Panel Discussion

Back to the Future

Thomas Edison or Nicola Tesla?

October 22, 2014

Consider:

Lighting

      DC motors

            Electric Vehicles

                  Appliances

                        Renewable energy

                  Batteries

            Communications

      Electronics

Power Quality, Reliability, Capital Cost, Energy
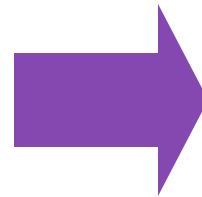
Who would win the debate now?

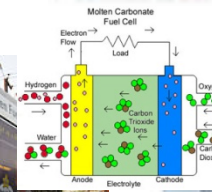**Changes since the Tesla – Edison debates:**
- End uses operate with native DC:
  - Electronics
  - Motors
  - Variable speed devices
  - Lighting
  - Communications
- Renewable generation is DC – PV, Wind, Fuel cells
- Electric powered transportation/vehicles
- Storage – batteries, capacitors
- Power quality and reliability improvement
- Energy savings
- Opportunity for world wide standards
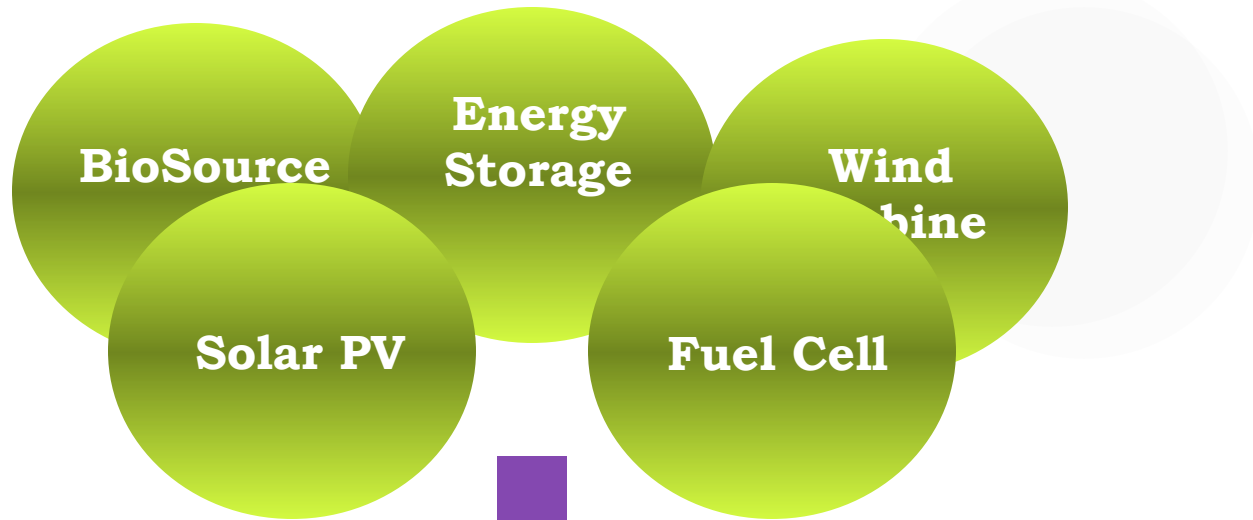
Central station generation to distributed generation

Fossil Burning Power Plant
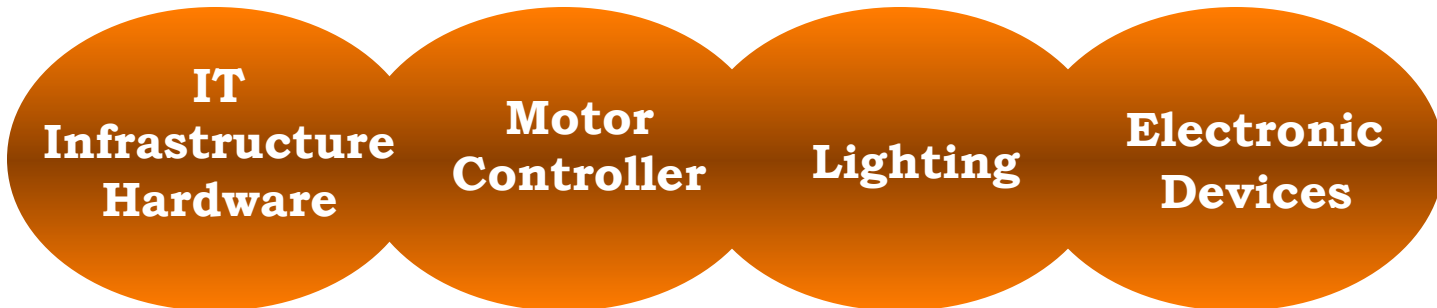

Renewable Onsite Generation

Two Trends Observed

BioSource

Energy Storage

Wind ~~bine~~

Solar PV

Fuel Cell

The Generation:
Renewable/Distributed

DC PRODUCING

DC CONSUMING

The Demand:
Everything Digital

IT Infrastructure Hardware

Motor Controller

Lighting

Electronic Devices

How is Renewable Energy Used today?

**Solar PV
Producing DC**

**Inverter Turning
DC into AC**

**AC is Converted
Back to DC at the
Server Equipment Level**

**Energy Is Lost
In the conversion
Steps**

Converting AC to DC, and

Integrating alternative DC

Sources with the mainstream

AC supply, are inefficient and

Expensive activities to capital

Cost and lock us all into archaic

And uncompetitive utility

Pricing structure

DC Equipment Exists

Organizations Active in DC Power

- Emerge Alliance
- Electric Power Research Institute
- NTT – Japanese telecom
- Lawrence Berkeley National Laboratory
- Pacific Northwest National Laboratory
- European Telecommunications Standards Institute (ETSI)
- Institute of Electrical Engineers of Japan (IEEJ)
- Korea Electrotechnology Research Institute (KERI)
- International Electrotechnical Commission (IEC)
- National Electrical Manufacturers Association (NEMA)
- China Communications and Standards Association (CCSA)
- Japan's New Energy and Industrial Technology Organization (NEDO)

EMerge® ALLIANCE

DC-The Power to Change Buildings

What is the EMerge Alliance?

- Not-for-profit 501c -Part 6
- Open application standards - DC platform
- Eco-system development and promotion
- 100+ Member organizations and growing!

Who is the EMerge Alliance?

- Architects, Engineers
- Contractors/Builders/ Integrators
- Manufacturers - Service Providers
- Building Owners – Facility Managers
- National & Independent Labs
- Academic Institutions
- Codes & Standards Groups

What is an EMerge Standard?

- Commercial Applications Standards
- Subordinate to safety, equipment standards
- Physical, electrical, operational interfaces
- Application definition - listing requirements of other standards (incl. IEC)

Members as of 9/15/2011