



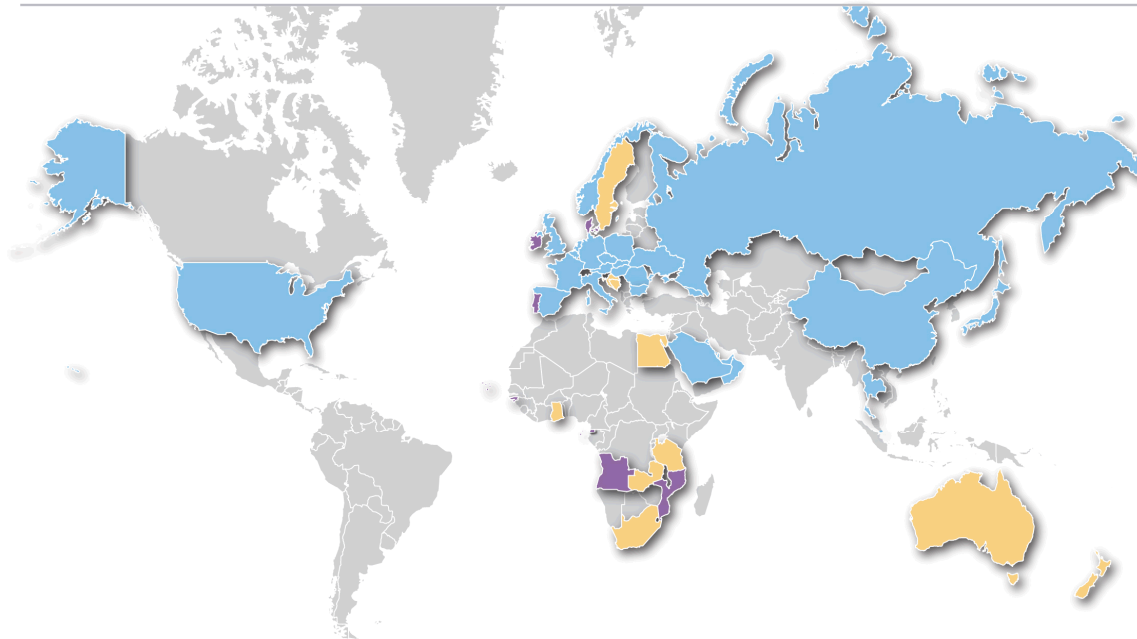
Commercializing Solar – Negotiating Solar Power Purchase Agreements

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US Energy Sector - Experience and Service

Sector experience includes: **Energy sector services include:**

- Solar
 - Wind
 - Biofuels
 - Clean Technology
 - Climate Change
 - Emissions Trading
 - Green Energy
 - Liquefied Natural Gas
 - Oil & Gas
 - Nuclear
 - Power Generation
 - Smart Grid
- Government/Regulatory
 - Bidding and RFPs
 - Commercial and Construction Documents
 - Corporate Structuring and Tax Advice
 - Financing
 - Intellectual Property
 - Licensing and Technology Transfer
 - Litigation and International Arbitration
 - Mergers and Acquisitions

Solar as a Service – Power Purchase Agreement Overview

Procuring solar power supply

- **Outright purchase - expensive**
- **Power Purchase Agreement**
 - SOLAR AS A SERVICE
 - *Long term revenue stream is basis of debt servicing and financeability
 - Driving force behind solar uptake (75% of all solar generated via PPA)
 - Affordability with no capital outlay
 - No operations and maintenance costs
 - Very little performance risk – only pay for what is delivered
 - Price hedging
 - Long term fixed rates (15 – 20 years)
 - Carbon scheme will make pricing more competitive
 - Chance to reduce peak load
 - Environmental benefits and supports green economy
- **Solar Lease (residential)**
 - Minimize risk for Seller; potential upside (and downside) for Buyer

Solar Project Economics

Overview of Economics of Solar Projects

- **High capital costs – needs to be covered for each project**
- **lenders and tax investors cautious about construction phase**
- **Project complexity (PPA, EPC, O&M, interconnection, transmission, loan (construction and take out/term), tax equity, LLC Agreements, development services**
 - Significant lender and investor due diligence
- **Despite apparent plethora of incentives, all available revenue and tax incentives must be optimized to make money**
 - Power sale revenue
 - Sale of RECs (value will increase if carbon priced)
 - Federal ITC/Grant in Lieu
 - MACRS Depreciation
 - State and local rebates (CSI, San Francisco Solar Incentive)



