Power Purchase Agreements for Renewable Energy

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AGENDA

- **PPA Basics**
- **PPA “How to” Guide**
- **Nellis Experience**
- **Ft. Carson Experience**

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Renewable Energy Projects

- **Objective: Develop renewable generation**
  - **Reduce fossil fuel use & foreign oil dependence**
  - **Meet Federal renewable energy goals (EPAct, Executive Order 13423, etc)**
  - **Reduce and stabilize utility costs**
  - **Improve energy supply security & reliability**

Renewable Energy Projects

- **Key requirements**
  - **Renewable resource**
  - **Available land**
  - **Acceptable mission impact (radar, air space)**
  - **Environmental requirements**
  - **Utility prices and regulatory conditions**

Renewable Energy Projects

- **Key requirements (continued)**
  - **Local financial incentives**
  - **Tax incentives (Federal & State)**
  - **Local champion**
  - **Execution team**

PPA Basics

- **Definition: Power Purchase Agreement**
  - **Contract between generator and purchaser**
  - **For electricity or capacity (power or ancillary services)**
- **Used by generator to raise non-recourse financing**
  - **Lender is entitled to repayment from profits**

PPA Basics

- **Benefits of PPA vs Federal ownership**
  - **Tax incentives**
  - **Funds**
  - **Sale of RECs**
  - **Project operation and maintenance**
- **May require PUC approval**
- **May be performed by local utility company**

PPA Basics

- **Land use instruments**
  - **Ground lease**
  - **Enhanced Use Lease (EUL)**
  - **None**
- **Sale of electricity to Federal customer**
- **40 USC 591 (previously § 8093)**
  - **State laws and rules apply**

A ‘How To’ Guide for Power Purchase Agreements

Mr. Steve Dumont

Air Combat Command

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The Steps

- Build a Team
- Evaluate Economic Viability
- Conduct Market Research
- Prepare Documents
- Issue a Solicitation
- Evaluate Proposals/Bids
- Make a Selection

Build a Team

- Small dedicated team provides:
  - Flexibility and quick reaction
  - Feeling of ownership / empowerment
- Include required core expertise:
  - Contracting, Technical, Legal, Economics, etc
- Establish direct, frequent communication
- Conduct meetings at major milestones
- Core team builds extended support team

Economic Viability

- Economic viability analysis
  - Analyze from both points of view (buyer & contractor)
  - Determines potential for win-win arrangement
  - Develop scenarios with range of assumptions – sensitivity analysis
  - Significant assumptions to include:
    - PPA power cost
    - Standby tariff costs
    - Tax incentives and rebates
    - Construction costs
    - REC cost/income
    - Cost of money
    - O&M costs

Market Research

- Know the market factors
  - Renewable portfolio requirements
  - Tax incentives
  - Rebates
  - Renewable resources
  - REC market
  - Other interest/solicitations
  - Standby tariff
  - Net metering
  - Seek interested parties (RFI)

Prepare Documents

- Environmental Impact (NEPA) – important!
- Technical Data Library
- Contract (Solicitation)
- Land Use Instrument

Basic PPA

- Environmental Baseline Study
- Legal Survey
- Land Appraisal
- Interconnection and Standby Agreements

Technical Library

- Data needed by potential offerors to develop an adequate technical proposal and bid.

- Contains
  - Site maps
  - Twelve months of electrical data (15 minutes internals)
  - Twelve months of billing records
  - Local/base standards
  - Electrical drawings
  - Substation and distribution system one-line drawings
  - Other data pertinent to the project

Solicitation

- Summarize performance requirements
  - Tell them what you want, not how to do it
  - Type of power (solar, wind, biomass), system output (kWh/kW), term (20yr)
- State experience requirements
- Establish proposal/bid format
- Explain evaluation and selection process

Selection Methodology

- Best Value
  - Subjective, protest may be more difficult to defend
  - More flexibility in selection
  - Not necessarily lowest cost
- Low Bid
  - Objective, higher risk of performance problems
- Technically Acceptable Low Bid
  - Good compromise, low risk of poor contractor, lower protest risk, best price

