8/6/2020

SOLSMART
NATIONALLY DISTINGUISHED. **LOCALLY POWERED.**

How Local Governments Can Buy Renewable Energy and Support Market Development

Agenda

- Introduction to SolSmart — Danny Falk, The Solar Foundation
- Introduction to Renewable Energy Purchasing Options for Local Governments — Chad Laurent, Cadmus
- Cast Study: Arlington Virtual Power Purchasing Agreement – John Morrill, Arlington County, Virginia
- Case Study: Denver Community Solar – Jonathan Rogers, City and County of Denver
- Q&A

About SolSmart

Funding

- U.S. Department of Energy Solar Energy Technologies Office

Goal

- Help local governments make it faster, easier, and more affordable for residents and businesses to go solar

Participants

- U.S. municipalities, counties, and regional organizations

Designation

- SolSmart nationally recognizes local solar achievements by designating communities as SolSmart Gold, Silver, or Bronze

Technical Assistance

- Provided at no cost to help communities achieve designation

Program Design and Execution

Technical Assistance Program

The SOLAR FOUNDATION™ for a bright future

CADMUS

NLC NATIONAL LEAGUE OF CITIES CITIES STRONG TOGETHER

NREL NATIONAL RENEWABLE ENERGY LABORATORY

RAP®

BROOKS ENGINEERING

EPRI ELECTRIC POWER RESEARCH INSTITUTE

SEIA Solar Energy Industries Association®

NATIONAL ASSOCIATION of COUNTIES NACo

Designation Program Administrator

ICMA Leaders at the Core of Better Communities

National Civic League

The SOLAR FOUNDATION™ for a bright future

Home Innovation RESEARCH LABS™

CADMUS

SolSmart Categories

The SolSmart scorecard is used to baseline a community's current solar processes and identify areas for technical assistance in the following 8 categories:

- Permitting
- Planning, Zoning, & Development
- Inspection
- Construction Codes
- Solar Rights
- Utility Engagement
- Community Engagement
- Market Development and Finance

SolSmart Communities

Acknowledgment and Disclaimer

- *Acknowledgment:* This material is based upon work the supported by the Department of Energy and Office of Energy Efficiency and Renewable Energy (EERE), under Award Number DE-EE0007155.

- *Disclaimer:* This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.

Chad Laurent

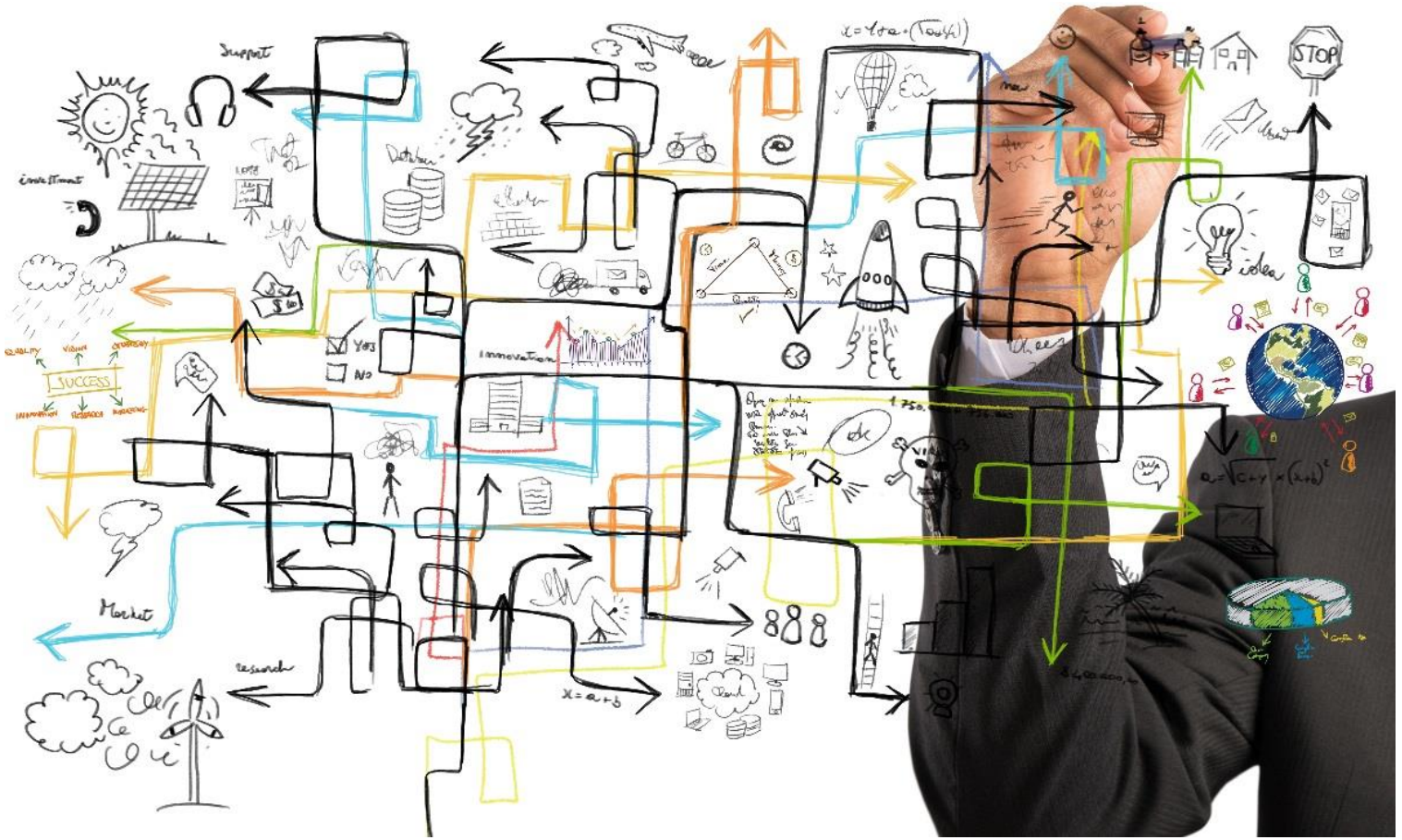
Principal, Cadmus

Over 150 cities, 10 counties, and 7 states across the U.S. have already adopted ambitious 100% clean energy goals. Six U.S. cities — Aspen, Burlington, Georgetown, Greensburg, Rock port, and Kodiak Island — have hit their targets.

- Powered by 100% RE
- Committed to 100% RE
- Working toward 100% RE

https://www.sierraclub.org/ready-for-100/commitments

Charting a path to a clean energy future can be challenging



Why Are Local and Regional Governments Interested in Buying More Renewables?

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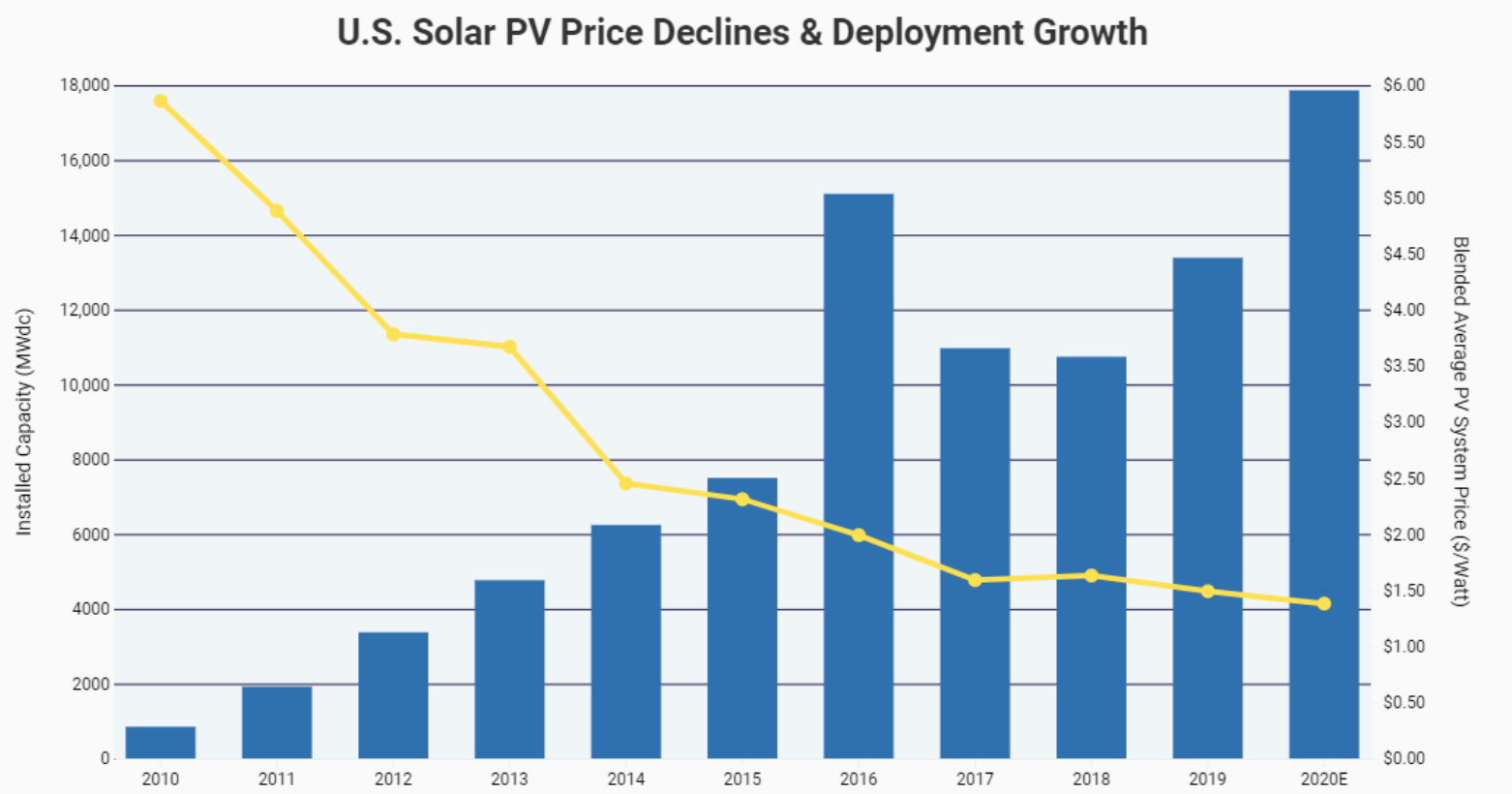
- Reduce GHG emissions
- Generate economic and financial benefits
- Reduce dependence on fossil fuels
- Display clean energy leadership
- Support broader environmental/social goals
- Attain price security (and potentially savings)

