Community Choice Aggregation 3.0
www.northamptonma.gov/2069/Climate

Wayne Feiden, FAICP (WFeiden@Northampton.gov)
City of Northampton, Director of Planning & Sustainability

Community Electricity Programs in Massachusetts

February 24, 2020

PEREGRINE ENERGY GROUP

Introduction – two presentations

- Peregrine Energy Group, focusing on
  - One state – Massachusetts
  - Opportunities that build from existing, proven approaches
  - The aggregation program, not the entity sponsoring the program
    - Uses the term “Community Electricity Program” (CEP)
- Local Power, focusing on
  - A national perspective
  - New trends and opportunities
  - The sponsoring entity
    - Uses the term Community Choice Aggregation (CCA)

CEP in Massachusetts

- Authorized by the Electric Industry Restructuring Act of 1997
- The first program launched in 2002
- Today, over 150 communities have programs, including many of the largest communities in the state, such as Newton, Worcester, Cambridge, and Lowell
- Initially, most CEPs focused on saving money
- Today, many CEPs focus on supporting renewable energy

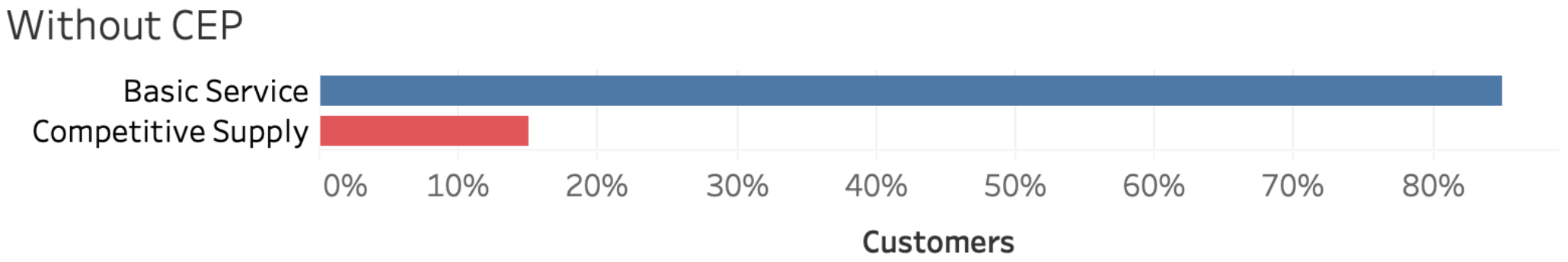
Challenges for MA CEPs

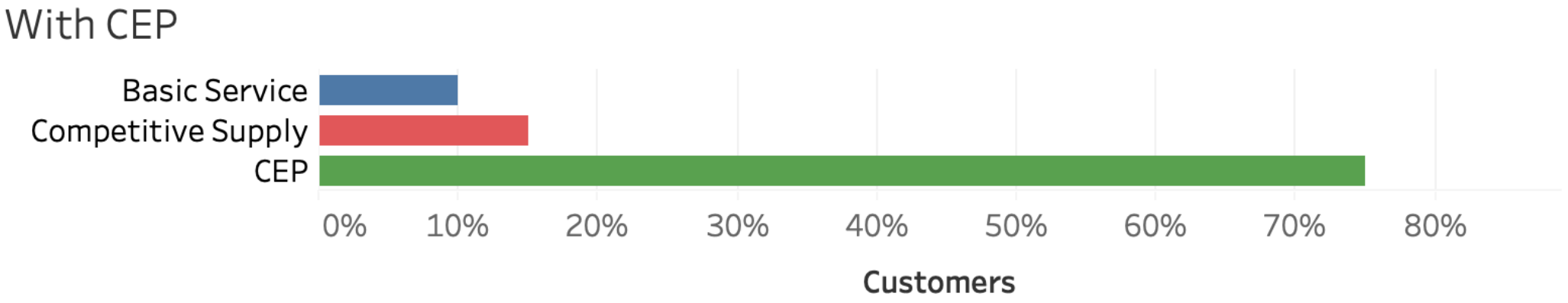
- Customers can leave any time
- Robust competition from competitive electricity suppliers
- Utility Basic Service rates based on short-term market prices
- No supplier consolidated billing
- No advanced metering for small customers

The power of MA CEPs

Opt-out enrollment

75% of customers in a community can be switched to green electricity with the stroke of a pen.

