Business Structures and Financing for Energy Projects

Paul Schwabe

U.S. DEPARTMENT OF ENERGY


5 STEP PROJECT DEVELOPMENT PROCESS

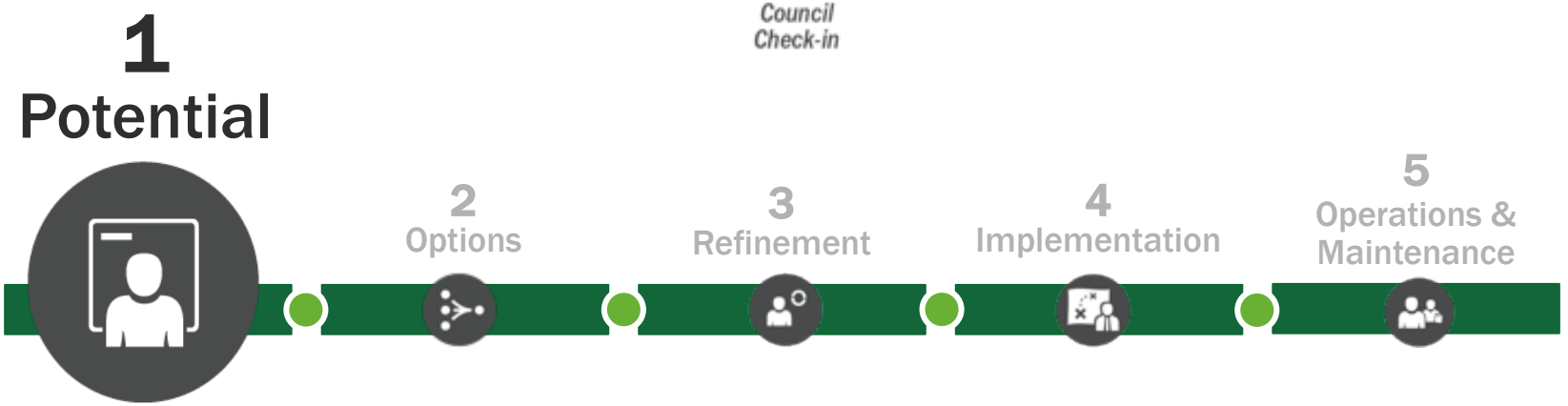
Project Development Process: What Is It?

- Framework based on **experience**
- Focuses on key **decision points**
- Shows that project development is **iterative**
- Emphasizes that delaying or deciding against a project that does not meet current **goals** is a viable outcome and option

More information available at:

http://www.energy.gov/indianenergy/resources/education-and-training


Comprehensive Energy Plan
1 PROJECT POTENTIAL: Data Collection and Opportunity Assessment
Council Check-in
2 PROJECT OPTIONS: Strategy and Detail
Council Check-in
3 PROJECT REFINEMENT: Planning and Development
Council Check-in
4 PROJECT IMPLEMENTATION: Financing and Construction
5 PROJECT OPERATIONS AND MAINTENANCE
Project Development and Financing Strategy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Options
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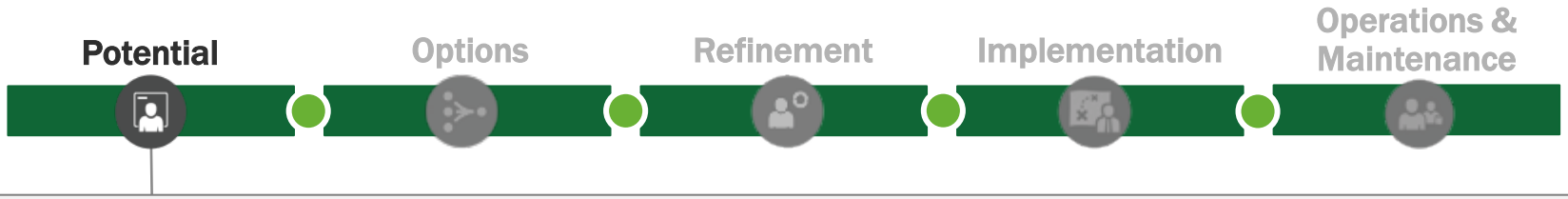
Refinement
4
Implementation
5
Operations & Maintenance

Step 1: Site, Scale, Resource, and Community Market Potential



Purpose: Determine whether basic elements for a successful project are in place

Tasks:

1. Identify possible **sites** for project locations
2. Determine the **energy load/demand** for these sites using past electric bills for these facilities
3. Confirm renewable energy **resource**
4. Review Tribal facility electric cost data, regulations, and transmission and interconnection requirements
5. Evaluate community market potential for renewable sales. **Your community is the marketplace/energy –user.**
6. Assemble or communicate with the right team, those in positions or with knowledge to facilitate, approve, and champion the project

→ Analyze risks: financing, permitting, construction costs

→ Analyze utility rules: interconnection and transmission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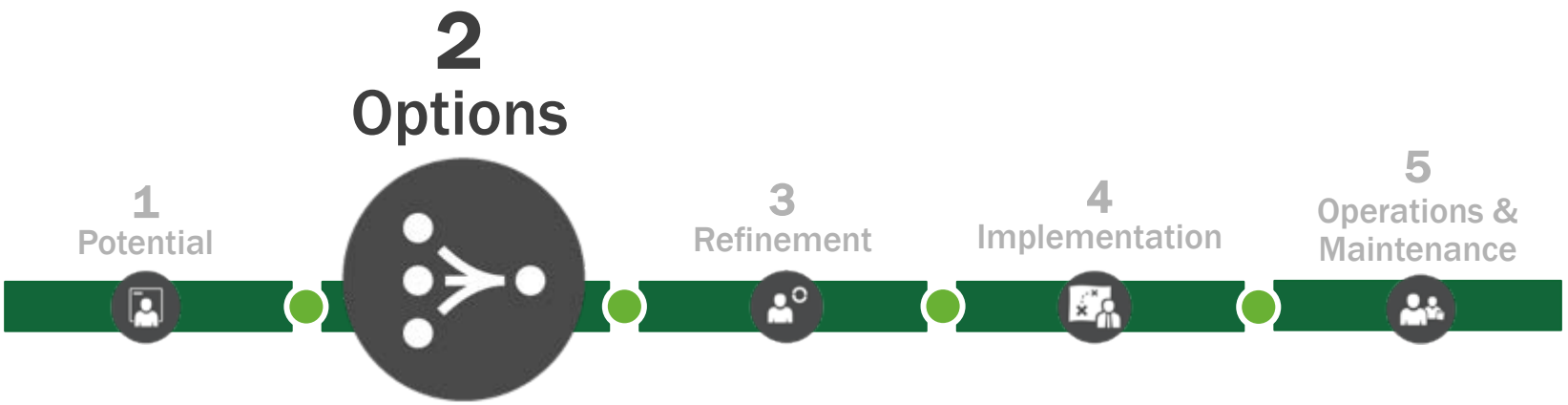
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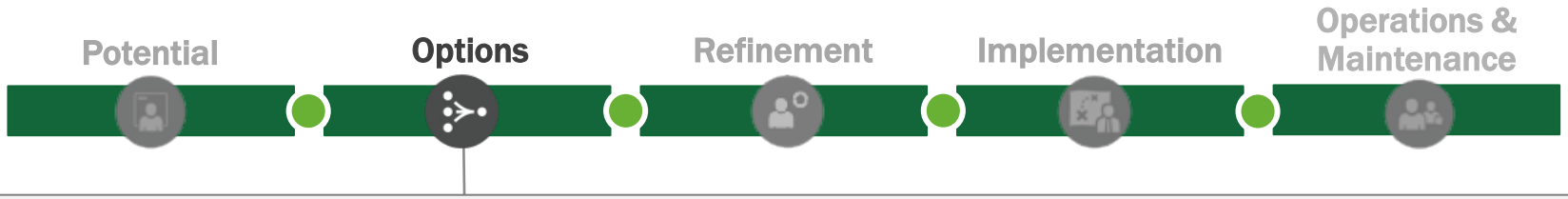
Step 2: Project Ownership and Local Regulatory Options



Purpose: ***(Assumption: community-scale project on tribal land)*** Determine ownership structure and permitting considerations if any. *(Note: It is likely that internal tribal permitting is required if developed on Tribal lands, however, state and federal permitting may be required if the Tribe is dealing with fee or trust land outside the Tribal land holdings.)*

Tasks:

1. Identify final resource and project location
2. Understand ownership structure/Tribal role and risk allocations
3. Narrow financing options and clarify tax-equity structure
4. Initiate engineering, procurement, and construction (EPC) process
5. Understand and plan for permitting, interconnection, and transmitting power to residents within the community

Resources:

DOE Office of Indian Energy renewable energy technology-specific webinars:
http://www.energy.gov/indianenergy/resources/education-and-training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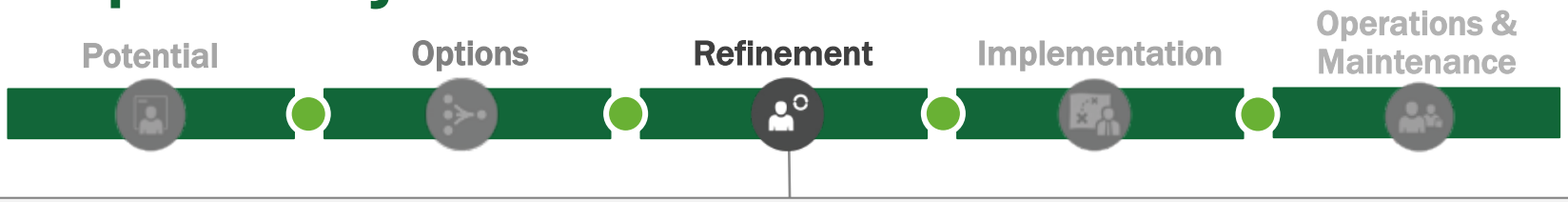
Step 3: Project Refinement



Purpose: Validate decisions and finalize project structure

Tasks:

1. Finalize ownership structure and project team identification
2. Finalize permitting including environmental reviews, net metering, and interconnection
3. Finalize technology, financing, and development costs

Outputs:

