

## WWS Generation

### WWS electricity generation

- Onshore/offshore wind
- Distributed/utility PV
- CSP
- Geothermal electricity
- Hydroelectricity
- Tidal & wave electricity

### WWS heat generation

- Solar heat
- Geothermal heat

## WWS Grid

### Transmission/distribution

- AC/HVAC/HVDC lines
- Distribution lines
- Grid management
  - Software
  - Demand response

### Grid interconnection

- Among WWS generators
- Among regions/countries

## WWS Storage

### Electricity storage

- Batteries
- CSP storage
- Pumped hydro storage
- Hydropower reservoirs
- Flywheels
- Compressed air
- Gravitational storage
- Grid hydrogen storage

### District heat storage

- Water tanks
- Soil (boreholes)
- Water pits
- Aquifers

### District cold storage

- Water tanks
- Ice
- Aquifers

### Building heat storage

- Water tanks
- Thermal mass

### Industrial heat storage

- Firebricks

### Non-grid H<sub>2</sub> storage

- Hydrogen storage tanks

## WWS Equipment

### Building & district air/water heating

- Electric heat pumps

### Building and district cooling

- Electric heat pumps

### Industrial heat

- Arc/induction furnaces; electric crackers
- Resistance furnaces, kilns, boilers
- Electron beam/dielectric heaters
- Electric heat pumps; solar heat

### Hydrogen generation/compression

- Electrolyzers; compressors

### Transportation vehicles

- Battery-electric
- Hydrogen-fuel-cell-electric

### Some appliances/machines

- Electric induction cooktops
- Electric leaf blower/lawn mowers
- Heat pump washers/dryers/dishwashers

### Green H<sub>2</sub> industrial processes

- Ammonia manufacturing
- Steel manufacturing

### Efficiency/reduced energy use

- Insulate/weatherize buildings
- LED lights; efficient appliances
- Telecommute; use public transit