


# Alternative Energy Technologies



## Objectives

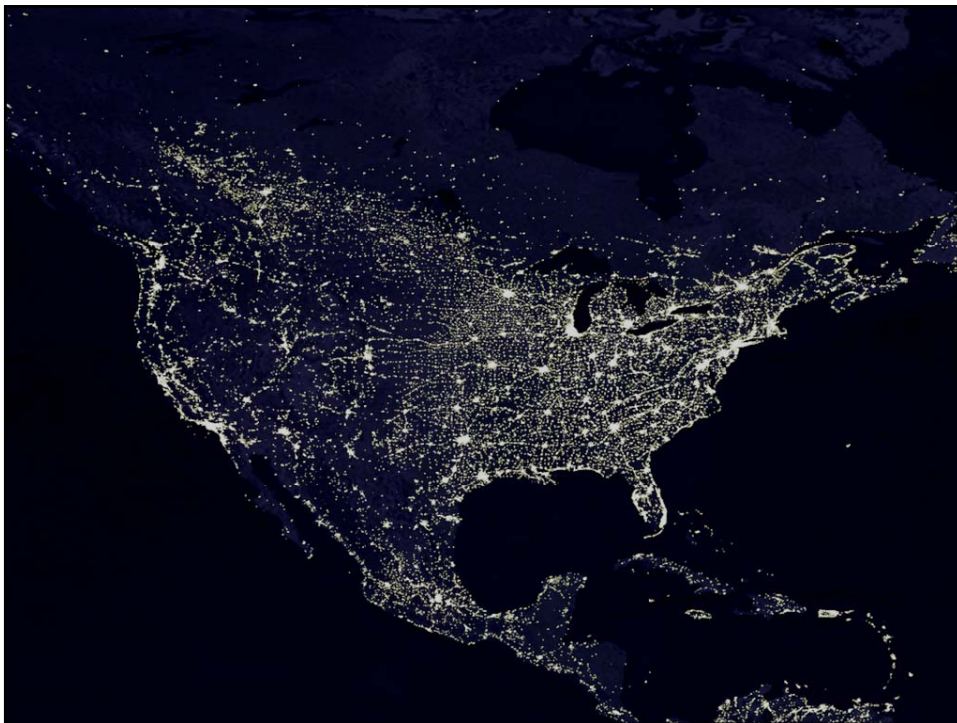



- Review activity related to alternative energy technologies
- Review energy use concerns related to Smart Grid initiatives
- Review necessary installation safety requirements related to alternative energy source installations
- Preview concepts of proposed 2014 NEC® changes

