



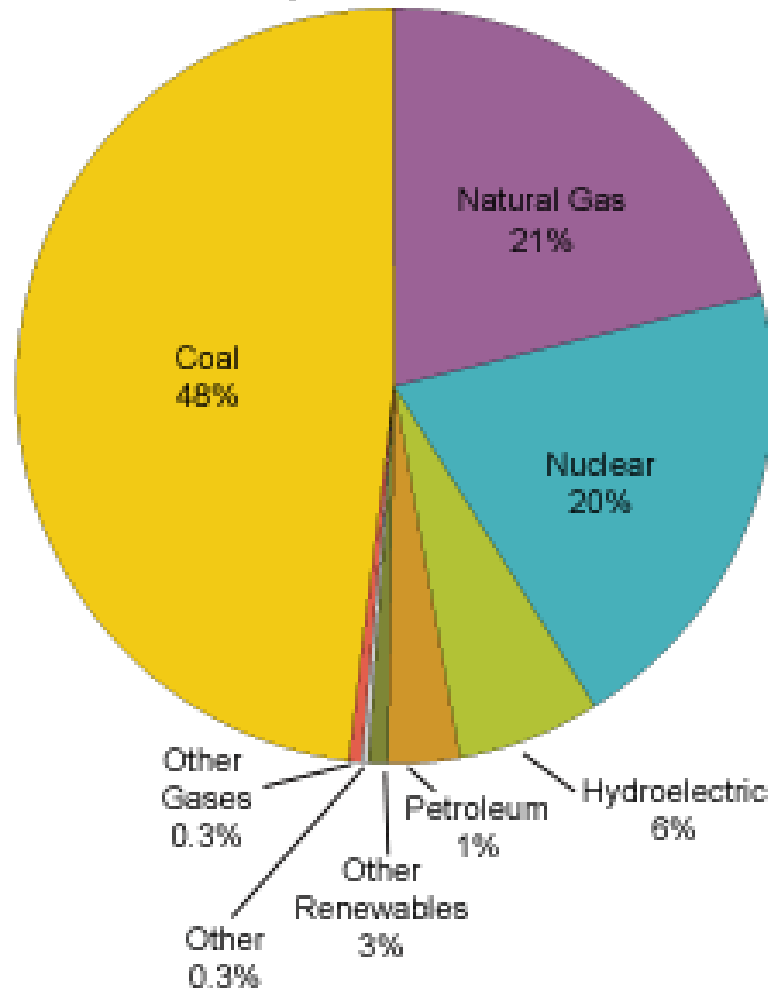
Overview of Renewable Energy Course Background

Yahia Baghzouz, Ph.D., P.E.

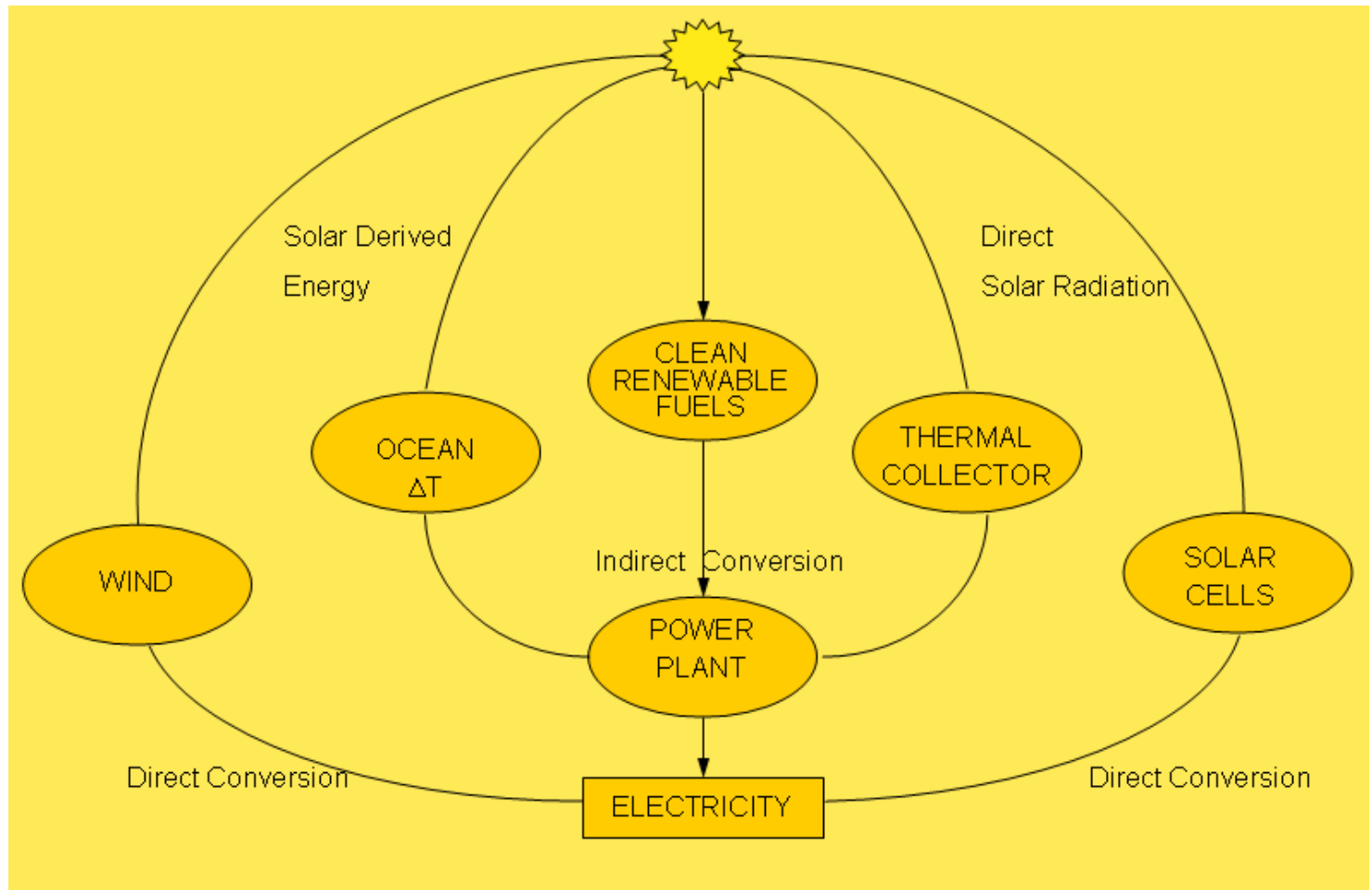
Electrical & Computer Engineering Dept.

