

SOLAR 101: PURPOSE AND IMPACT



AGENDA FOR THIS LECTURE

Discuss

Discuss what solar systems are

Discuss

Discuss why we need them

Introduce

Introduce “The Big 5” – 5 major equipment categories

Discuss

Discuss a brief history of solar

Review

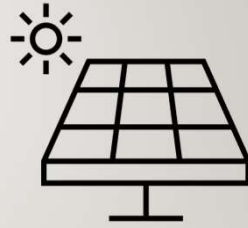
Review current statistics about climate change

Review

Review the dark side of the solar cycle

WHAT ARE SOLAR SYSTEMS AND WHY DO WE NEED THEM?

- What are solar systems?
- A Hotter Future is Certain: Impact of Climate change on quality of life
- Resiliency
- Impact Review



WHAT ARE SOLAR SYSTEMS REALLY?

- A way to capture the energy already in our atmosphere
- The major materials are going to have the same main goals regardless of size



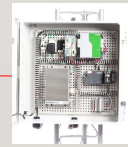
**Solar Modules
And
Solar Racking**



**Inverters (DC->AC)
& Optimizers**



**AC Equipment
(Electrical Panel)**

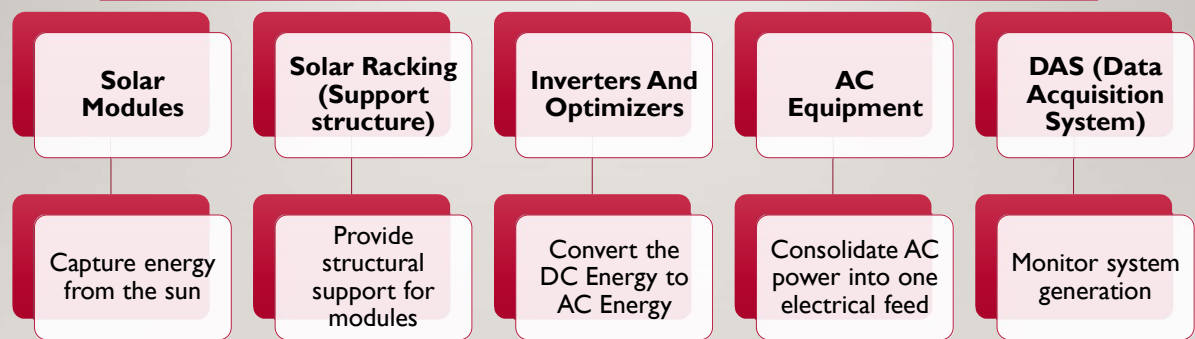


Monitoring System



End User

THE BIG 5



THE IMPACT OF CLIMATE CHANGE ON QUALITY OF LIFE

- Wildfires have decimated homes across California
- Hurricanes and water based natural disasters will be stronger with more damaging winds
- Hotter sustained temperatures can become unlivable for humans
- Less natural materials available for global markets
- Loss of natural animal habitat



1. wildfires: Entire town of Tahoe in CA had to evacuate due to widespread natural fires. Because of rapid snow melt and critical dryness at higher elevations, fires can reach elevations upto 8000 feet now.
2. Hurricanes: On average, [hurricane seasons](#) include only around 14 named storms, with seven of them being hurricanes and only three of those considered major or severe. The assumption for 2021 is that there will be at least 17 named tropical storms, and that number could include as many as eight hurricanes and four major hurricanes.
3. Temperatures: July 2021 was Earths Warmest month in record history
4. Natural materials: Timber, Climate change could **alter the frequency and intensity of forest disturbances such as insect outbreaks, invasive species, wildfires, and storms.**
5. Loss of natural animal habitat: nesting animals, sea animals, you name it

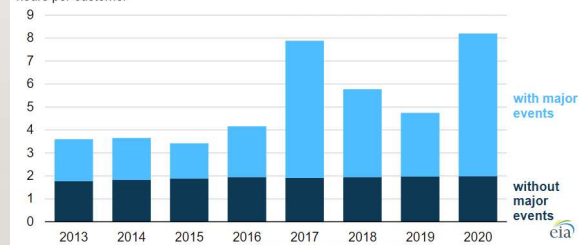
WHAT HAPPENS WHEN THE POWER GOES OUT?

- Electric infrastructures can be compromised
- Local generation becomes a priority
- Emergencies happen

NOVEMBER 10, 2021

U.S. electricity customers experienced eight hours of power interruptions in 2020

Average duration of total annual electric power interruptions, United States (2013–2020)
hours per customer



UNDERSTANDING THE IMPACT OVERALL



Power availability



Power resiliency



***Power
affordability***

HOW SOLAR HELPS RESILIENCY EFFORTS

Solar helps resiliency in every function it serves, whether it is

- as a back up power source
- as a power generating addition to the energy grid
- as an off-grid generator

Taking a step back: Looking at our energy resources

- In 2021, renewable energy sources accounted for ~12% of total US energy electricity generation
- Industrial production accounts for 33% of energy usage in the US

Source: US Energy Information Administration