

SUNPOWER™



Solar and Wind Power Seminar Warren County Planning Department

Jim Torpey
Director Market Development
SunPower Corporation

SunPower

- Founded 1985. Worldwide footprint.
- Has delivered cumulatively over 1 GW of PV and 1 TWh over the past decade
- Designed and installed over 550 turnkey systems totaling more than 450 MW
- Current production capacity of 600 MW will ramp to 1GW/yr by 2012
- Largest utility-scale projects in the US
- World record cell efficiency (23%)
- 5,500 employees. All we do is solar.
- Over 85 patents and publicly traded
- Over a quarter century of experience

Technology Leader. Proven Performance.



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Solar Basics

Power- instantaneous- kilowatts/megawatts (1000 kw)

Energy- power over time- kilowatt hours/megawatt hours (1000 kwh)

Residential energy use in New Jersey
9000 kwh/yr

Solar energy production in NJ (SP trackers)
1600 kwh/kw

Six kw solar = one household's annual use

Six MW solar farm = one thousand homes

Solar Installation Types



Commercial

Serving on site loads

Net metered

Roof or ground mounted

From 50 Kw- 5 MW



Residential

Roof mounted

Net Metered

1-10 Kw



Power Plants

Directly connected to distribution or transmission grid

Normally 5-30 MW in East

Normally 5-250 MW in West

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Land Used for Solar Plants Depends on Panel Efficiency

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37 Acres
19.3% efficiency

Conventional



57 Acres
12.6% efficiency

Thin Film



79 Acres
9.5% efficiency

6 MW solar plant

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Solar Power Plant Examples



Cape Kennedy, Florida, USA



Muehlhausen, Bavaria, Germany,



Trujillo, Extremadura, Spain-Elecnor



Jumilla, Murcia, Spain-Elecnor



Serpa, Portugal



DeSoto, Arcadia, Florida

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Janssen Pharmaceuticals – 4.1MWp Tracker

Titusville, NJ



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SAS Institute – 1MWp Tracker

Cary, NC



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T0 Tracker
FPL Desoto – 25 MW

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Solar Farms Site Selection Criteria

- Access to Sub-Transmission System
- Cost of Grid Interconnection
- Available Land
- Slope and Wetlands conditions

Solar Best Practices

Siting Strategy

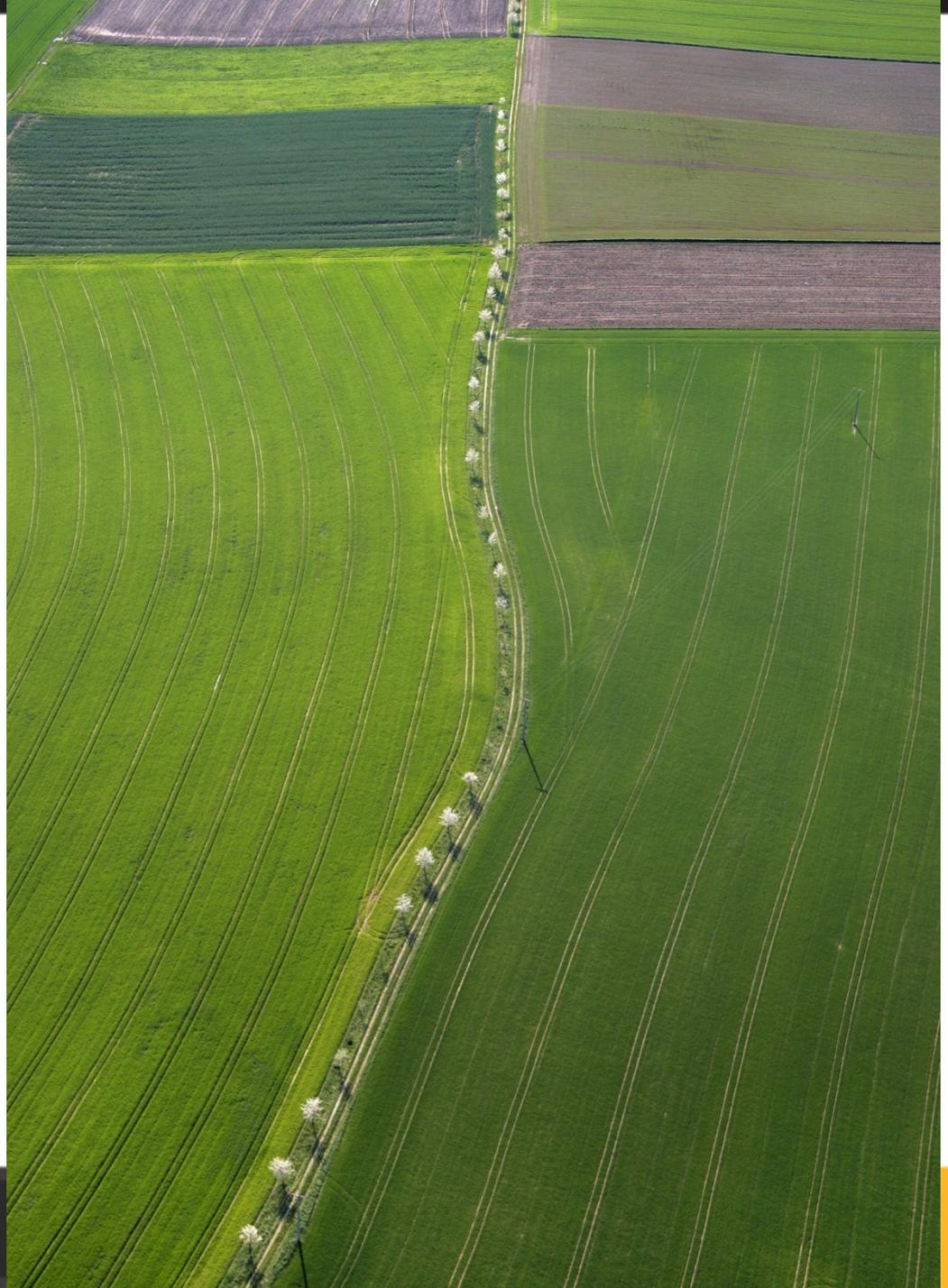
- Site on already disturbed lands
- Reduce existing negative impacts
- Deploy in a minimally invasive manner
- Promote the ecological potential of the land
- Monitor for impacts