1. Proposed financing/commitments and organization structure
2. Detailed economic models
3. Vendors selected
4. Completed environmental reviews and finalized permits
5. Net-metering and interconnection agreement
6. Transmission finalized, if necessary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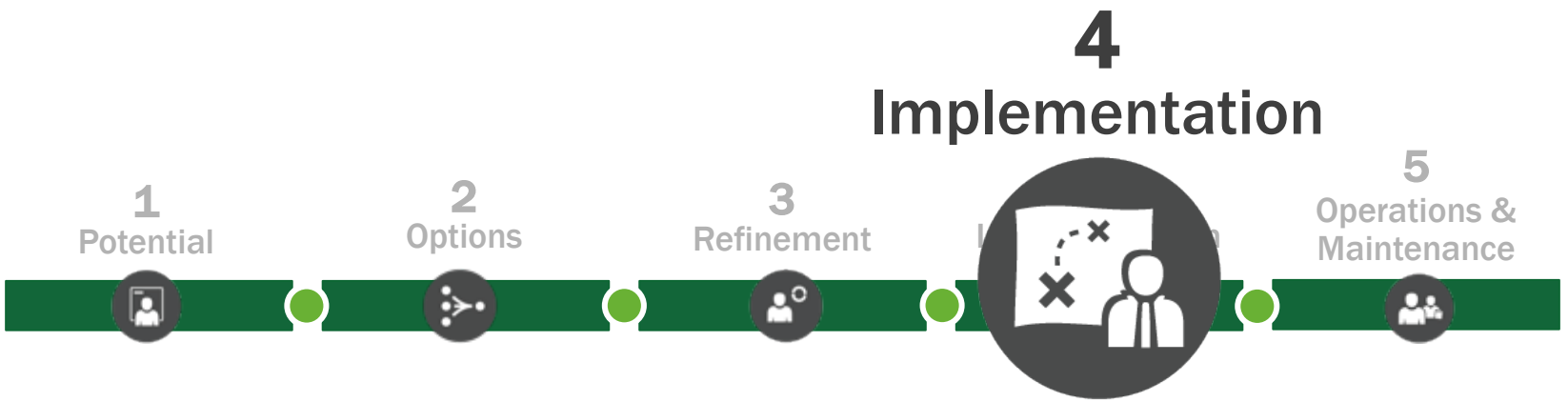
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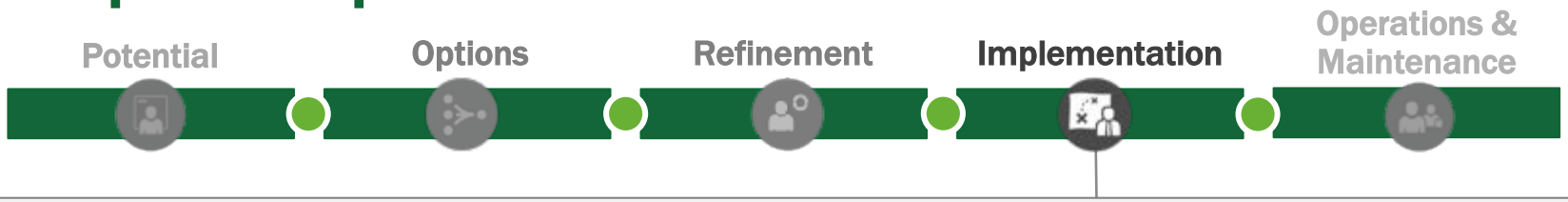
Step 4: Implementation



Purpose: Contract for, realize physical construction of project

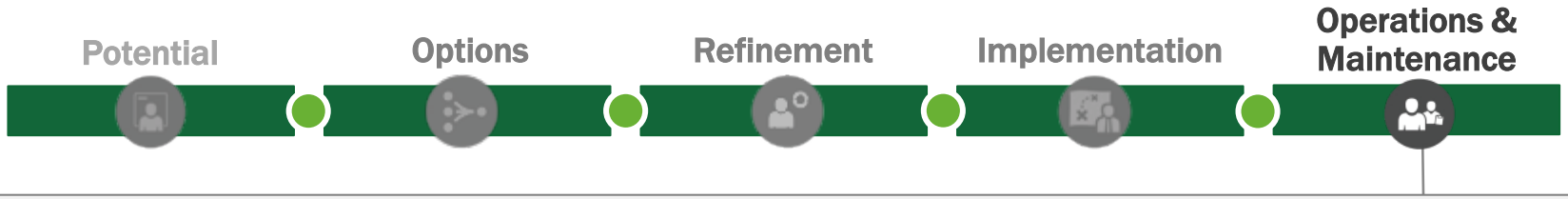
Tasks:

1. Finalize project agreements
2. Finalize vendor contracting process
3. Finalize preconstruction tasks
4. Realize construction and equipment installation
5. Realize interconnection and net metering
6. Realize project commissioning leading to operation

Output: Completed project (operation)

Project Development Process

Step 5: Operations & Maintenance



Purpose: Conduct or ensure ongoing operations and maintenance (O&M), including repair and replacement (R&R)*

O&M Costs:

- Equipment maintenance and upkeep
- Gearbox/inverter replacement
- Insurance
- Labor
- Extended warranty agreements

Maintenance:

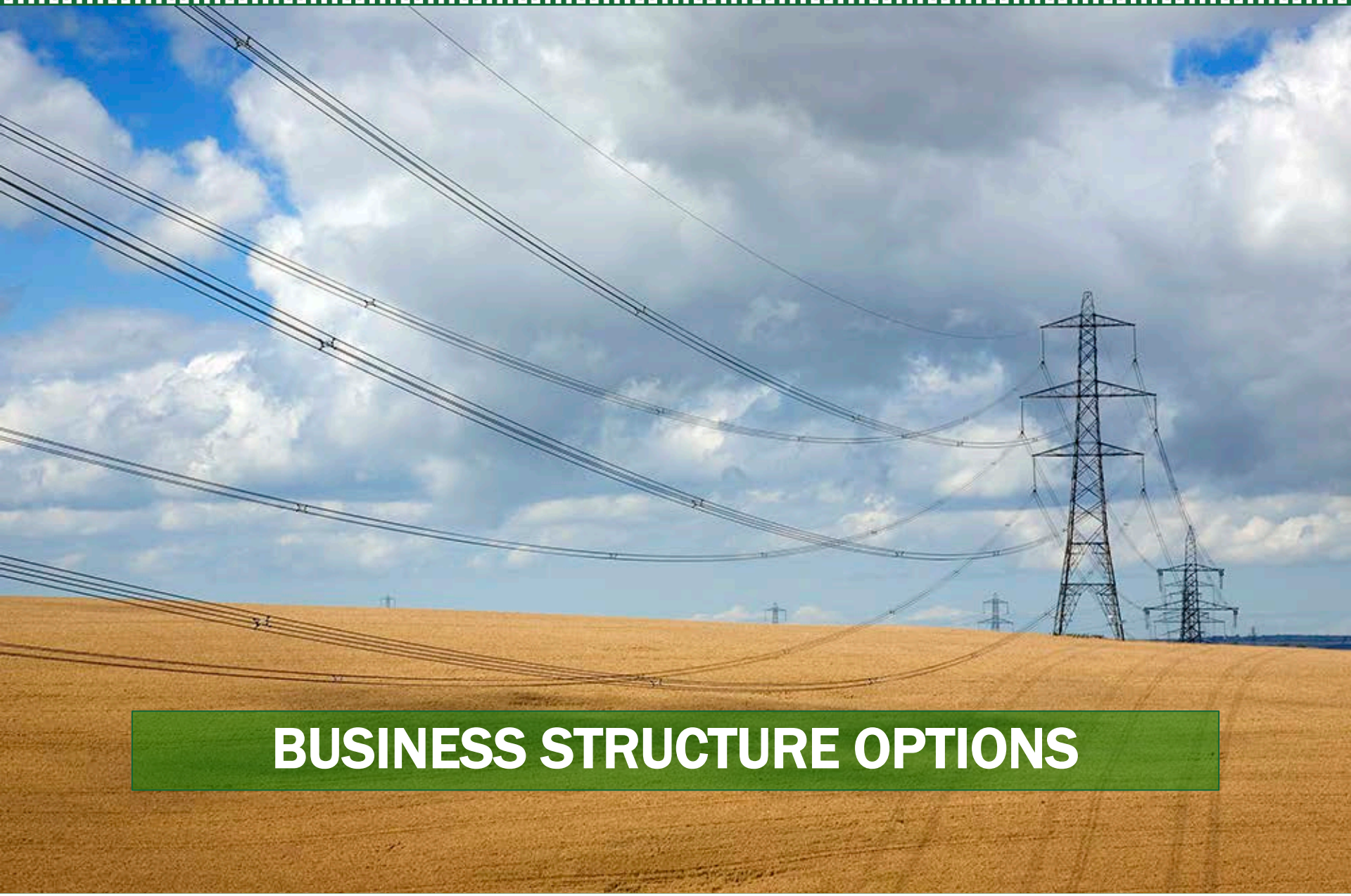
- If **leasing**, lessor often manages maintenance
- If **power purchase agreement (PPA)**, vendor typically manages maintenance

**Especially if owner – role of highest O&M risk*

Photo from Florida Solar Energy Center, NREL 14728

Financing Agenda

- Business Structures
- Requirements for Financing
- Federal Tax Incentives: Why should you care?
- Financing Options



BUSINESS STRUCTURE OPTIONS

Importance of Choosing the Right Business Structure

- Protect Tribal assets
- Preserve Tribal sovereignty
- Minimize potential liability

Photo by Brian Hirsch, NREL 20893

Business Structure Options for Tribes

1. Tribal government entities
   - Unincorporated instrumentalities
   - Political subdivisions
   - Utility authority
2. Section 17 corporations
3. Tribally chartered corporations
4. State law entities
   - State law corporations
   - Limited liability companies (LLCs)
5. Joint venture

Evaluating the Options

Business Structure Option	Simplicity and Quick Formation	Shield Tribal Assets from Business Liabilities	Avoid Federal Income Taxes	Separate Business from Tribal Control	Ability to Secure Financing
Tribal Instrumentality*	●		●		●
Political Subdivision*			●		●
Section 17 Corporation*		●	●	●	●
Tribal Law Corporation*	●	●	●	●	●
State Law Corporation	●	●		●	●
LLCs/Joint Venture		●	●	●	●