CADMUS ARLINGTON VIRGINIA DENVER THE MILE HIGH CITY The SOLAR FOUNDATION for a bright future

Growth in Solar Led by Falling Prices

- The cost to install solar has dropped by more than 70% over the last decade.
- As of Q1 2020, prices are at their lowest levels in history across market segments.
- An average-sized residential system has dropped from a pre-incentive price of ~$40,000 in 2010 to ~$18,000 today.

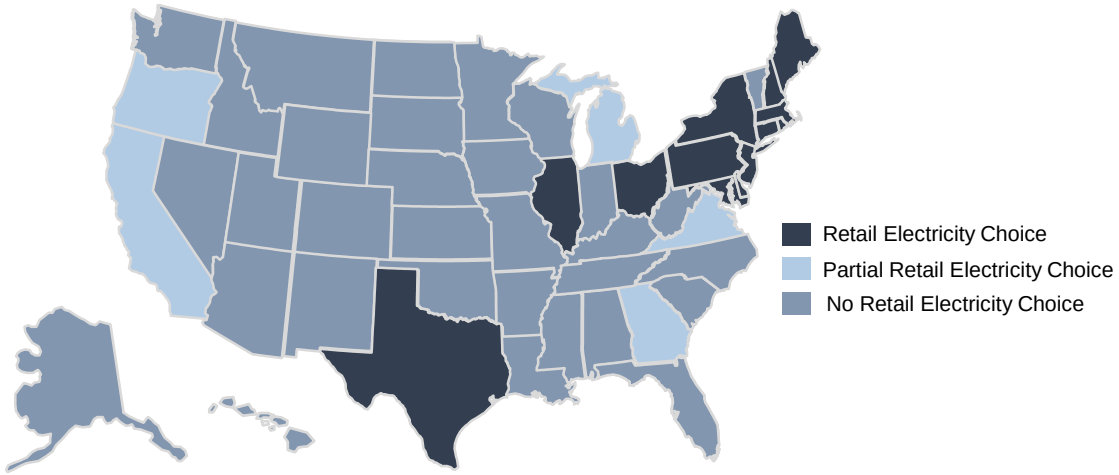


Procurement Pathways

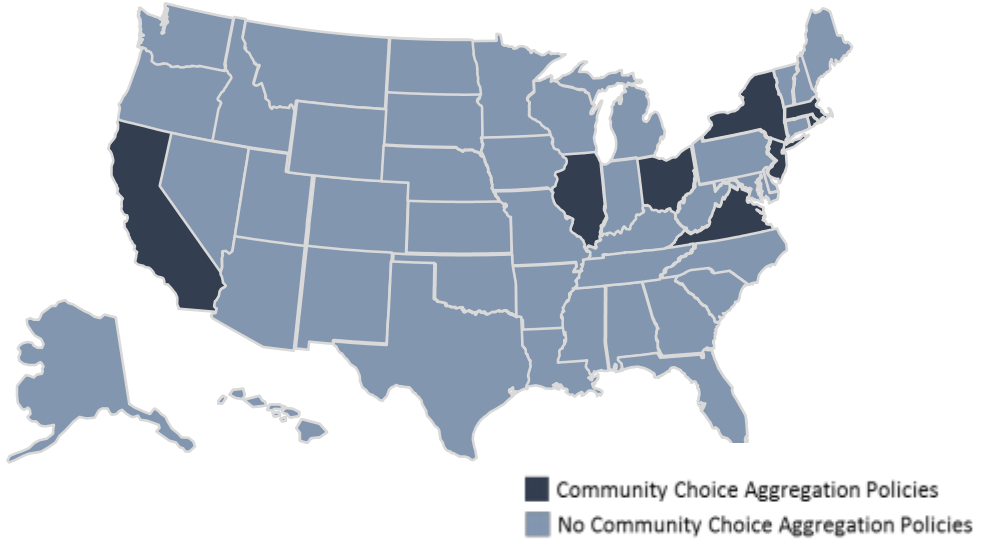
Local governments can consider the following options for procuring renewable energy:

- Buy Renewable Energy Certificates
- Own and Operate
- Community Choice Aggregation
- Contract with Energy Service Company
- Utility Green Tariff Program
- Power Purchase Agreement
- Virtual/Financial PPA
- Community Solar

