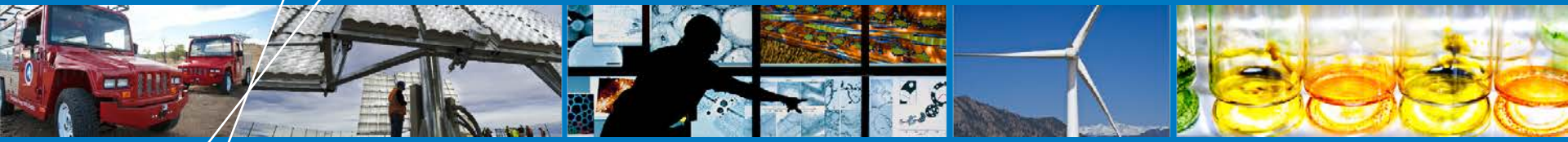
NREL
NATIONAL RENEWABLE ENERGY LABORATORY

# Power Purchase Agreements and their Role in Project Finance



## DOI/BIA Utility-Scale Solar Energy Development Workshop

## Phoenix, AZ

## February 20, 2013

**Scott Haase**

# Objectives

- **Review key concepts/terms**
  - RPS – renewable portfolio standard
  - IRP – integrated resource plan
  - PPA – power purchase agreement
  - PUC – public utility commission
- **Overview of IRP process**
- **How PPAs are generated in the IRP process**
  - The request for proposals (RFP)
- **Role of PUC in approving the PPA**
- **Typical PPA elements**

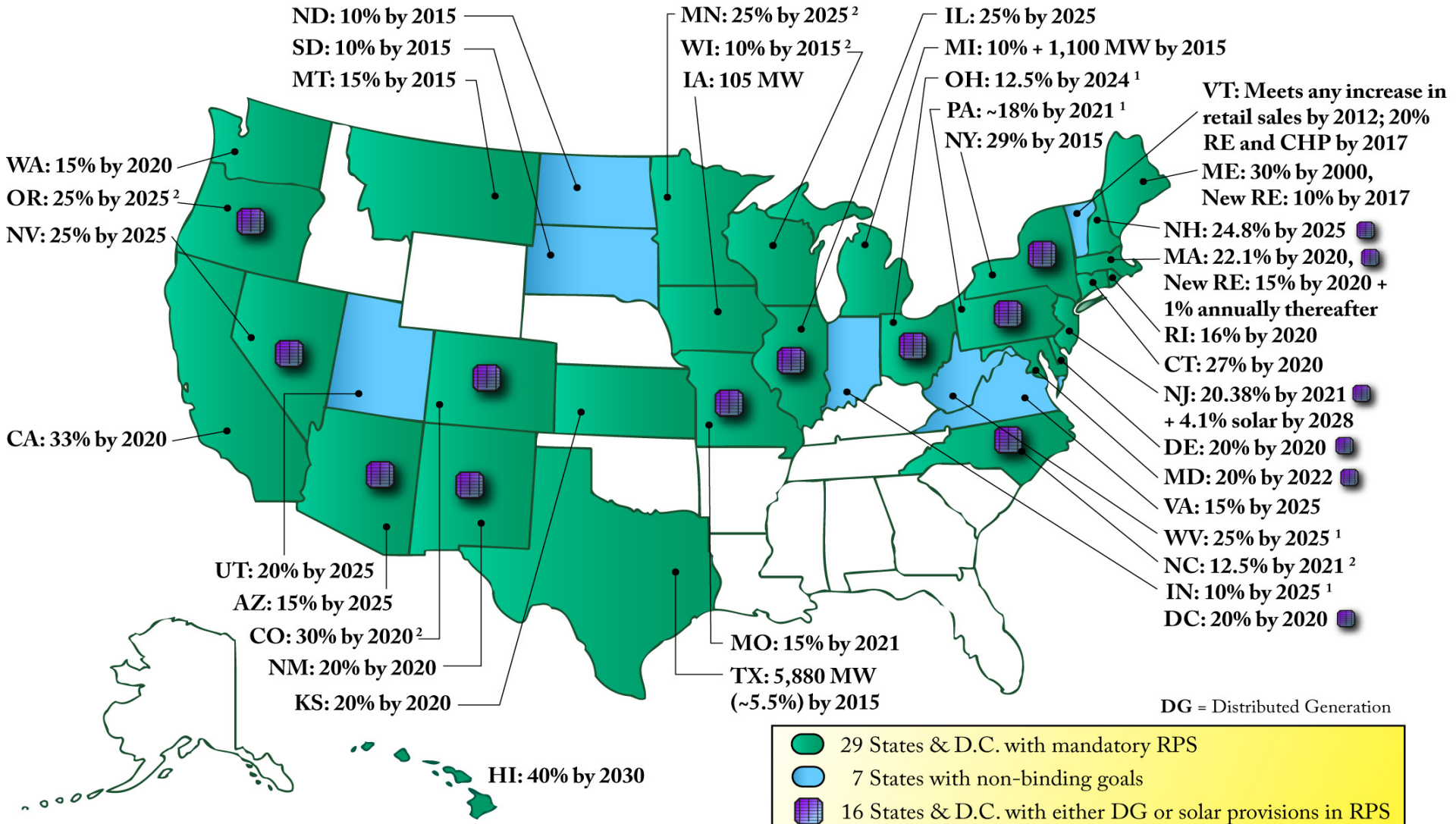
# Key Concept: Renewable Portfolio Standard

