natural disasters and unable to fully utilize our renewable energy resources. These insufficiencies in the electric grid have been a roadblock in the nation’s path to a cleaner future and have led to tragedies such as the 2021 Texas power crisis. As such, solutions must address both the issues of the electric grid’s vulnerability and inability to support more renewable power generation.  
  
Scope

My white paper will focus on solutions that can both improve the electric grid’s reliability and ability to support more renewable power generation. I will not be discussing any specifics on the implementation of any solutions. However, I will be discussing possible solutions and their efficacy for solving these issues.

Discussion

Statement of work

My plan is to research to learn more about solutions that can both improve capacity and reliability of the electric grid. I then plan on writing the white paper with the knowledge I have gained from the research. If necessary, I plan on researching more on anything else I have determined would be necessary and proceed to use that new knowledge to continue writing the white paper.  
  
Schedule

10th July 2022: Finish research for the white paper  
11th July 2022: Turn in an outline for the white paper

18th July 2022: Finish writing a draft for the white paper

18th July 2022: Turn in a draft for the white paper

28th July 2022: Finish revising the draft of the white paper

28th July 2022: Turn in completed white paper  
  
Difficulties

Research will likely take up a large amount of time because I have any prior knowledge about this topic. I will also be traveling out of state for the next couple weeks for a wedding and will likely be quite busy.

Works Cited

“2020 Population Distribution in the United States and Puerto Rico.” *United States Census Bureau*, 19 Oct. 2021, https://www.census.gov/library/visualizations/2021/geo/population-distribution-2020.html.

United States census to be used with map of various types of renewable electricity as an argument for adding capacity to the electric grid because of a lack of demand in one area

Dillon, John. “Transmission Grid Bottlenecks in Northeast Kingdom Stall Solar Development.” *Vermont Public*, 17 Dec. 2020, https://www.vermontpublic.org/vpr-news/2020-12-15/transmission-grid-bottlenecks-in-northeast-kingdom-stall-solar-development.

Proof that the current grid does not have enough capacity

~~“Intertie.”~~ *~~Northwest Power and Conservation Council~~*~~, https://www.nwcouncil.org/reports/columbia-river-history/intertie/.~~

~~Example to be used with population census of surplus power being generated that is transferred elsewhere~~

Brown, Matthew, et al. “Storms Batter Aging Power Grid as Climate Disasters Spread.” *AP NEWS*, Associated Press, 6 Apr. 2022, https://apnews.com/article/wildfires-storms-science-business-health-7a0fb8c998c1d56759989dda62292379.

About the fragility of the current electric grid

Lopez, Anthony, et al. “U.S. Renewable Energy Technical Potentials: A GIS-Based Analysis - NREL.” *National Renewable Energy Laboratory*, July 2012, https://www.nrel.gov/docs/fy12osti/51946.pdf.

Maps showing the potential of various types of renewable electricity generation across the US

Seltzer, Molly, and Andlinger Center for Energy and the Environment. “Big but Affordable Effort Needed for America to Reach Net-Zero Emissions by 2050, Princeton Study Shows.” *Princeton University*, The Trustees of Princeton University, 15 Dec. 2020, https://www.princeton.edu/news/2020/12/15/big-affordable-effort-needed-america-reach-net-zero-emissions-2050-princeton-study.

About costs for the scale of changing the electrical grid that would be necessary

“Solar Industry Research Data.” *Solar Energy Industries Association*, https://www.seia.org/solar-industry-research-data.

To show increase in residential and commercial solar as an argument for more microgrids

Wood, Elisa. “Microgrids Help Texas as It's Forced to Undertake Rolling Blackouts.” *Microgrid Knowledge*, 28 Aug. 2021, https://microgridknowledge.com/microgrids-texas-blackouts/.

About microgrids working during 2021 Texas power crisis

Lindstrom, Anodyne, and Sara Hoff. “U.S. Electricity Customers Experienced Eight Hours of Power Interruptions in 2020.” *Homepage - U.S. Energy Information Administration (EIA)*, 10 Nov. 2021, https://www.eia.gov/todayinenergy/detail.php?id=50316.

McWilliams, Gary. “Texas Grid Operator Warns of Potential Rolling Blackouts on Monday.” *Reuters*, Thomson Reuters, 11 July 2022, https://www.reuters.com/world/us/texas-grid-operator-warns-potential-rolling-blackouts-monday-2022-07-11/.

Smith, Adam B. “2021 U.S. Billion-Dollar Weather and Climate Disasters in Historical Context.” *2021 U.S. Billion-Dollar Weather and Climate Disasters in Historical Context | NOAA Climate.gov*, 24 Jan. 2022, https://www.climate.gov/news-features/blogs/beyond-data/2021-us-billion-dollar-weather-and-climate-disasters-historical.

“Pacific Intertie: The California Connection on the Electron Superhighway.” *Pacific Intertie: The California Connection on the Electron Superhighway*, 1 May 2001, https://www.nwcouncil.org/reports/pacific-intertie-california-connection-electron-superhighway/.

“2020 Population Distribution in the United States and Puerto Rico.” *United States Census Bureau*, 19 Oct. 2021, https://www.census.gov/library/visualizations/2021/geo/population-distribution-2020.html.

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