Regulated and Deregulated States

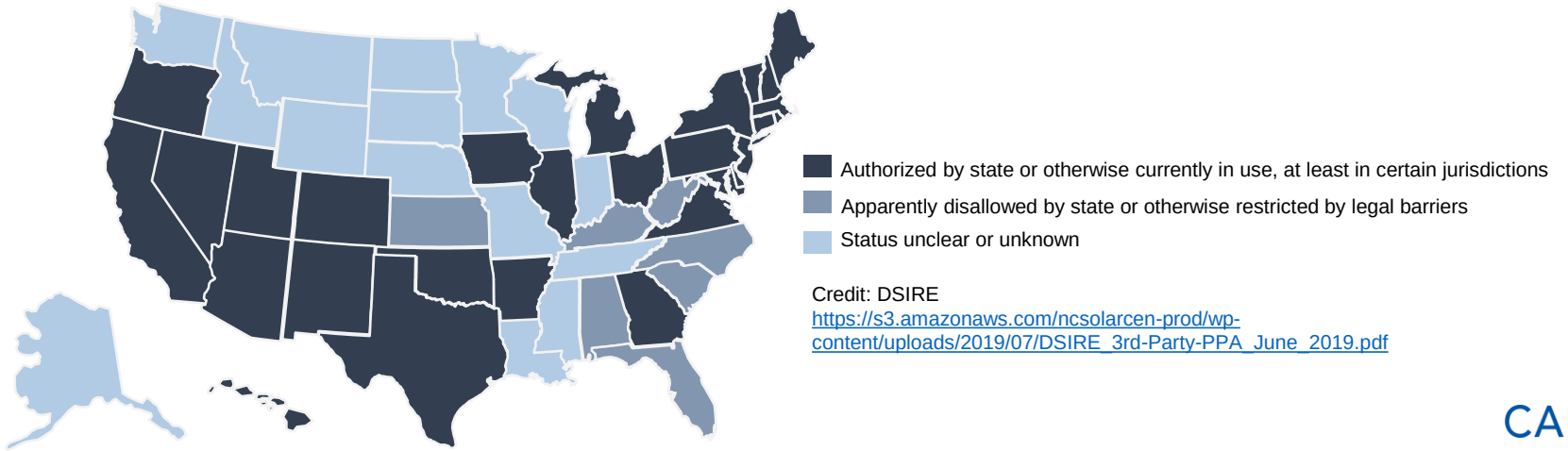


States with Community Choice Aggregation



Credit: Pathways to 100
Referenced: LEAN
https://leanenergyus.org/cca-by-state/

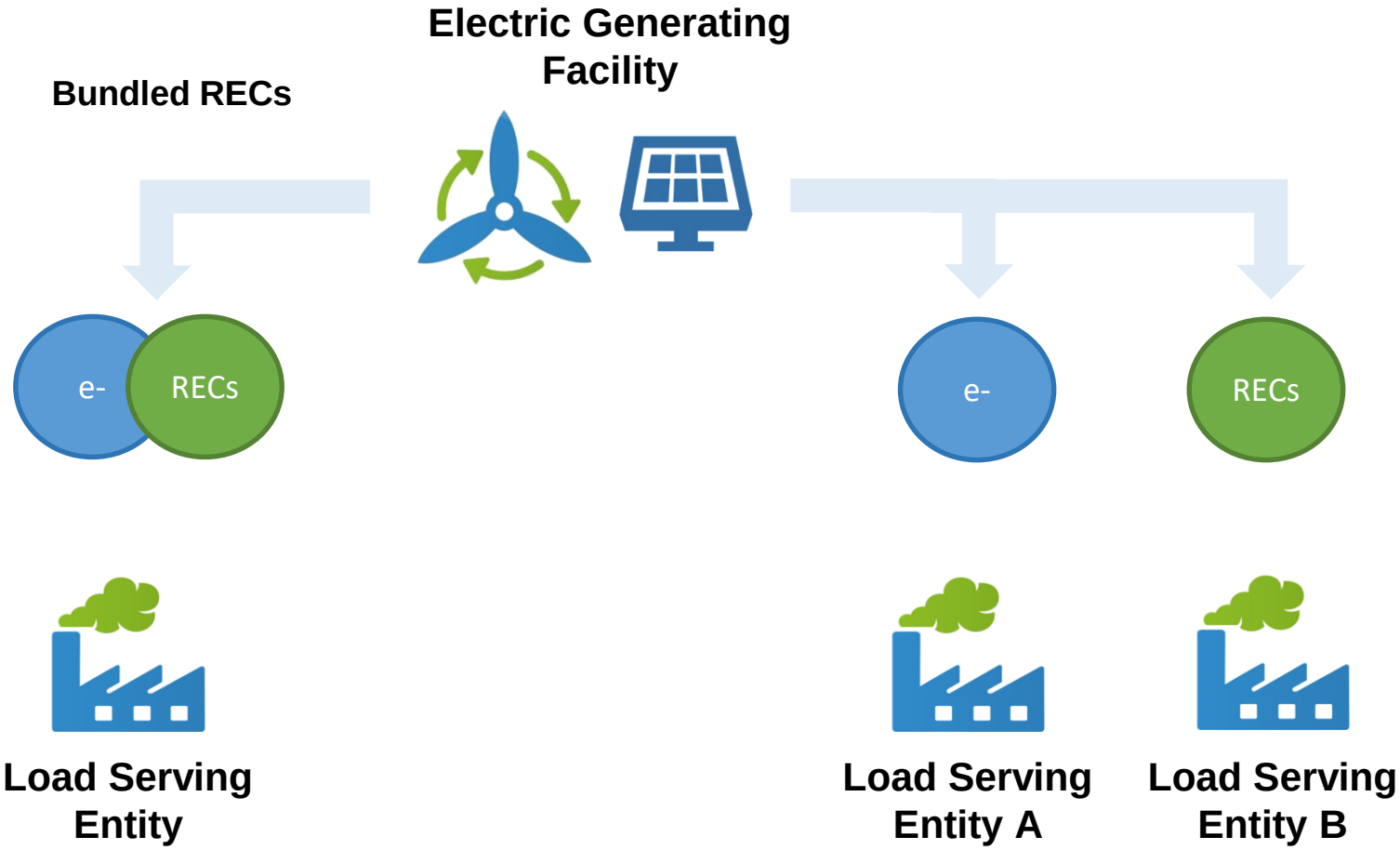
States Allowing Power Purchase Agreements (PPA)



Credit: DSIRE
https://s3.amazonaws.com/ncsolarcen-prod/wp-content/uploads/2019/07/DSIRE_3rd-Party-PPA_June_2019.pdf

Renewable Energy Certificates

- Renewable energy certificates (RECs), are an accounting instrument representing the rights to the environmental and other non-power attributes of renewable energy generation.
- One REC is generated for every one-megawatt hour (MWh) of renewable electricity generated.



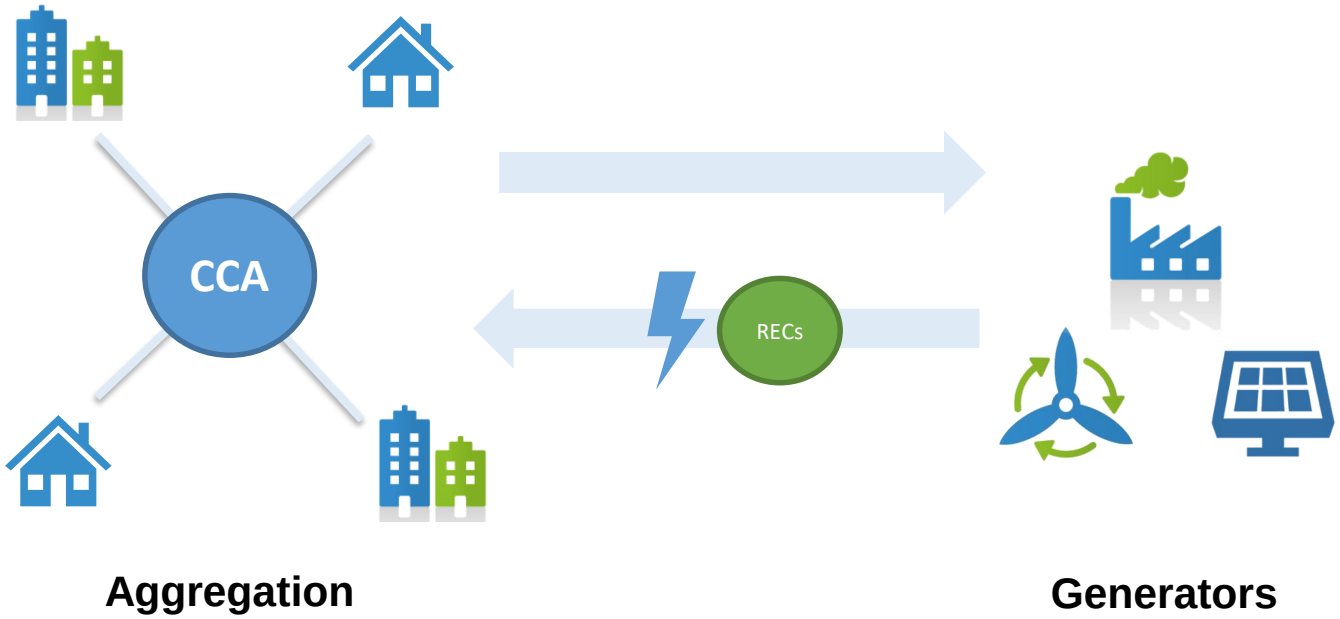
Adapted From: ISLR

Own and Operate

- Local governments can own and operate PV systems for themselves
- Municipalities use typical construction contract procurement
- Typically financed through a bond, or included in the price of a new building or a roof replacement

Community Choice Aggregation (CCA)

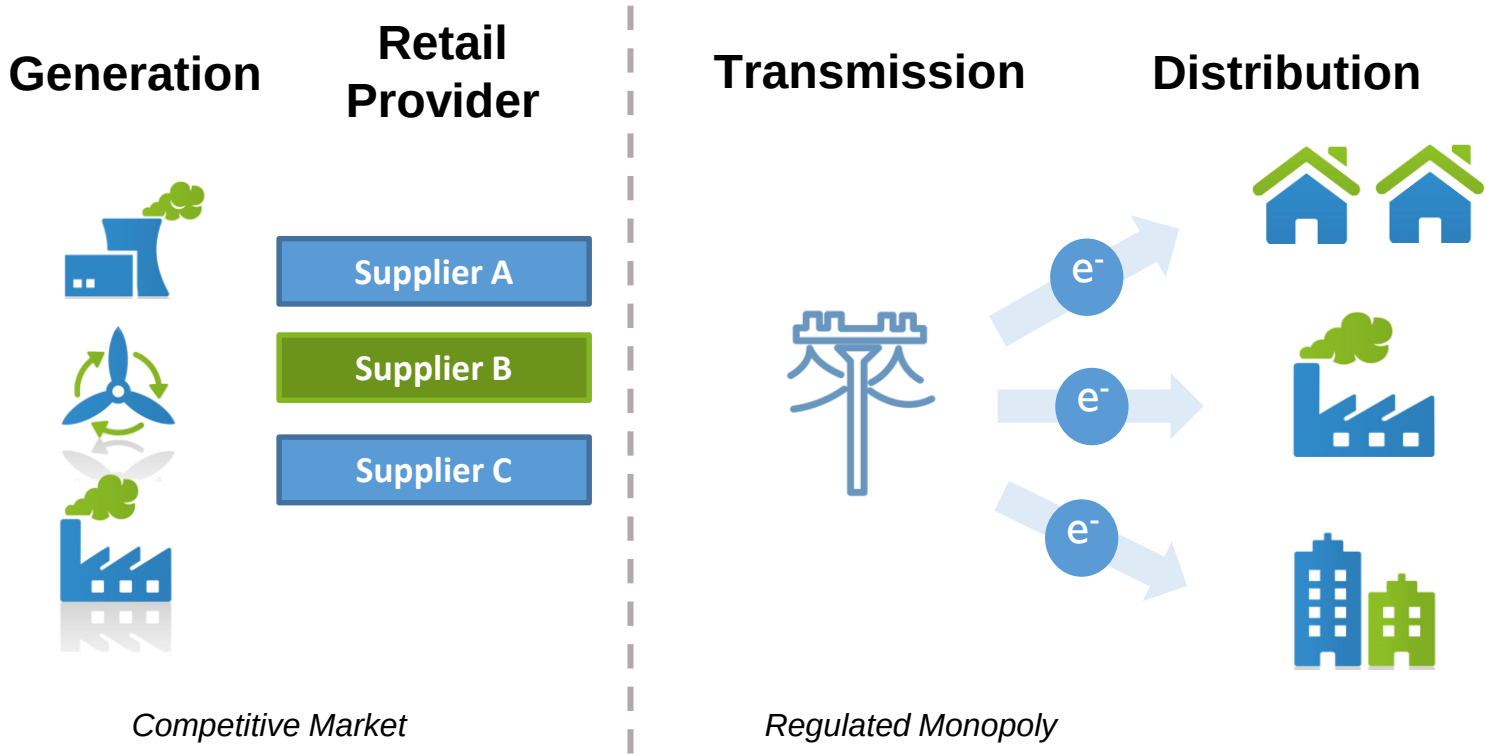
- CCA structures will vary by state, but they generally enable a local government to **pool the electricity demand** of customers within its jurisdiction **and procure power from an alternative supplier on their behalf**, while the electric utility continues to provide transmission and distribution services.
- Common drivers for establishing a CCA include **competitive electricity rates** and **increasing percentages of RE** within the electricity supply.