*(*Can be protected by Tribal sovereign immunity)*

FINANCING REQUIREMENTS

Requirements for Financing

Site	Resource	Off-Take / Energy Users	Permits	Technology	Team	Capital
Securing site: No site, no project	Engineering assessment (input)	Power purchases: off-take contract – (revenue)	Anything that can stop a project if not in place…	Engineered system (output)	Professional, experienced, diverse	Financing structure
• Site control • Size and shape • Location to load and T&D • Long-term control • Financial control • Clear title • Lease terms • Collateral concerns • Environmental • Access • O&M access • Upgradable	• Volume/ Frequency • Variability • Charac-teristics (power/speed) • 24-hour profile • Monthly, seasonal, and annual variability • Weather dependence • Data history • Std. deviation • Technology suitability	• Credit of counterparty • Length of contract • Terms and conditions • Reps and warranties • Assignment • Curtailment • Inter-connection • Performance • Enforcement • Take or pay • Pricing and terms	• Permitting/ entitlements • Land disturbance • Environmental and cultural impacts • Resource assessments • Wildlife impacts • Habitat • NEPA, EIS • Utility inter-connection • Other utility or PUC approvals • Lease and/or ROW approvals	• Engineering design plans • Construction plans • Not generic solar panel and inverter • Engineered resource/ conversion technology/ balance of system designs • Specifications • Bid set	• Business management • Technical expertise • Legal expertise • Financial expertise (including tax) • Transmission interconnection expertise • Construction/ contract management • Operations • Power marketing/sales	• Development equity • Project equity • Nonrecourse project debt • Mezzanine or bridge facility • Tax equity • Grants, rebates, other incentives • Environ-mental attribute sales contracts (RECs) • Bond finance

FEDERAL INCENTIVES: DETAILS

Federal Tax Incentives

- Investment Tax Credit (ITC)
- Modified Accelerated Cost Recovery System (MACRS) and bonus depreciation

Comparison of Tax Incentives

	ITC	Accelerated Depreciation
Value	Tax credit of 10% or 30% of project costs, depending on tech	Depreciation of eligible costs (not all project costs qualify)
Select Qualifying Technologies	• Solar • Fuel cells • Small wind • Geothermal	Depreciation can be taken with either PTC or ITC
Basis	Eligible project cost. Credit taken at the time the project is placed in service. Can be combined with depreciation.	MACRS: 5-year depreciation schedule Bonus: 50% first year accelerated depreciation on equipment
Expiration	Placed in service before 1/1/2017*	MACRS: None Bonus: 1/1/2014

Key Concept: Tax-Equity Partnerships

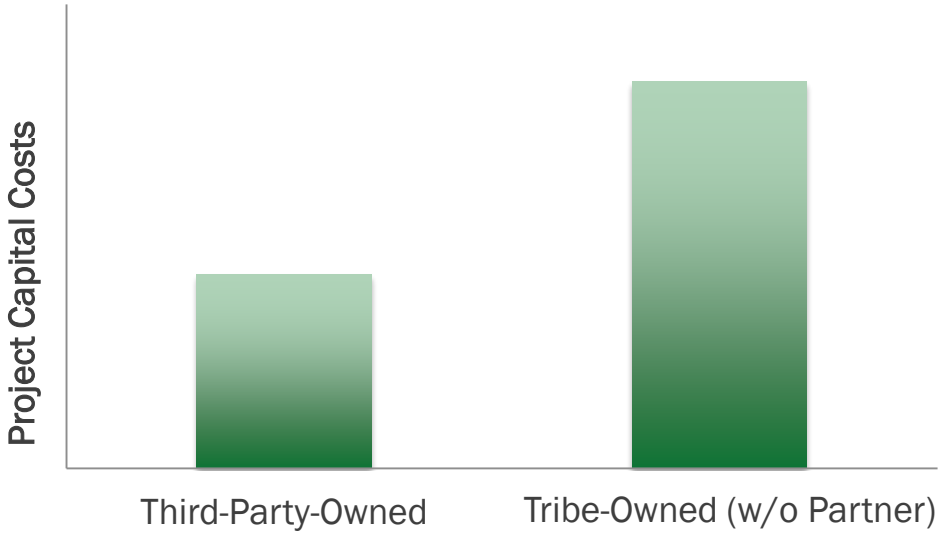
1. Tribe can benefit from tax-equity incentives without being taxable

2. Tribes can partner with third-party tax investors and/or developers to gain this incentive/advantage
   - Recent IRS PLR supports Tribal partnerships with third-party tax equity http://www.irs.gov/pub/irs-wd/1310001.pdf
   - Even with IRS ruling, the Tribe needs capital to build a large renewable project

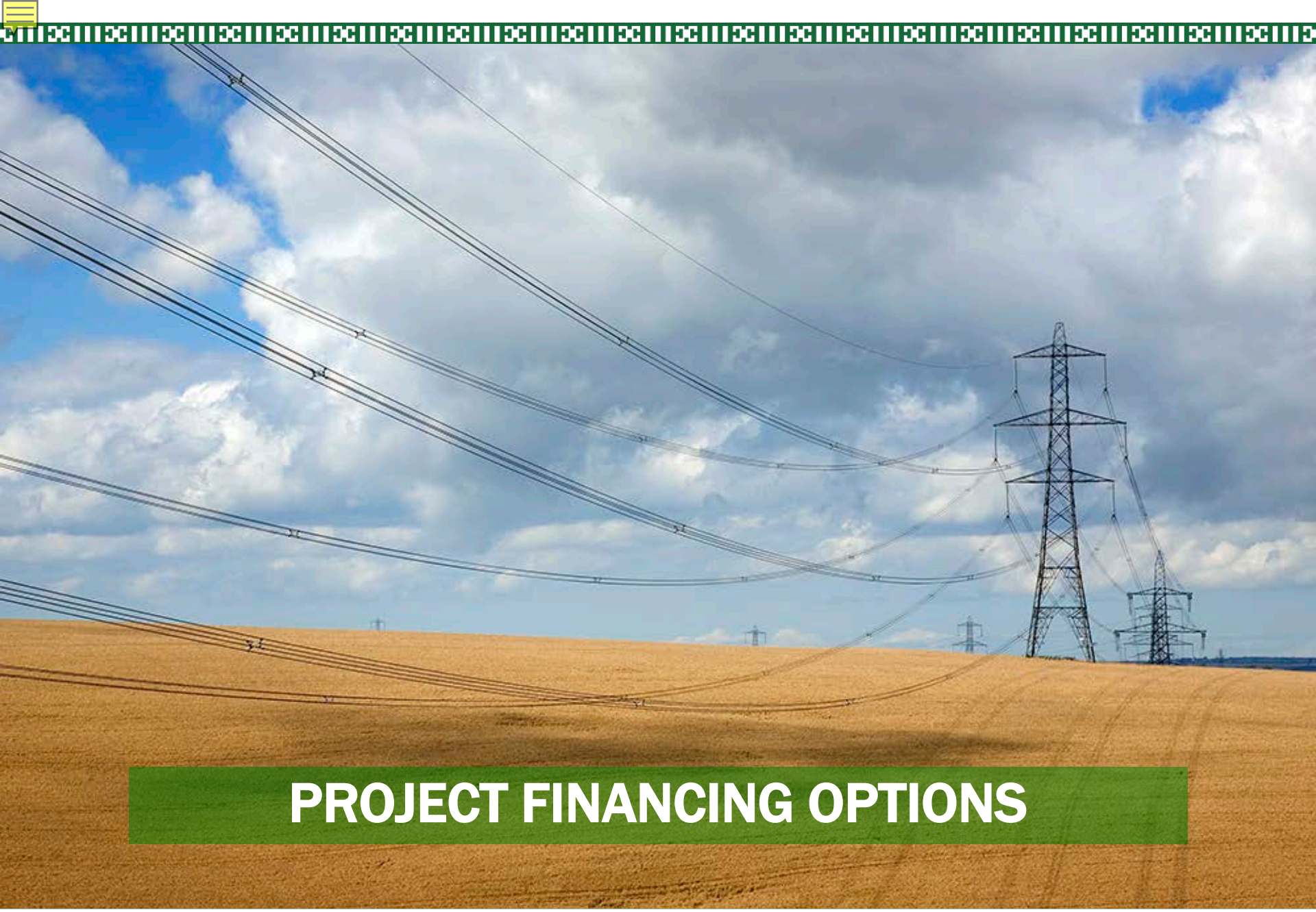
3. Tribe benefits by offering a more competitive price for energy and RECs from the project to a utility

So Why Seek a Tax-Equity Finance Partner?

