

# **Grand Challenges for Renewable Energy**

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AIRE – Panel Session

# Key Issues

- Cannot take a view of devices and materials only – **THIS IS A MYOPIC VIEW**
- Urgent need for systems level design – from **generation** to **end use**. e.g., PV – Role of power converters and control before dc voltage is used as a source. This is also true for fuel cells.
- Primary concern – Efficiency, energy conversion balance, scalability, and economic viability.

# Key Issues

- **Correlation with load demand – Large scale storage, cost, and efficiency.**
- **DC-AC converter is the weak link in terms of reliability, need for better topologies and control methods, and value added functionalities**
- **Distributed generation - grid interface:**
  - **What voltage level?**
  - **What cost?**
  - **Reliability?**
  - **Distribution level – Will architecture have to change?**

# Energy efficiency is an important renewable energy resource

- **Power electronics is a key technology to realize energy efficiency and conservation**
- **Motor drives, HVAC**
- **Powering information technology**
- **Power conversion for solid state lighting**
- **Capturing maximum energy from renewable resources – PV, wind**