- What? State based law (or goal) requiring a certain percentage of retail power sales to come from renewable energy
- Who? Utilities, regulators, developers
- When? Dates vary widely
- Why? Supply diversity, economic development, desire to be green

➔ Some states have solar set asides


# States with Renewable Portfolio Standards

## (indicating solar/DG set-asides)




**DG** = Distributed Generation

29 States & D.C. with mandatory RPS

7 States with non-binding goals

16 States & D.C. with either DG or solar provisions in RPS

[1] Includes non-renewable alternative resources

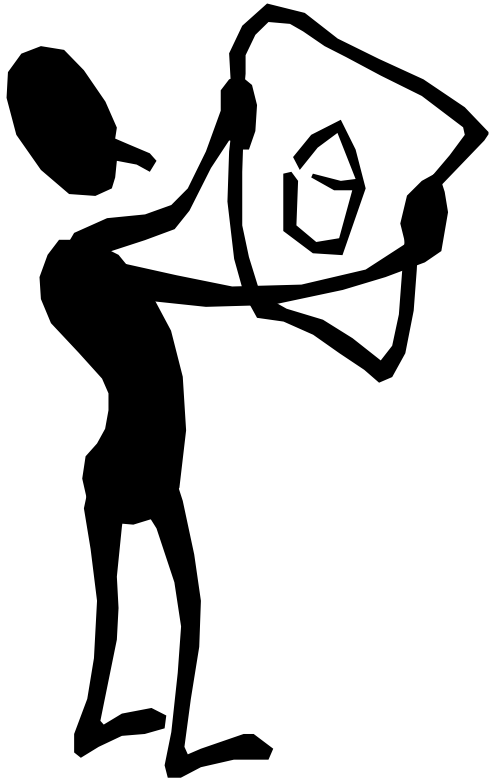
[2] Indicates variations by utility

**Source:** National Renewable Energy Laboratory and DSIRE (October 2012)

# Key Concept: Integrated Resource Plan

- What? Public planning process and framework to evaluate utility resource options to meet demand
- Who? Utilities and regulators
- When? Short-term and long-term needs
- Why? Analyze cost of and benefits from supply-side and demand-side options

