



# Solar Pie

## Solar Basics Webinar



There is more energy from the sun that hits the earth's surface in one 12 hour day than all the oil that has ever been consumed on planet earth



# Renewable Energy Sources

## Solar

$1.2 \times 10^5$  TW at Earth surface  
600 TW practical

Tide/Ocean  
Currents  
2 TW gross

Wind  
2-4 TW extractable

## Hydroelectric

4.6 TW gross  
1.6 TW technically feasible  
0.9 TW economically feasible  
0.6 TW installed capacity



energy gap  
~ 14 TW by 2050  
~ 33 TW by 2100

## Geothermal

12 TW gross over land  
small fraction recoverable

## Biomass

5-7 TW gross  
all cultivatable  
land not used  
for food



# Solar Technologies



## Solar Technologies

- Solar Thermal-Captures the heat from the sun to heat water directly
- Concentrated Solar Thermal-Captures the heat from the sun to make steam which drives equipment to make electricity
- Photovoltaic-Uses semi conductor cells to turn light into electricity



## Solar Technology Efficiencies

- 75% Solar Thermal
- 75% Concentrated Solar
- 22% Photovoltaic



## Solar Thermal



Flat Panel



Evacuated Tube





# Solar Thermal Concentrator







# Solar Concentrator





# Photovoltaic Collectors



**Solar Crystalline panels**



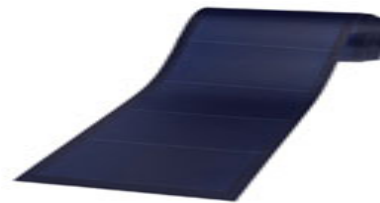
**Solar Shingles**



**Solar Roof Modules**



**Solar Awnings**



**Solar Laminates**

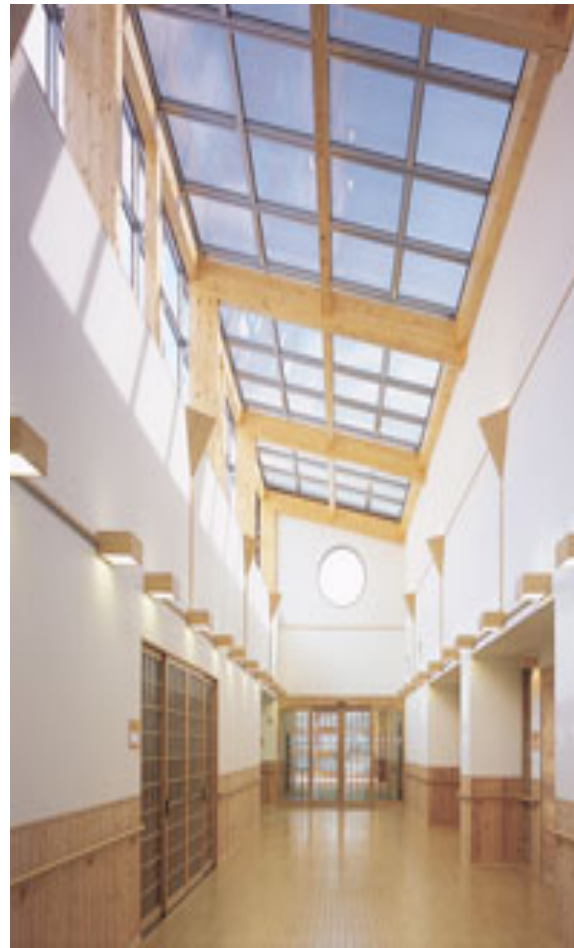


**Solar Tiles**





# Photovoltaic collectors







# Photovoltaic Collectors





## Mounting Panels

- Penetrating Roof mount
- Non penetrating Roof Mount
- Peel and Stick
- Ground Mounting System





## Charge Controllers / Inverters

- Off Grid Battery
- Grid Tied





## Solar Incentives

- Residential
  - 30% Tax credit
  - Production .15 kWh
  - Green Tags .01 kWh
- Washington Package
  - Production
  - Panel .36 kWh
  - Inverter .18 kWh
  - Total .54 kWh
- Commercial
  - 30% Tax Credit
  - Accelerated Depreciation
  - 50% Deprec. of 85% Yr.1
  - 5 Yr, MACRS on remainder
  - Production .15 kWh
  - Net Meter .045 kWh
- Washington Package
  - Production
  - Panel .36 kWh
  - Inverter .18 kWh
  - Total .54 kWh





## Incentives in Action

- \$70,000 System
  - -\$21,000 ITC
  - -\$11,000 Deprec.
  - -\$ 1,100 Production
  - -\$ 330 Net Meter
  - \$ 36,570 1<sup>st</sup> Year
- \$70,000 System
  - -\$21,000 ITC
  - -\$20,825 Deprec.
  - -\$ 6,600 Production
  - -\$ 1,650 Net Meter
  - \$19,925 5 Years



Thank You