

Optimizing Rooftop Space with SolOpt



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NREL
February 23, 2011



Funded By:
 **SOLAR AMERICA
COMMUNITIES**

**What type of solar system
should be installed on a
facility rooftop?**

Solar Power System Objectives

Best utilization of space for:

- Highest net present value
- Maximize energy savings
- Reduce your carbon footprint
- Lowest possible payback
- Lowest levelized cost of energy



SolOpt – Solar Optimization Tool

Photovoltaic (PV)



Takes building information, electrical usage, electrical rates, weather data files, and runs hourly production and financial calculation

Solar Hot Water (SHW)



Takes building information, domestic hot water system, fuel costs, weather data files and runs hourly production and financial calculation

Finds the best mix of the two technologies

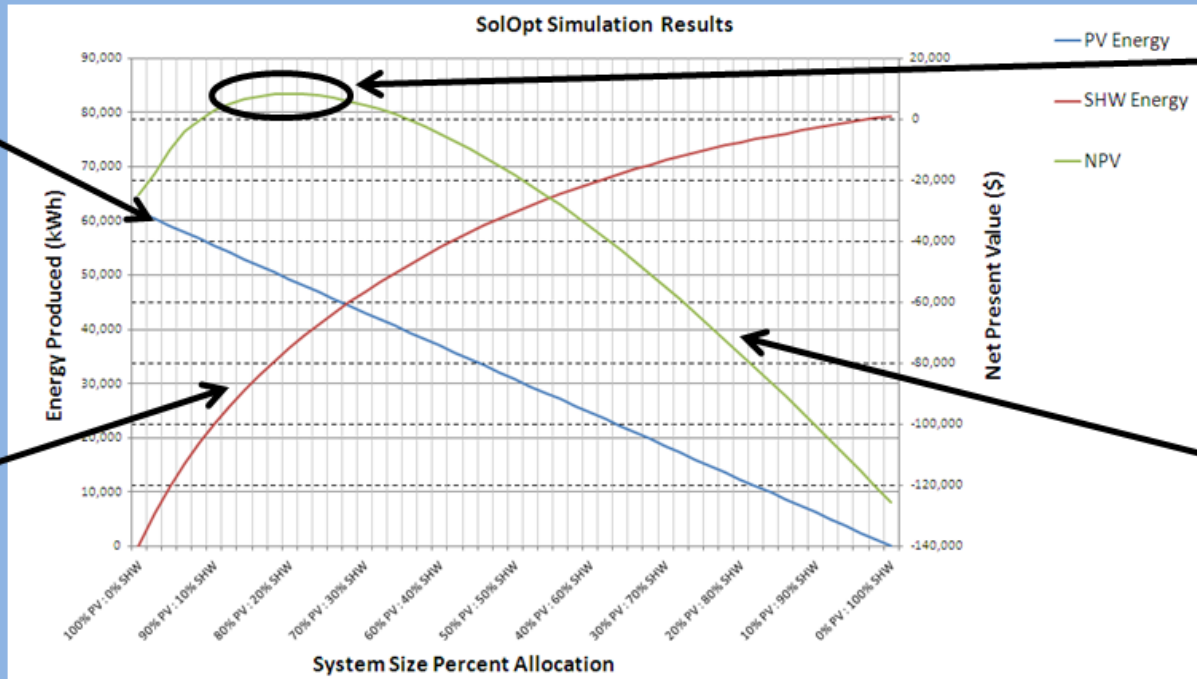
100% PV



100% SHW

Area allocation for each technology

Interpreting the Results



PV Energy
Production Plot
(units left axis)

SHW Energy
Production Plot
(units left axis)

Peak Indicates
Optimal Region

Optimization
Criteria Plot
(units right axis)

← All PV All SHW →

Applications

- Homeowner can determine the most efficient way to reach net zero
- Sustainability/city manager can identify high potential buildings for solar technology
- Building manager can determine if solar power is cost effective, and at what utility costs it becomes cost effective
- City planner can calculate the total solar power potential for a neighborhood
- State policy maker can set incentive levels based on what it takes to make solar cost effective
- Budget planner can determine how much money should be budgeted for solar projects in the next 5 years to offset utility costs
- Someone implementing a system can doublecheck the calculations included with the bid documents

Tool Demonstration

Demonstration Task 1

Model a building with the following characteristics:

- Location: Phoenix, Az.
- Rooftop Area: 10,000 ft²
- Building size: 12,000 ft²
- Tax Status: Commercial (tax-paying)
- Building Use: Health Care
- Current hot water system: Electric standard tank
- Electricity Rate: \$0.09
- Annual Consumption: 850,000 kWh
- Run the simulation for PV and SHW to fill entire roof

- Copy results for Maximize Net Present Value to the Output Table using the “Copy Results...” button

Demonstration Task 2

Using the same model as task 1, open the advanced inputs and change the following fields:

General System Characteristics:

- Add a 20 degree tilt

- Re-run the simulation for PV and SHW to fill entire roof
- Copy results for NPV to Output Table

Demonstration Task 3

Using the same model as task 1 and task 2, open the “Incentives” tab and change the following fields:

SHW Commercial Production Credit:

- Add a production incentive for Arizona of 5 cents/kWh for 20 years.

- Re-run the simulation for PV and SHW to fill entire roof
- Copy results for NPV to Output Table

Questions?

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