➔ can include environmental impacts, EE and RE alternatives



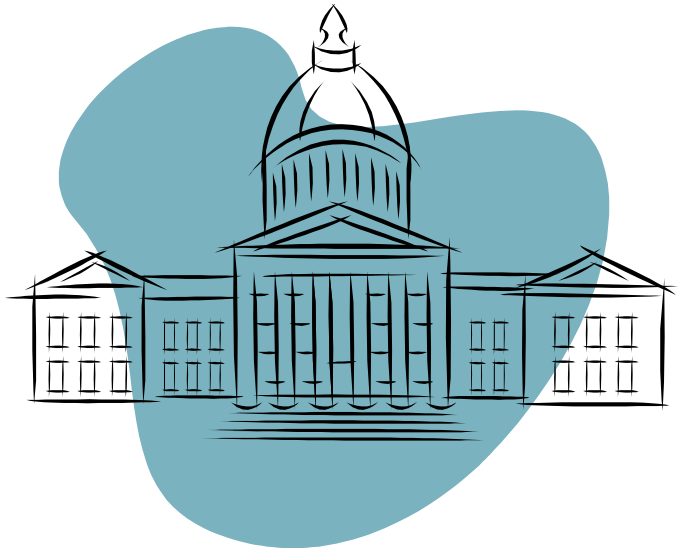
Sources: EEI, Expert Glossary

# Key Concept: Power Purchase Agreement

- What? Contract to purchase electricity (a.k.a. power)
- Who? Between utilities and independent power producers
- When? Long-term (10-25 years; ~20 years for RE)
- Why? To secure investor capital to build the plant in the first place

# Key Concept: Public Utility Commission

- What? State regulatory agency that oversees retail utility rates and approve PPAs
- Who? Governs investor-owned utility decisions about new generation, transmission and distribution
  - Does not include municipal utilities or rural coops
- When? Short- and Long-term
- Why? To make sure that customer rates are reasonable, while electric grid reliability is maintained
- Also called? Public Service Commission