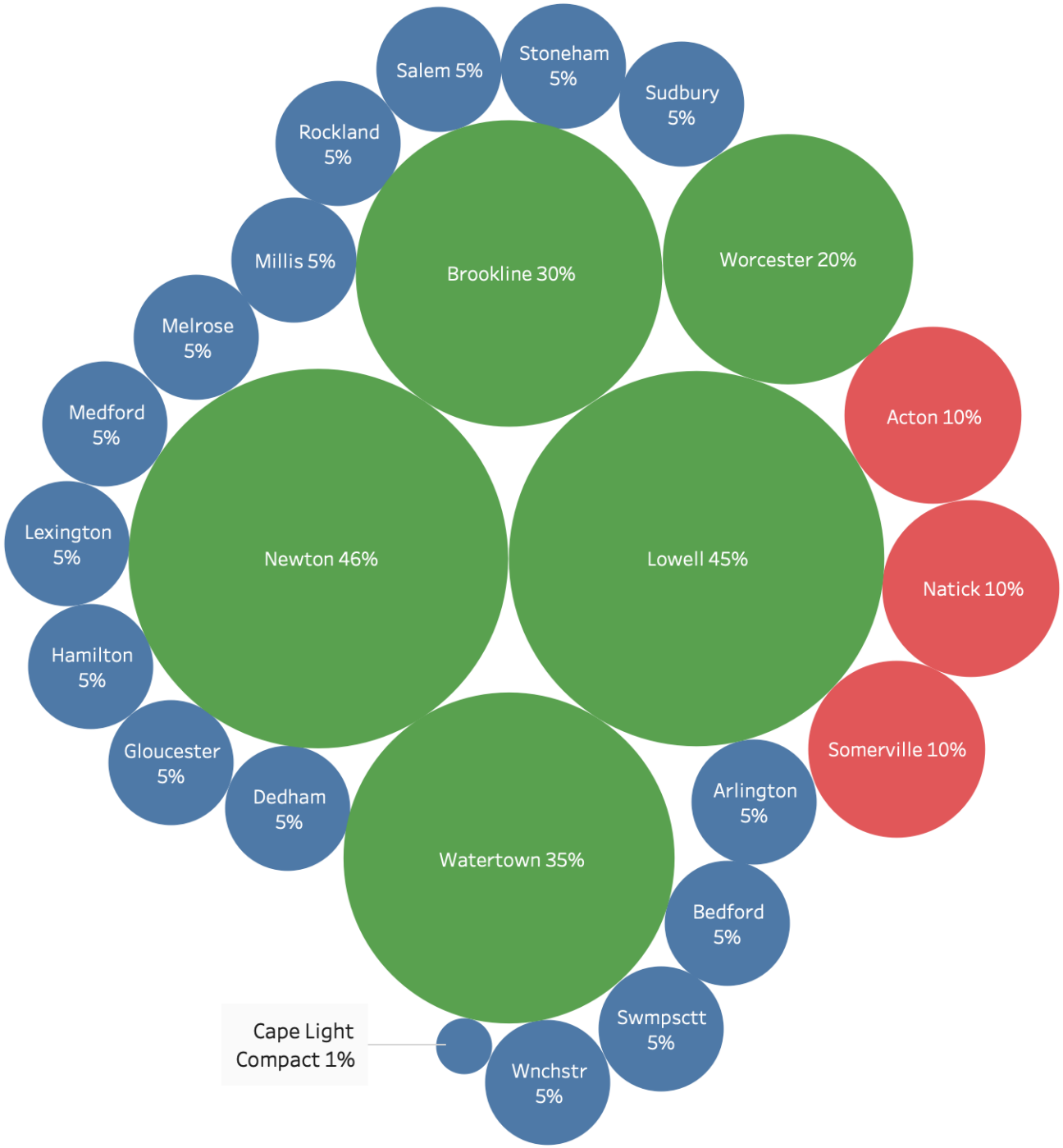


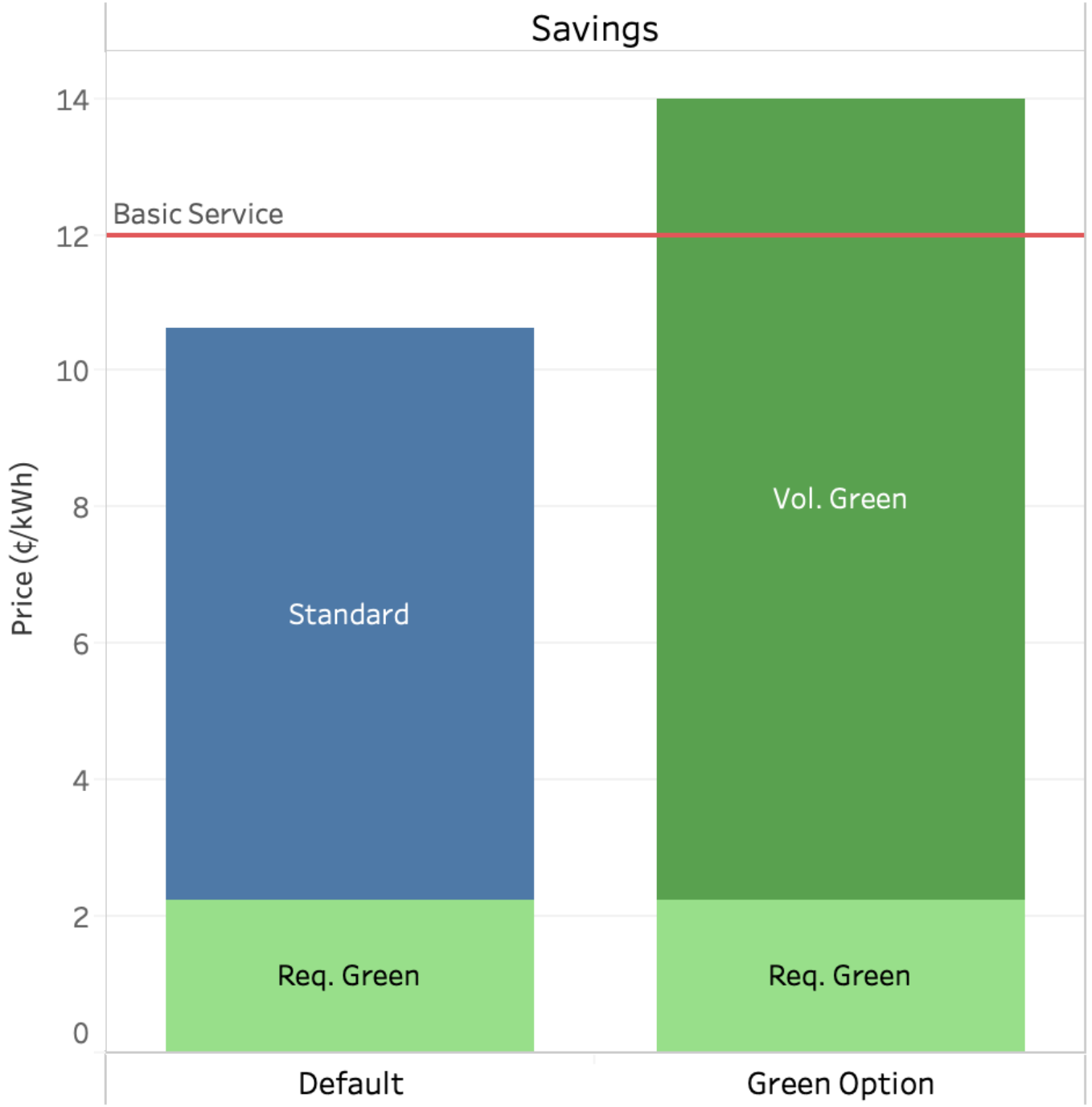


Percentage of renewables above the state minimum

24 CEPs are providing additional renewables in their default product

Several communities have increased their percentage of additional renewables over time





