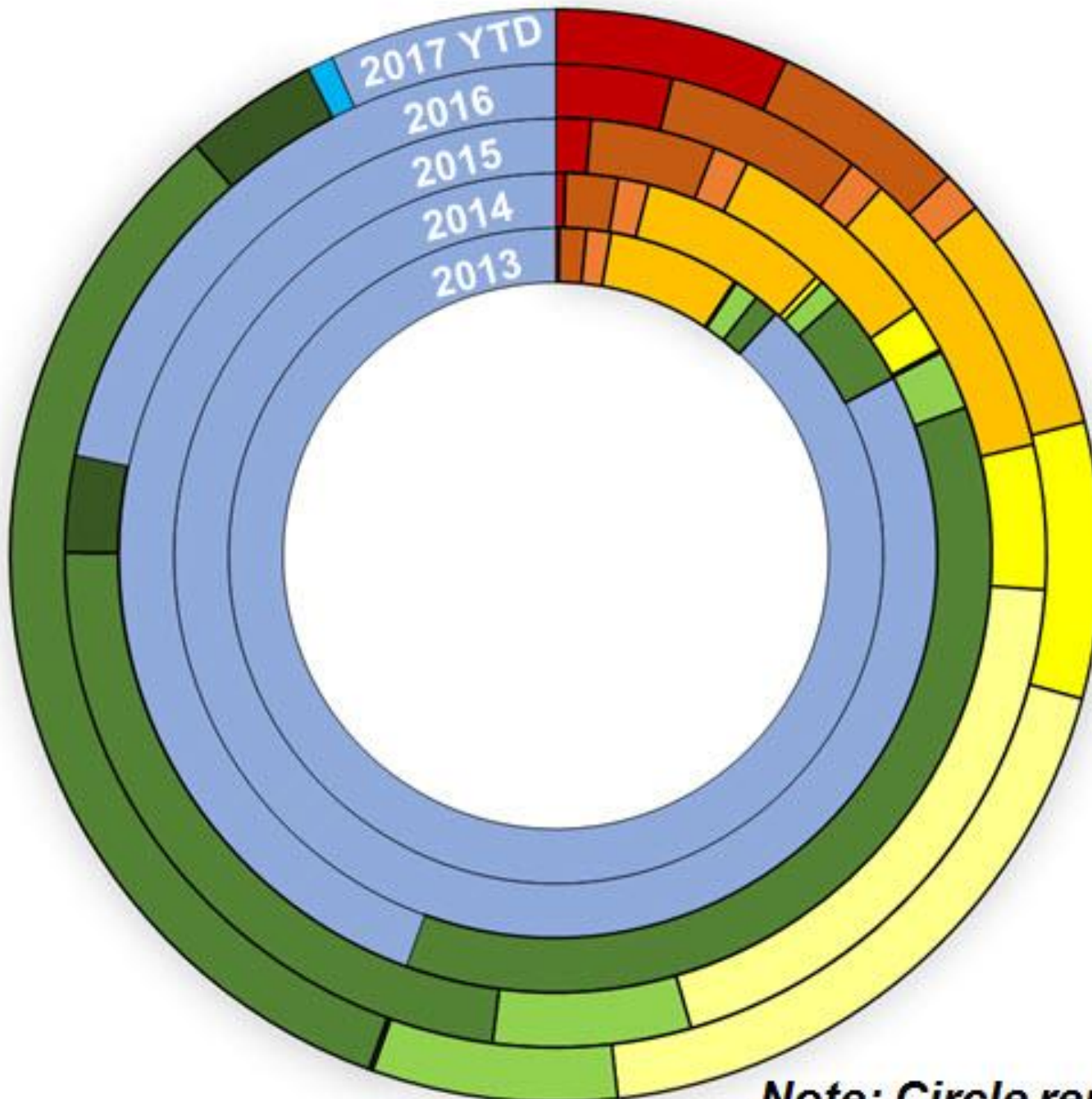




Solar Business Model Options and Opportunities

Andrew Cotter
for the
FEJA Workshop



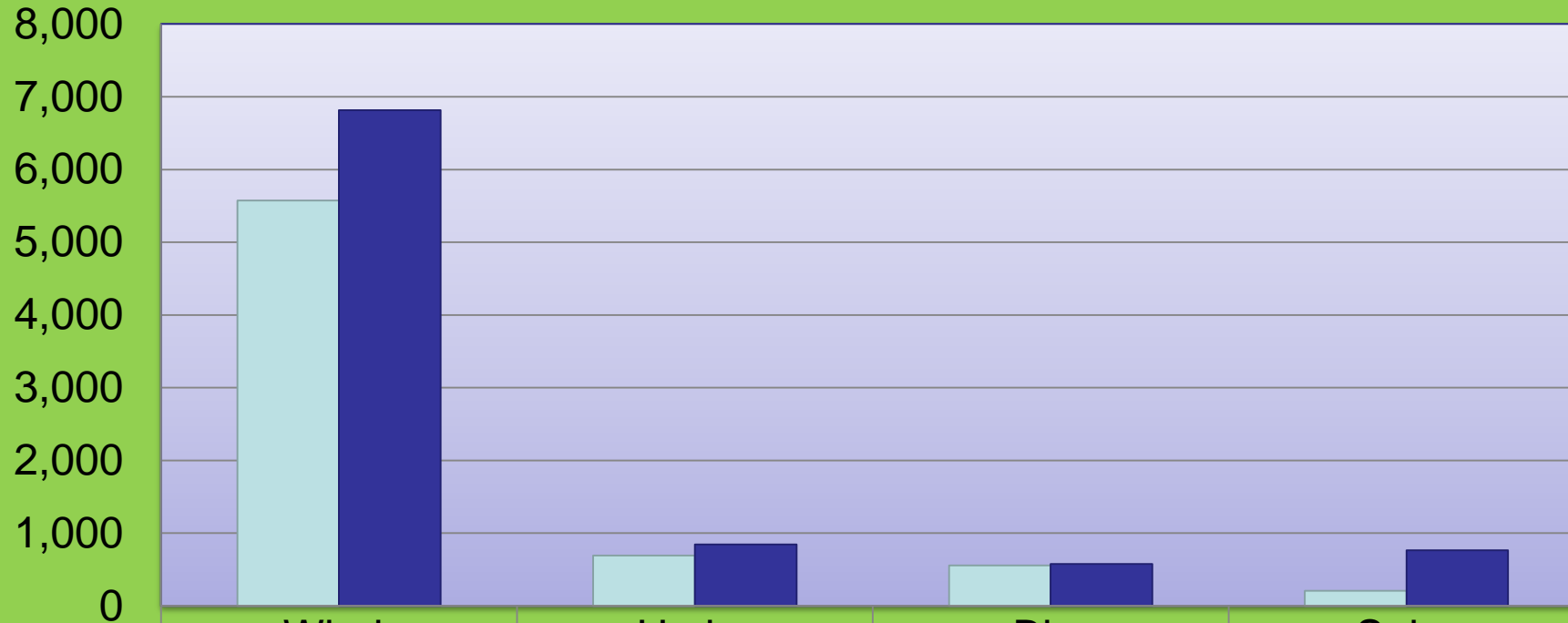


- Expanding
- Experienced
- PPA Only
- Demo (less than 100kW)
- Co-op Sited, G&T Owned
- G&T Solar/Collaboration
- Active Planning/Deployment
- Rooftop program
- Aware/Investigating
- Solar Info on website
- Inactive
- No Data

Note: Circle represents 909 distribution and G&T co-ops

Existing and Planned Renewable Capacity (MW)

MW of energy Capacity



■ Total Existing
■ Planned Capacity

Wind

Hydro

Bio

Solar

5,572

692

557

207

6,817

845

578

766

- 17000 MWs of Renewables Existing
- 2000 MWs of Planned Capacity
 - 100% of Planned Wind Capacity through PPA (1200 MW)
 - 66% of remaining planned capacity through PPA (800MW)

**CO-OP
NATION**
STRONG & PROUD

Coop Solar Market Overview – May Edition



- 560MWs Online, 350MW planned; over 910MWs total
 - Feb: 207MW existing; 560 planned; about 850MW total.
- Economics continue improving Cost reductions to \$1.20/W....sub \$1/W
- Projected coop deployments of 300-400MW annually ~\$700M annual investment
- **PPAs continue to be attractive option for coops** - low risk, attractive pricing... enhanced with prepays
- **Clean Renewable Energy Bonds (nCREBs) are an attractive option...enhanced with REAP grants**
- **G&Ts getting more active on behalf of distribution coops ... decision making**