Solar Project Economics

- **Estimated that 50% cost covered by incentives in California**
 - Project modeling needs to be done very carefully
- **Despite certain cost of having crashed**
 - Entire solar sector went into supply-side overdrive
 - Silicon, module prices crash
- **Feed-in-tariffs in Europe make solar projects there much more attractive**

Breakthroughs needed

- **Breakthroughs in design, manufacturing, supply chain, installation and financing/incentives**
 - Maxed out
- **Big breakthrough needed is in the fundamental cell technology**
 - 30 or 40% efficiency would **revolutionize life on earth**
 - Energy free and boundless
 - Significantly but not proportionately advanced over last time ('70s)
 - Combined with storage and wireless transmission
 - ****Opportunities in solar are boundless**

Incentives - overview

Overview only

- **§ 1603 Federal Cash Grant**
- **hugely significant in most deals**
- **projects placed in service in 2009 or 2010, or with commencement of construction by Oct 2011**
 - Hopefully will be extended
- **Amount? - 30% of capital cost**
 - What is included – no crystal-clear guidelines
 - >500K requires accountant certification of cost basis
 - Reduces depreciable basis of system by 50% of grant or 15%
- **Timing? - Paid within 60 days of date system “placed in service”**

Incentives - overview

- Risk?
- 100% audit risk – all applications reviewed
- Recapture if
 - Change in use
 - Permanent closure
 - Sale/transfer to disqualified owner (tax exempt, gov't body, non-profit)
 - Foreclosure by lender does NOT result in recapture.
- **Not taxable as income by Federal Govt; talk of California taxing – doesn't get easier....**

Incentives - overview

§48 Federal Investment Tax Credit (alternative to Cash Grant)

- Alternative to cash grant; 30% tax credit (reduces tax bill)
- Low audit risk (regular tax audit risk)

Federal Loan Guarantee Program

- Up to 80% of project cost
- Applications costly and time consuming
- Subject to and critical and qualitative/competitive evaluation by DOE
 - Unlike cash grant which goes to everyone
- not viable for fast track or small projects

Depreciation

- MACRS depreciation of system over 5 years (very short considering life of the system (25+ years))
- stimulus legislation allowed one time 50% bonus depreciation in year 2008 (i.e. 50% could be depreciated in 2008)

Incentives - overview

State Incentives

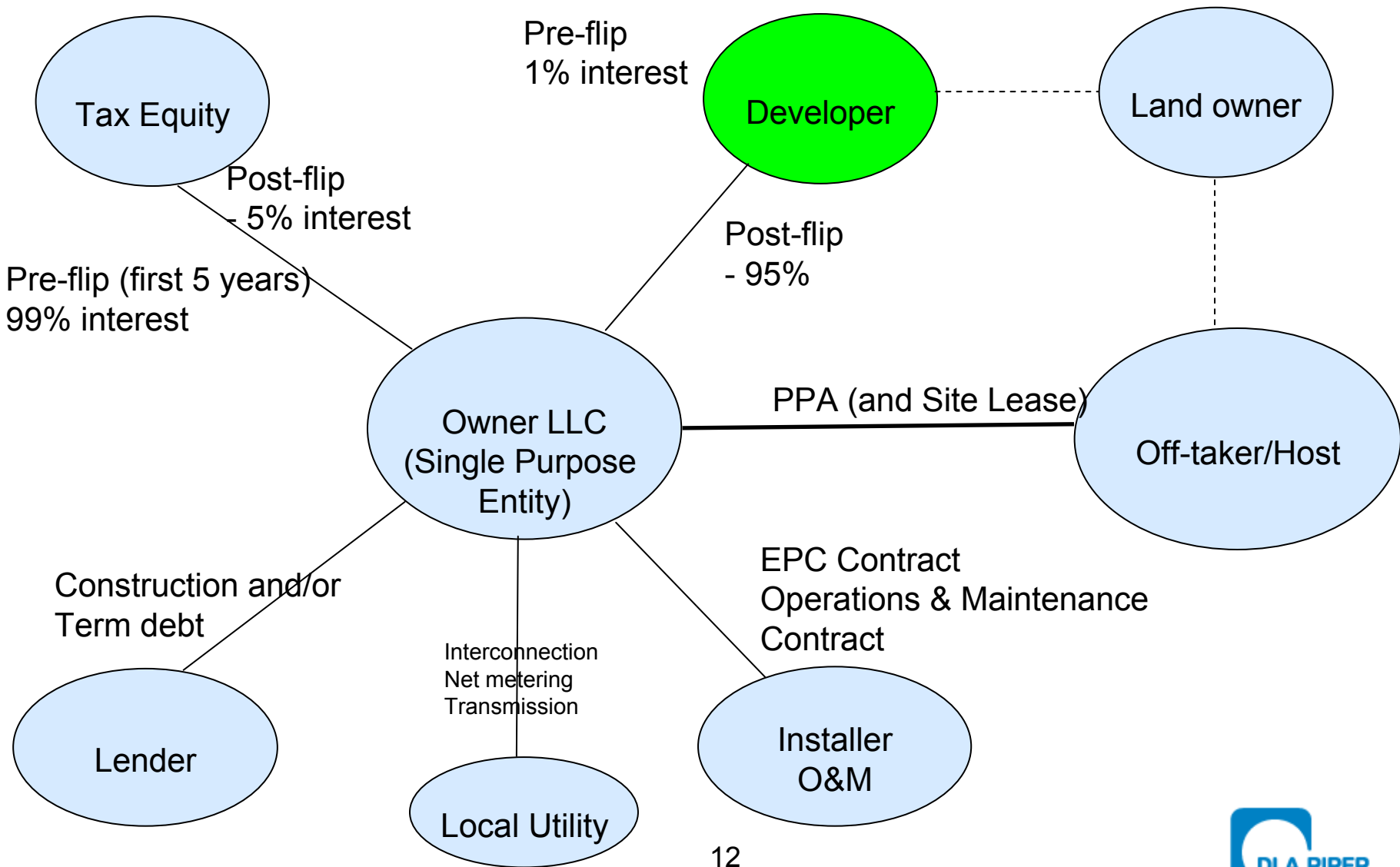
- **Example: California Solar Initiative**
 - Performance Based Incentive (PBI) for > 50kW
 - Based on actual output
 - Paid monthly over 5 years
 - Currently at 15c per kWh for commercial