Traditional approach

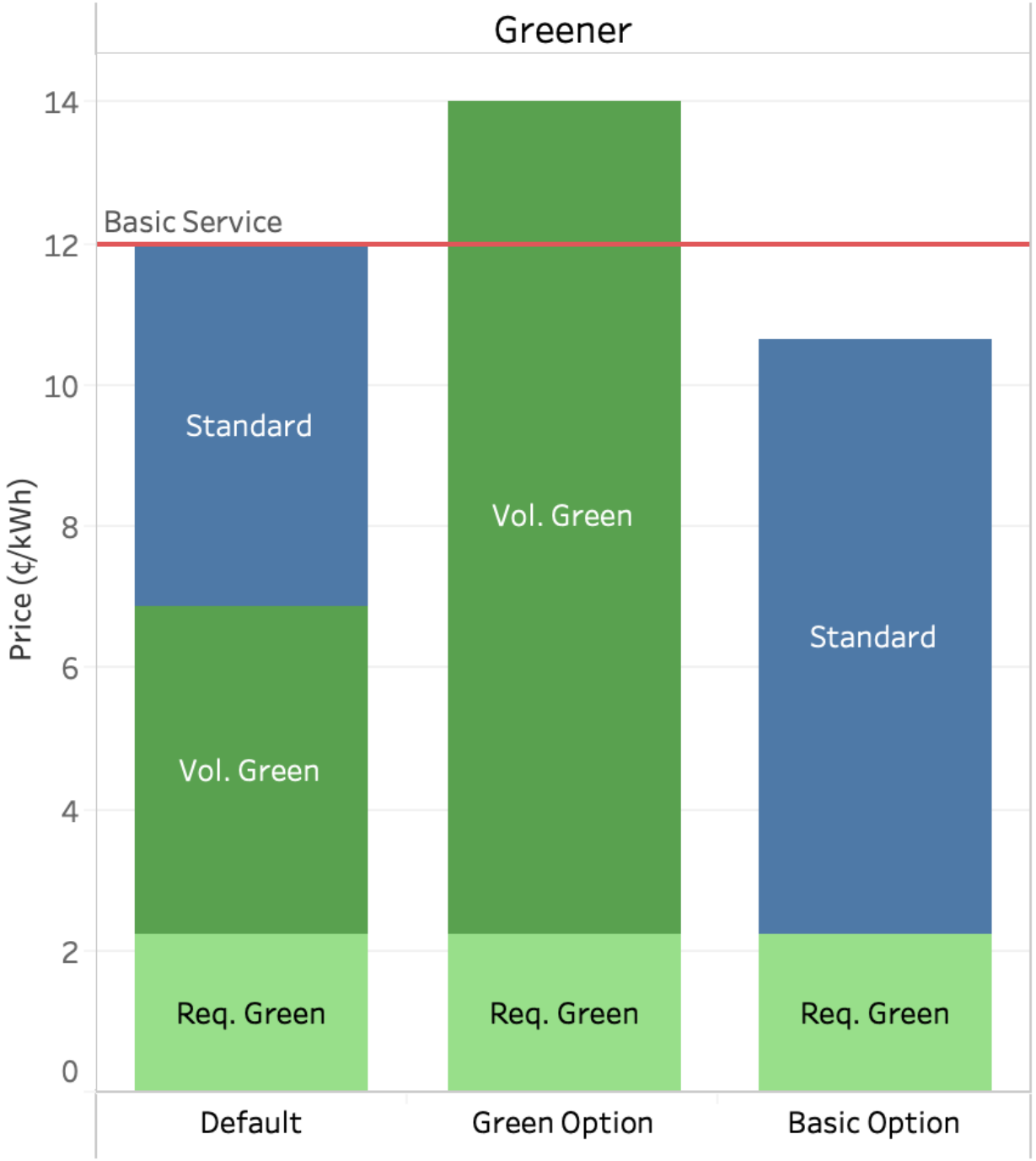
Default product is designed to maximize savings. It contains only the minimum amount of green electricity required by state law.