SUNDA Tools



Evaluation and Decision-Making



Project Management and Engineering



Business and Financial Models



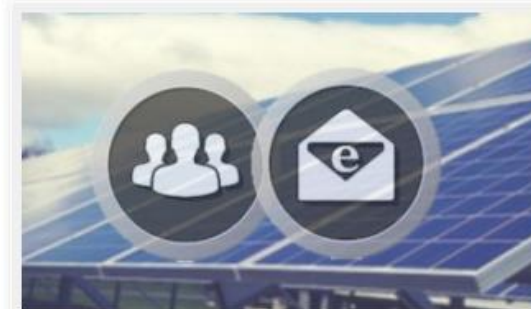
Solar Communications Toolkit



Discounts Program



Participants and Deployments



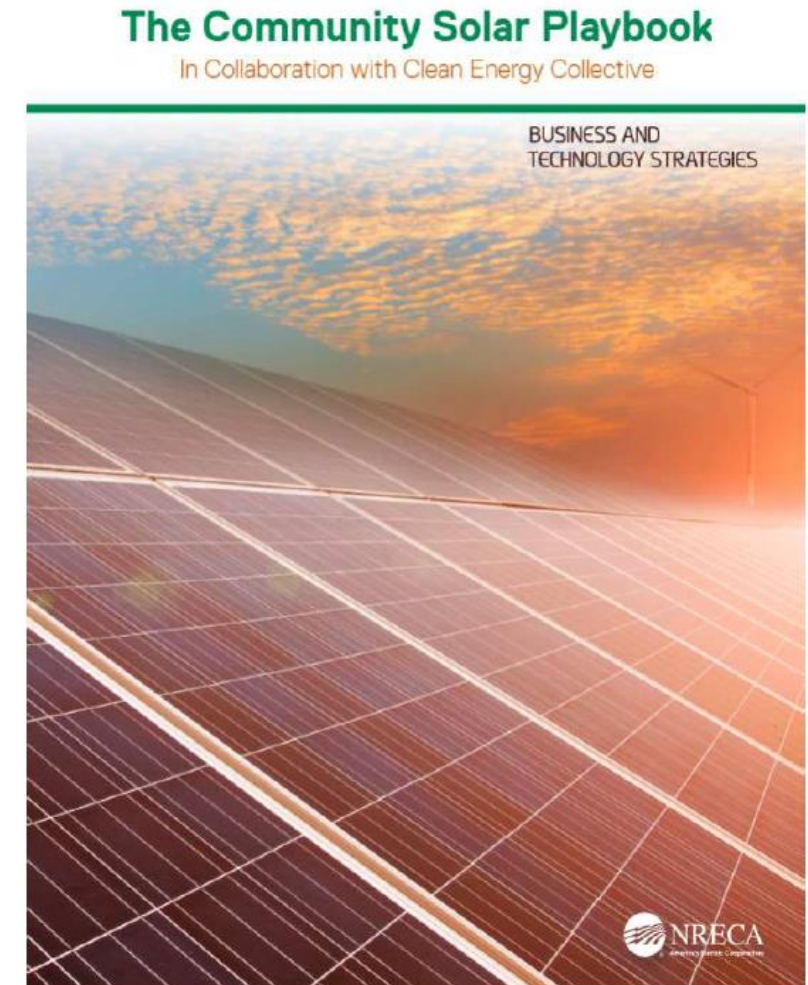
Contacts

Available at: www.nreca.coop/Solar

Community Solar Playbook

- Provides best practices developed from experienced cooperative and solar specialists
- Practical step-by-step guidance based for key project Team Members:
 - Module 1: Executive Management, Regulatory & Governance
 - Module 2: Marketing, Member Services and Communications
 - Module 3: Information Technology
 - Module 4: Business, Finance, and Administration
 - Module 5: Project Management, Engineering, Commissioning, and Operations