Adapted From: NREL

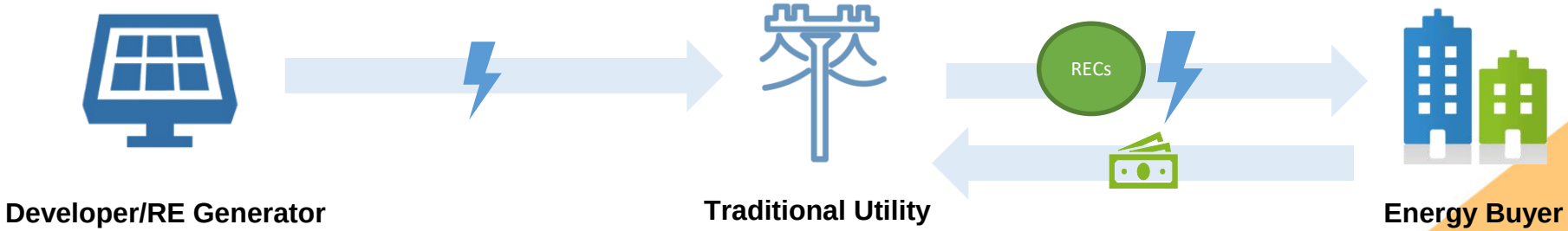
Contract with energy service company/ competitive supplier

- In states that have competitive retail supply (the "deregulated" states), communities can work with a third-party supplier to deliver an energy supply contract that includes a higher % renewables.
- Competitive retail suppliers may also be able to incorporate individual renewable energy projects into their supply mix.



Utility Green Tariff Program

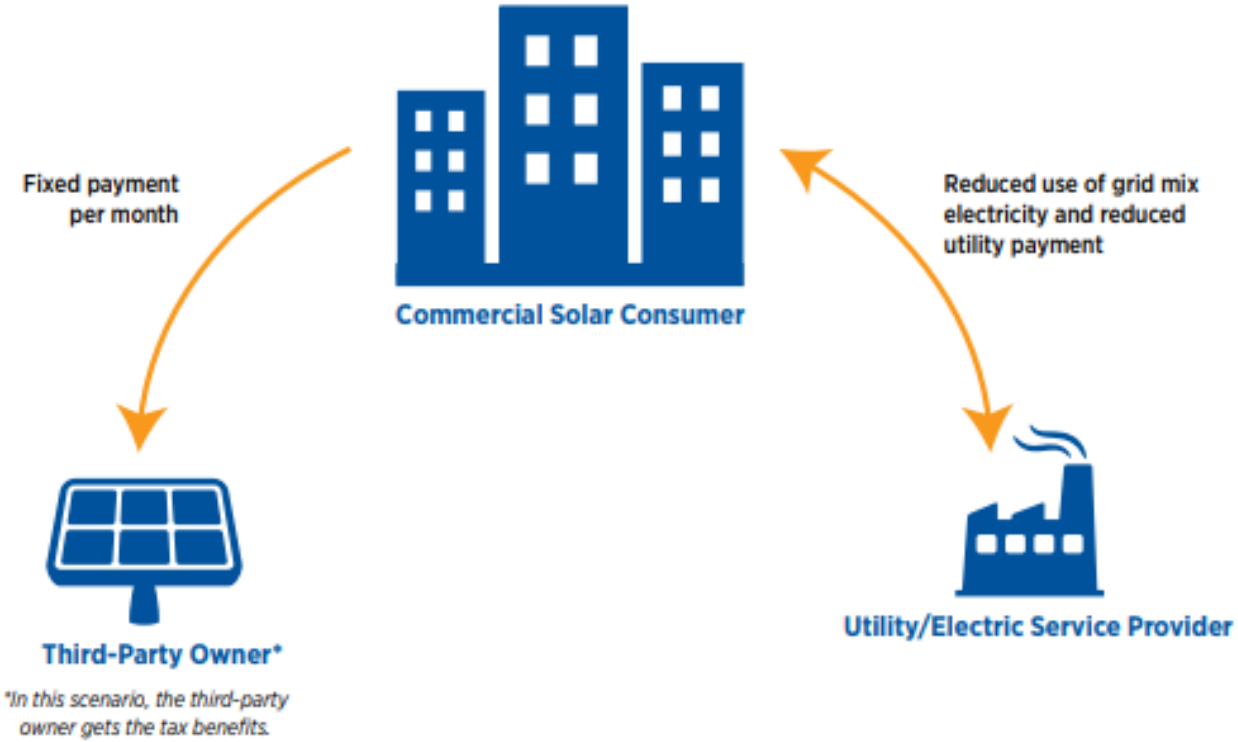
Utility green tariffs are optional programs in regulated electricity markets offered by utilities and approved by state public utility commissions (PUCs) that allow larger commercial and industrial customers to buy bundled renewable electricity from a specific project through a special utility tariff rate.



Adapted From: [American Cities Climate Challenge Renewables Accelerator]

Power Purchase Agreement (PPA)

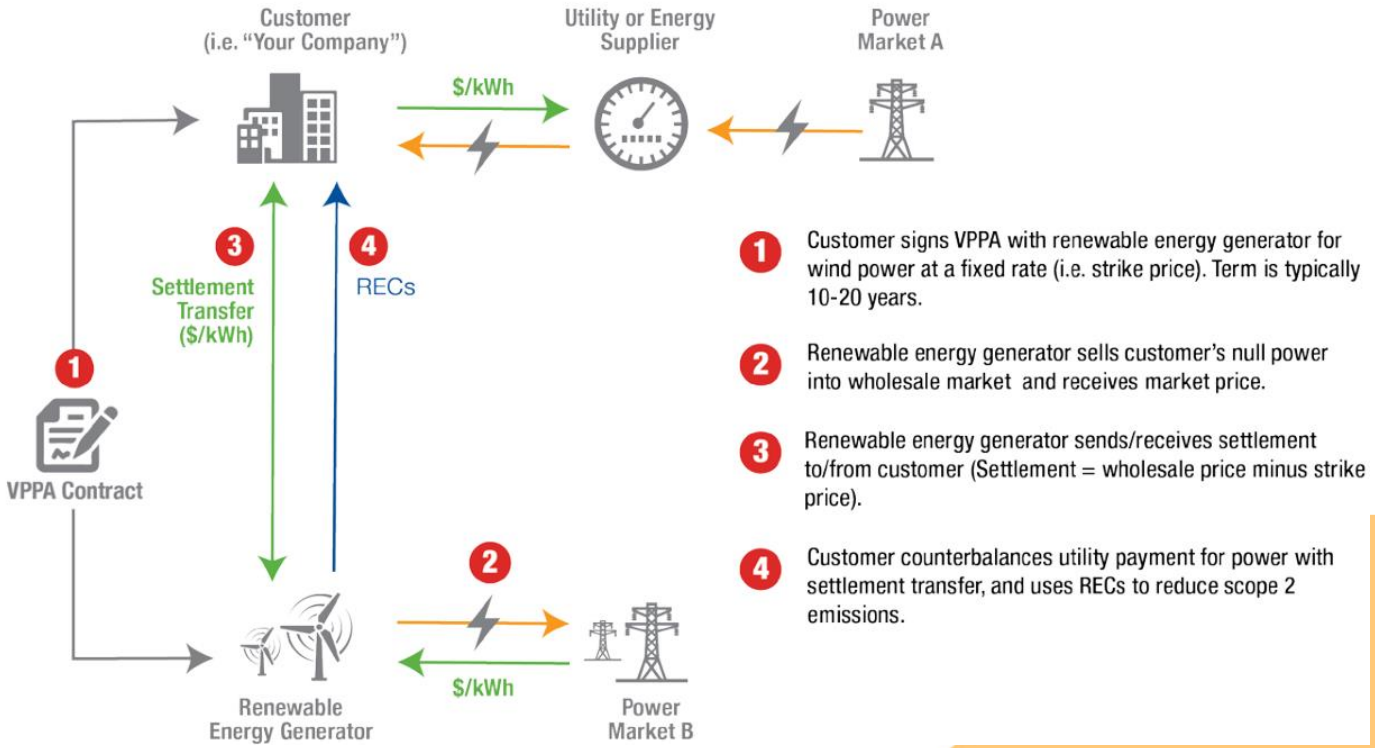
- In deregulated markets, power customers may negotiate direct contracts (PPAs) with independent renewable power generators, in which the customer purchases the output of a specific renewable energy project or portfolio of projects.



