

SOLAR THERMAL IT'S **HOT** AGAIN!



Phoenix, AZ



Presented by:



GovEnergy
www.govenergy.gov



For More Information

- Would you like to know more about this session?
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- Southern California Gas Company
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Don't forget to fill out and drop off your session evaluations!



Thermal Solar – 14 Area

MCBCP 14 Area Pool Solar



- 9840-sqft pool / 6400-sqft thermal solar system
- Items of note:
 - 39,000-therm annual savings
 - New support structure doubles as pool-side patio cover
 - Pool deck expanded under solar panels
 - Individual Engineering and Construction Contracts
 - Includes 15-kW PV System



14 Area Pool Solar



Low Profile



Steel support rack created pool cover & expanded pool deck





Thermal Solar – 53 Area



- 9840-sqft pool / 7040-sqft thermal solar system
- Items of note:
 - 36,400-therm annual measured savings
 - New ground-mount racks adjacent to pool
 - Individual Engineering and Construction Contracts
 - Includes 15-kW PV System



Thermal Solar – 41 Area

MCBCP 41 Area Pool Solar



- 5100-sqft pool / 4000-sqft thermal solar system
- Items of note:
 - 20,680-therm annual savings
 - Refurbished existing support structure and maximized collector surface area in tight space
 - Singular Design-Build Contract



Thermal Solar – 62 Area



- 9840-sqft pool / 6160-sqft thermal solar system
- Items of Note:
 - 31,640-therm annual measured savings
 - New ground-mount low-profile rack adjacent to pool maximized collector surface area in tight space
 - Individual Engineering and Construction Contracts
 - Includes 15-kW PV System



Thermal Solar – 13 Area



MCBCP 13 Area Pool Solar

- 5000-sqft pool / 4000-sqft thermal solar system
- Items of Note:
 - 20,540-therm annual savings
 - Panels on building roof and new ground-mount support structure
 - Singular Design-Build Contract



Thermal Solar Tips

- Energy Saving Rule of Thumb
- Performance Expectation for Pools
- Pool Covers
- Solar Angle
- Panel Piping Design
- Good Independent Data Source



Thermal Solar Savings

- Rule of Thumb:

$\frac{1}{2}$ Therm / sqft / month



User-Performance Expectation

- A properly-sized solar pool system can heat a pool 4° to 6° per day
- If pool loses **less** than the daily solar heat gain, solar can maintain temperature
- If pool loses **more** than the daily solar heat gain, solar can assist, but cannot maintain temperature

In other words: Time to turn on the backup heater!



Pool Covers...

- Pool covers are much more cost-effective than pool solar systems
 - Install a pool cover to keep your heat gain and extend your swim season
 - And, make it easy to use:
Install motors on your pool cover reels!



Solar Purist vs. Realist

- Consider oversizing your system, instead of optimizing the solar angle
- The Purist recommends mounting your panels at the angle of latitude (In San Diego: 34°)
- The Realist compares the cost of optimum angle racks to low angle racks. Adding panels at the lower angle could be a more cost-effective and aesthetic solution



Solar Purist vs. Realist

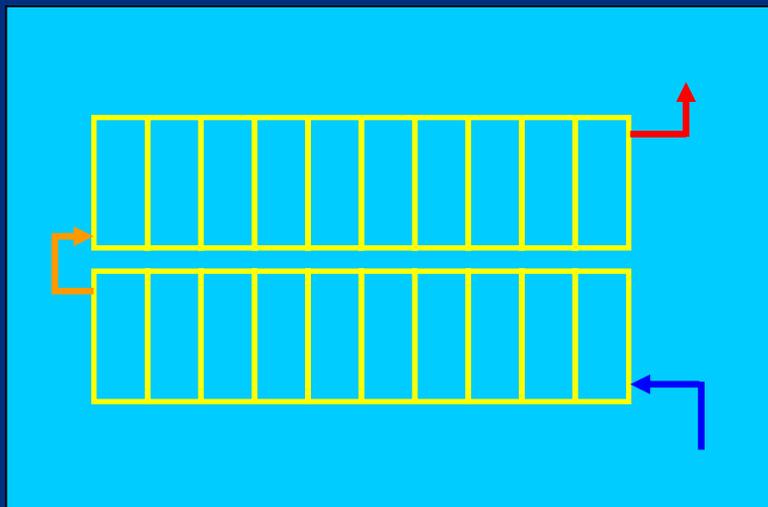
For Instance...

- The 2° racking system at 14 Area is 7,200-sqft
- If mounted at 34°, the racking system would have been 10,000-sqft including the shade impact!
- The resultant cost difference would have been \$123k to mount the panels at the optimal solar angle!





Panel Piping Design

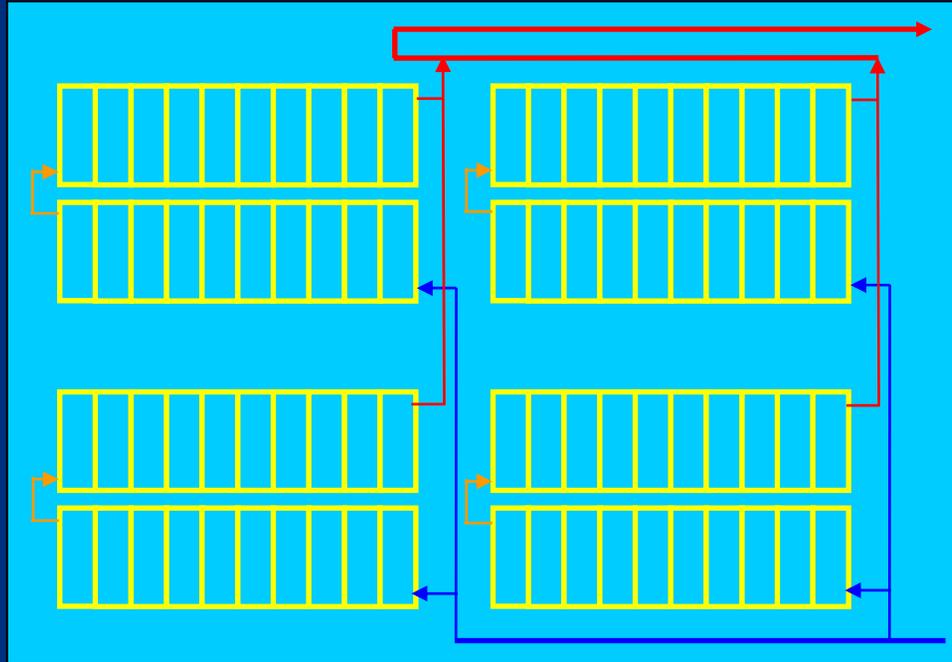


If possible, serpentine plumb 2 panel banks

- Decreases overall flow requirement by 50%, which reduces pump & pipe size req's
- Uses less pipe



Panel Piping Design



Plumb Reverse-Return to eliminate flow control valves



Solar Panel Data Source



Independent Data Source

- <http://www.solar-rating.org/ratings/ratings.htm>
- Standardized comparisons of solar energy products



In Conclusion

- With Natural Gas at or approaching \$1.50/therm, Thermal Pool Solar Systems can have a 6-year simple payback!
- It's hot out there!
- **NOW**, is the time!



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