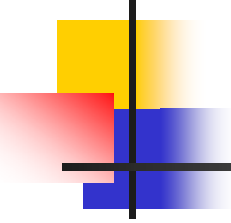


US Electric Power Industry Net Generation (2009)



Electricity from the Sun

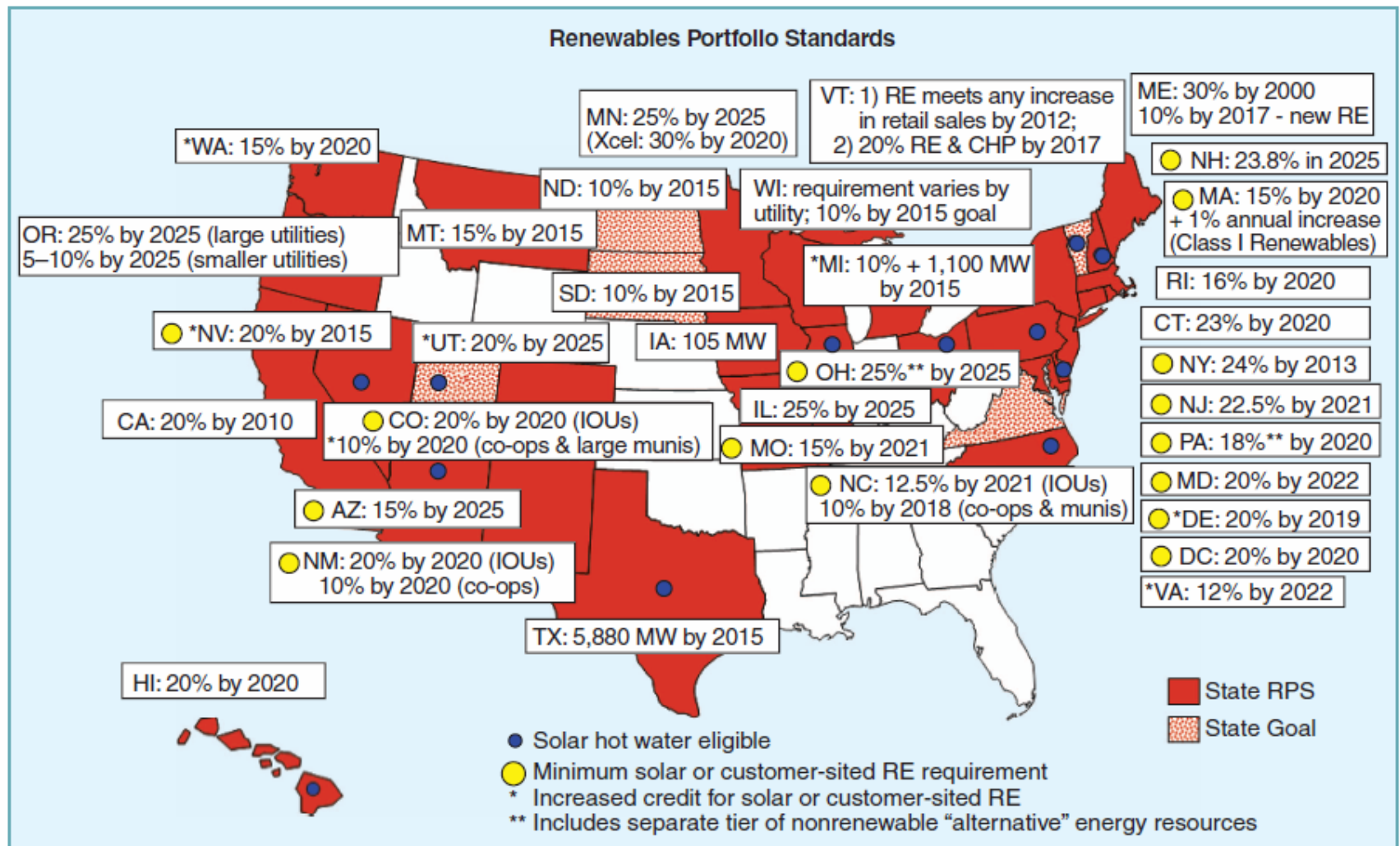




Push for more Renewable Energy (Federal Level)

- President Obama called for doubling the renewable energy production within the next few years.
- The Secretary of Energy recommended that the following amounts of the total electricity consumed by the Federal Government come from renewable energy:
 - Not less than 5% in fiscal years 2010-2012
 - Not less than 7.5% in fiscal year 2013 and thereafter

