

OAK RIDGE SOLAR PARK Dual-Axis-Tracker



DENA Solar Roof Program

Presentation in Berlin, Oct. 1st, 2012



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DENA Solar Roof Program

vis solis would like to apply for the DENA grant to promote German High Tech Innovations of Dual-Axis-Tracker sensors from Deger, Germany along with German solar panels and inverters.

We have chosen the site Oak Ridge Heritage Center since it combines both energy worlds: Nuclear and Renewable Energies having one thing in common: CO2 free emissions.

Dual-axis-trackers are commercially specifically interesting in regions with limited capacities and excess land, like Tennessee.

OAK RIDGE SOLAR PARK, LLC

vis solis` targets

- Tracker as Show Case Project in Oak Ridge
- Technology from German market leaders
Deger, Solarworld, Refusol ,
- Development of a Marketing Concept
- Presence, presentations, trade shows
- Public Relation / Networking
- Strengthening strategic position of vis solis
- Training of sales reps, installers and service & maintenance operators

vis solis GmbH / vis solis LLC

FACT Sheet USA

- vis solis GmbH founded Apr/09 (www.vis-solis.de)
- AHK Export-Initiative New Jersey City, NJ in May/10
- Foundation of vis solis LLC, TN in Aug/10 (www.vis-solis.us)
- Different developments during 2010
- First application DENA Mar/2011
- AHK Export-Initiative in Denver, Colorado Jun/11
- Reorganization of vis solis GmbH in Sep/11
 - Solmotion 55% (www.solmotion.de), CASAMA 35% (www.casama.de), EnoRS 10% (www.enors.de)
- First installation of 3 MW in Fayetteville, TN in Nov/11
- Installation of 6.1 MW in Tucson, AZ 12/11 – 9/12
- Own developed shovel-ready portfolio of 650 kW in TN
- vis solis was market leader in Tennessee in 2011

vis solis GmbH / vis solis LLC

Strategy USA

- Teaming-up with Retail Shopping Centers
- Lead account: Phillips Edison & Co. with 225 Shopping Centers in 35 States
- Other Partners: BC Woods, Rouse Properties
- Millions of sft roof space and parking space
- Multiple tenants like Walmart, Kroeger, K-Mart, Tractor-Supply, etc. who have own properties too
- ICSC – International Convention of Shopping Centers Las Vegas
- Tracker as “Eye-Catcher” at idle corners and as bill boards along the highways and interstates

OAK RIDGE SOLAR PARK, LLC

Photovoltaic Portfolio

- Total of 650kWp rooftop photovoltaic power.
- Flagship: 1 Dual-axis-tracker @ 50 kW.
- 12 Shopping Centers @ 50kWp = 600kW PV.
- TVA to buy 100% of electricity generated for 20 years.
- TVA pays 12-cent premium plus retail for 1st decade and retail for 2nd decade.
- Property owners have more than 300 properties in 35 states for potential additional solar.

OAK RIDGE SOLAR PARK, LLC

Why Oak Ridge Heritage Center?

- Oak Ridge National Laboratories ORNL (www.ornl.com)
- Representative location at the former DOE complex
- ORNL is the largest science and energy laboratory in the Department of Energy
- ORNL partners with the State of TN, Universities, and Industries
- ORNL is home of several of the world's top computers and is a leading neutron and nuclear energy research
- On the topsoil of the decommissioned 1st Nuclear Plant and Research Center in the World (1943)
- High science and research reputation and recognition worldwide

OAK RIDGE SOLAR PARK

Dual-Axis-Tracker

Flagship Project German Technology

- Technology and market leader with high-tech sensor
- 50,000 installations worldwide
- Tracks the solar resource instead of just the sun
- 45% higher yields and ROI
- Ideal for capacity limits



1st tracker development 800 kW in TN



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1st development - inverters



1st development - transformers



Oak Ridge Solar Park

Photovoltaic Dual-Axis-Tracker

- Install cost: \$4.50/W = \$225,000 / 50 kW
- Production Factor: average 1,350 kWh/kWp
x 145% = 1,960 kWh/kWp
- PPA Retail Rate (Yr 1): \$0.10/kWh - \$0.11/kWh
- PPA Term: 20 years
- PPA Escalator: 3.0% estimated annually
- PPA Incentive: \$0.12/kWh
- Incentive Term: 10 years

12 SYSTEMS @ 50kW

Showcase Project 200 kW Lenoir City, TN



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TELICO Plaza, Lenoir City, TN (near Oak Ridge)



Phillips Edison & Company TVA Rooftop PV Systems

| | | |
|----------------------------------|---------------------------------------|-------|
| 1. | Florence, AL – Cloverdale Village | 50kW |
| 2. | Florence, AL – Cox Creek Plaza | 50kW |
| 3. | Dandridge, TN – Squirewood Village | 50kW |
| 4. | Knoxville, TN – Chapman Square | 50kW |
| 5. | Madison, TN – Rivergate Square | 50kW |
| 6. | Memphis, TN – Gleneagles Court | 50kW |
| 7. | Murfreesboro, TN – Kensington Place | 50kW |
| 8. | Nashville, TN – Hickory Plaza | 50kW |
| 9. | New Tazewell, TN – Cumberland Gallery | 50kW |
| 10. | Portland, TN – Portland Village | 50kW |
| TOTAL PECO –TVA Rooftop PV Solar | | 500kW |

BC Woods TVA Rooftop PV Systems

| | | |
|---------------------------------------|--|-------|
| 1. | Fayetteville, TN – Lincoln Park Center | 50kW |
| 2. | Fayetteville, TN – River Oak Center | 50kW |
| TOTAL BC Woods – TVA Rooftop PV Solar | | 100kW |

Oak Ridge Solar Park

Rooftop Photovoltaic Portfolio

- Install cost: \$2.80/W = \$140,000 / 50 kW
 \$1,680,000 total portfolio (600 kW)
- Production Factor: average 1,350 kWh/kW
- PPA Retail Rate (Yr 1): \$0.10/kWh - \$0.11/kWh
- PPA Term: 20 years
- PPA Escalator: 3.0% estimated annually
- PPA Incentive: \$0.12/kWh
- Incentive Term: 10 years

Carlos Mayer
Managing Partner

Tim Hayes
Managing Partner

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*Developers of world-class solar electric generating systems –
financing, engineering, procurement, construction and operation.*

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vis solis



the power of the sun