Selection Organization

- Separate organization and management chain of command
- Sole purpose is to accomplish proposal evaluations in accordance with RFP
- Consists of a source-selection authority, evaluation team, and advisors
- Establish firewall between technical and price evaluation

Evaluating Price

- Develop model to compute single value which reflects ‘total cost to buyer’
- Model should account for:
  - PPA power rate
  - Standby tariff costs
  - Length of agreement
  - REC replacement (if sold)
  - Cost of money (discount)
  - Escalation
- Low bid is lowest ‘total cost to buyer’

The Nellis PPA Experience

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The Site

- 140 acres on Nellis AFB
- Desert land
- Among military facilities
- Includes 45 acre landfill
- Adjacent industrial area
- Bisected by railroad

The Solicitation

- Performance based – pay only for kWh delivered
- All power used by Nellis - direct connect to base grid
- Developer:
  - Designs, finances, builds, and operates the array
  - Sells power to Nellis at proposed price/escalation
- Nellis AFB:
  - Signs indefinite utility contract with developer
  - May cancel with one year notification
  - Provides land for PV array via a ground lease

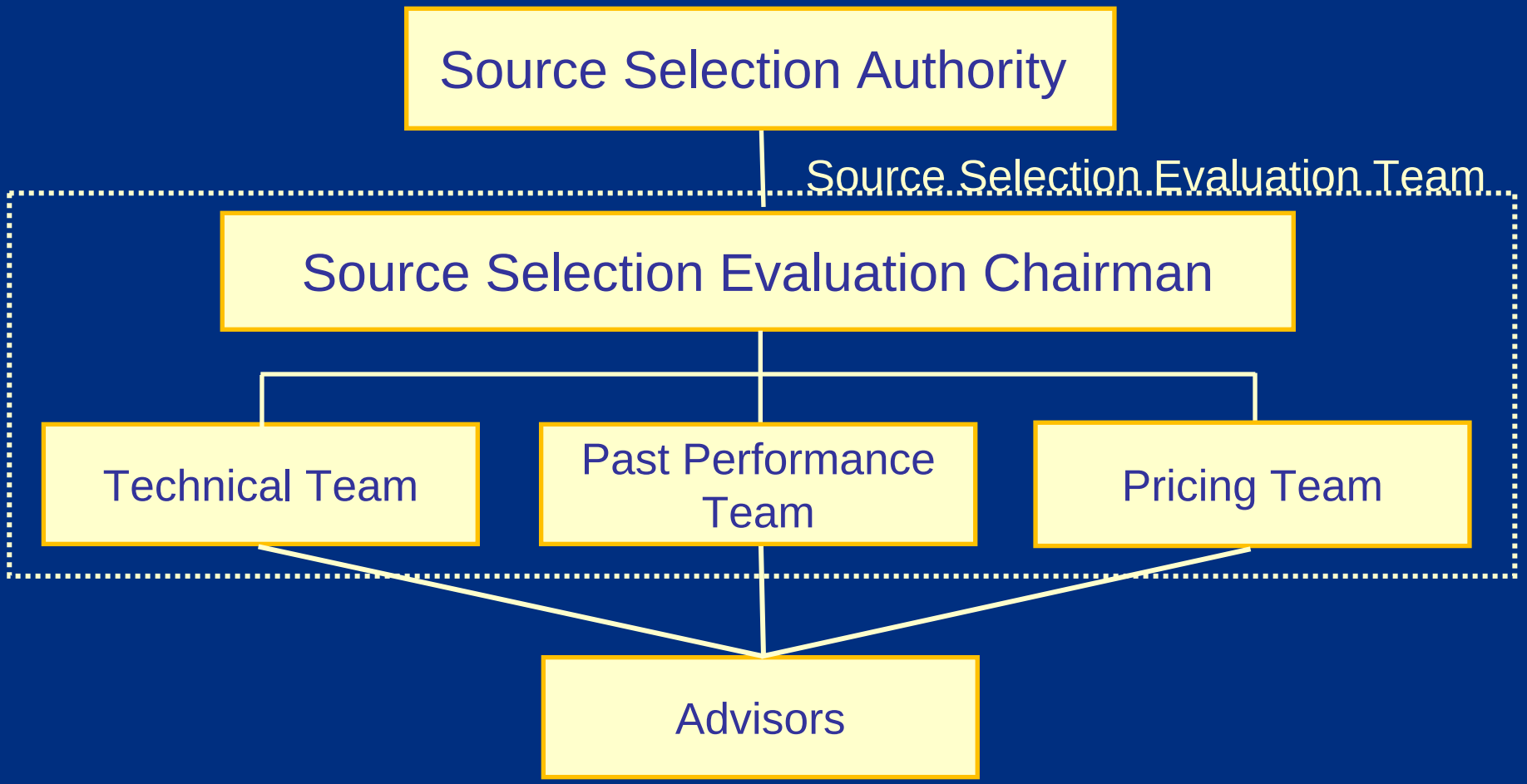
The Selection

- Technically acceptable low bid
  - Retains competitive leverage for pricing
  - Low risk of poor contractor
  - Low protest risk

The Evaluation

- Technical
  - Performance Plan
  - Financial Capability
  - Implementation Plan
  - Quality Management Plan
- Past Performance
  - Review past performance on like projects
- Price (evaluated among acceptable proposals)
  - Evaluated by separate team to avoid potential bias
  - Single present value cost computed for each proposal