Push for more Renewable Energy Production (State level)

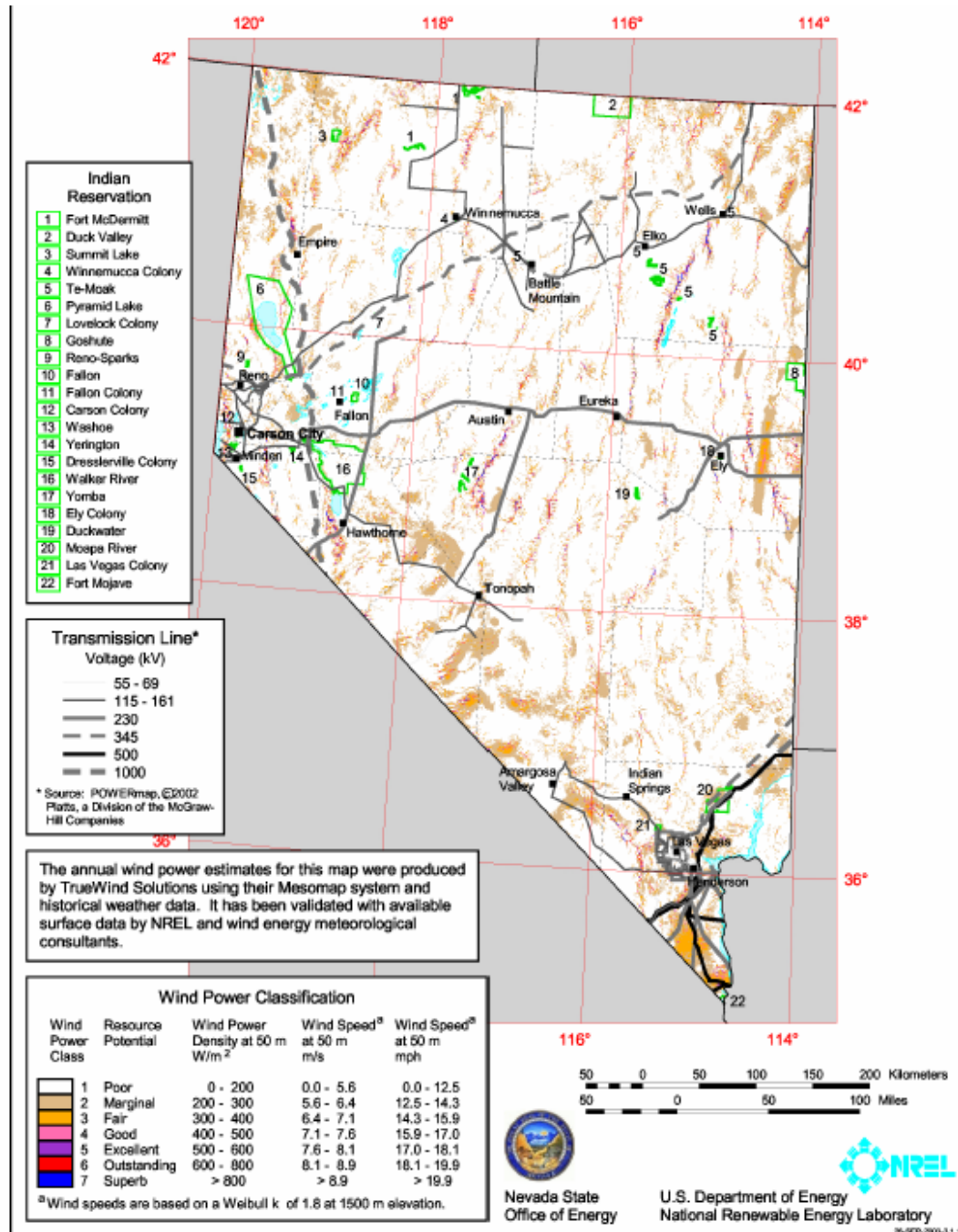


Nevada Wind Resource:

Poor

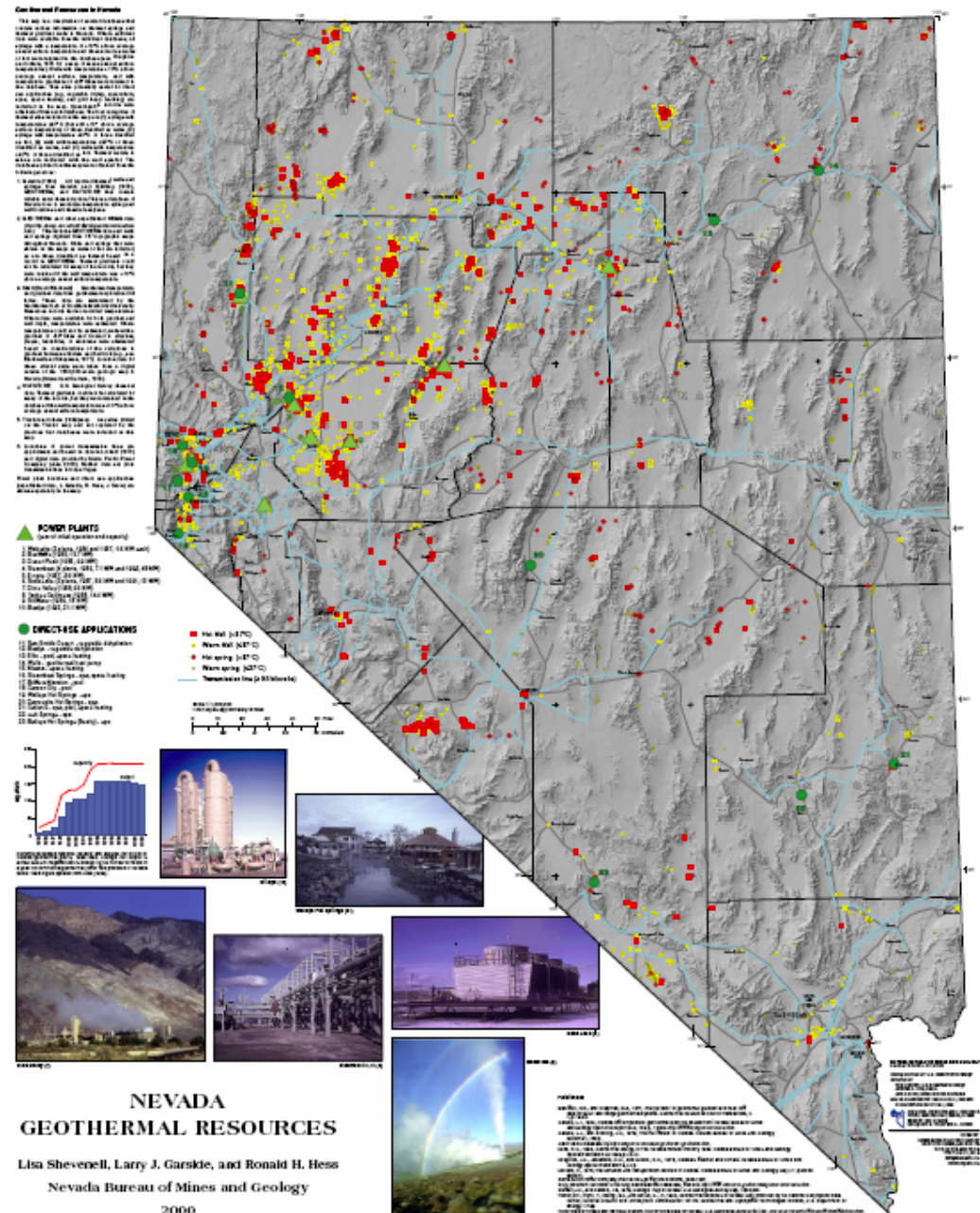
Current Installed

Capacity: *non-measurable*



Nevada Geothermal Resource: *Good in the North-West Region*

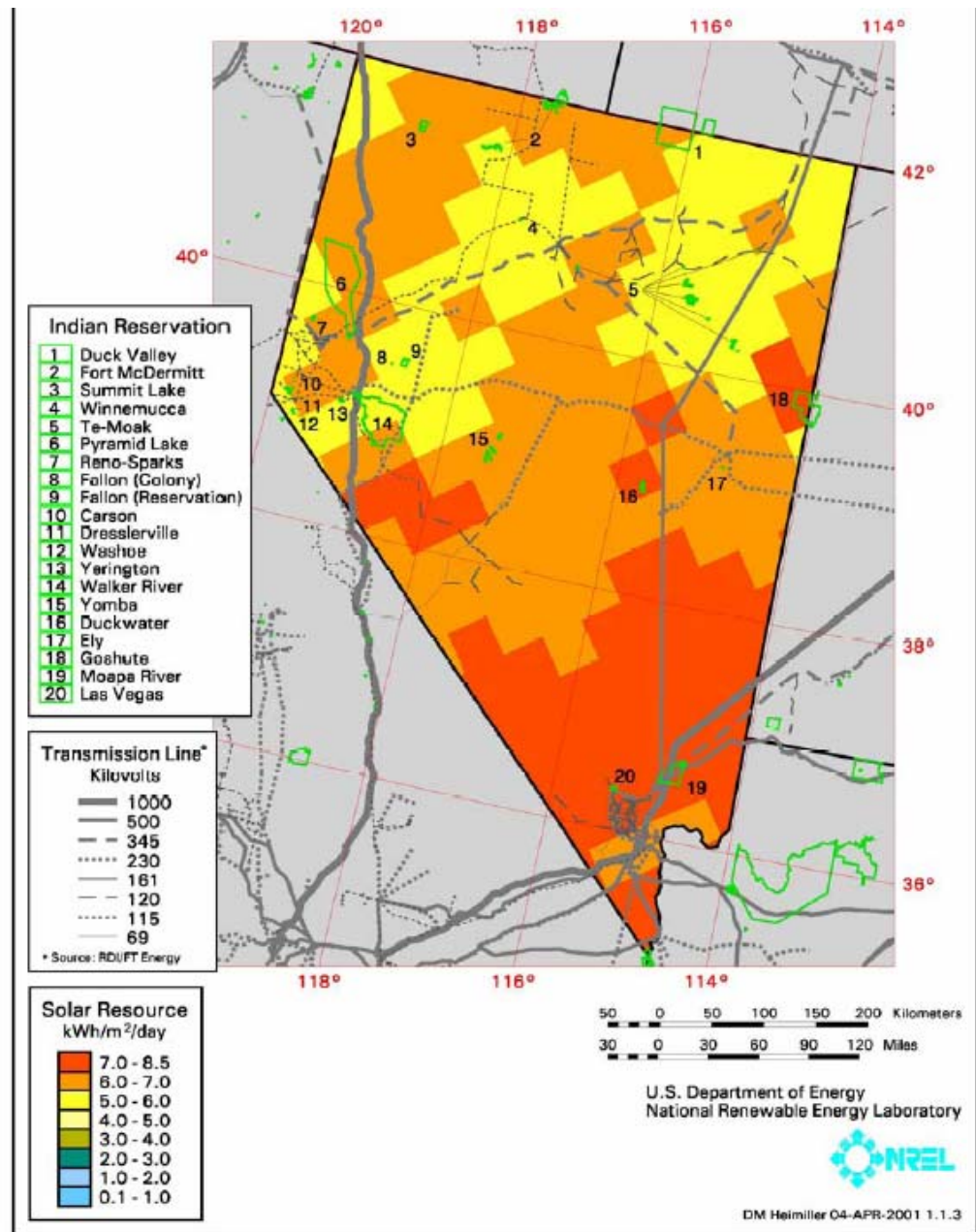
Current installed Capacity: *484 MW*



Nevada Solar Resource:

Excellent in the Southern Region