Available at: www.nreca.coop/Solar



Each Module: Specific and Practical

- Each module is focused on the actions required from a particular division of a cooperative utility in order to establish a community solar program
 - It includes:
 - Planning and Execution Checklists
 - Key Templates
 - Information on critical concerns
 - List of Resources



CEO Module - Overview

Business &
Technology
Strategies

This module includes:

1. A CEO Checklist for Successful Community Solar Projects
2. Solar Business Case Template
3. Developing a Community Solar Business Case
4. Developing a Scope of Work and Staffing Plan
5. Resources for Additional Support
 - Governance Guide included

The Community Solar Playbook

In Collaboration with Clean Energy Collective

Module 1: Executive Guide

Management Governance, and Regulatory
&
Governance and Community Solar Policy
Development Guide

What you can find in other modules

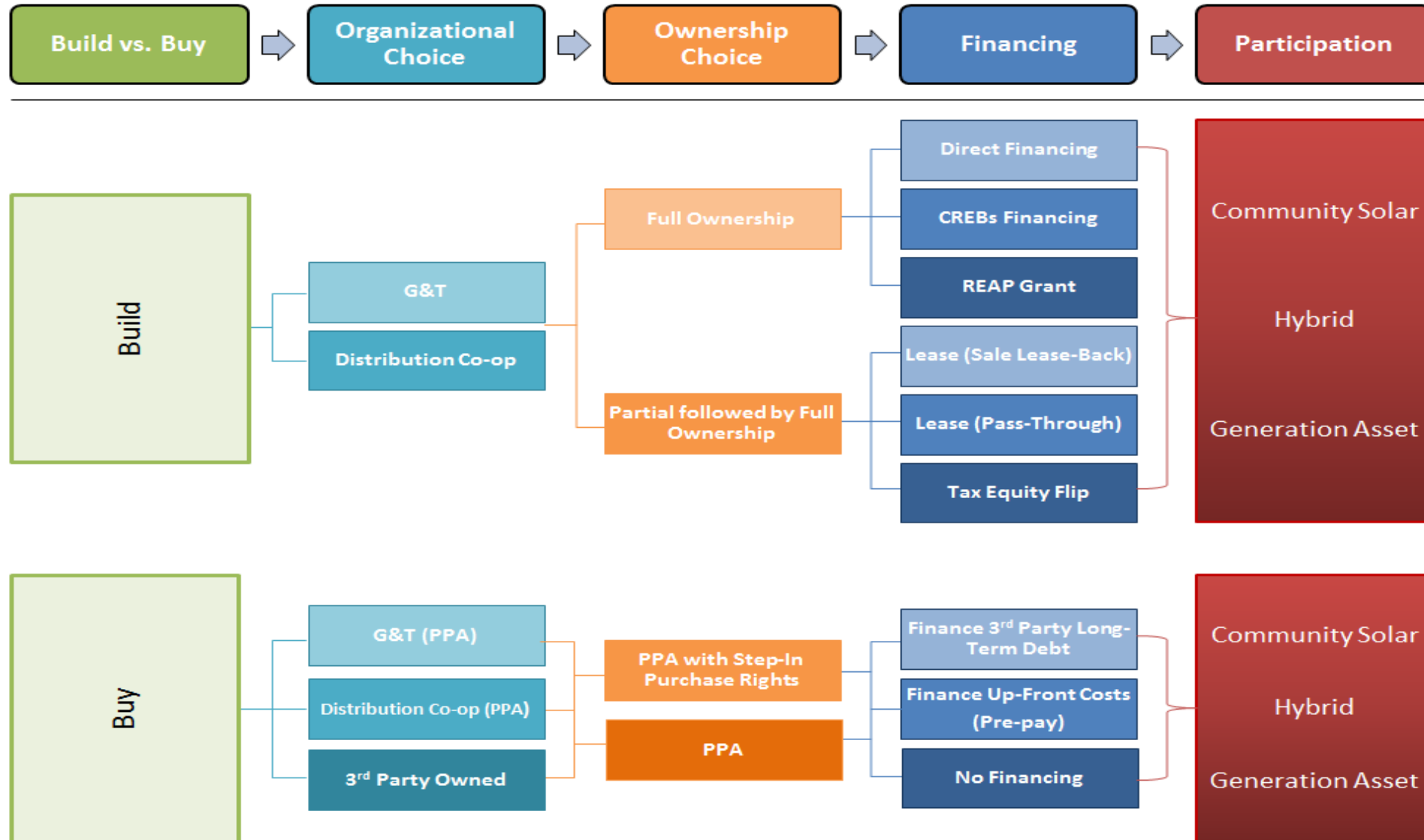
1. Marketing and Member Services
 - Guidelines for developing a strong “Value Statement”
 - Sample marketing materials
2. IT to Support Marketing and Program Administration
 - Software Assessment Template and Sample
 - Cyber Security Procurement Language
 - Interoperability Checklist and “Questions to Ask the Vendor”
3. Finance and Accounting
 - Financial Plan Template
 - Economic Evaluation Guidelines