  - Successful offeror was lowest present value price

Selection Organization



The Results

- Only 141 days from team stand-up to award
- Three proposals received
- Single round of clarifications
- All proposals placed in the competitive range

Awarded to SunPower (PowerLight) - 2.2¢/kWh

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The Results

Fort Carson Solar PV Project Example

Mike Warwick

Pacific Northwest National Lab

(Thanks to Vince Guthrie of Fort Carson)

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Project Summary

State Amendment 37 limited the size of the project to 2 MW

2 MW Ground Mounted Solar Array

PV Generates 3,200 MWh/year

Powers 2.3% of Installation's Load

Structure covers over 12 acres

Panels use Thin Film PV Technology

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Bottom Line Up Front

Fort Carson's award winning Solar PV Project represents successful application of innovative business model

$13 million Solar PV Array is the largest on-base Project in the Army

1. Underutilized asset in the form of 12 -15 acres contributed under flat lease, surface only
2. Strong resource potential for solar project
3. Visionary State Governor established Renewable Portfolio Standard with Solar Carve Out
4. Federal Tax Credit of 30% available for solar project
5. State RPS created Renewable Energy Credit Market
6. Long-term REC purchase (2% of base power)
7. Private sector project development instrumental in success
8. Third party equity and asset ownership
9. Local utility to host and manage the PV array, power stays on base
10. Price stabilization achieved through long term, fixed rate (PPA)
11. Fort Carson pays the developer for the power
12. All front-end development costs rolled into the price of the power

