ELECTRICAL ENGINEERING WITH DR ANAMIKA DUBEY

TALKING POINTS

KNOWLEDGE

1. Give three examples of HILP events that may impact the electric grid.
2. How have extreme weather-related power outages impacted the USA?

COMPREHENSION

3. Why is it important that power distribution systems are resilient to extreme weather events?

APPLICATION

4. An electrical engineer is planning upgrades to an existing power distribution system in a city. What questions would you ask them to ensure the new grid will be resilient?
5. In what ways could an extreme weather event cause disruption to power supply?

ANALYSIS

6. How have Anamika's childhood experiences influenced her career path and motivated her work?

SYNTHESIS

7. How do you think global supply of, and demand for, electricity will change in the future? What impacts will these changes have on the resilience of power networks?
8. How would you assess the role that increasing demand for power has on the resilience of power grids?

EVALUATION

9. Do you believe that current methods will be enough to 'future-proof' power distribution systems from the impacts of extreme weather, or is further development needed? Explain your answer.

CREATIVITY

10. Imagine that your entire country lost electrical power for 24 hours. How would this impact you personally in your daily life? What would the effects be on your country?

ACTIVITIES YOU CAN DO AT HOME OR IN THE CLASSROOM

1. Research recent HILP events (e.g., extreme weather events, wildfires) that have occurred in your country and elsewhere around the world. How did these events impact local power distribution systems? Compare the impacts of different types of HILP events. Which type of HILP event has the largest impact on power networks? What other factors may also be influencing the resilience of the power grid in these situations? For example, does the level of regional economic development correspond with the level of disruption caused by the HILP event?

2. In a group, list 15 uses of electricity in society (e.g., lighting your house, supplying hospital operating theatres, powering factories, providing internet access). If power supply was disrupted by an extreme weather event, which of these uses of power should be prioritised for directing electricity to? Individually, rank your 15 uses of electricity in order of importance for receiving power. Then, compare your ranking with the rest of your group. Did you agree on the most and least important uses of electricity? Can you come up with a quantitative way of scoring these uses of electricity to establish their importance?

MORE RESOURCES

- Read more about Anamika's research: **eecs.wsu.edu/~adubey/research.html**
- See, in real time, how much electricity is being used across the USA: **www.eia.gov/electricity/gridmonitor/dashboard/electric_overview/US48/US48**
- The US Energy Information Administration has a wealth of information, facts and figures about electricity and electricity usage: **www.eia.gov/energyexplained/electricity**
- The EIA also provides energy-related lesson plans for schools: **www.eia.gov/kids/for-teachers/lesson-plans/secondary.php**