Local Incentives

Environmental Attributes

- **Environmental Attributes (credits, benefits, emissions reductions etc attached to generation of renewable energy)**
- **RECs**
 - 1 REC for 1 MWh green power
 - Unbundled from the actual power
- **PPA needs to specify ownership**
- **Include “Reporting Rights”**
 - ability to publish use of green power – E.g. “This factory is powered by the sun”.
 - If no RECs, then buyer of solar power cannot publicly state that the power generated is green power

Example Solar Project Structuring – Partnership Flip (wind safe harbor)



Structures

Structure of project

- **Partnership Flip**
- **Sale Leaseback**
- **Inverted lease**

PPAs – Key Issues and Considerations – Chronological order

Project participants

Scale of project and parties

- **Residential**

- Cover page

- **Commercial**

- **Utility**

- **Creditworthiness**

- Buyer - needs to sustain long term purchase cash flow
- Seller - larger scale, to stand behind output guarantees, curtailments, liquidated damages
- Needs to be monitored (downgrades)

Decreasing Seller
ability to negotiate

Increasing
creditworthiness



PPAs – Key Issues and Considerations

Off-Ramps and Conditions Precedent

- The first thing to do when getting into something is to work out how to get out of it!
- Usually PPA executed first, with other key contracts following later and as conditions precedent to effectiveness of PPA
- Must be met by “Condition Deadline”
- Waiver rights (beneficiary of CP)
- If not, termination without liability (i.e. walk-away right)
 - Break fee? => utilities want security deposit up front - forfeited
- “Notice to Proceed” to EPC contractor

PPAs – Key Issues and Considerations

Construction - EPC Contract (not usually part of PPA, but can be)

- Turnkey design, procurement, installation/construction, testing, permitting and commissioning, usually O&M
- **Need to back to back many EPC provisions with PPA**
 - Fixed price – affects PPA pricing
 - Guaranteed “Final Completion” date and liquidated damages
 - Guaranteed output/capacity and liquidated damages
 - Guarantees of performance
 - Performance Bond
 - Labor bond
- **Contractor wants**
 - Assurance of payment (parent guaranty, letter of credit etc)
 - Grant of O&M contract

PPAs – Key Issues and Considerations

Pricing – Contract Rate (usually tied to current or expected utility rate)

- Fixed with escalator (usually between 3 and 4%)
- Fixed without escalator
- Tied to utility rate

Pricing - Test Rate

- PPA may require buyer to take electricity if system producing some but not all expected electricity due to incompleteness => Buyer may specify reduced price for such electricity

RECs

Prepayment

- Long term revenue stream not enough alone in current market
- Used as deposit for financing in return for power price discount