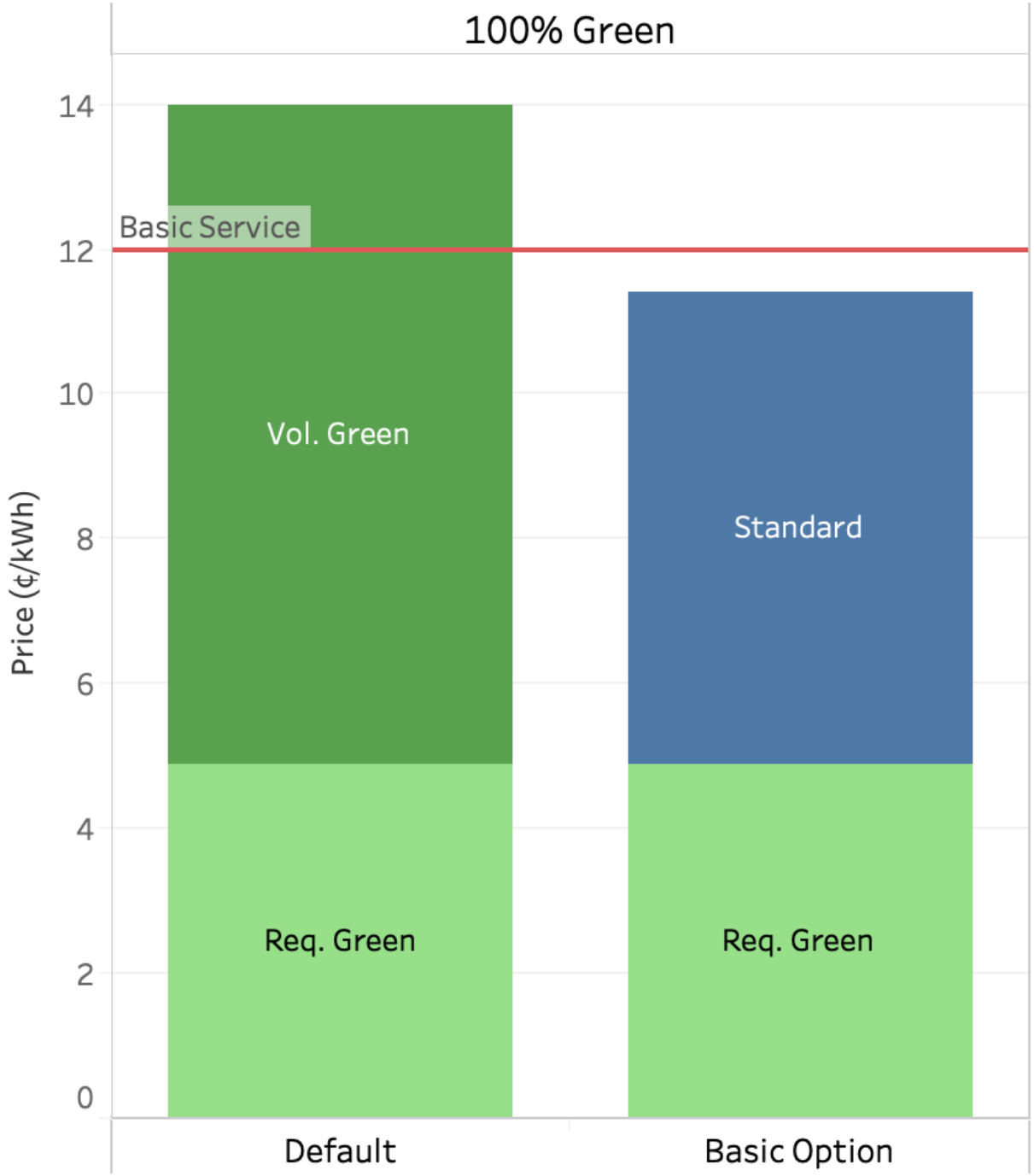
A 100% green option, containing additional, “voluntary” green electricity, for customers who choose it.

Current approach

Default product is designed to maximize renewables *while staying below the cost of utility basic service*