Current Installed Capacity: \approx 100 MW

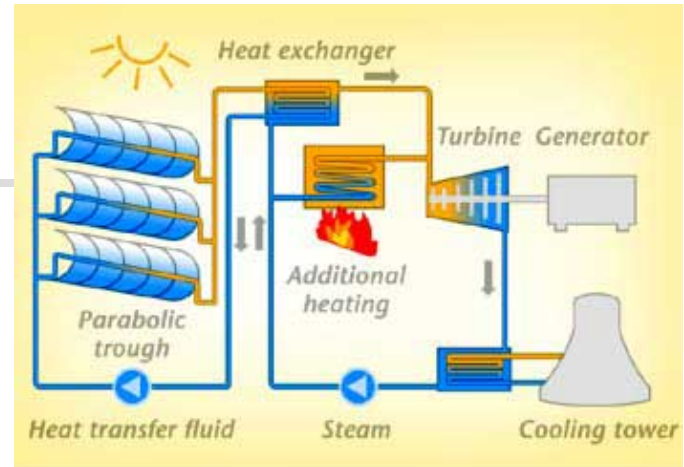


Sempra Energy 48 MW PV System Largest PV System in North America (*serves Southern California*)

775,000 thin-film photovoltaic solar panels



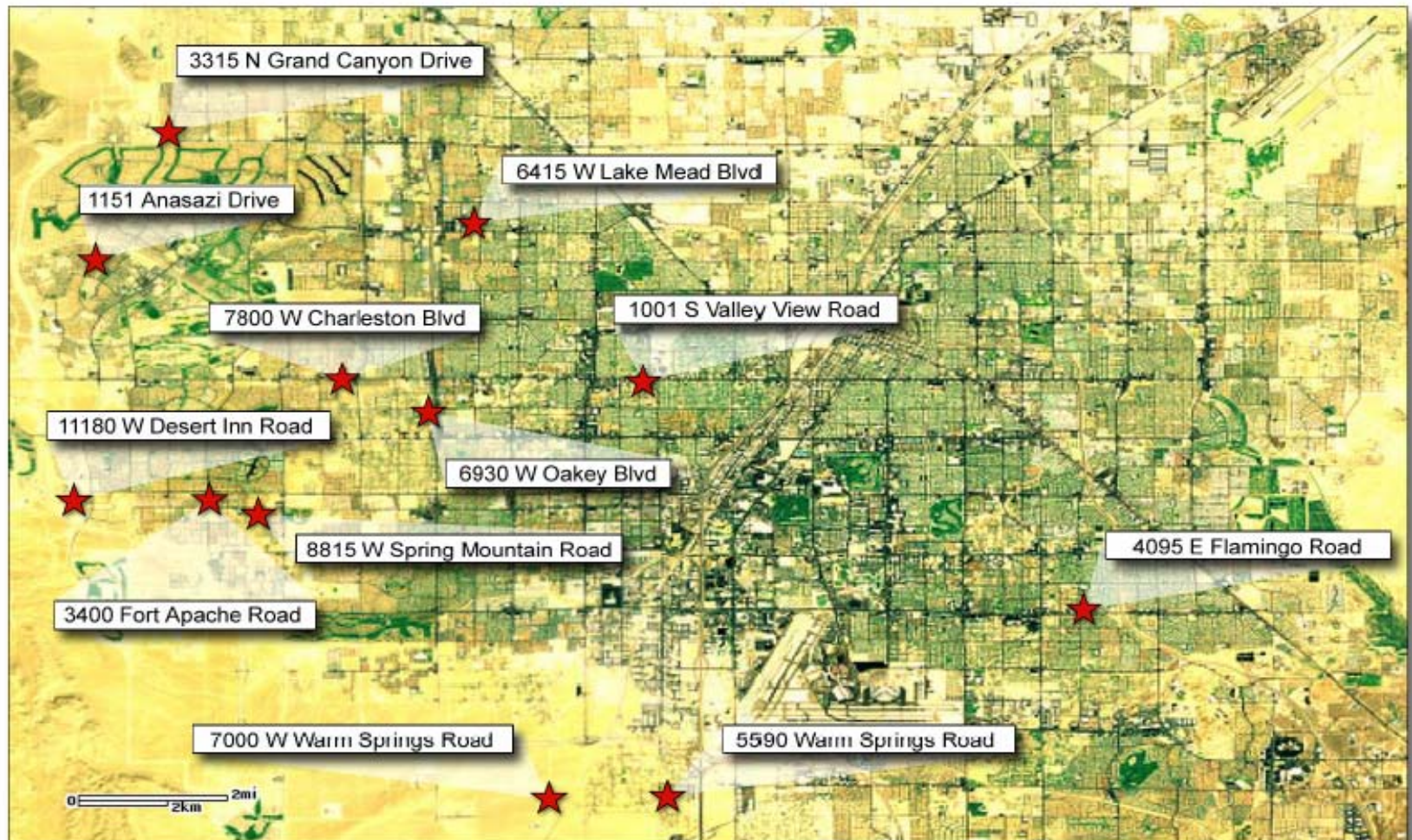
Nevada Solar I – 65 MW Solar Trough Plant