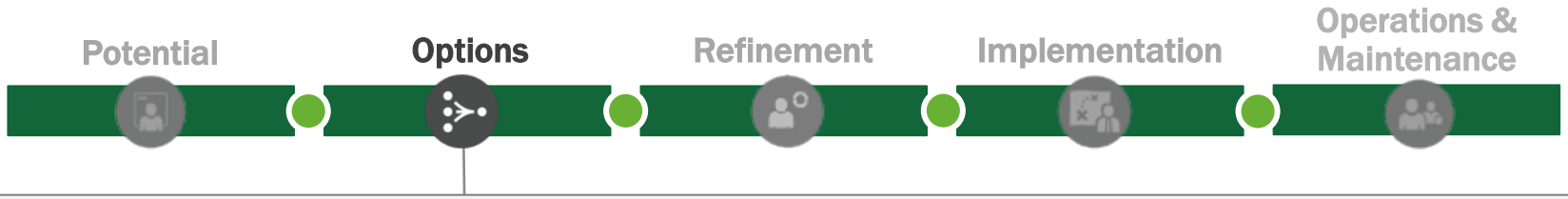
- Tax incentives such as Modified Accelerated Cost Recovery System (MACRS) and either Production Tax Credit (PTC) or Investment Tax Credit (ITC) can represent up to half the project value, or reduce project capital costs by ~50%



- Tax incentives can help to achieve a competitive price of power
- Many projects also require state-level incentives to be economic

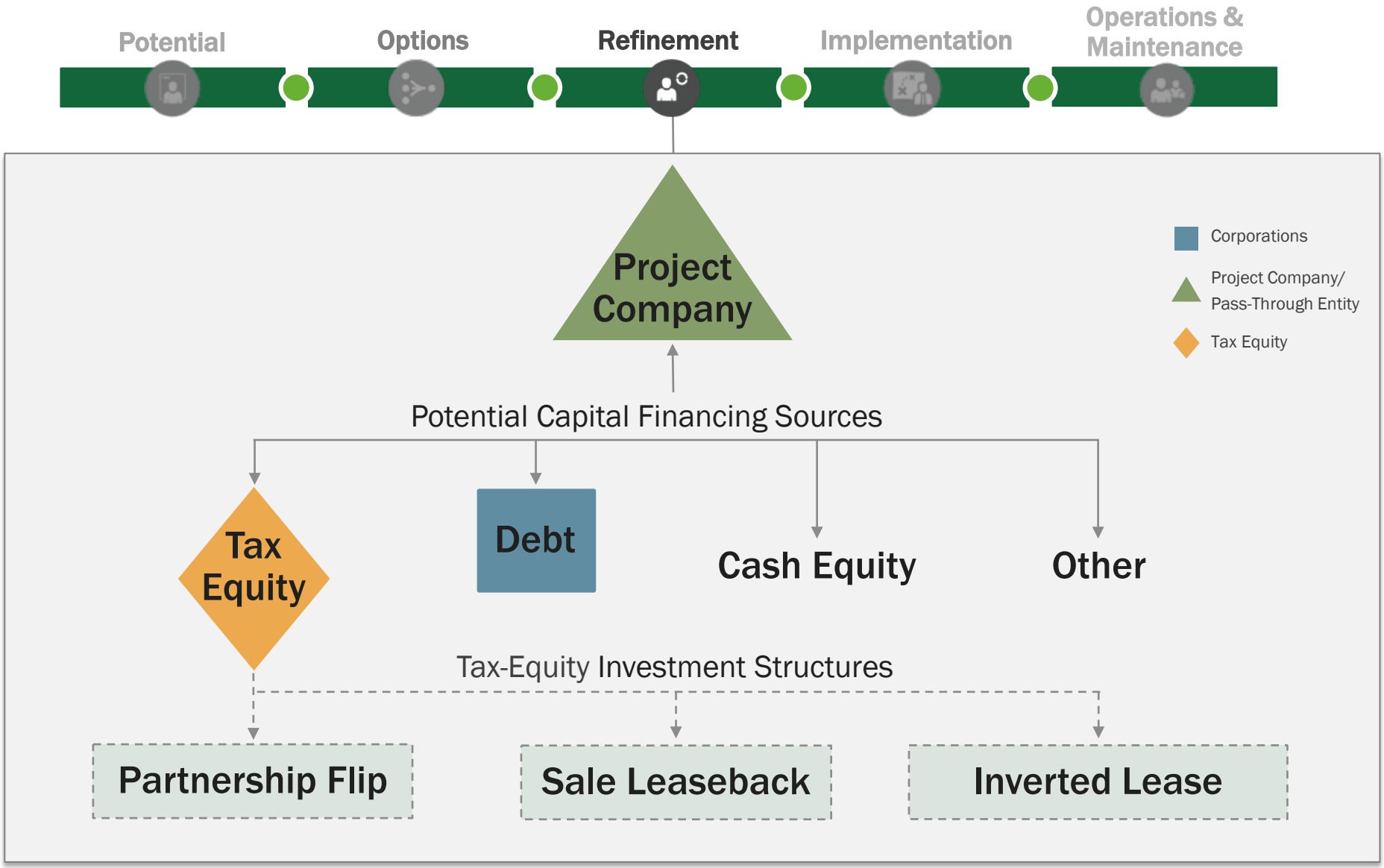

PROJECT FINANCING OPTIONS

Step 3: Ownership and Financing Options



- Direct ownership (cash)
- Grants
- Incentives
- Debt
- Energy savings performance contracts (ESPCs)

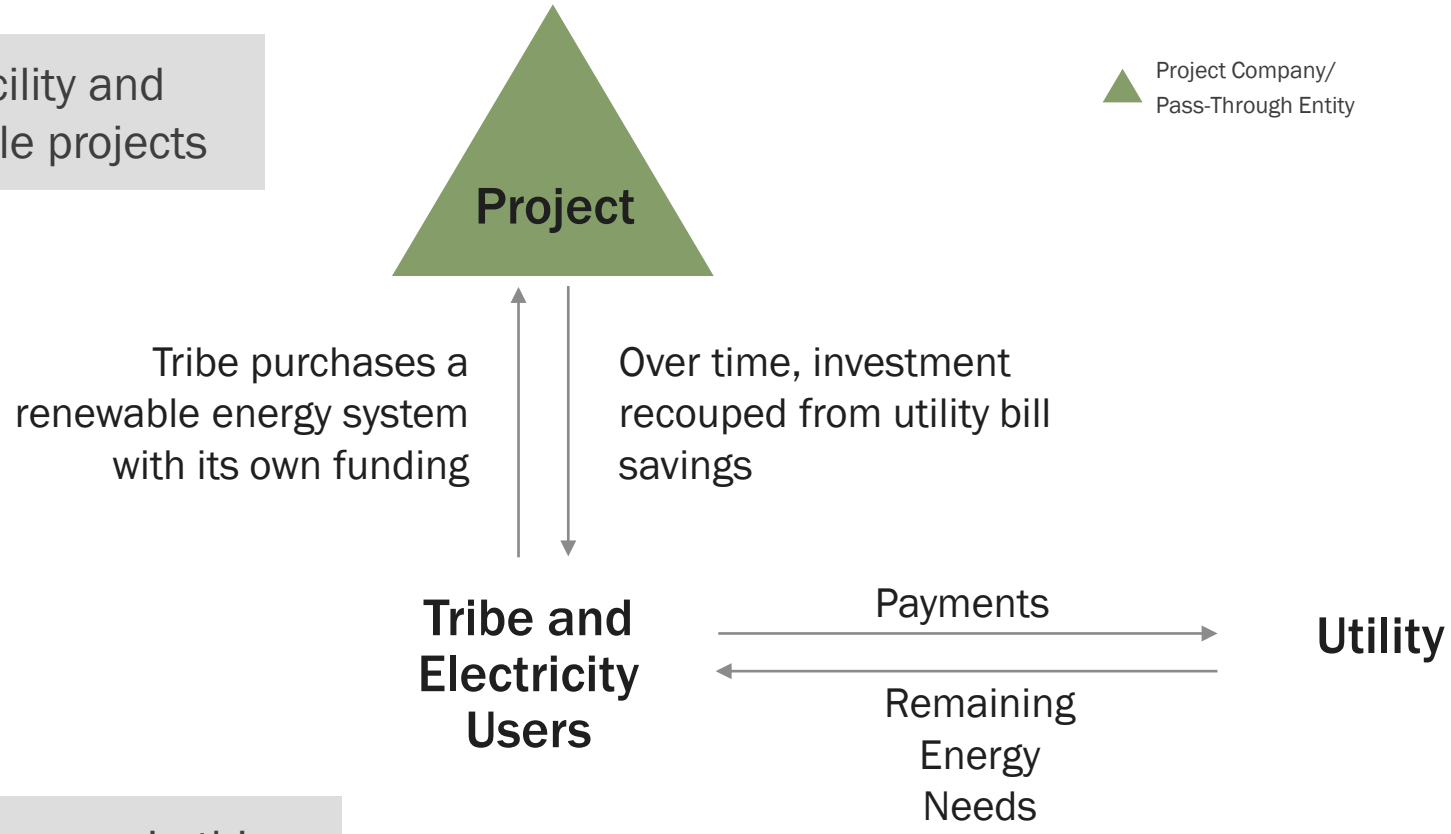
Possible Sources of Capital



Source: Graphs adapted from "Renewable Energy Project Finance in the U.S.: An Overview and Midterm Outlook" (Mintz Levin Green Paper, 2010)

Direct Ownership Structure

Primarily for facility and community-scale projects



The Tribe is the owner in this structure and self-generates its electricity

Direct Ownership

Advantages

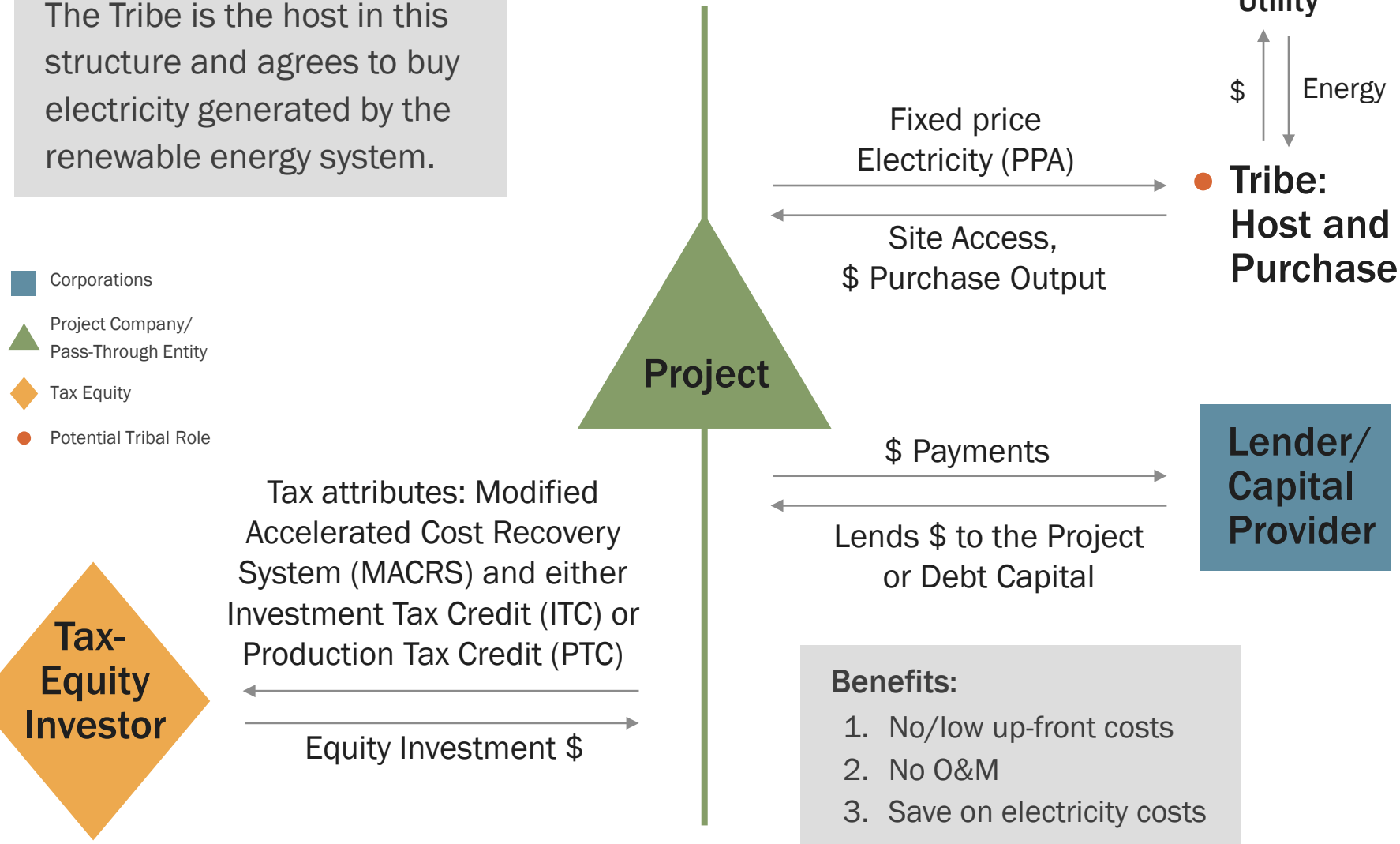
- Maximum reduction in electricity bills
- Lower finance costs (or none depending on source)
- Full control over a project: design, operations, and risks
- Own renewable energy credits (RECs) and can choose to retain or monetize
- Might be only option for small projects