100% green and basic options for customers who choose them



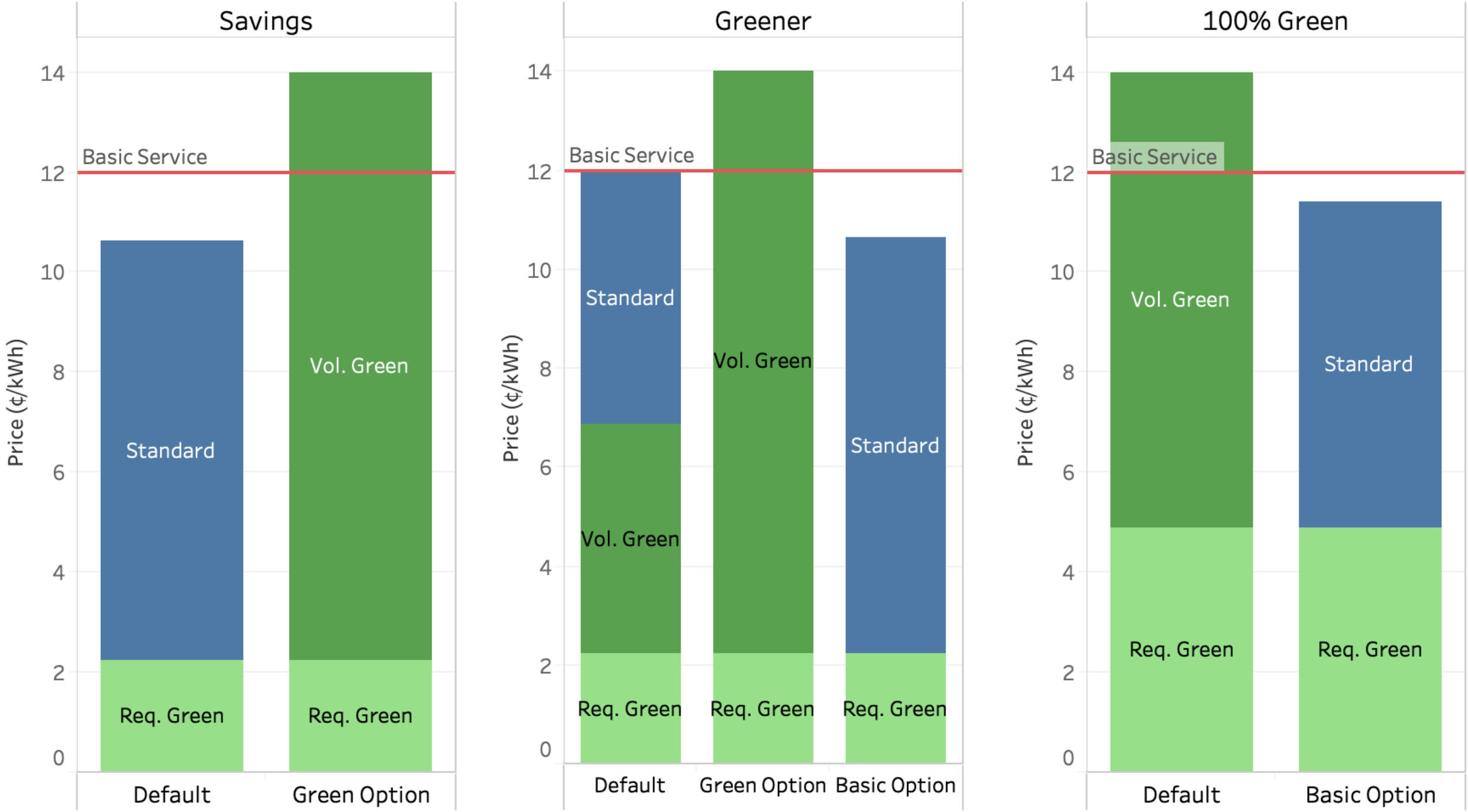


New approach

Default product is 100% green

Customers must affirmatively choose a less green option

Note: Communities are looking at phasing in this approach as part of their plans to achieve community-wide climate goals.


Savings
Greener
100% Green
Price (¢/kWh)
0
2
4
6
8
10
12
14
Basic Service
Standard
Vol. Green
Req. Green
Default
Green Option
Basic Option

Strategies for making the default product green

- Renewable Energy Certificates
- Long-term contract with a renewable generator
- Modular investment in renewable generation

Renewable energy certificates (RECs)

Description: Purchase more RECs than are required by the Renewable Portfolio Standard. Purchase RECs as part of periodic energy supply procurement .

- This strategy is well-established and used by many CEPs today.
- Very flexible. The CEP can modify its strategy over time.
- Like the Renewable Portfolio Standard, this strategy provides market-based additionality rather than the direct additionality that comes from a commitment to a specific generator.