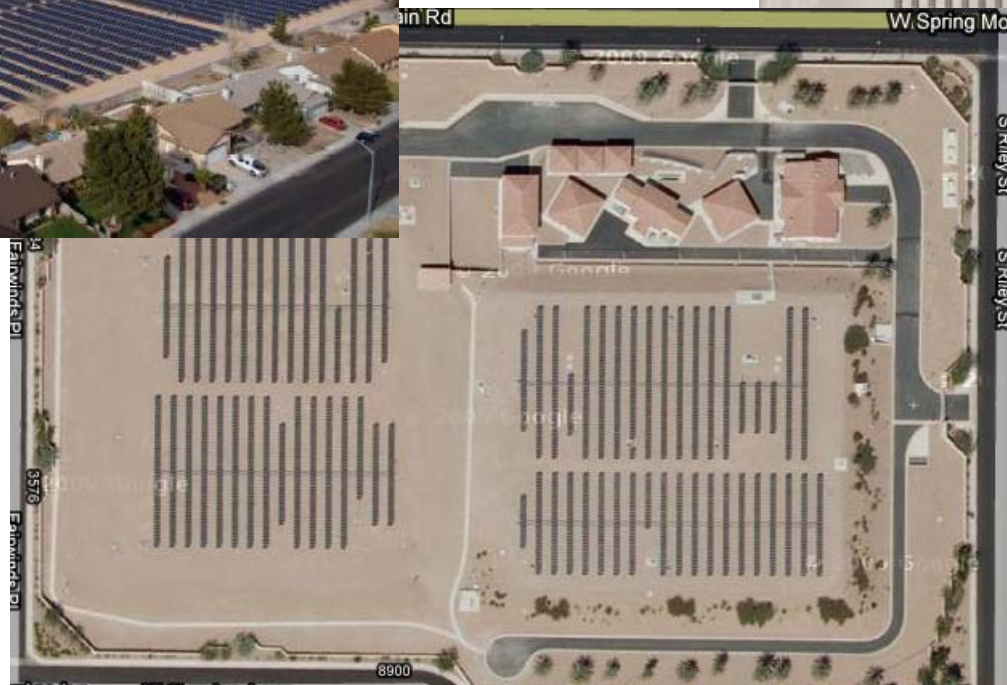
15 MW PV plant at Nevada NAFB



LVVWD 12 Distributed PV Systems (Total peak power 3.2 MW)



Sample of Ground-Mounted PV Systems on Covered Water Reservoir.



Numerous Commercial Grid-Connected PV Systems



Numerous Residential (Roof-Mounted) PV Systems



Customer Incentives

SolarGenerations Incentive Steps

Program Category	Residential and Small Business		Schools		Public and Other Property		Total Capacity
Step Program Year	kW Capacity	Rebate Per Watt	kW Capacity	Rebate Per Watt	kW Capacity	Rebate Per Watt	kW
Step 1 2010/11	1090*	\$2.30	2180*	\$5.00	828*	\$5.00	4098*
Step 2 2011/12	1188	\$2.10	2376	\$4.90	903	\$4.90	4467
Step 3 2012/13	1295	\$1.90	2590	\$4.80	984	\$4.80	4869

- **Where does the money for the incentives come from?**
Renewable Generations is a public benefit program funded by ratepayers of NV Energy. All NV Energy customers should see a small charge on their monthly bill.
- **Does NV Energy pay for excess energy they produce?** By State law, NV Energy gives a kWh credit for each kWh of excess energy produced (no cash). The kWh credits carry over from one year to the next.



