

United States Air Force Warfare Center

Testing - Tactics - Training

Nellis AFB Solar Power System



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**This Briefing is:
UNCLASSIFIED**



AGENDA

- **Nellis Background**
- **Project Overview**
- **Acquisition Factors**
 - **Nellis/AF Factors**
 - **Nevada/Photovoltaic Market Factors**
 - **Other Renewable Factors**
- **Acquisition / Construction Process**
- **Lessons Learned**





NELLIS BACKGROUND

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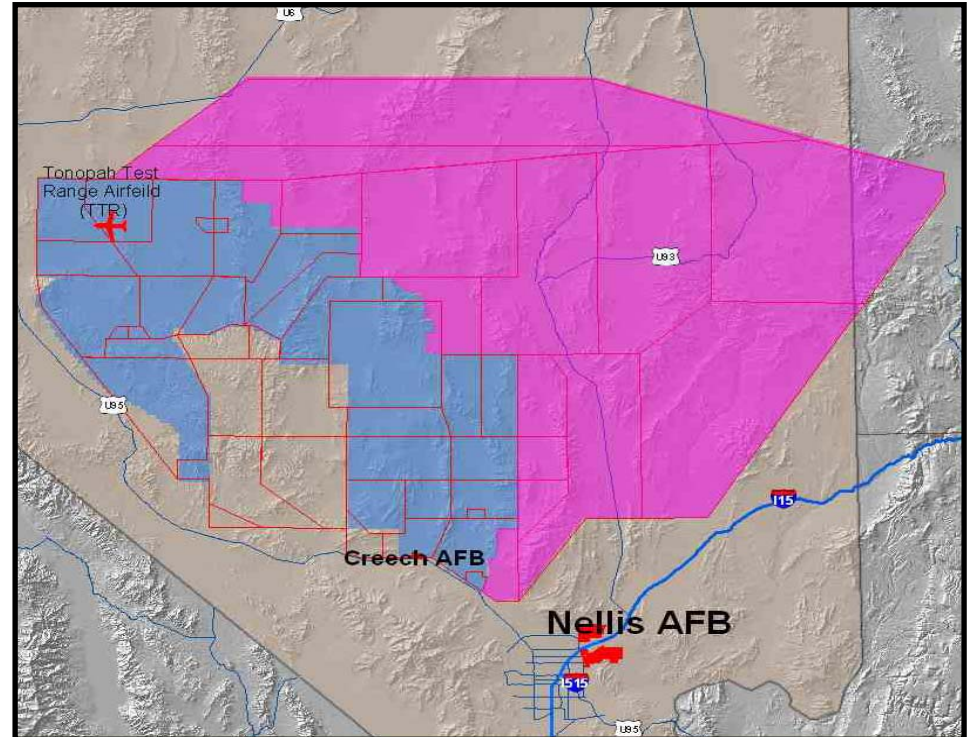
Nellis AFB Information

■ Base Details

- Over 12,000 people
- Millions of acres of NV
- ~9M Square feet facility

■ Nellis Energy Program Includes

- Nellis AFB
- Creech AFB
- Facilities of Test & Training Range





SOLAR POWER SYSTEM OVERVIEW





Project Overview

- **Largest PV array in America**
 - 14.2 MW (DC) peak output
 - 25-30% of annual electricity
 - Costs over \$100M to construct
- **140 acre site**
 - Includes capped landfill ~ 33 Acres
- **20 year land lease**
- **Power purchase agreement**
 - Indefinite term - no escalation
- **Developer (Solar Star NAFB)**
 - Performs all design/build
 - Sells all power to Nellis
 - Sells all REC's to Nevada Power
 - Performs all O&M
- **Saves AF over \$1M a year**





ACQUISITION FACTORS



Nellis / AF Factors

- **Significant electrical need**
 - 140M Kwh/ 27MW Peak Demand
 - \$11M Annual Cost
 - No funds for utility scale power
- **Established energy goals**
 - EO 13423 Strengthening Federal Environmental, Energy, & Transportation Management
 - Energy Policy Act 2005 - 7.5% by 2013
 - DoD goal - 25% by 2025
- **Compatible land**
 - 140 acres / 33 acres of landfill
 - Adjacent to base electrical circuits for transmission