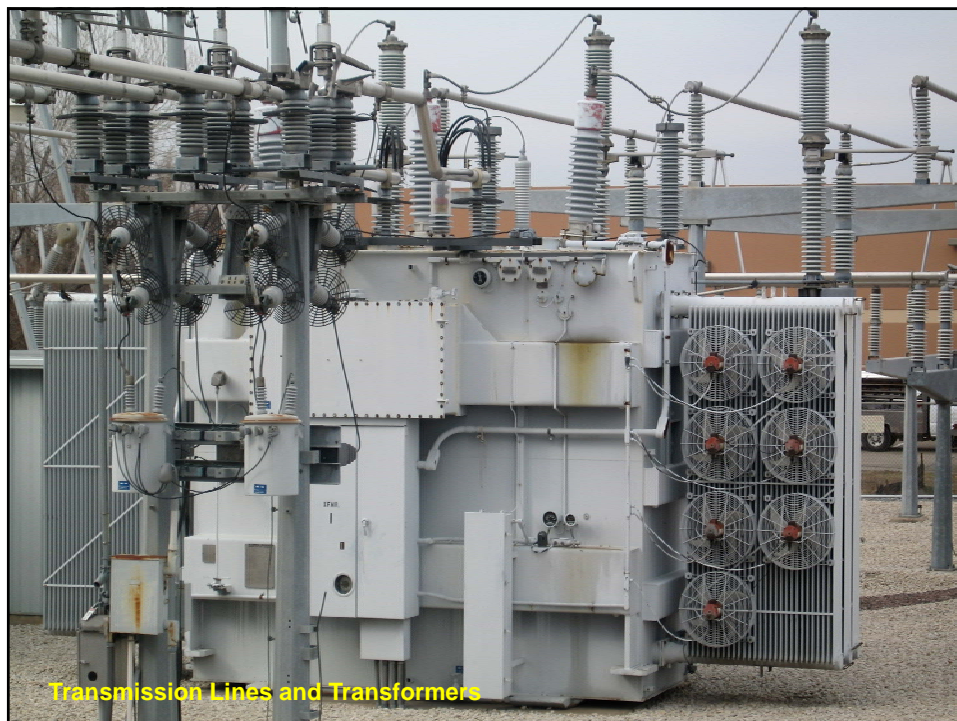
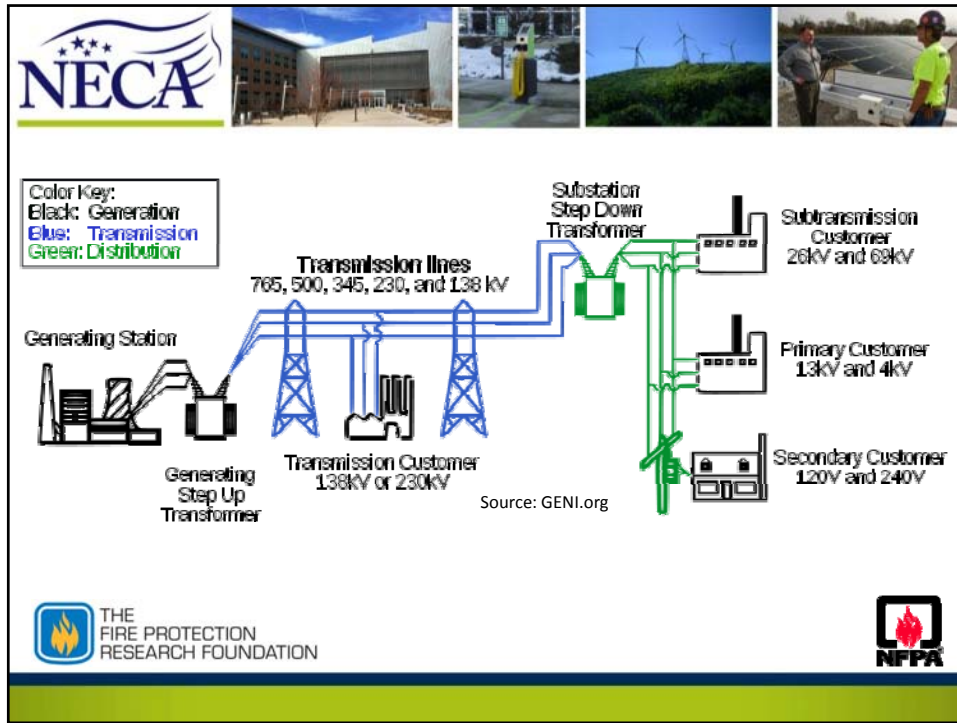




### Smart Grid Initiatives

- Smart metering and monitoring energy use
- Energy management and load control (new rules)
- Activity on the line and load side of the defined “service point”







### Energy Management Rules in the NEC®


- Coordination with performance requirements in other Energy Codes
- Installation requirements in the NEC®
- Load controlling for premises wiring systems
- Load control hierarchy and priority
- Possible additional Safety requirements in NFPA 70E®




### Photovoltaic Systems

- Installations on buildings
- Concerns from first responders
- Utility interactive systems and connectivity
- Proposed new requirements for PV source output circuits
- Article 690 in the NEC®





Source: NECA




Source: NECA © Rob Colgan



### DC Wiring Installations



- New technologies and systems
- Storage systems on both sides of the “service point”
- New requirements in the 2014 NEC®





### DC Wiring Installations

- Established 2014 NEC® DC Task Group
- Review the current DC requirements in the Code
- Make recommendations for specific code requirements to fill identified gaps
- Provide any needed updates to existing requirements.





Source: AEP



### Electric Vehicle Charging


- Additional load on the electric grid
- Wiring for charging stations in residential and commercial applications
- Load management systems



Source: NECA © Rob Colgan









### Electric Vehicle Charging

- CMP-12 Task Group addresses gaps and revisions and reorganization of Article 625
- Clarify branch circuit requirements
- Clarify cord and plug connections for Level 2 EVSE
- Load management alternatives in the NEC®



Source: NECA



Source: Eaton Corp.




Source: NECA      Source: NECA © Rob Colgan

 THE FIRE PROTECTION RESEARCH FOUNDATION 



 


**Electric Vehicle Charging**

- Vehicles as energy storage systems.
- Vehicle to grid support for the Smart Grid efforts.






Source: NECA © Rob Colgan

 THE FIRE PROTECTION RESEARCH FOUNDATION 




### Interconnected Electric Power Production Sources

- Meeting the Load Demands
- Utility interactive systems on the premises
- Utility concerns and regulations
- Using storage systems effectively
- Article 705 in the NEC®







### Renewable Energy Sources

- Solar (Photovoltaic systems)
- Wind (Wind power generation)
- Hydro-power production
- Nuclear power production
- Waste to energy conversion
- Others



Source: NECA © Rob Colgan



## Alternative Energy Technologies



Implications for the NEC®