Upcoming Solar Projects

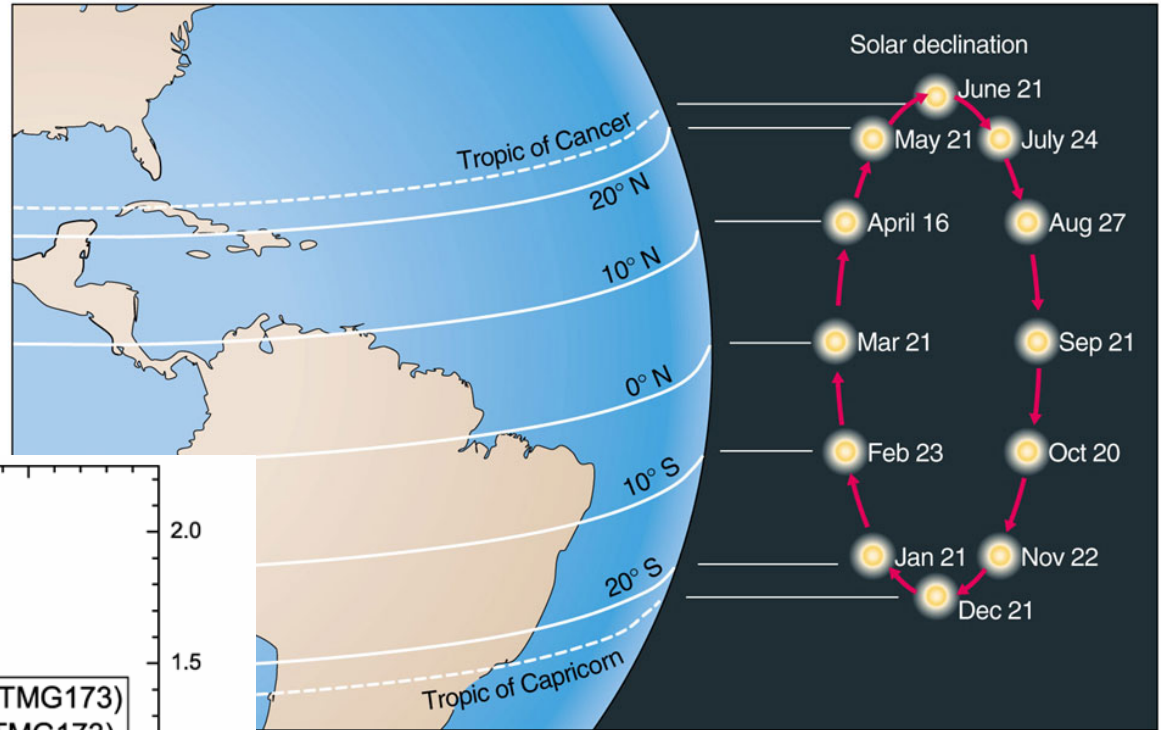
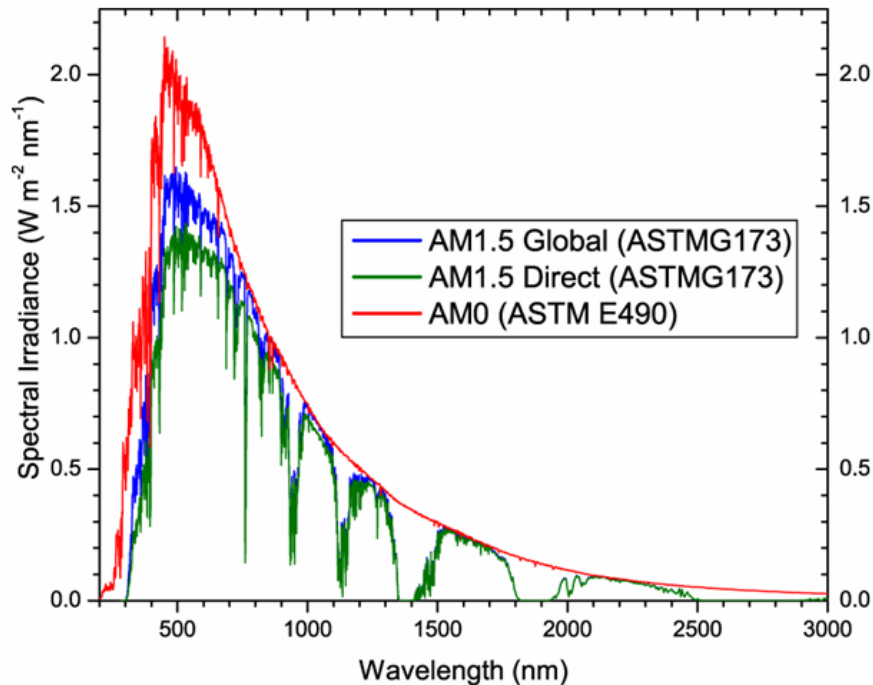
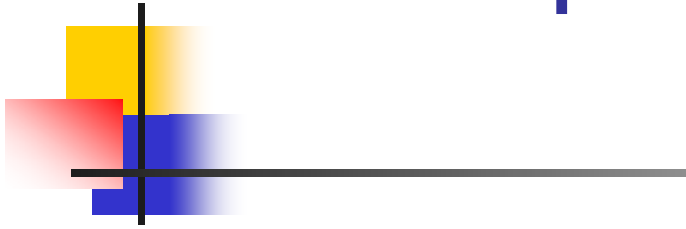
- Visit NVEnergy.com for future solar projects in Nevada