Source: EPA Guide to Purchasing Green Power

Virtual PPA

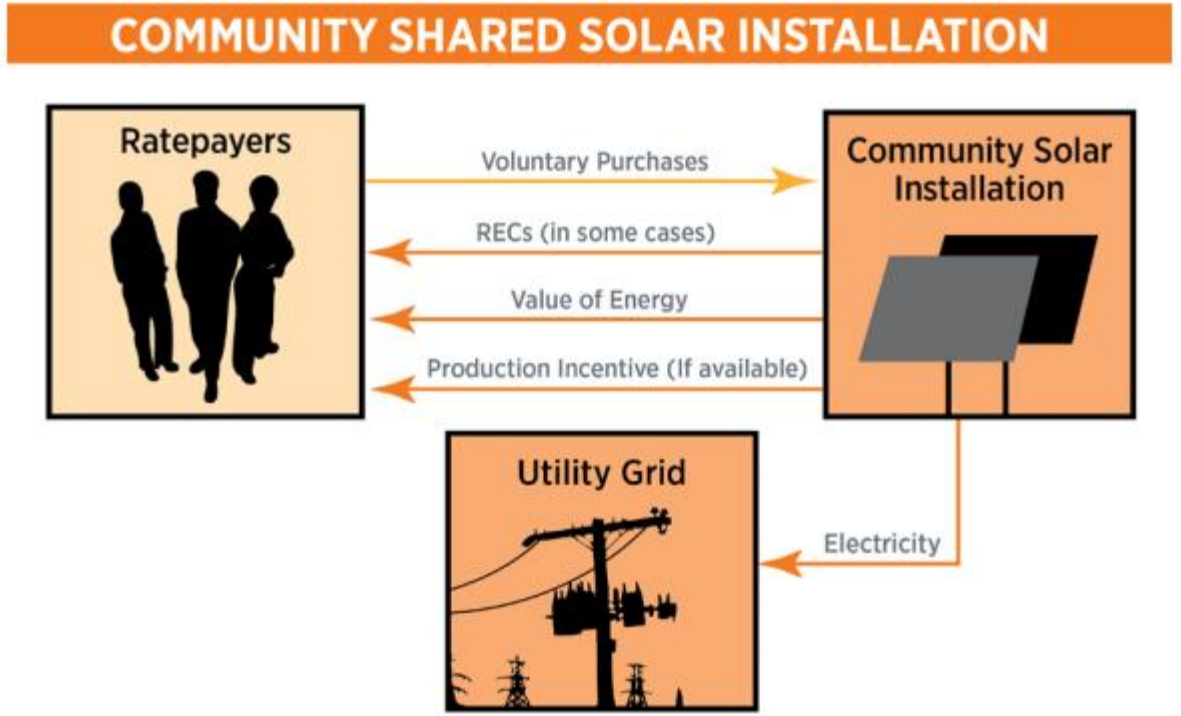
- A VPPA is a financial transaction where the buyer does not own the elections produced by the renewable energy project but receives titles to the RECs.
- VPPAs allow both the buyer and the generator to hedge against electricity market price volatility and allow the buyer to benefit from long-term price stability.



Source: EPA Green Power Partnerships

Community Solar

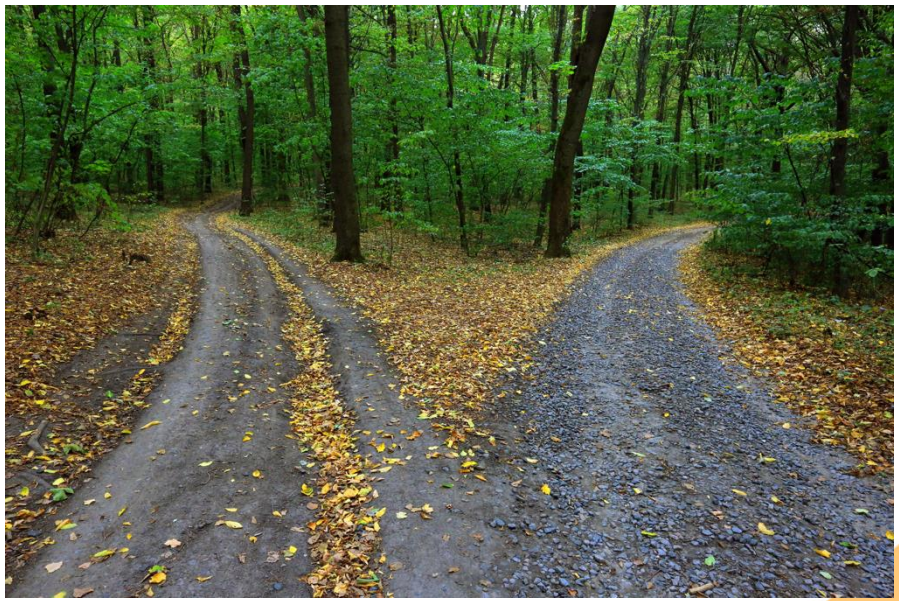
- Local governments can host community solar installations and/or can be an off-taker at a level that can help secure project financing.
- Local governments are also finding innovative ways to help support LMI households to participate in community solar projects.



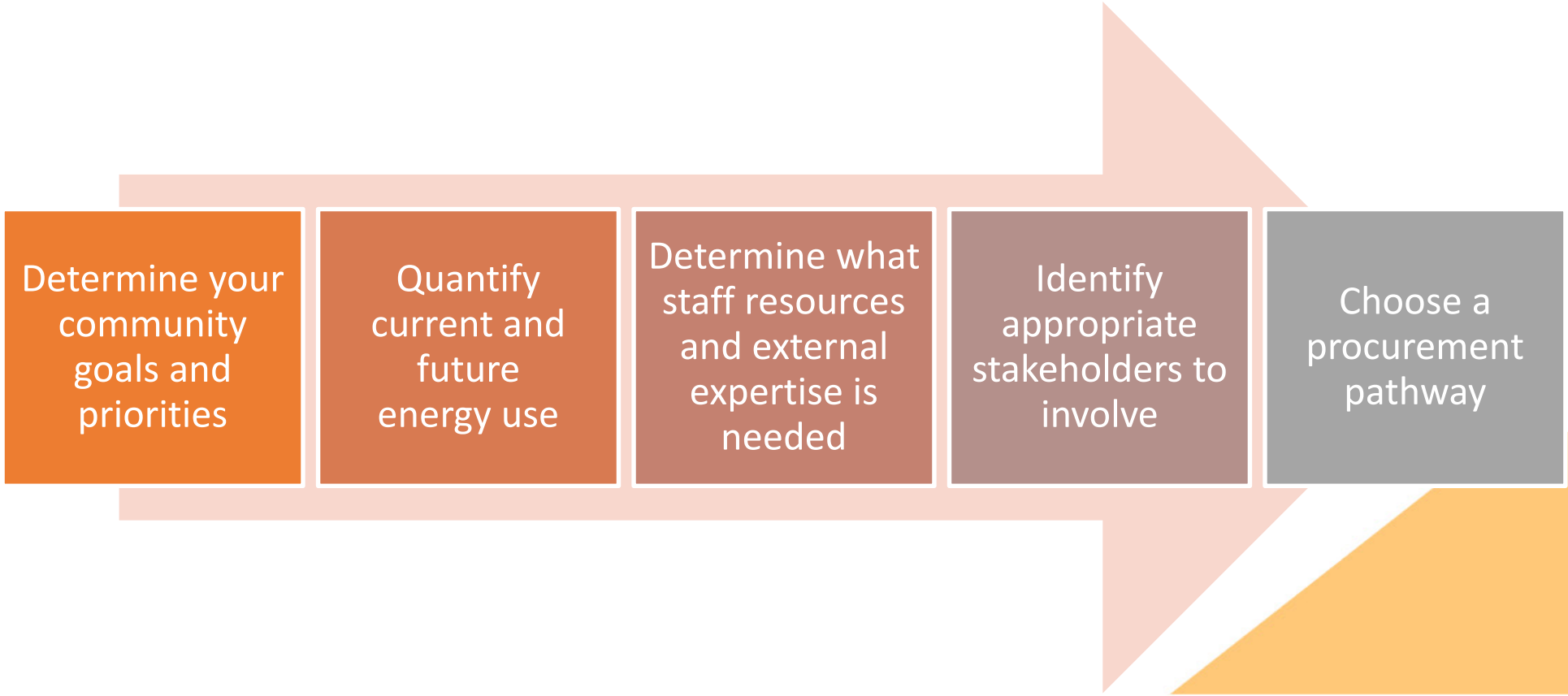
Source: NREL

Considerations for Selecting a Pathway

- Additionality versus “green purchase”
- Local impacts
- Simple versus complex transaction (1-2 months to execute versus 6-9 months)
- Contracting and legal costs (minimal to $75,000)
- Some pathways only allowed in deregulated markets
- Ability to save money, hedge against electricity price volatility