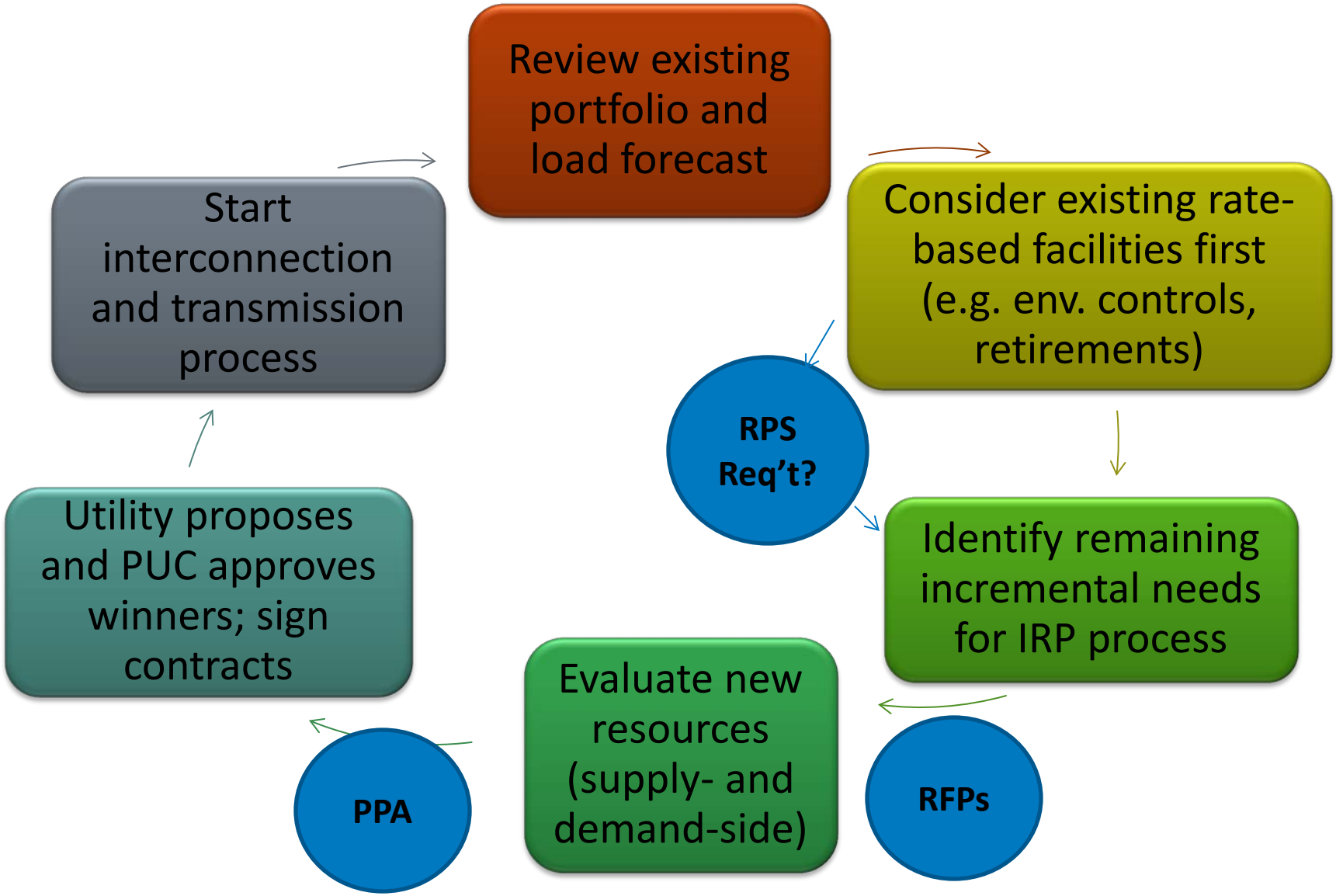


Sources: EEI, Expert Glossary

# For investor-owned utilities, PUC regulate:

- **Supply decisions**
  - Utility-owned generation (rate-base)
  - PPAs with utility-scale generators,
  - Demand response programs,
  - Other supply- or demand-side sources
- **Transmission decisions**
  - Interconnect new generators under PPA
  - New transmission builds to enhance reliability
- **Distribution decisions**
  - Interconnect new customers (e.g. load)
  - Interconnect on-site generation

# Overview of IRP Process (every 2-5 yrs)



# Contracting: How PPAs are Generated

1. **Request for proposal (RFP)**
   - Utility gets PUC permission to issue an RFP
     - Usually RE done in its own RFP (to meet RPS)
     - Sometimes RE eligible in general RFP
   - Proposals submit by date certain
   - Utility evaluates and makes recommendation to PUC
     - Least-cost is usually main criterion
   - PUC approves or asks for changes – next step: PPA!

2. **Sole source contract (opportunistic situations)**
   - Developer approaches utility directly (if no RFP open)
   - If interested, utility asks PUC for approval
   - Next steps depend on the state and the PUC
     - Some will approve after evaluating
     - Some might require an RFP to compare
   - PUC approves or asks for changes – next step: PPA!

# Typical RFP requirements

1. Confidentiality agreement
2. Project location
3. Evidence of site control*
4. Full technical description of project including status of interconnection agreements
5. Resource assessment
6. Evidence of community support
7. Status of environmental compliance, permits
8. Proposed schedule for delivering power
9. Team qualifications
10. Price, terms, credit-worthiness, financing partners