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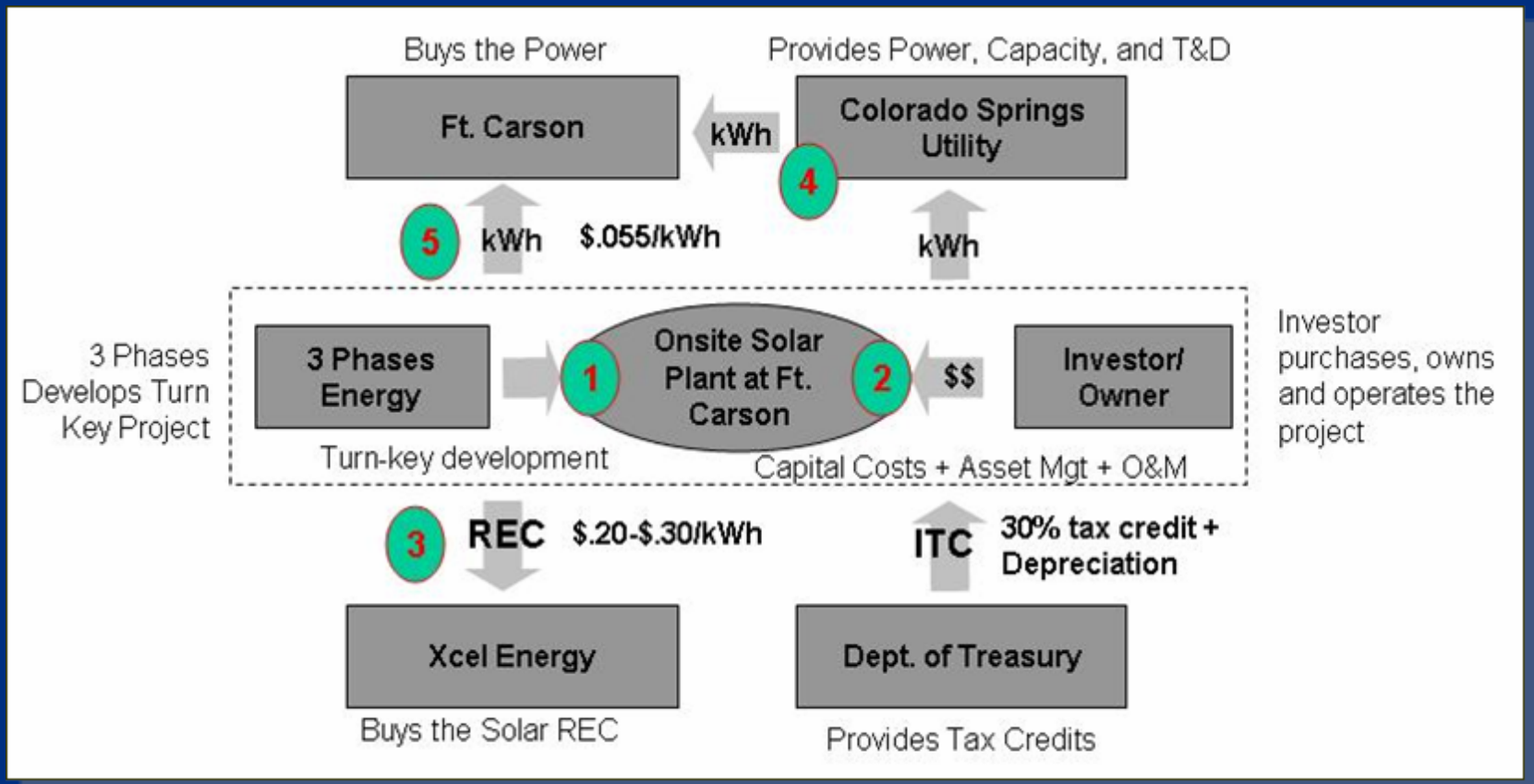
Project Structure