Steps to get started



John Morrill

Energy Manager,
Arlington County, Virginia

Arlington County, Virginia

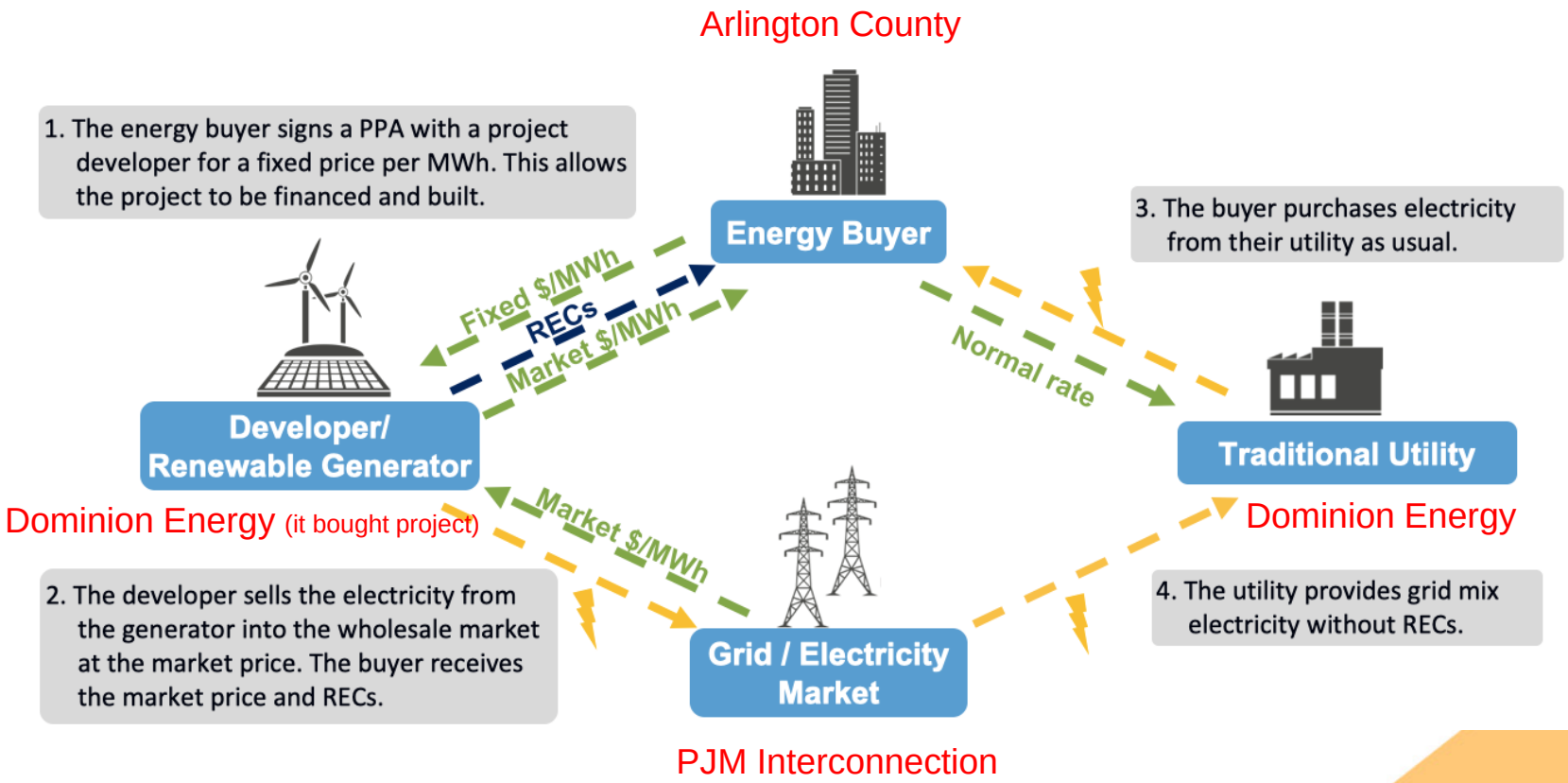
- Urban community across the Potomac River from Washington DC
- Only 26 square miles, population of 230,000
- Affluent, highly educated residents
- Home of Arlington National Cemetery, the Pentagon, new Amazon HQ2

Why? Advances Community Energy Plan

- Revised Community Energy Plan calls for carbon neutral community by 2050
- Arlington is committed to 100% renewable electricity for government operations* by 2025 (50% renewable by 2022)
- Arlington is an urban county; land is scarce and valuable
- This project reduces county government greenhouse gas emissions by over 30%

* Community-wide goal of 100% renewable electricity by 2035

How a VPPA Works



Generic illustration by https://cityrenewables.org/vppa/, this project's labels added in red text

Why Dominion?

- Virginia investor-owned utilities remain regulated monopolies
- Arlington, like other localities and public school systems, have separate contract with Dominion (not under SCC jurisdiction)
- Building the relationship between the County and the utility

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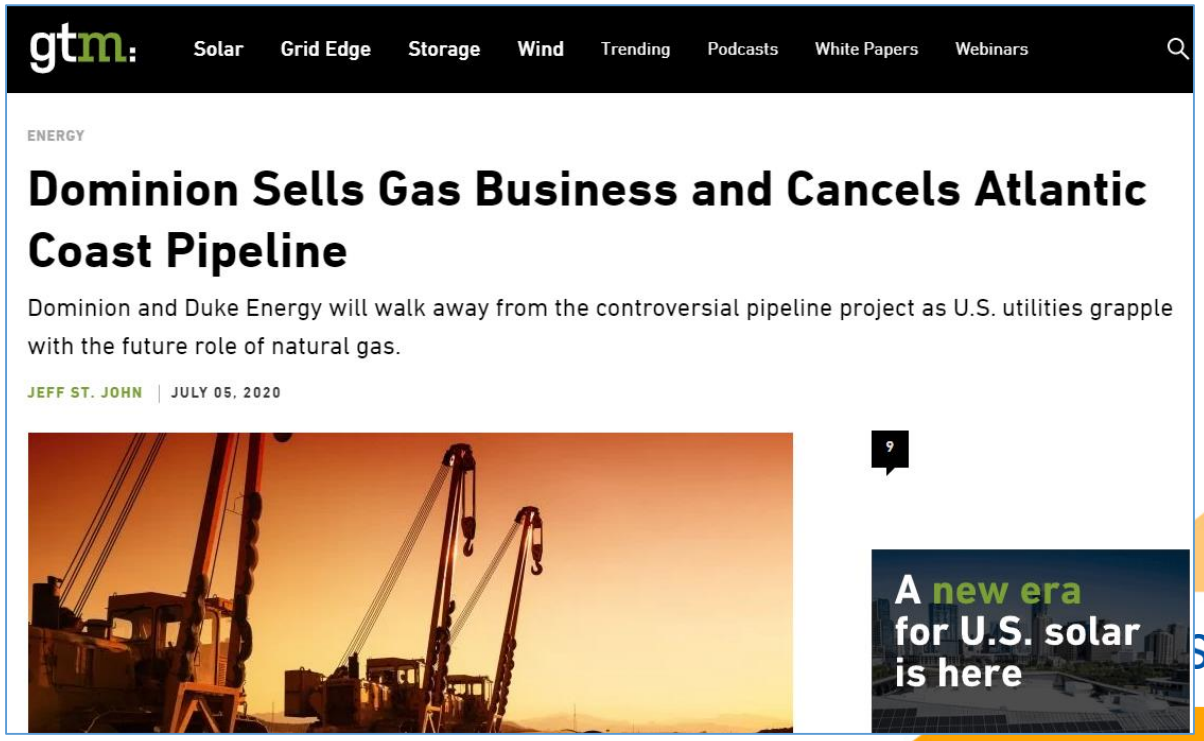


The Solar Farm Project

- Located in Pittsylvania County, VA
- Land size: 1,500 acres
- Project capacity: 120 MW_{peak}
- Lead customer: Amazon*
- County share: up to 38 MW_{peak}
- Arlington's portion will offset 90% of the County's annual electricity use (government operations)
- Now under construction
- Operational Date: Q3 2022
- Contract Term: 17 years

* Two separate contracts with Dominion. We know we did not get the same deal as Amazon, but we have very different situations.