PPAs – Key Issues and Considerations

Evaluating Price - Buyer

- ****Need to understand how local utility charges for electricity**
 - Tariff is basic cost per kWh - may vary depending on “Time of Use”
 - May also include Demand Charges – additional cost based on peak demand average
 - Also different tariffs
- **Conduct evaluation of customer energy use patterns, system output and available tariff structures**
 - → what components of utility rates offset by solar energy
- **Pricing based on net metering expectations**
 - most utilities (nearly all in California), but terms vary greatly
 - Need to understand
 - credit rate (may be very low price) – best if at least retail equivalent
 - caps: may be a maximum: CA is 2.5% peak demand
 - ****Cost of additional capacity exceeds benefits, so generally best to have system which does not exceed output requirements of host**
 - In Europe FITs make systems profit centers; not in the US

PPAs – Key Issues and Considerations

Output Purchase

- **Standard “Take and Pay”**
 - Seller sells and Buyer buys all output from system
- **Must be delivered to “Delivery point” to get paid**
 - Title and risk pass to Buyer
 - Distributed – delivered to point of interconnection of solar system and Buyers electric system (“behind the meter”)
 - Utility or large scale**
 - Seller wants Delivery Point to be point of interconnection of system with transmission lines (like FOB)
 - Buyer wants guaranteed delivery across transmission lines to point at which transmission connects to Buyer system

PPAs – Key Issues and Considerations

“As Available” or Output Guaranty?

- **Seller argue “as available” since motivated by revenues**
 - Specify output schedule as “targets only”
- **If power price below utility rate, Buyer may insist on Output Guaranty**
- **Often required in utility scale because power requirements of utility more complex and sourcing from multiple supply sources.**
 - Utility may be relying on RECs for RPS too
- **Utility may even specify reduced rate for excess supply**

PPAs – Key Issues and Considerations

- **Output Guaranty – Big risk item - Seller protections**

- Need ramp up and rolling average overlay to make up losses
 - Seek one or 2 years of performance to be able to fix problems before output guaranty imposed
 - Annual target subject to 3 year rolling average and “true up”
- Try to set low bar and build in annual degradation => reduction of guaranty over time
 - Seller to include acknowledgement (based on manufacturer warranties) that output will degenerate by approx 1% p.a. (in line with manufacturer warranty)
- Exclude Buyer curtailments or curtailments related to transmission problems
- Offer “Availability Warranty”
 - The panels will be available (i.e. ready and able) to produce solar power for a certain percentage of time (excludes maintenance etc) – weak guaranty.

PPAs – Key Issues and Considerations

Output Guaranty - Seller protections cont'd

- Seek “back to back” output guaranty from EPC
- Seek to rely solely on pass thru of manufacturers warranties
 - Standard warranties
 - Understand scope – often limited to “repair or replace” – no damages
- Try to hedge risk with commitments from EPC and manufacturers and pray for sunshine!

PPAs – Key Issues and Considerations

- **Consequences of breach of Output Guaranty**
 - Liquidated Damages formula
 - supply shortfall x cost per mWh (usually based on incremental cost of alternative procurement)
 - may include lost value of RECs if going to offtaker
 - Seller wants cap on LDs
 - Persistent failure to meet output guarantees => right of termination

PPAs – Key Issues and Considerations

Curtailments

- Reduction or suspension of delivery or acceptance of energy
- Lost output reduces revenues and reduces benefits (PBI under CSI, RECs, TLAs, ETLAs etc)
- Seller wants to treat lost output as if generated => Buyer to pay price plus after-tax value of lost benefits
- Treatment should be based on underlying cause or allocation of risk
 - Transmission congestion
 - Inability or unwillingness of Buyer to accept delivery
 - Emergency
 - Force Majeure
- Other compromises
 - curtailed energy applied towards output guarantees
 - Seller to mitigate loss - bypass Buyer and deliver to third party or onto grid

PPAs – Key Issues and Considerations

Force Majeure for the New Millennium (meteorites)

"Either party's non-performance of this Agreement shall be excused to the extent that it is caused by any of the following events:

- (i) Alien abduction, invasion, possession or interference. As used herein, "alien" means a life form, *whether or not carbon-based*, from any other time, world, galaxy, universe, or dimension, and includes angels, Lucifer and his minions, Yeti (a/k/a Bigfoot), Mothman, Chupacabra, Gozer, Pukwudgies and the so-called "Grays." For avoidance of doubt, "alien" does not mean a foreign national without a work visa.
- (ii) A pandemic or plague, whether or not caused by an unknown virus released during an alien autopsy at Area 51.
- (iii) *Seas boiling (whether or not the result of global warming)*, the rising of the dead (whether or not the dead appear as so-called zombies), mountains falling (but not earthquakes), the re-emergence of Atlantis, and dogs and cats living together.
- (iv) Destructive power unleashed by any of the following: the finding of the remaining crystal skulls, the reverse engineering of alien technology, or the discovery of the Ark of the Covenant.
- (v) The end of the world on December 21, 2012, according to the Mayan calendar. "