Challenges

- Need the resources to pay for the project
- Don't fully benefit from available tax incentives given tax-exempt status
- Responsibilities of ownership (operations & maintenance)
- Possible electricity rate impacts for tribe (increase or decrease)

Third Party Power Purchase Agreement (PPA)

The Tribe is the host in this structure and agrees to buy electricity generated by the renewable energy system.

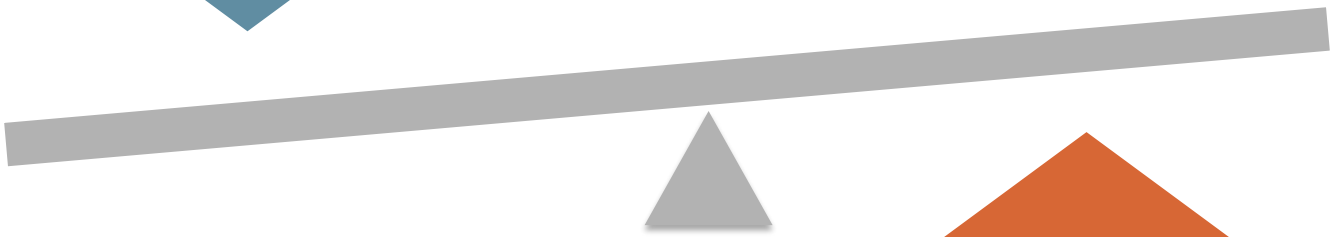


Benefits:

1. No/low up-front costs
2. No O&M
3. Save on electricity costs

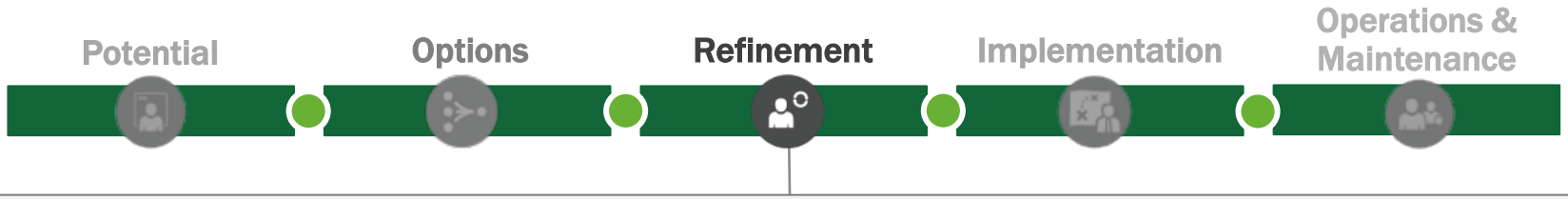
PPA Considerations to Weigh

- May not beat current electricity rates
- Tough economics for small projects
- Higher transaction costs
- Renewable energy credit (REC) and project ownership requirements



- No/low up-front costs
- No O&M
- Benefit from tax incentives
- Locked-in energy price
- Path to ownership

Community Project PPA: Eventual Tribal Ownership Example

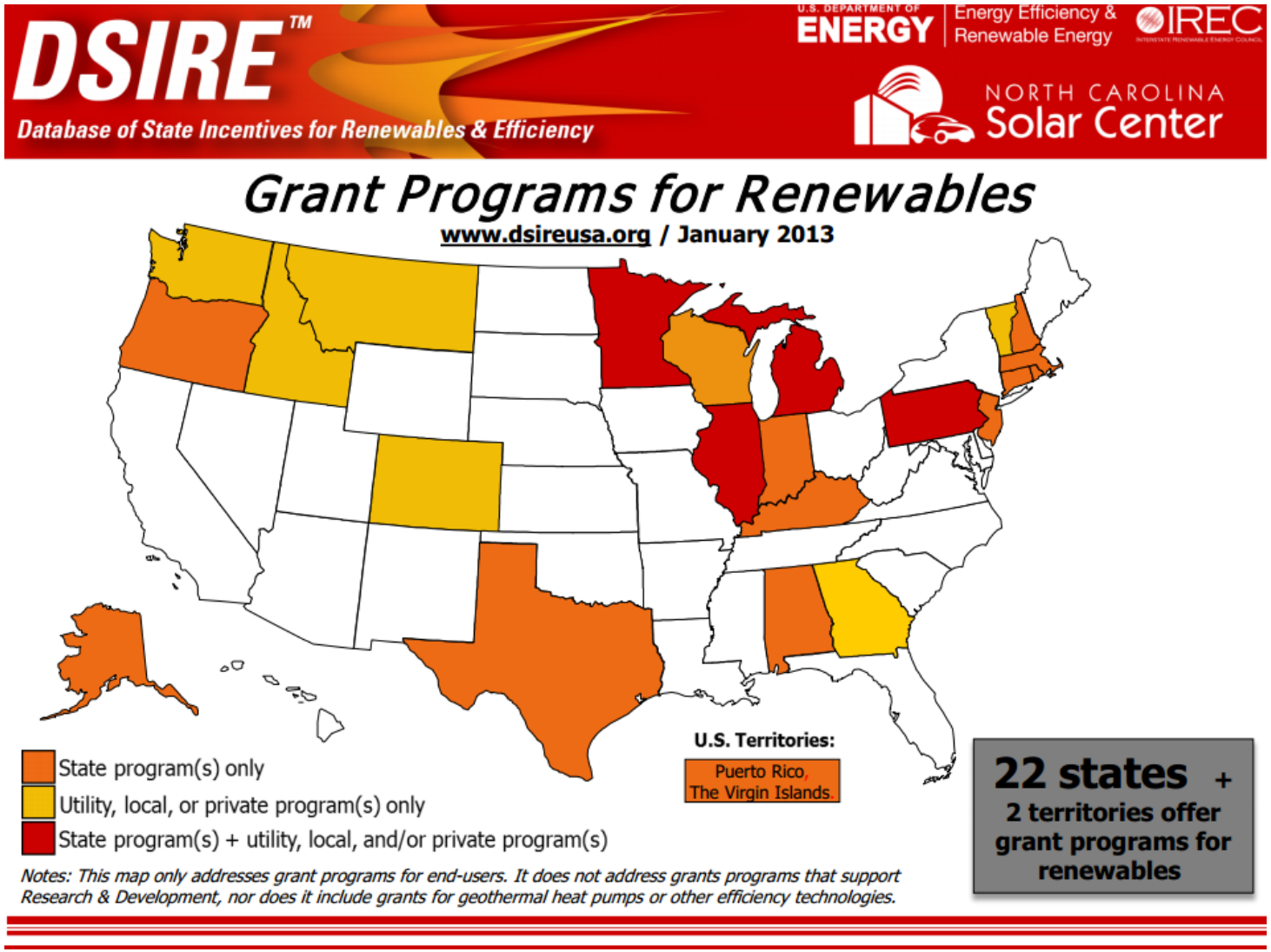


- Developer and investor form a special purpose vehicle/entity to develop a solar/wind/biomass/MSW power plant
- Tribe executes a PPA with wind project to purchase power
  - Hopefully at a discount to current power price
  - Discount will depend on project economics and local rates
- At end of 6 years (ITC) or 10 years (PTC)
  - Investor ownership "flips" from 99% down to 5%
  - Developer buys investor 5% ownership at "fair market value"
- In year 7 or 11, developer can sell project to Tribe, which assumes the project's debt
  - Project price is substantially reduced compared to Tribe project development from year 1

Grants

- Do not need to be repaid
- Must be used for specific purpose
- Grantee must meet eligibility requirements
- Typically funded by state or federal government