Advantages

FINANCIAL/PROGRAMMATIC

- Fixed rate, no escalation
- No capital outlay by County
- Expense neutral, potential to be revenue-positive
- Reinforces County leadership role
- Opportunity to further expand Dominion partnership

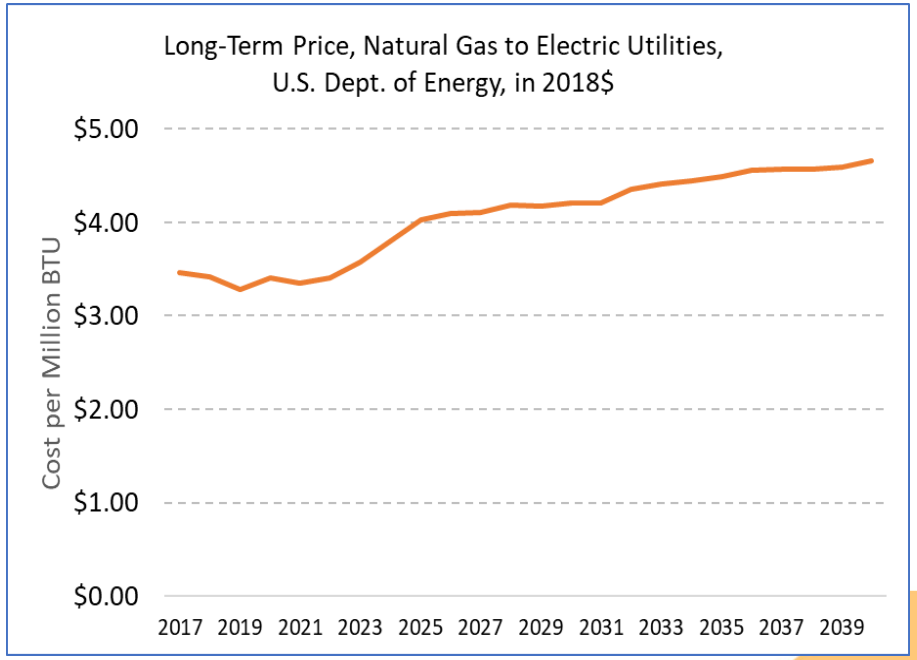
SUSTAINABLE/RESILIENT

- High-quality Renewable Energy Credits (RECs)
- Site is primarily agricultural land
- Local economic impacts in-state
- Exceeds County's CEP Goal of 50% renewable energy for Government Operations by 2022

Risk and Mitigation Factors

MARKET FACTORS

- **RISK**: Wholesale market rates fall below County's fixed rate for an extended period
  - ➢ If so, the rates the County pays for electricity will likely fall as well, and offset losses
  - ➢ However, outside expert analyses forecast rising costs for natural gas and wholesale electricity in Virginia in the future



The price of natural gas has a direct effect on the price of wholesale electricity. Over half of the electricity made in Virginia comes from burning natural gas.

Lessons Learned, Next Steps

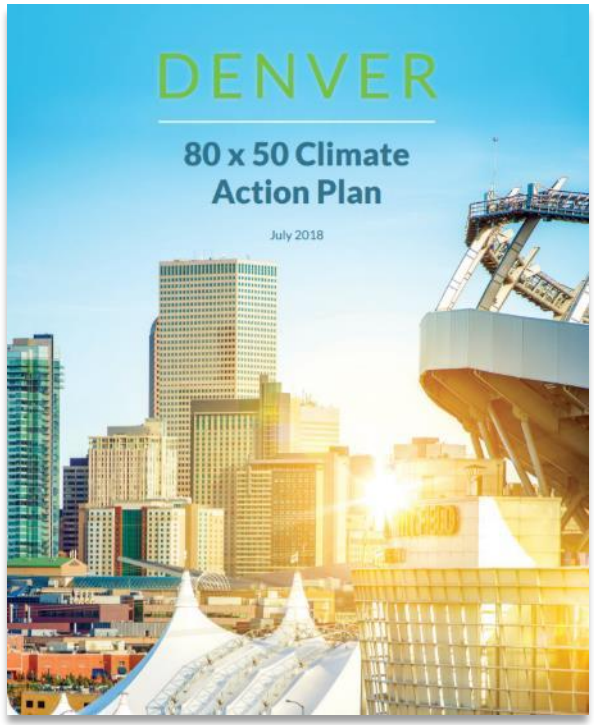
- Another VPPA is likely for remainder of Arlington's government operations load
- Next VPPA likely to be competitive, with public and/or private partners
- Resources emerging from SolSmart, American Cities Climate Challenge, etc on navigating PPAs of all kinds

Jonathan (Jonny) Rogers

Renewable Energy Specialist,
City and County of Denver

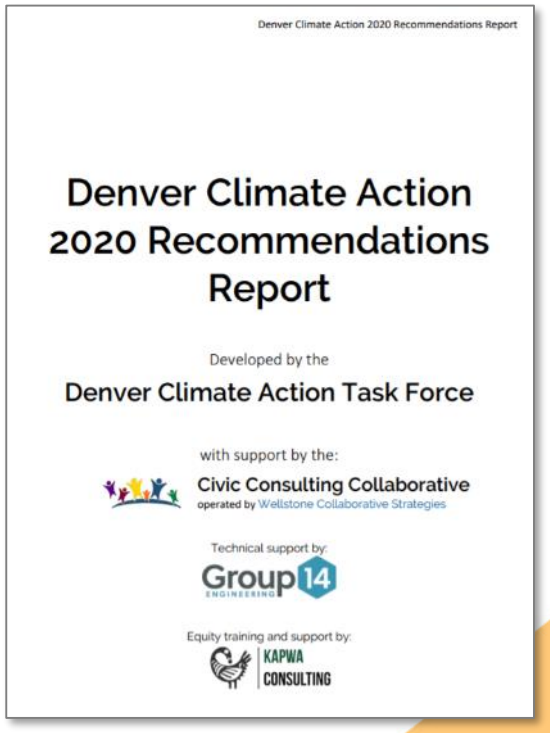
Denver's long-term climate goal

2018 commitment from the Mayor



Reduce GHG emissions **80%** by 2050 from 2005 baseline

Even bolder recommendations from the public



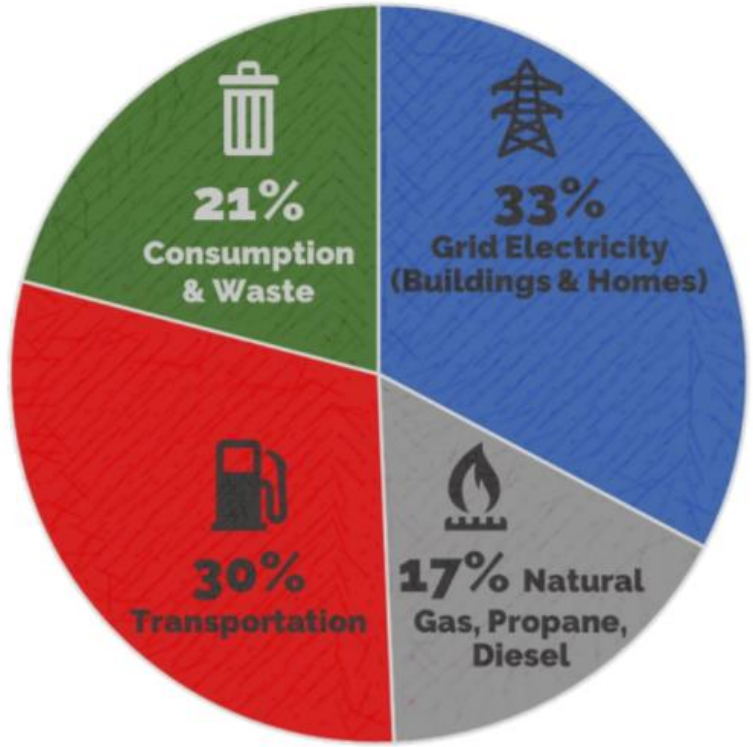
Reduce GHG emissions **100%** by 2040 from 2005 baseline

We can reduce greenhouse gas emissions AND advance equity and racial justice.

Decarbonizing the grid is foundational to Denver's climate objectives including beneficial electrification

Key considerations for HOW we do it,

- What are the city's objectives?
- What matters to achieve systems-level decarbonization?
- How do we achieve our clean energy targets while empowering the community?



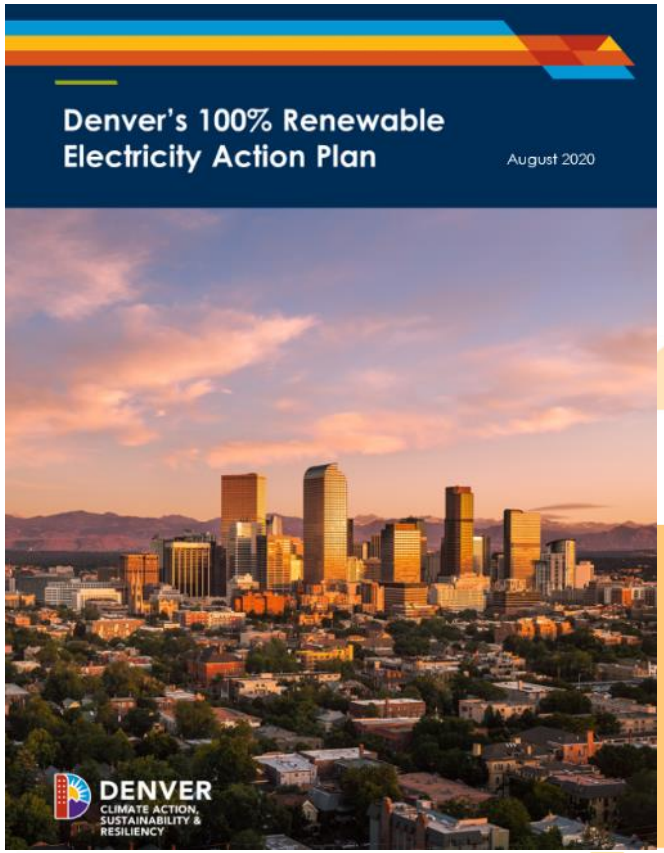
Focus on the system and the community.