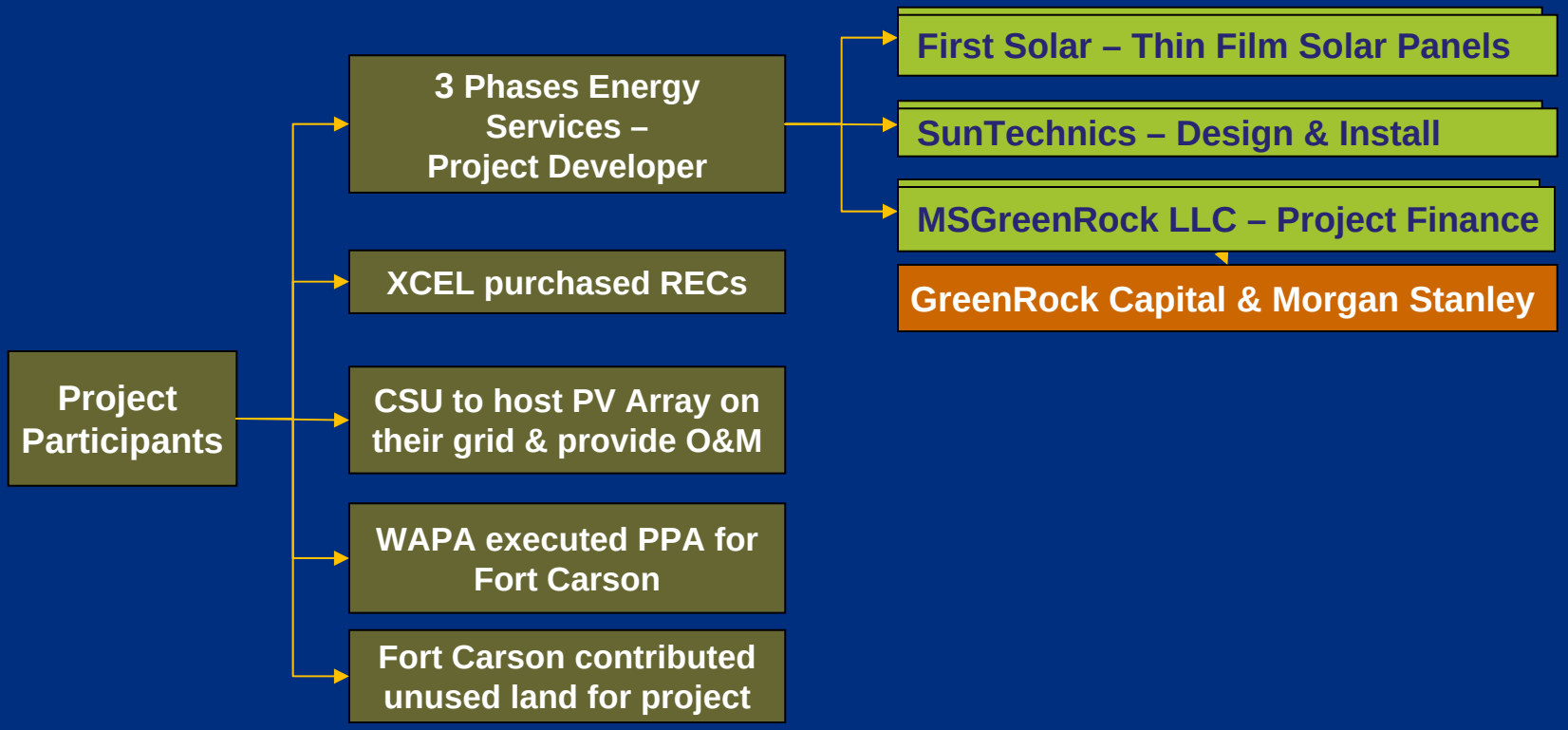
- Five related, bi-lateral contracts with Carson
  - Land lease between Carson and developer
  - WAPA power supply (allocation) contract to Carson
  - Power sale to WAPA (from developer but with conditions attached by Carson)
  - Power purchase from project via WAPA “energy support” contract provision
  - Integration and power management contract with local utility
- Other contracts between developer, financiers, WAPA that determine project cost, REC value, tax benefits, finance terms, etc. These might as well be a “black box.” All Carson needs to know is price of power.

Development Model



Project Development Team

9 Different Companies Participated in making the Project a Reality



Procuring the Power

Through Western's Power Marketing Authority, they are authorized to execute long-term power arrangements

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Fort Carson's power purchase agreement between Western & vendor with base responsible for payments

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PPA uses the energy support provision of Fort Carson's firm electric services (FES) contract with Western

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Monthly delivery schedule of power provided to base from PV in kwh and is reflected in exhibit to the contract

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Power price is fixed at installation's current rate

Lessons Learned

- This is another unique example, but could become more commonplace
  - PMA contract
  - State RPS
  - REC sale
- PMA contract essential (or retail wheeling arrangement with utility)
- Sale of RECs to reduce cost/price
- RPS w/solar set aside key to high REC price
- “Good price” – Price that is life cycle cost effective and covers any utility fees for stand-by, shaping, etc.

TAKE AWAYS

- Find win-win opportunities
- Do your homework
- Form dedicated core action team

Think Big!

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Don't forget to fill out and drop off your session evaluations!