What is Community Solar?

- Optimized, Central Location
- EPC, O&M, Financing Managed on an aggregate basis
- Ownership and Output allocated based on member-subscription
- Actual/Allocated Output is netted against utility bill
- Credit to subscribers is formula-based

Different Business Models – Pros/Cons



Key Assumptions

- Project Size 1836 KW (AC)
- AC/DC Ratio 0.96
- Total project costs (included in EPC) \$3,910,500 (\$2.1/W)
- First year output (MWh) 3196 MWh
- Deterioration (Annual) 0.5%
- First year O&M (including insurance) \$41,000
- Escalation of O&M Costs (annual) 1%
- Inverter Replacement (end of year 15) \$350,000
- Discount Rate 3%

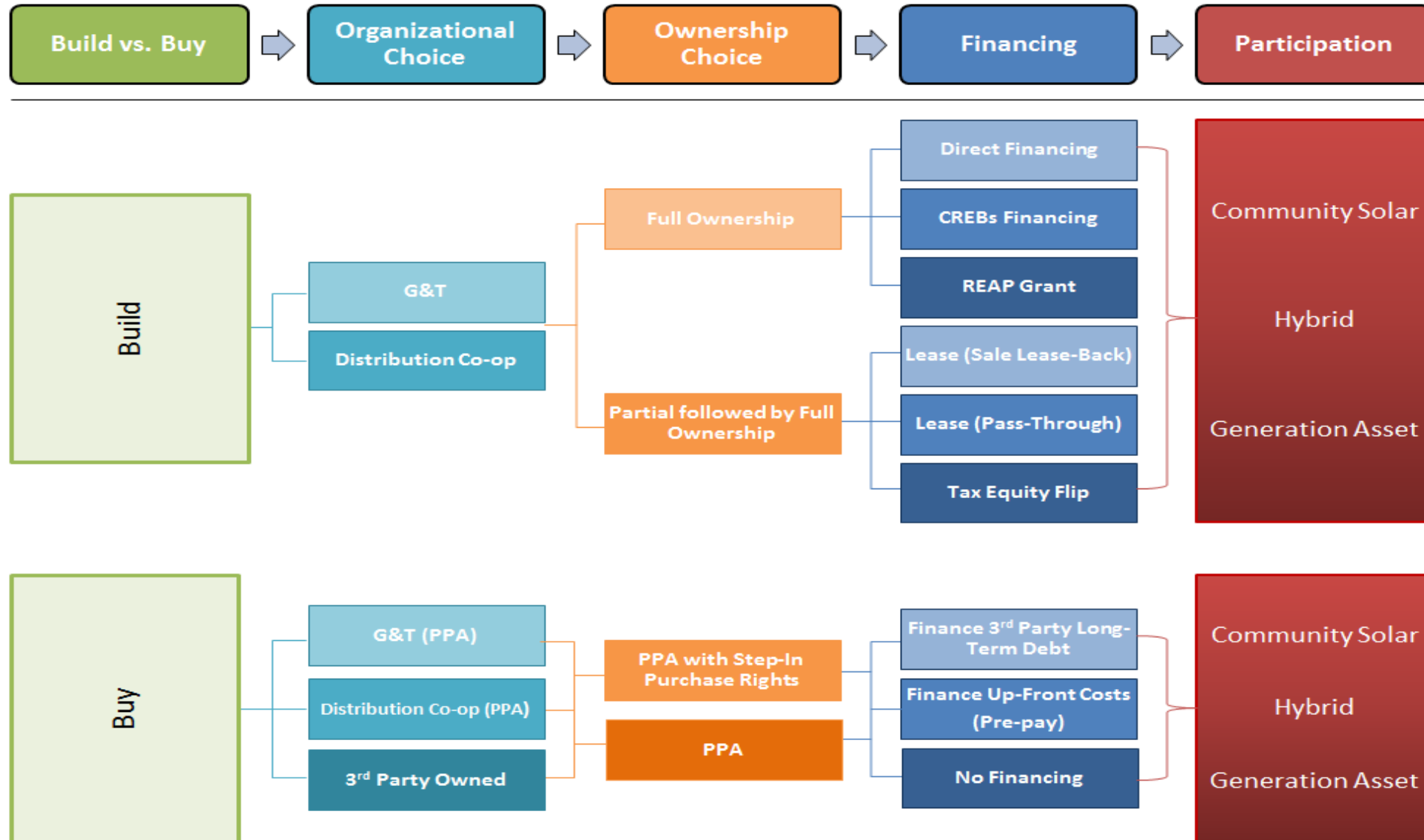
- ** Please note that the actual lease payments are monthly and CFC loan payments (for NCREBs loan) can be quarterly or semi-annual. The timing differences will impact on costs and the financing rates relative to annual cash flows used in the illustrations.*