Denver's renewable vision is to enable a rapid and equitable transition to a 100% renewable electric system in Colorado.

By 2030, 100% of Denver's community-wide electricity use will contribute to this vision.

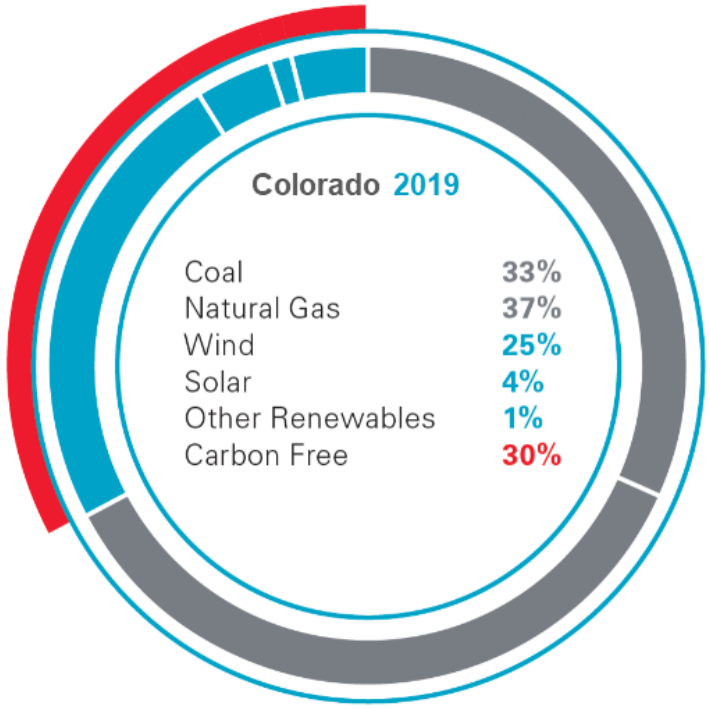
Priorities:

1. Maximize investments in local renewable energy sources. (including by creating and transferring additive RECs to Xcel Energy)
2. Produce co-benefits such as workforce development, utility bill savings, and more resilient public facilities.

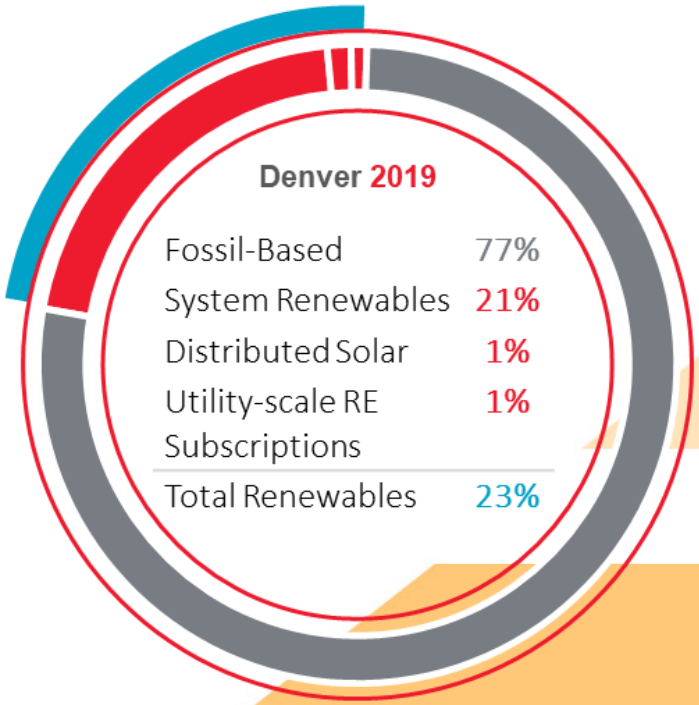


Additive, local renewable energy capacity is necessary for system decarbonization

- Denver as a community represents about 25% of Xcel's Colorado retail sales. Our actions and advocacy can influence the whole system.
- Added renewable energy capacity does more to decarbonize the grid than buying RECs from existing generating units.
- Transportation and building electrification allows us to rethink the distribution system and the strategies to promote resilience and renewables integration.



Xcel Energy Colorado Power Supply 2019



Denver's Contributions to a Clean Electric Grid

Denver's no-cost strategy to advance our energy and community objectives

RENEWABLE DENVER
Community Solar

Powering Denver facilities, while empowering our communities

1. Host community-solar gardens (CSGs) on municipal property
2. Co-locate EV charging infrastructure at community accessible solar canopy CSGs
3. Maximize co-benefits via bill savings for LMI residents and workforce/student programs
4. Create a visible and replicable framework for deploying solar in Denver at no up-front cost

Supported by a $1,000,000 award from the CO Department of Local Affairs

1. Solar deployments occur at no up-front cost to the City or our host facilities.
2. Enables long-term savings on electric rates for muni-operations and LMI subscribers.
3. Provides a test-case for a portfolio-based CSG framework using multiple sites.
4. Supports our ability to provide workforce training and student education programs.

At the end of the day, we are turning a $1 million award into $40+ million worth of solar and testing a framework that will not require future grant funding to replicate and scale.

Community Impact as a Core Principal

- ✓ Solar Futures (student) Program
  - Lab for at least 10 students in 60hr course
  - 10 Schools engaged
- ✓ Job training designed specifically for underserved communities
  - At least 15 Denver Metro residents to participate in Solar Training Academy + employment for at least 19 Denver residents.
- ✓ Energy bill savings for LI residents
- ✓ Partnerships to ensure subscribers have access to comprehensive energy reduction services
- ✓ “Community Solarthon” to engage the full community

Unlocking solar potential and co-benefits through a multi-site portfolio

System Type

	Canopy	Roof	Ground
Cost	$$$$	$$	$
Visibility			
Co-benefits			

Aggregated Costs =

- Portfolio bankability
- Utility bill savings
- Visible projects
- Investment in more neighborhoods
- Community co-benefits

Renewable Denver CSG Process Flow

1

Select CSG Partner:

Competitive solicitation emphasizing experience, local employment, and community engagement.

2

Master Services Agreement:

Conduct site evaluations and select a portfolio of rooftop, parking canopy, and ground mount CSG sites.

6

Reinvest and Repeat:

Energy cost savings to the City are reinvested into additional energy and efficiency programs. Repeat.

Process Flow

3

Site Lease Agreements:

Waive lease fees in exchange for lower-cost electricity and low-income participation/savings targets.

5

Operations and Maintenance:

Solar provider's return on investment is coupled to O&M and system performance, reducing Denver's risk.

4

Power Purchase Agreement:

Subscribe City facilities to the CSGs and make excess power available to members of the community.

Three Pillars of the Renewable Denver Initiative

Benefits of being a Community Solar Host

1. No-cost opportunity to advance city-wide climate goals
2. Realize economic benefits over the life of the project
3. Enable community impacts and co-benefits

Project Development – Stage Gate Process

Site Selection and Due Diligence

- ✓ Maximize projects located within the community and each district
  - ❑ Focus on solar canopies and optimized rooftops
  - ❑ Account for EV Charging and storage
- ✓ Will need larger “anchor” projects to achieve project goals
- ✓ Stakeholder and community engagement are critical to success
- ✓ Clear understanding of what makes for a good project.

Denver's next steps to realize the initiative

1. Lock in commitments from City-agency partners to meet the project development timelines

- Make our partners' involvement as simple as possible.
  (No costs. Minimal administrative burden. Transparency at every step.)
- Be ready with a complete bid package for Xcel Energy CSG RFP in October 2020

2. Coordinated/collaborative community engagement strategy

- Phase I: Identify key points of contact in the city and at community organizations
- Phase II: Coordinated community engagement and educational campaign
- Phase III: Implement job training and student focused programs

Conclusion

Additional Resources

- **Webinar #1:** Local Government Strategies for 100% Clean Energy
- **Webinar #2:** Using Community Choice Aggregation to Achieve Clean Energy Goals

- Pathways to 100: An Energy Supply Transformation Primer for U.S. Cities
- A Guidebook on Equitable Clean Energy Program Design for Local Governments and Partners

- Guide to Purchasing Green Power

- Institutional Renewable Energy Procurement: Guidance for Purchasing and Making Associated Environmental Impact Claims

Engaging Your Community with SolSmart

- No-cost technical assistance can help your community achieve solar energy goals, including CCAs
- Available to all municipalities, counties, and regional organizations

Contact us for more information at **info@solsmart.org.**

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Q&A

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