Best Practices (cont)

Deployment Strategy

- Respect Natural Contours
- Low-Impact Access
- Respect Natural Drainage
- Removable Foundations
- Enhance Native Flora
- Address Visual Impacts
 - Security System
 - Array fields
 - Inverters and Buildings
- End-of-Life Restoration of the Land



Light and Permeable Roads where necessary

Meadow road at Minihof, Bavaria, constructed 2004, photo Dec 2009, 20 cm gravel



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Foundations are Removable Screws or Piers



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Field Seeding to Promote Biodiversity / Grazing



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Visual Screening using typical hedges



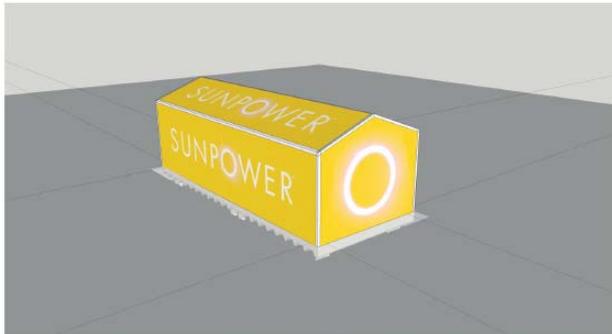
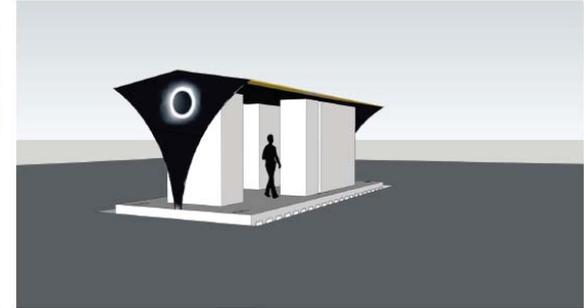
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Border Landscaping provides further screening



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Addressing Visual Impacts of Inverter Housing



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Addressing Visual Impacts of O&M Buildings



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Public Walking Paths can lead to Solar Fields

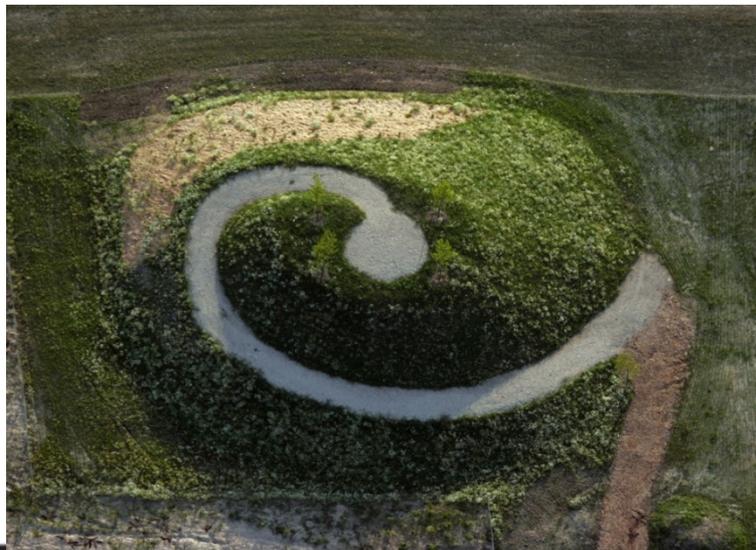


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Solar Farms can be Community Assets