Financing Options - Comparative Economics



Option	LCOE (\$/MWh)	Drivers of the Economics
Direct Financing	97	None
PPA - Other	103	Monetization of ITC and MCRS Depreciation – but not of land clearance, developer’s lack of scale
PPA + Buyout	77	Efficient monetization of ITC and MCRS Depreciation (all but land clearance), scale economics
PPA + Buyout With 25% Prepay	74	Efficient monetization of ITC and MCRS Depreciation (all but land clearance), scale economics, prepay 25% of the PPA and buyout amount with 4% financing vs 8.27% discount rate offered
Tax-Equity (sCoop)	75	Monetization of ITC and MCRS, land clearing not available for tax benefits
Operating Lease	71	Monetization of ITC but not of land clearance
NCREBs	76	Low cost financing of all costs including land clearance, Treasury subsidy but no tax benefits
NCREBs (w/REAP Grant of \$500 K)	69	Low cost financing of all costs including land clearance, Treasury subsidy, REAP Grants but no tax benefits

Different Business Models – Pros/Cons



The G&T Aggregation Model

- G&T owns large Solar (PPA), integrates it into bulk power supply
- G&T purchases software license for all D-Coops
 - Back-end: Tracking, recording, billing
 - Front-end: Sells product, and engages customer
- D-Coops determines own program pricing
 - Subscriptions are totally scalable
 - No penalties for leaving
 - No X-subsidies

Cheat Sheet – General in Nature



- REAP Grants with CREBs for systems smaller than 2MW
 - SCOOP for sub 500KW systems
- Lease-Back agreements and Tax-Equity flip: two financial structures driven by the same economics. tend to be best for greater than 2MW systems...
 - For T/E Flip, overhead is high, so bigger is better 5MW
 - Lease-Back is cheaper, but may need to be a taxable entity
- PPA's are the easiest and can attain most of the economics of a T/E-Flip or a Lease-Back agreement
 - Great economic improvements if Co-ops can provide development capital.
 - You pay for easy