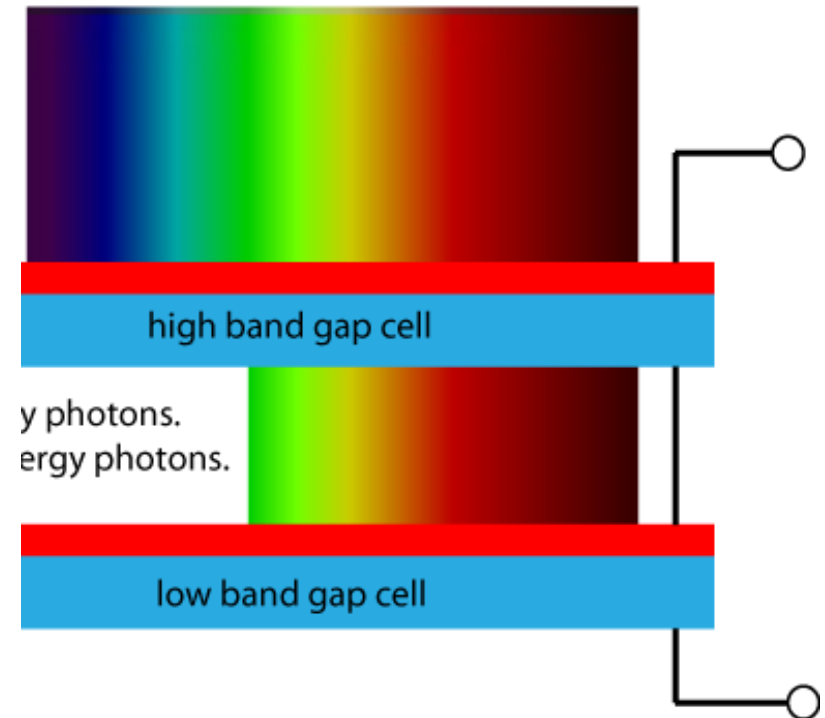
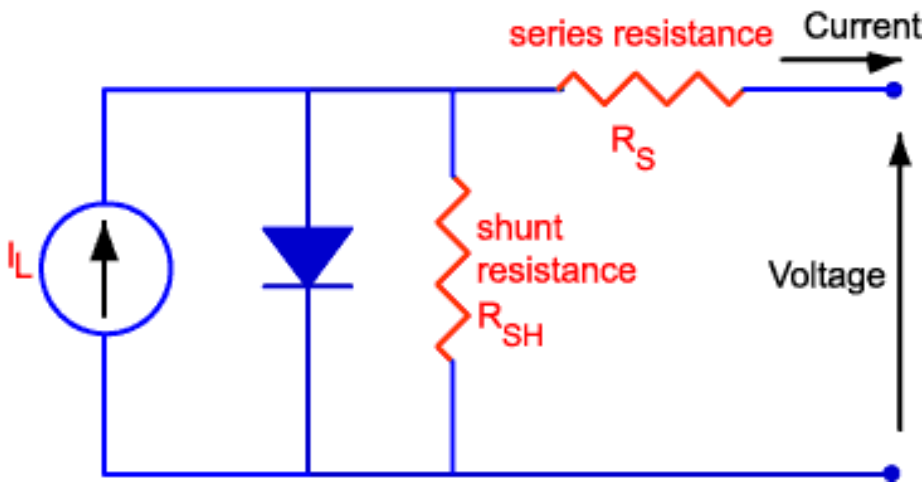
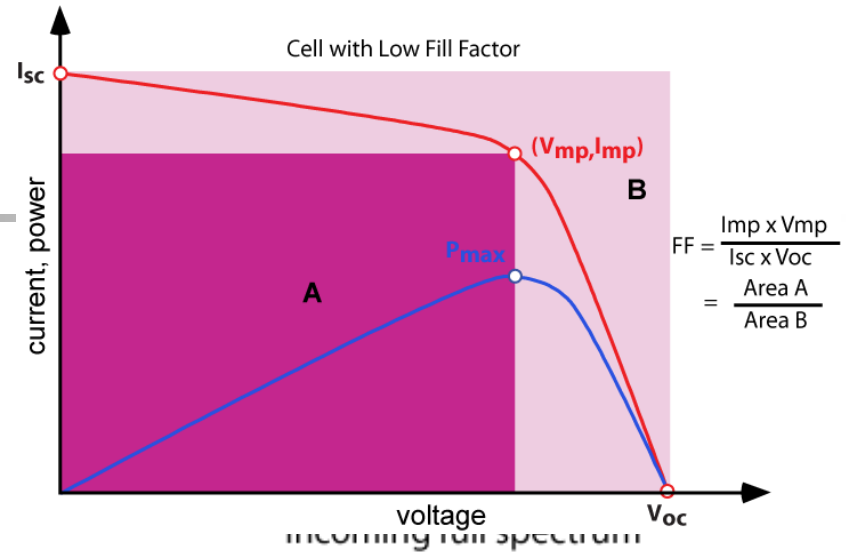
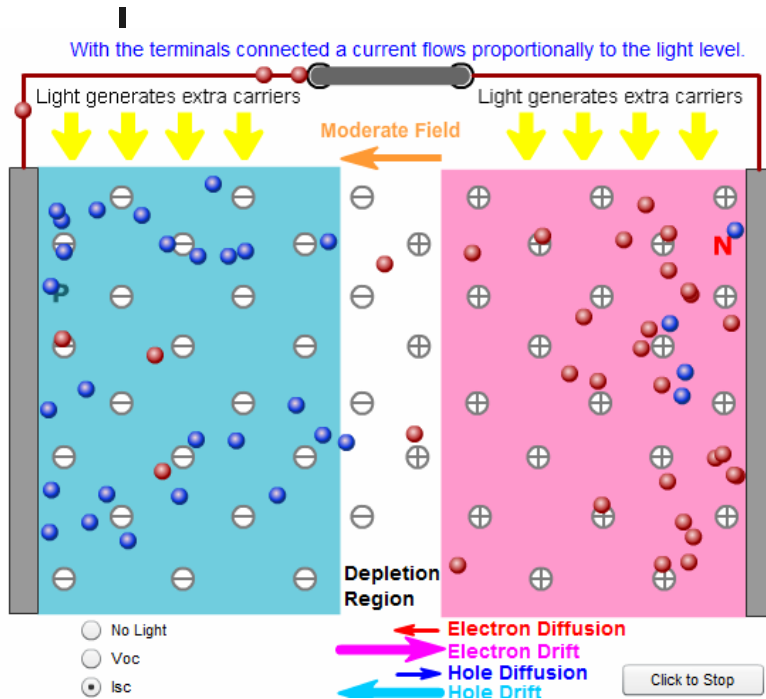
Stand-Alone and Mobile PV System



Solar Spectrum and Sun Motion



Physics and Types of Solar Cells





Other topics to be covered

- Mechanical Consideration
- Environmental Consideration
- Economic Considerations