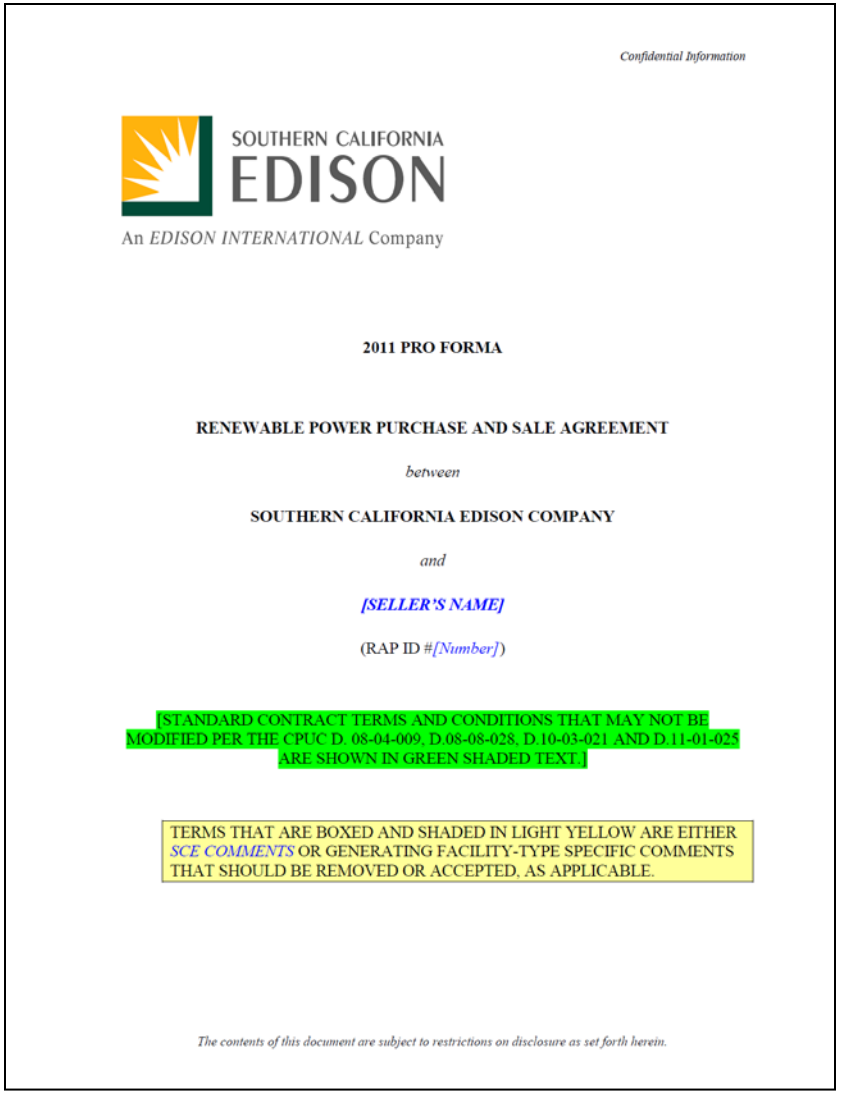
* Critical issue – successful developers have legally binding agreements for site

# Typical RFP/PPA process and milestones

1. RFP released- detailed instructions on what, how, when to submit
2. Proposal conference for developers
3. Proposals submitted
4. Utility evaluates, ranks
5. Utility creates short list
6. Utility/developer sign exclusivity agreements
7. Final short list submitted to PUC
8. Utility negotiates with short listed applicants for Final Agreements (PPA)
9. Utility submits Final Agreements to PUC for approval
10. PUC approves/rejects

# Typical PPA Elements

- Specialized legal assistance required
- Primary document used to obtain financing for construction
- Long (200+ pages), complicated contract
- Governs terms and conditions of the project for at least 20 years
- Project description, key milestones, delivery guarantees, penalties for failure to deliver
- Rights and responsibilities of all parties
- Credit and collateral requirements, performance bonds



*Confidential Information*

SOUTHERN CALIFORNIA EDISON

An *EDISON INTERNATIONAL* Company

**2011 PRO FORMA**

**RENEWABLE POWER PURCHASE AND SALE AGREEMENT**

*between*

**SOUTHERN CALIFORNIA EDISON COMPANY**

*and*

***[SELLER'S NAME]***

(RAP ID #*[Number]*)

[STANDARD CONTRACT TERMS AND CONDITIONS THAT MAY NOT BE MODIFIED PER THE CPUC D. 08-04-009, D.08-08-028, D.10-03-021 AND D.11-01-025 ARE SHOWN IN GREEN SHADED TEXT.]

TERMS THAT ARE BOXED AND SHADED IN LIGHT YELLOW ARE EITHER *SCE COMMENTS* OR GENERATING FACILITY-TYPE SPECIFIC COMMENTS THAT SHOULD BE REMOVED OR ACCEPTED, AS APPLICABLE.