A quick note on Residential PV Models



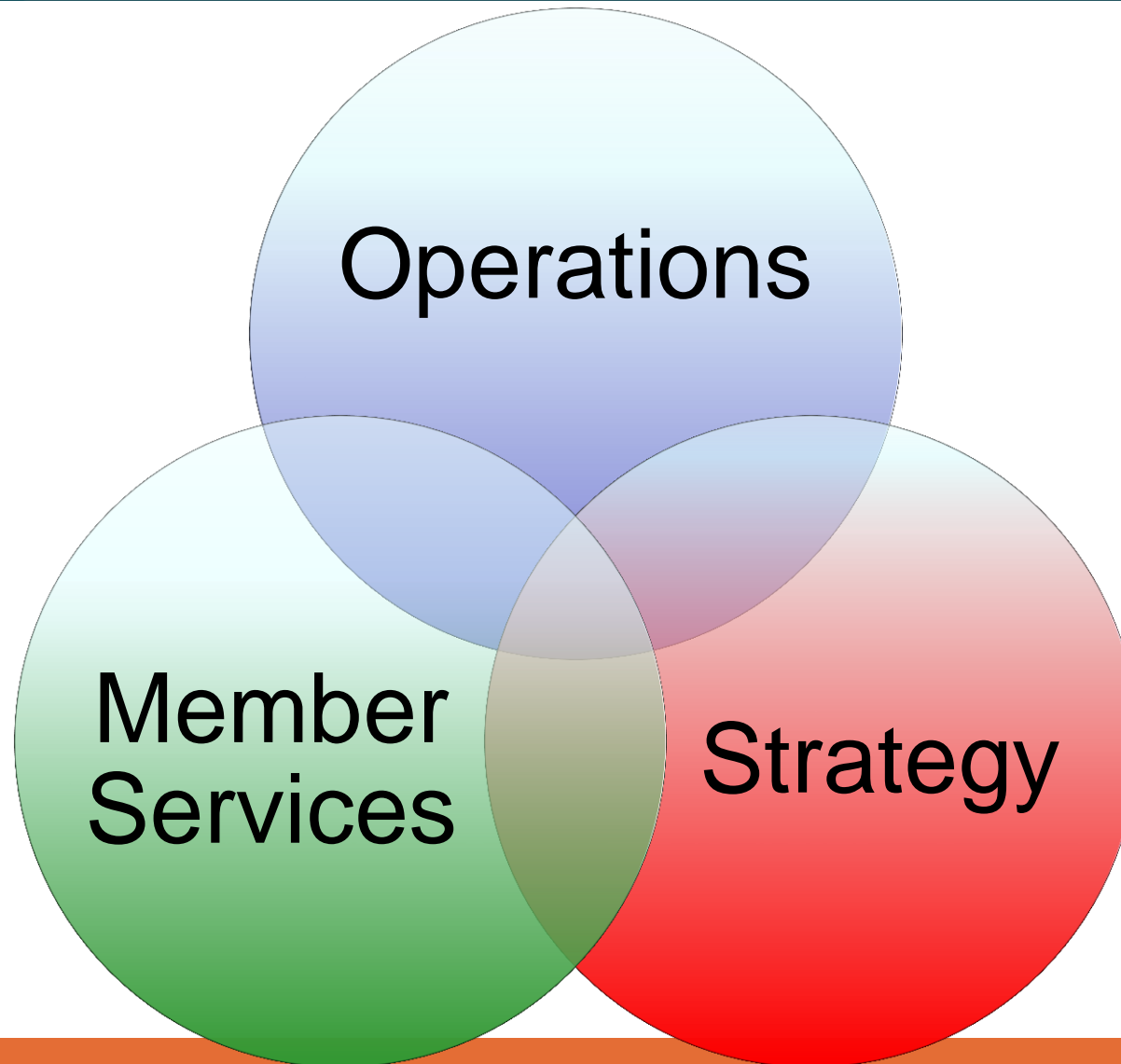
- **Consumer-Owned, Consumer-Installed**
 - Co-op financed
 - Co-op incentivizes
 - Co-op pay-for-use
- **Consumer-Owned, Coop Installed**
 - Partner with a 3rd Party Installer
- **Cooperative-Owned; Coop Installed**
 - Roof lease
- **Community Solar Program**

Lessons Learned from this work



1. Cooperatives (and Munis) have a different procurement process than the large IOUS.
 - Smaller staff, move quicker; but more incrementally
 - May require significant “pre-sale” education and support.
2. Simplicity is highly valued
 - PPA’s a familiar contract vehicle
 - **Marketing**, IT, Legal/Regulatory Support
3. Coops are a Network
 - G&T serve Distribution Coops who serve Consumer-Members (3 different value props)
4. Consumer-Members are the lifeblood of the Coop
 - Don’t get between a coop and its consumer-members

Why do you want to do this?



That's it

Thank you for your time and attention.

Andrew Cotter

Renewable And Distributed Generation Program Manager

Business and Technology Strategies Division, NRECA

Andrew.Cotter@nreca.coop

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