Muehlhausen, Germany, 2004



Florida Power & Light – 27.6MWp Tracker

Arcadia, FL



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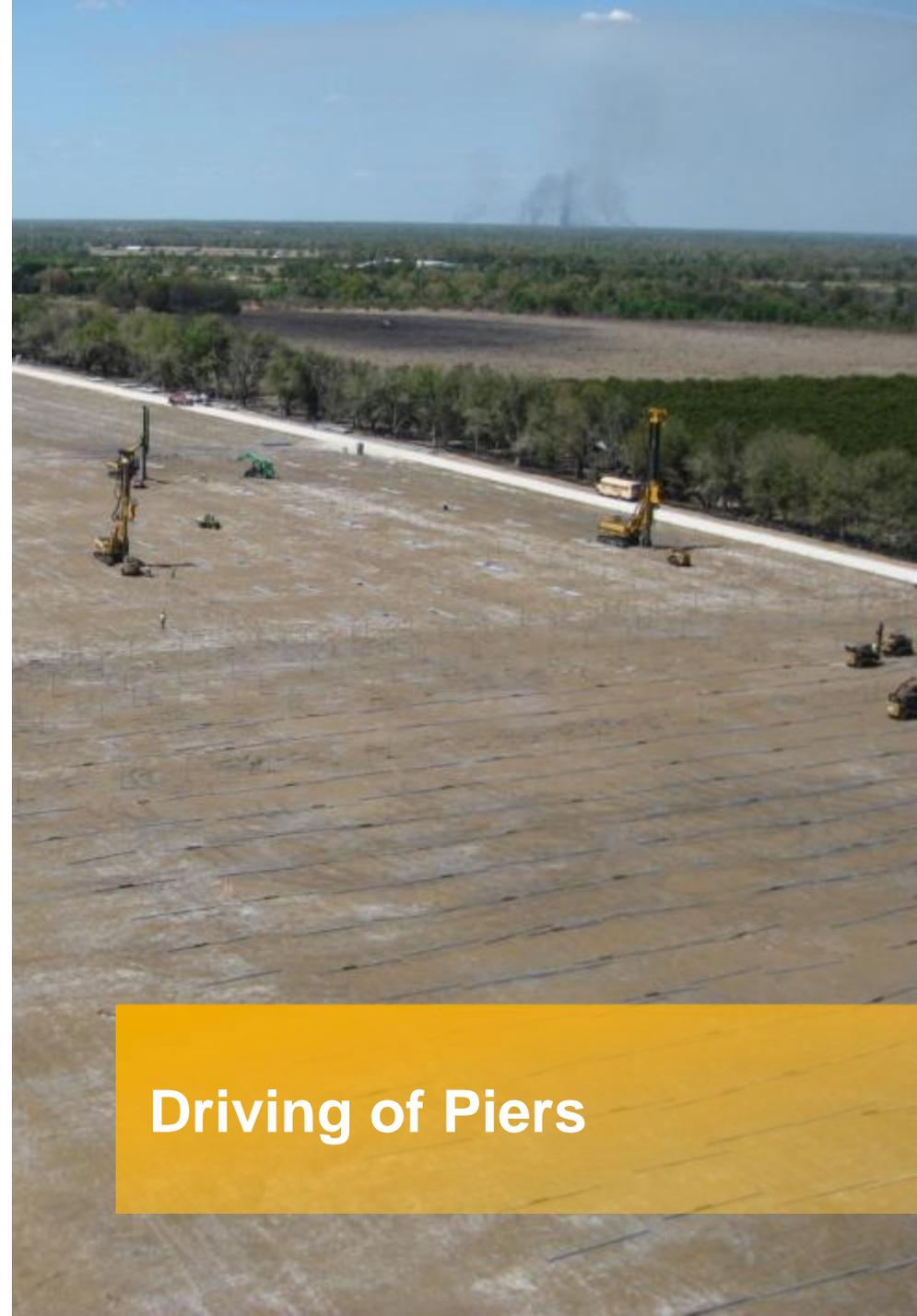
January 2009
Start of Construction



Start of Construction

361 Acres – Cleared Site





Driving of Piers



Installing Metal Trackers

Pouring Container Foundations



Attaching PV Modules



Installing Drive Motors



Substation Tie-in



June 2009
System Energized



THANK YOU

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APPENDIX

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Natural Contours Respected with Slope Tolerance



oration

Meadow can be used as Construction Access



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Roads are low-impact and to the inverters only



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Vegetated Drainage Swales at Hilly Sites

Decrease erosion potential, increase habitat and filter water before infiltration



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Detailing a Cornwall Hedge for Site Security

Blackthorne Bush / *Prunus Spinosa*



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Dr. Martin Hundsdorfer, mayor of Mühlhausen:

„As a solar village we have a unique selling point for tourism. It feels good to generate innovative renewable energy in my community. We have an energy-trail, which reflects our pride and is used by my citizens and guests from outside.“