NV / Photovoltaic Market Factors

- **NV's Strong Renewable Portfolio Standard (RPS)**
 - 15% of all electricity must be renewable by 2013
 - Ratcheted every two years
 - **Solar Set-aside**
 - 5% of renewable electricity must be solar energy
 - PV REC value is 2.4 credits for every kwh
 - Additional 0.05 credits for customer maintained generation
 - Additional credits available for efficiency measures
- **Good market price for REC's**
 - REC price must be negotiated - increases risk for developer
- **Overall effect was strong market for Energy Credits**
 - Led to unsolicited interest
 - *REC prices were vital to project viability -as much as 35-45% of value of project*



Other Renewable Factors

- **NV Energy's tariffs affect project**
 - Net metering not available to AF - limits system size
 - Standby tariff may add an additional financial burden
 - Wheeling tariff for remote lands adds significant cost
- **NV Energy's interconnection standard**
- **Transmission line availability**
- **Local laws (ex: property taxes)**
- **BLM – public withdrawn land concerns**
- **Tax incentives available**
 - **Tax incentives , depreciation, & rebates**
 - ***Incentives also crucial to determining project viability - as much as 55-65% of value of project***



ACQUISITION / CONSTRUCTION PROCESS



Project Objectives

- All power produced will be used by Nellis AFB
 - *Effect of net metering*
- Power output directly connected to base grid
 - *Effects of wheeling tariff & transmission line availability*
- Developer:
 - Designs, finances, builds, and operates the PV array
 - Sells PV power to Nellis at proposed price
- Nellis AFB:
 - Sign indefinite term utility purchase contract with developer
 - May cancel with one year notification
 - Provide land for PV array via a ground lease (Property owned by AF)
- Best option for acquisition:
 - REPP (Renewable Energy Purchase Process)
 - Land lease combined with a renewable power purchase agreement



Acquisition Timeline

- **March 7 '06 – Acquisition team formed**
- **April 18 '06 – Nellis issues RFP**
- **June 16 '06 – Proposals received**
- **June 23 '06 – Source selection begins**
- **July 19 '06 – Source selection decision**
- **July 27 '06 – Project awarded to Powerlight**
- **November 20 '06 – Approval to issue lease**
- **December 6 '06 – Land appraisal completed**
- **December 14 '06 – Lease signed (with preliminary land survey)**
- **January 9 '07 – 99 ABW/CV signs EBS**
- **March 23 '07 – 99 ABW/CC signs Powerlight interconnect agreement**
- **April 16 '07 – 99 ABW/CC signs NVP interconnect agreement**
- **April 20 '07 – Legal survey completed**
- **April 23 '07 – Groundbreaking**



Partners

- **Energy Purchase & Site Host (Lessor)**
 - **Nellis Air Force Base**
- **Utility (Renewable Requirement)**
 - **Nevada Power (NV Energy)**
- **Design & Development (Contractor)**
 - **Powerlight (Sun Power Corp)**
- **System Owner & Operator (Lessee/Financing)**
 - **MMA Renewable Ventures (Munie Mae)**