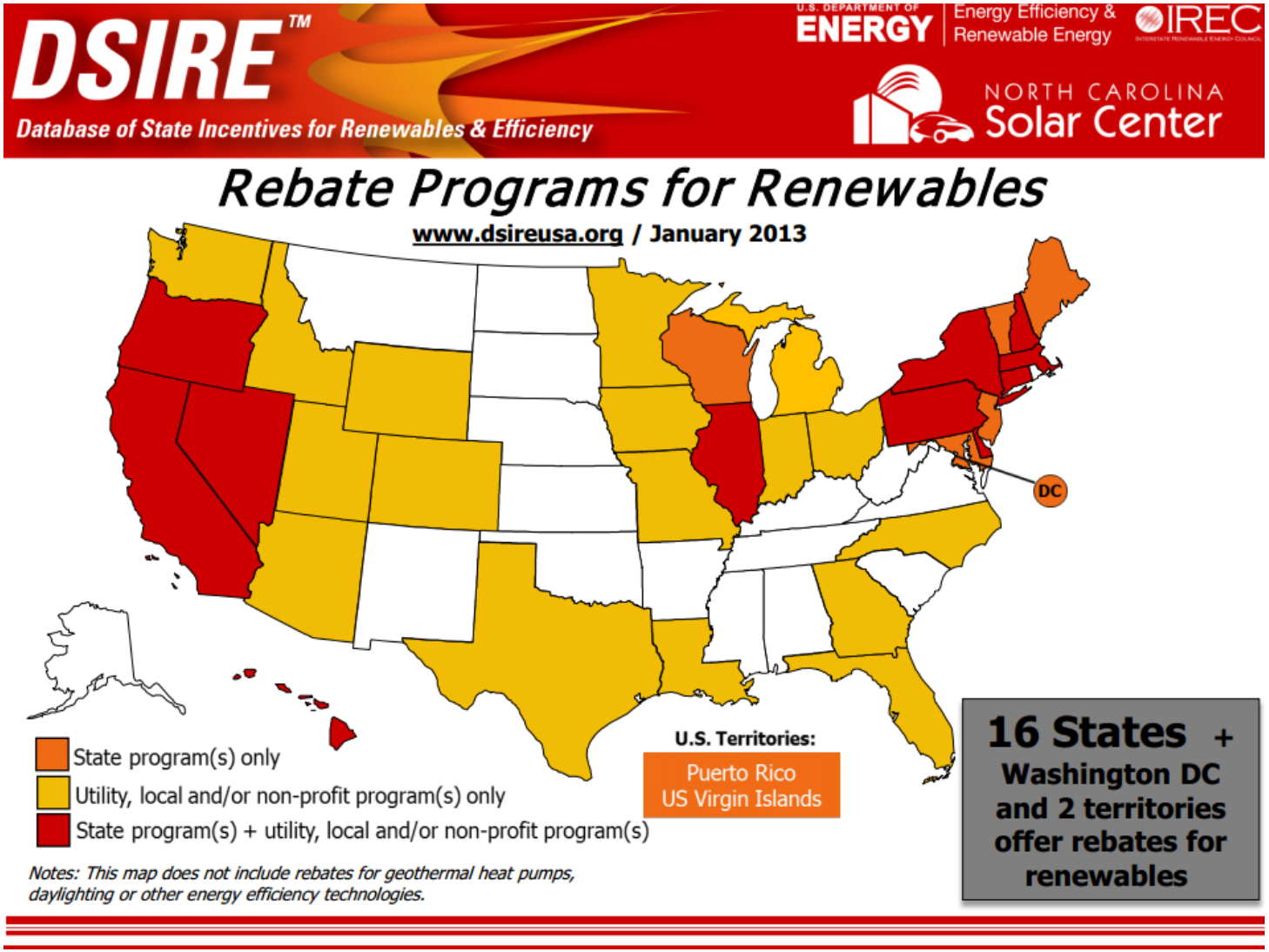
Grants – State, Local, Utility, & Private Sponsored



Grants – Federal Government Sponsored

Program	Type	Details
Rural Energy for America Grant Program (USDA)	Grant	• $2,500–$500,000 or 25% of project costs, whichever is less • Requirements: Borrower must be rural small business or agricultural producer • Technology: biomass, solar, wind, hydro, hydrogen, geothermal • Applications: equipment, construction, permitting, professional service fees, feasibility studies, business plans, land acquisition
High Energy Cost Grant Program (USDA)	Grant	• $75,000–$5,000,000 • Requirements: Community's average home energy costs must exceed 275% of national average • Technology: Solar, Wind, Biomass, Hydro • Applications: Energy generation and transmission and distribution • No open solicitations
Tribal Energy Program Grant (DOE)	Grant	• Amount varies • Requirements: Varies by solicitation • Technology: Solar, wind, biomass, hydro, geothermal • No open solicitations
Energy and Mineral Development Program (DOI)	Grant	• Amount varies • Applications: Evaluation of energy and mineral resources on tribal lands. • Annual solicitations

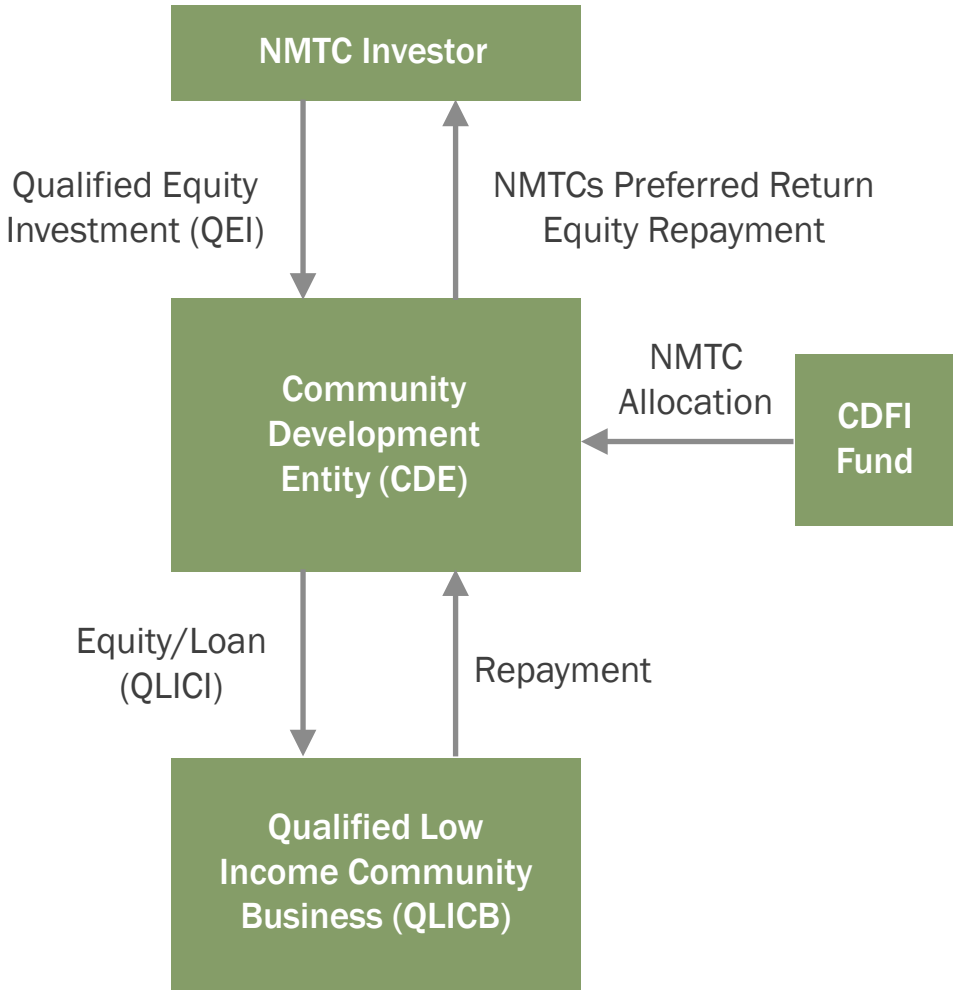
Incentives – Rebates



Debt – Government Sponsored Loan Programs

Program	Type	Details
Rural Development Biorefinery Assistance Program (USDA)	Guarantee	• Up to 90% of loan amount • Technology: Commercial-scale bio refinery • Applications: Equipment, construction, permitting, land acquisition, cost of financing
Power Project Loan Fund (Alaska Energy Authority)	Loan	• Amount varies • Technology: Solar, wind, MSW • Applications: For development or upgrade of small-scale power production (<10 MW), conservation facilities, and bulk fuel storage, includes transmission and distribution
Indian Affairs Loan Guaranty, Insurance, and Interest Subsidy Program (DOI)	Guarantee	• Max 90%; Interest subsidy covers the difference between the lender's rate and the Indian Financing Act rate • Requirements: Borrower must have 20% tangible equity in the project. This is for business development.
Rural Energy for America Loan Guarantee Program (USDA)	Guarantee	• Up to 85% of loan amount • Requirements: Borrower must be rural small business or agricultural producer • Technology: Biomass, solar, wind, hydro, hydrogen, geothermal • Applications: equipment, construction, permitting, professional service fees, feasibility studies, business plans, land acquisition • No open solicitations

New Market Tax Credits



- **Up to $5B available in CY 14**
- **39% tax break**
  - 5% in first 3 years
  - 6% in last 4 years
  - Net value: 20% due to financing complexity, number of parties
- **CDE can shop credits to investors**
  - Renewable energy project must be aligned with CDE mission
  - CDEs take time to establish
- **Examples**
  - 1 MW PV City of Denver's buildings[1]
  - 1.65 MW PV in Salt Lake City[2]

Sources:

[1] http://www.nrel.gov/docs/fy10osti/49056.pdf

[2] http://nationaldevelopmentcouncil.org/blog/?p=2242

Energy Savings Performance Contracting (ESPCs)