<http://contractualmusings.blogspot.com/2008/05/force-majeure-clause-for-new-millennium.html>

PPAs – Key Issues and Considerations

Term

- **PPA binding from Effective Date (subject to conditions precedent)**
- **Commencement of Term: “Commercial Operation Date” (COD)**
 - Seller wants “target” COD (whereas wants fixed “Date of Final Completion” in EPC contract)
 - Buyer usually wants fixed COD (especially if utility that needs (green) power) with liquidated damages if delay.
 - Buyer may even want milestone schedule for individual components of project (financing, module purchasing, completion of permitting etc)
- ****Not to be confused with “Placed in Service” (PIS) date**
 - Must be careful
 - Note also interplay between COD and PIS and “Substantial Completion” and “Final Completion” in EPC contract

PPAs – Key Issues and Considerations

Term of PPA

- **Usually 15, 20 or 25 years, but can be less**
- **May be renewals (usually debt paid off so price should drop)**
 - Seller beware continuing obligations re output or may have to replace modules without charge
- **End of term Seller usually required to remove system**
 - In practice?
 - Just cells swapped out and systems remain in place

Buyer Option to purchase

- **Buyer usually has option to purchase after year 5 when tax benefits have been exhausted (cash grant/ITC, MACRS, CSI)**
- **May be options every year after yr 6, or every 5 years thereafter, at end of term only or no option at all – no standard.**

PPAs – Key Issues and Considerations

Option Pricing

- **IRS requires that price must be no less than “Fair Market Value”**
- **Usually greater of FMV and scheduled “Termination Amount”**
- **Forced buyout on termination for breach by Buyer will often include additional costs**

PPAs – Key Issues and Considerations

Termination

- **Drastic remedy, so significant opportunities to cure and real time liquidated damages**
- **Lenders and Tax Equity rights**
 - Step in rights to cure
 - Notice and extended cure periods
- **Uncured breach by Buyer**
 - Forced buyout at greater of FMV and Termination Amount plus additional breach costs => liquidated damages
- **Sale of property by Buyer – forced buyout at greater of FMV and Termination Amount**
- **Uncured breach by Seller**
 - Liquidated damages
 - Failure to meet COD
 - Failure to meet Guaranteed Output
 - Termination for uncured material breach or chronic breaches (death by a 1000 cuts)

PPAs – Key Issues and Considerations

- **Walk away**
 - Condition Precedent – walk away, maybe break fee (or forfeited down payment to utility)
- ****Utility Right of First Offer (ROFO)**
 - Termination for failure of condition precedent or extended Force Majeure

PPAs – Key Issues and Considerations

Interconnection and Transmission

- **Interconnection costs power usually payable by Seller**
 - Expensive and long cues
- **Transmission: if project located on remote land, may require significant transmission of power from system to remote delivery point (e.g. substation)**
 - expensive and may involve payment of additional amounts for network upgrades to transmission provider

Operations & Maintenance

- **Simple “Preventive Operation & Maintenance Services”**
 - Annual inspections of modules, inverters, roof penetrations and supports
 - Meter checks, system performance monitoring (real time using DAS)
 - Cleaning – remove dust, debris, power washing
 - Repairs
 - Inverter replacement (usually every 10 years) - expensive
- **Usually granted to EPC contractor**

PPAs – Key Issues and Considerations

Real property rights – Lease, Easement or License

- **To be financeable, need long term site rights to build, operate and maintain the system**
 - include access rights
 - unencumbered and unencumberable solar exposure
 - rights to transmission of power from the property to transmission lines etc (if applicable)
 - ****flexibility for modifications (e.g. swapping solar panels for better panels in future and O&M**
- **Lease or easement bankable because both an “interest in land” secured on title**
 - Lease: broadest rights
 - Easement: can be similar to a lease but usually for non-exclusive occupancy land rights

PPAs – Key Issues and Considerations

- License: mere personal property interest, not real property interest and may be revocable or breachable without specific performance
- **Need Buyer covenant to procure non-disturbance agreement with Buyer mortgagee (or master lessor)**
 - Allows continuation of lease if bank forecloses/master lessor terminates buyer/lessee lease
- **Ownership of land may be necessary**
 - Options for large scale projects or land identified for multiple projects
- **May need easements over adjacent property to ensure no activity which obstructs sunlight**

The End