Long-term contract with a renewable generator

Description: To support the development of a new project, the CEP makes a long-term commitment to purchase the RECs and energy from a renewable energy generator.

- The CEP takes the risk of fluctuations in the power price. The CEP would need to be prepared to increase its price to customers if needed.
- It is not clear that a commitment from a CEP is sufficient to support financing for a renewable project.
- Because this strategy requires a long-term commitment, it may preclude other options that the CEP could otherwise take later.

Modular investments in renewable generation

Description: Pay 1 – 2 years of funding from a CEP adder to a renewable generator in return for a commitment from the generator to provide the output of the facility for a long-term, e.g., 20 years.

- The size of projects that can be supported is limited, but multiple projects can be supported over time.
- Very flexible. Allows the CEP to evolve its strategy over time.
- Avoids difficulties related to a CEP's lack of credit.

Other strategies

- Promote voluntary opt-ups to a 100% Green product
- Reduce electricity use at times of greatest environmental impact
- Administer the energy efficiency programs that are funded through utility rates

Recommendation

- Opt-out enrollment is a CEP’s most powerful tool
- Start there

CCA 3.0

Reducing Greenhouse Gas Emissions

Paul Fenn

USDN-IF Community Choice Aggregation Webinar

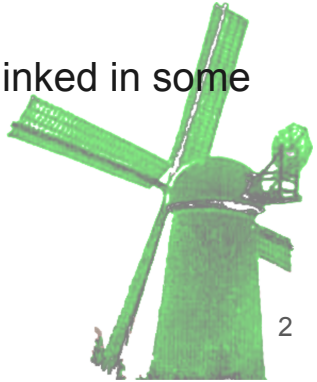
February 24, 2020

Local Power

USDN urban sustainability directors network

Energy terms used in this presentation

- **CCA** - Community Choice Aggregation is a municipally administered community-wide utility energy purchasing program authorized by state laws
- **DER** - Distributed Energy Resources are renewable energy generators, energy storage, demand management and energy efficiency measures installed at the end of distribution systems near or at the point of use.
- **REC** - Renewable Energy Certificates are tradable, non-tangible energy commodities in the United States that can be sold and traded or bartered, and the owner of the REC can claim to have purchased renewable energy.
- **Green Bonds** - Fixed-income financial instruments (municipal revenue bonds) linked in some way to climate change solutions.



Interviews

Massachusetts Somerville, Nantucket, Brookline, Arlington, Melrose, Cambridge, Newton, Lowell, Cape Light Compact, DPU, Massachusetts Clean Energy Center, Metropolitan Area Planning Council

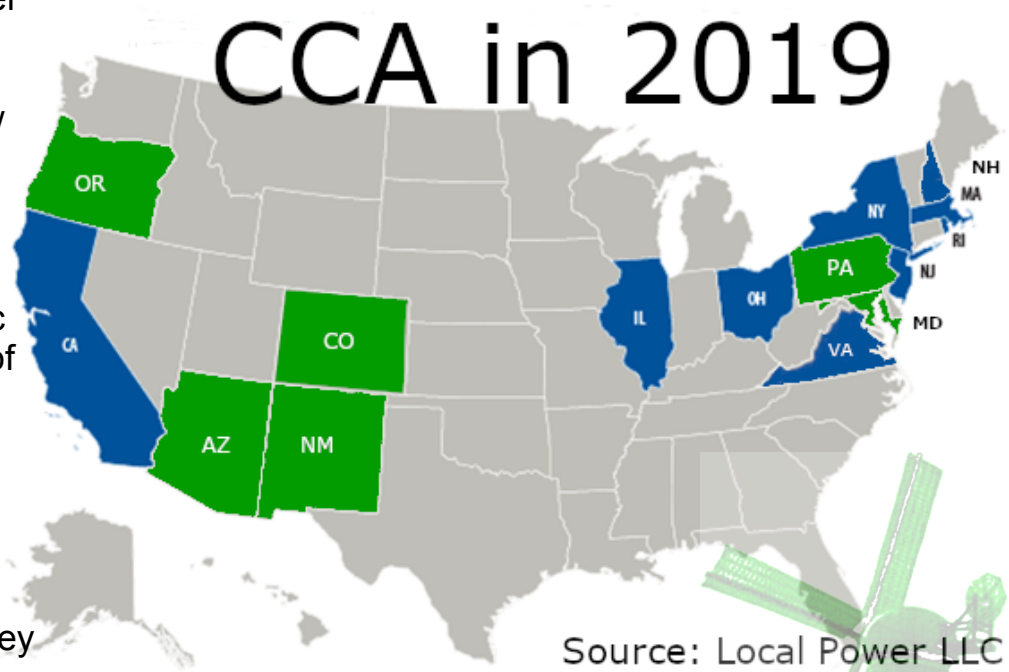
California Redwood Coast Energy Authority (Humboldt County), Clean Energy Coalition (Los Angeles County), East Bay Community Energy, Monterey Bay Community Power, Valley Clean Energy (Yolo)