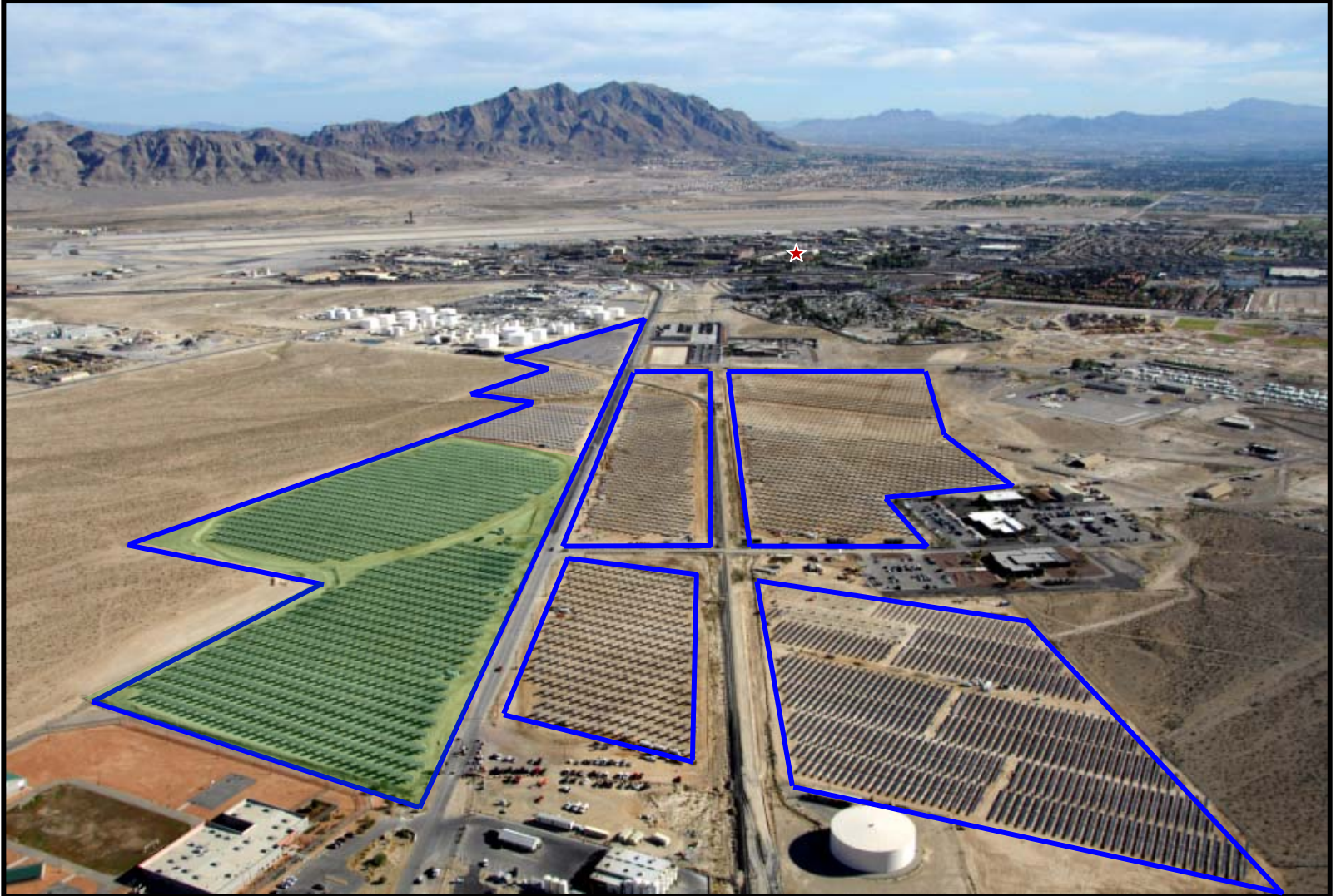
Construction Timeline

- **April 23 '07 – Groundbreaking**
- **June '07 – Construction begins**
- **Oct '07 – 1st 5 MW Online**
- **Nov '07 – 2nd 5 MW Online**
- **Dec 1 '07 – Final 4.2 MW Online**
- **Dec 17 '07 – Dedication ceremony**





Completed Construction



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LESSONS LEARNED

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Summary of Lessons Learned

- *If...a state has a robust market for Energy Credits, tax incentives, and/or rebates to make the project financially viable*
- Then...private industry will actively pursue projects in the state
- So...the AF can bring to the table some compatible land, a power requirement, aggressive goals, and energy expertise

AND

- *A REPP like the Nellis model can be used at other DoD installations to purchase the use of on-site renewable energy*