*The contents of this document are subject to restrictions on disclosure as set forth herein.*

Sample PPA:
http://asset.sce.com/Documents/Shared/B-1_2011_SCERFPProFormaAgreement.doc

# Drivers of future RE


## Demand drivers

- RPS increases
- National RPS/RES

## Market Driver

- Cost drivers (technologies getting cheaper)
- Energy Imbalance Market (EIM)

## Legislative Drivers that Shift Supply

- Environmental regulations (e.g. EPA MATS??)
- Climate change legislation

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# Leading the Way to a Clean Energy Future

# Back-up slides – RFP details

# Site control

- Project location
- Site control
  - Legal description of property
  - Site maps
  - Copies of legal agreements from tribe and/or landowners to use the land for the project
  - Aerial photos

# Technical description

- Technology type, description
  - Solar, wind, biomass, geothermal
  - Size and type of turbines, panels, etc.
  - Manufacturer specs
  - Equipment performance guarantees
- Power production estimates (expected generation by hour for an entire year) and engineering calculations used
- Plant schematics and one line drawings showing layouts for generation equipment, buildings, roadways, interconnection
- Describe all interconnection equipment (transformers, switchgears, substations, new lines, delivery points)

# Fuel supply/resource assessments

- **Biomass**
  - Copy of supply study
    - quantity, availability, cost, location
  - Delivery arrangements, fuel supply contracts
  - On-site storage amount
  - Cost risk – who bears it?
  - Competing markets
- **Wind**
  - Site specific data from met towers
  - Copy of seller's wind resource report
  - Verified by third party meteorologist/ engineer
- **Solar**
  - Site specific data

# Interconnection agreements

- Follows FERC process
- Usually, must be able to deliver power to purchasing utility system
  - Or Seller must arrange for third party service/wheeling
- Seller must file interconnection requests, or describe plans for filing
- Copies of any completed applications
- Copies of any agreements or completed Feasibility Studies, System Impact Studies or Facility Studies
- Copies of any agreements for network upgrades
- Copies of any executed interconnection agreements

# Regulatory compliance

- Seller is responsible for NEPA and obtaining all permits
- A written description of all applications, permits and approvals required to construct and operate the facility and all associated interconnecting utilities, including but not necessarily limited to:
  - Conditional Use Permit; Air Emission Permit; Authority to Construct; or Certificate of Public Convenience and Need.
  - A description of Seller's progress toward obtaining the necessary applications, permits and approvals.
- Copies of any permits and approvals that have already been received
- Copies of any applications filed with a state or local authority seeking authorization of the construction or operation of the facility
- A table which summarizes the air emission levels Seller anticipates will be established for the Generating Facility by the appropriate air permitting agency, if applicable, including:
  - Oxides of Nitrogen (NOx); Carbon Monoxide (CO); Volatile Organic Compounds (VOCs); and Particulate Matter (PM)
- A written description of the operating limitations that the permits have or expect to have which may constrain the operation of the facility including the maximum number of operating hours

# Project schedule

- Milestone chart and schedule
- Show key activities
- Critical path items
  - Design
  - Engineering
  - Permits
  - Interconnection
  - Financing
  - Procurement
  - Construction
  - Commissioning

# Team

- Describe corporate structure of project entity (partners, ownership levels, managing partners)
- Fully describe roles and capabilities of each participant including
  - development team, management team, legal counsel, financial advisor
  - owner's engineer, construction contractor, transmission consultant, environmental consultant
  - construction period lender, operating period lender

# Pricing

- Prices are quoted in U.S. dollars and considered firm unless expressly stated otherwise
- Prices should be quoted as an all-in levelized cost, in terms of dollars per Megawatt-hour ($/MWh)
- The Seller will be responsible for compliance with all applicable existing and future environmental requirements during the term of a PPA
- If the Seller's pricing policy involves escalation or an index, the escalation terms and conditions or specific index must be included for evaluation
  - Indexes used should be published and publicly available

# Ability to Finance

- Utilities want credit worthy sellers
- Provide annual financial reports and independent audits of each entity in the ownership group
- DUNS #, S&P, Moody's debt ratings
- Description of project financing plan and all arrangements for equity/debt financing of the project
- Letters of credit