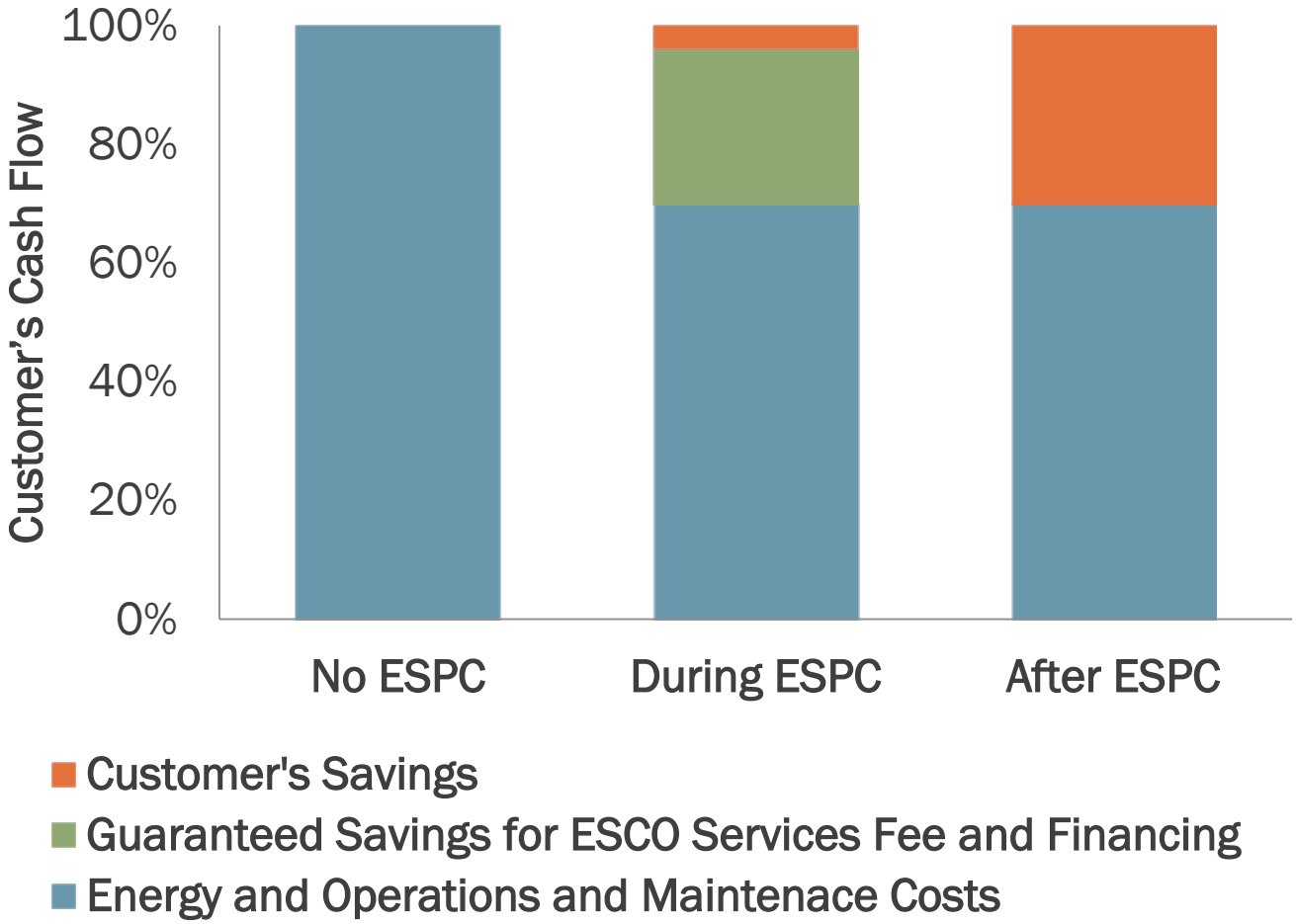
An ESPC is a **no up-front cost** contracting mechanism between a site customer and an energy service company (ESCO). Energy conservation measures and on-site generation are financed and implemented by an ESCO, which is **repaid through energy savings**. This would be done as a PPA, in conjunction with energy efficiency, to bring costs down.

Over 90 DOE-Qualified ESCOs, including:

Ameresco · McKinstry · Chevron · Siemens
Honeywell · Tetra Tech · Johnson Controls · Trane

For full DOE Listing: http://www1.eere.energy.gov/femp/financing/espcs_qualifiedescos.html

ESPCs Reallocate Current and Future Energy Spending




COMMUNITY SHARED SOLAR

Community (or Shared) Solar

- Off-site solar project that allows customers of a utility to directly benefit from a PV project without having to install the system on their own premises
- Various ownership options including utility owned and third-party owned
- Participants make a one time up-front payment or monthly payments
- Participants receive a bill credit either in kWh or $
- Numerous examples around the country

NREL

Example pricing

- $780 per solar panel
- $3.15/Watt
- $3 per 150 kWh per month (TEP)
- $3.38-$25.72/month (e.g., Sacramento Municipal Utility District [SMUD])

Why Community Solar?

There are many potential interested consumers of solar who are unable to install a PV system on their roof

The Vote Solar Initiative

Why?

- They rent
- They own a condo
- Their roof is shaded
- They can't afford an entire system
- They are not allowed (HOA restrictions)
- Their roof does not have the proper roof orientation
- They want to "dip their toe in the water"

Common Community Solar Project Structures

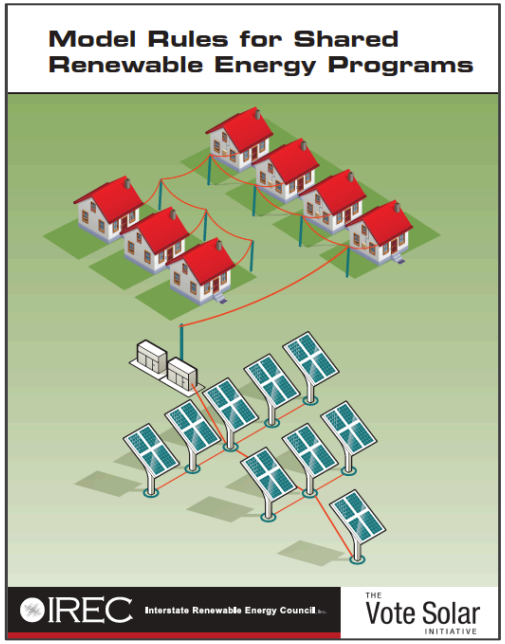
③ Utility structures community solar program around the output from the PV system

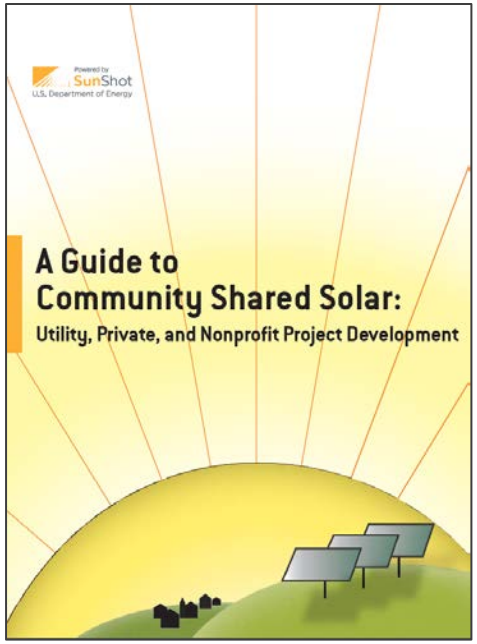
Community Solar Participants/Subscribers

- Monthly payments
  - SMUD SolarShares (1 MW)

Further Resources

- A Guide to Community Shared Solar: http://www.nrel.gov/docs/fy12osti/54570.pdf
- Shared Renewables HQ: www.sharedrenewables.org
- IREC Shared Renewables Program Catalog: www.irecusa.org/regulatory-reform/shared-renewables/





Slide from presentation given by Erica M. Schroeder. 2013. Interstate Renewable Energy Council, Inc. (IREC)

Thank you

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March 8, 2013 IRS Private Letter Ruling – 111532-11

- An Indian Tribal government is not considered a "governmental unit" or "tax-exempt organization" for purposes of solar energy tax subsidies
- This presumably could permit tribal governments to enter into an inverted lease structure ***without*** jeopardizing access and use of federal tax incentives (***potentially BIG change***)
- Yet to be executed in the market; perhaps only applicable to the Tribe that applied; it would be wise to seek legal counsel

IRS Private Letter Ruling (PLR): http://www.irs.gov/pub/irs-wd/1310001.pdf

Potential tribal implications:
http://www.renewableenergyworld.com/rea/news/article/2013/05/solar-tax-credit-opportunity-for-indian-Tribes

Sample REC Purchase Contract

Xcel Energy®

Application ID: <OID>

Solar*Rewards REC Purchase Contract

Customer-Owned PV Systems
Greater than 10 kW DC nameplate capacity

This Contract is made and entered into this <today's date>, by and between Public Service Company of Colorado ("Public Service" or "Company"), d/b/a/ Xcel Energy, a Colorado corporation, whose address is 1800 Larimer Street, Denver, Colorado 80202-5533, <Customer Name> ("Customer"), each of which may be referred to herein individually as a "Party" or collectively as the "Parties." Except as otherwise provided for herein, capitalized terms shall have the meanings set forth in Section 3652 of the Rules Regulating Electric Utilities of the Colorado Public Utilities Commission, 4 *Code of Colorado Regulations* 723-3-3652, as of the date of this Contract.

1. **Purchase and Sale**. On the terms and subject to the conditions set forth in this Contract, Customer agrees to sell and Public Service agrees to purchase Renewable Energy Credits ("RECs") as described herein. The photovoltaic solar system (the "PV System") from which the RECs will be generated is to be installed by Customer at the location identified below which is located within the electric service territory of Public Service and where Customer receives or will receive electric utility service from Public Service ("Service Address"). The PV System will have a rated Direct Current (DC) nameplate capacity of <system size> kW. Customer shall sell and Public Service agrees to purchase all RECs generated by the PV System at the Service Address for the Term hereof, as provided in Section 5(e) below.

   Service Address: <Premise address>

2. **Purchase Price**. The purchase price for the RECs hereunder shall be expressed in cents per kilowatt hour (kWh), with one REC being generated for each MWh of power generated by the PV System. Public Service shall pay Customer the price of $<**REC price**> per kWh for RECs purchased hereunder. Such purchase price shall be payable in monthly installments, based upon Public Service's receipt of RECs generated by the PV System in the immediately preceding month, in accordance with subsection 5(k) below.

3. **Incorporation of Tariff**. The Parties shall abide by, and this agreement shall be subject to, the Company's applicable electric tariffs related to photovoltaic systems, as on file with the Colorado Public Utilities Commission and as they may be revised from time to time. In the event of any conflict between the terms of this Contract and Company's electric tariff, the provisions of the tariff shall control.

4. **Representations**. Customer hereby makes the following representations and warranties to Public Service:

   a) Customer warrants that the person signing this Contract on behalf of Customer is individually authorized and competent to sign this Contract and to bind Customer to the terms hereof.

   b) Customer will own the PV System at the Service Address set forth above, and the primary business at the Service Address is not the generation of electricity for retail or wholesale sale and is the person or entity in whose name electric service is listed at the Service Address.

   c) The proposed PV System nameplate capacity in kilowatts (kW) DC does not exceed the Service Address service entrance capacity.

   d) If any of the above representations of the Customer are false or incorrect, such false or incorrect representation shall constitute an event of default under this Contract.

5. **Terms and Conditions**.

   a) Customer shall be responsible for ensuring that the PV System equipment installed at the Service Address is new equipment and meets all applicable codes, standards, and regulatory requirements at the time of installation.

   b) Customer represents that the PV System shall be sized to supply no more than one hundred twenty percent (120%) of the average annual consumption of electricity by Customer at the Service Address. Customer acknowledges that Public Service's Solar*Rewards Program is only available to PV systems where the estimated annual generation, as determined via PVWATTS, is not more than 120% of historical average annual electric consumption at the Service Address.

   c) "Commercial Operation" is achieved when (a) 100% of the nameplate capacity of the PV System is installed, (b) the PV System has operated without experiencing any abnormal or unsafe operating conditions, (c) all permits necessary to authorize the production and, if applicable, delivery to Public Service of Renewable Energy generated by the PV System have been obtained; (d) all necessary metering has been installed; and (e) any necessary Interconnection Agreement with Public Service has been entered into for purposes of connecting the PV System to Public Service's electric system.

   d) "Date of Commercial Operation" shall be the first calendar day following the date Customer has met all of the criteria of subsection 5(c) above.

   e) This Contract shall become effective upon its execution by the Parties and shall continue in effect for a Term of twenty (20) years from and after the Date of Commercial Operation.

   f) The PV System shall be located at the Service Address at all times during the term of this Contract.

   g) The PV System shall have a nameplate Direct Current output capacity greater than 10 kW and less than or equal to 500 kW.

   h) Customer shall maintain the PV System and the individual components of the PV System in good working order at all times during the Term of this Contract. If during the Term of this Contract the PV System or any of the individual components of the system should be damaged or destroyed or otherwise fall into disrepair, Customer shall promptly repair or replace the equipment to its original specifications, tilt and orientation at Customer's sole expense. All of Public Service's obligations hereunder during the period of such repair or replacement shall be suspended, except for making payment for any RECs generated prior to such damage or destruction; provided, however, that if the time period for repair or replacement is reasonably anticipated to exceed 180 days, Public Service shall have the right, exercisable at its sole option, to terminate this Contract upon not less than 30 days written notice, with no further obligation of the Parties to perform hereunder following the effective date of such termination. In all other situations, if the PV System is out of operation for more than ninety (90) consecutive days during the Term of this

Facility-Scale Project Risk – Post Step 3

	Risks	Risk Assessment Post Step 3	✓
Development	• Loss/waste of development resources	Medium; now with more assurance of success	✓
Site	• Improper orientation or project affected by shade	Low; some may be assumed by host	✓
	• Inadequate foundation or structural integrity	Assumed low; developer to assess	✓
	• Site control for challenges for safety/security purposes	Assumed low	✓
Permitting	• Tribe-adopted codes and permitting challenges	Low; permitting completed	✓
	• Utility interconnection challenges	Reduced	✓
Finance	• Capital constraints	Low; PPA elected and confirmed	✓
	• Incentive unavailability or insufficiency	Low; allocate to developer to facilitate	✓
Construction/ Completion	• Engineering, procurement, and construction difficulties	Low; allocate to EPC or developer	
	• Cost overruns	Low; allocate to EPC or developer	
	• Schedule overruns	Low; allocate to EPC or developer	
Operating	• Output shortfall from expected	Low; allocate to owner	
	• Technology O&M failure	Low; allocate to owner or O&M contractor	

NOTE: Underlining signifies that the risk assessment outcome changes during the step at hand.

Sources: Adapted from Holland & Hart, RE Project Development & Finance & Infocast, Advanced RE Project Finance & Analysis

Project Risk – Community-Scale Post Step 3

	Risks	Risk Assessment Post Step 3	✓
Development	• Poor or no renewable energy resource assessment	Low; site picked	✓
	• Not identifying all possible costs	Low; detailed model	✓
	• Unrealistic estimation of all costs	Low; detailed model	✓
	• Incorrect estimation of long-term "community" energy use (energy efficiency first)	Low; final projection	✓
	• Utility rules and ability to offset use with centralized production	Reduced	✓
Site	• Structural (e.g. rooftop solar, wind loading, soil conditions)	Assumed low; assessed	
	• Installation safety (e.g., wind tower, hazard for adjacent sites)	EPC assumes risk	
	• Site control for safety/security purposes	Low; site secure	✓
Permitting	• Tribe-adopted codes and permitting requirements	Low; complete	✓
	• Utility interconnection requirements	Low; complete	✓
Finance	• Capital availability	Low; PPA complete	✓
	• Incentive availability risk	Low; risk on developer	✓
Construction/ Completion	• EPC difficulties • Cost overruns • Schedule	Low; allocate to EPC or developer	
Operating	• Output shortfall from expected • Technology O&M	Assumed low, mitigable, or allocatable	

Sources: Adapted from Holland & Hart, RE Project Development & Finance & Infocast, Advanced RE Project Finance & Analysis

*NOTE: Underlining signifies that the risk assessment outcome changes during the step at hand.

Bonds – Qualified Energy Conservation Bonds (QECBs)

Tax Credit Bond	State Managed	Some Differences
• Governments only • $3.2 billion • Covers 70% of the "qualified tax credit" up front	• Allocations have been made by Treasury • Large local governments >100,000	• No sunset date (good) • Up to 30% for private sector entities • Either issues as reduced interest coupon or direct payment

For more information on QECBs, see http://www.nrel.gov/docs/fy11osti/49450.pdf

Bonds – Clean Renewable Energy Bonds (CREBs)

- **CREBs**
  - Apply to the IRS for an allocation
  - Federal tax credit to bond owner in lieu of interest payment from bond issuer
  - May be more attractive than tax-exempt municipal bonds
    - Issuer only pays back bond principal (for most part)
- **Total allocation of $1.2 B**
  - Up to 62.5% for public sector projects (rest: coops)
  - Round 1: 401 of 610 public sector PV projects
  - Round 2: $262M for public-sector PV projects
  - Additional rounds possible

Bonds – CREBs cont.

Challenges

- Not truly equivalent to interest-free bond
  - Assumes bond issuer is equiv. to AA corporate
  - Public entities with weaker credit must either:
    1. Make supplemental interest payments, or
    2. Sell the bond at a discount

- **Transaction costs are high**
  - Allocations made from smallest to largest projects
  - Solution: MA bundled 12 projects (1 MW)

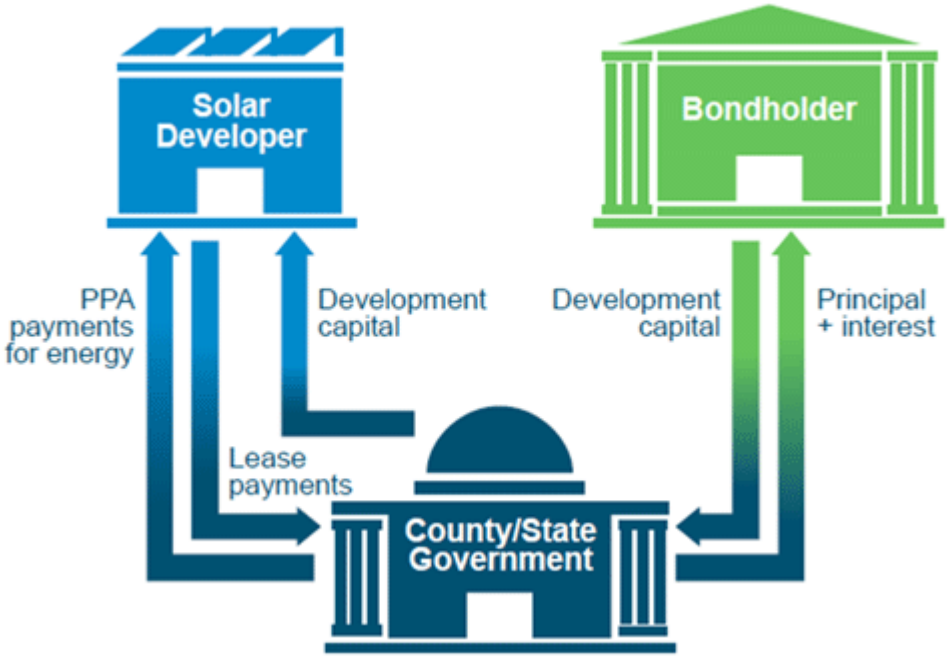
- **First principal payment due in December of the year the CREB is issued**

Bonds – Green Bonds

- **Finance tool for green projects: projects and activities that promote climate and other environmentally sustainable purposes**
  - Renewable energy
  - Energy efficiency
  - Sustainable waste management
  - Clean transportation
- **Nascent market for institutional investors who have climate considerations in their investment objectives**
  - Currently led by international organizations (World Bank, International Monetary Fund)
  - Some states beginning to look at these instruments (MA has issued some green bonds)

Hybrid – Morris Model

- Uses NMTC, QECB, or other bonding
- Combines tax benefits of third-party ownership with low-cost capital from public debt
- Bond proceeds passed to the developer through a lease-purchase agreement
  - Ownership transferred to the developer
  - Developer payments pays off bond principal and interest



So far, only used by counties in New Jersey; has promise elsewhere, and for Tribes

https://financere.nrel.gov/finance/content/municipal-bond-power-purchase-agreement-model-continues-provide-low-cost-solar-energy

http://www.nrel.gov/docs/fy12osti/53622.pdf

Monetizing Green Attributes: Renewable Energy Credits

Renewable Energy Credits (RECs)

- Used to track renewable energy production for state renewable portfolio standards (RPSs)
- Utilities may purchase RECs to fulfill state requirements
- Producer usually owns REC, but varies by state
- Transactions regulated by state
  - State may require contract with minimum length (e.g., 20 years)
  - Some states sponsor/facilitate market
  - Some states allow private/direct transactions