New York Westchester Power, Tompkins County/Ithaca, Ulster County/Kingston, New York Public Service Commission

Ohio Athens / Southeast Ohio Public Energy Council, City of Cincinnati

New Jersey Maplewood-administered regional CCA, Montclair, Sustainable New Jersey

Illinois Metropolitan Mayors Caucus



Conclusion: CCA represents an unparalleled umbrella for climate action:

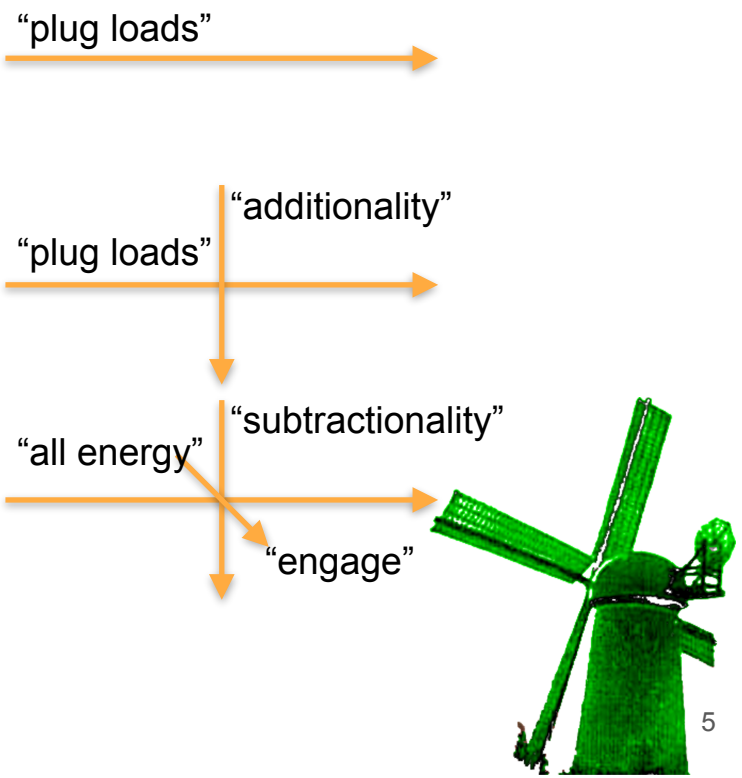
- **The Energy Service**: CCAs redefine the “primary” utility relationship to customers
- **Trust and consumer protection**: CCAs uniquely enroll customers by an opt-out process, and are democratic uniquely known to residents and businesses
- **Fiscal**: CCAs are trusted to control energy rates
- **Financial**: CCA member municipalities can issue Green Bonds
- **Environmental protection**: CCAs define and monitor energy content
- **Information**: CCAs have unique access to energy data, land use data, infrastructure data, community data that are critical for decarbonizing the grid
- **Economic Development**: CCAs have access to municipal redevelopment infrastructure
- **Communication**: CCAs have access to municipal billing platforms
- **Planning**: CCAs have access to municipal planning and permitting mastery
- **Ownership**: CCAs have access to municipal properties and municipal rights of way
- **Resilience**: CCAs have access to municipal emergency preparedness and planning
- **Bandwidth**: CCAs have access to the municipal infrastructure that is necessary to integrate complex parts into simple offerings to residents and businesses

Context: an evolving model 1995-2020

CCA 1.0 - *1D*

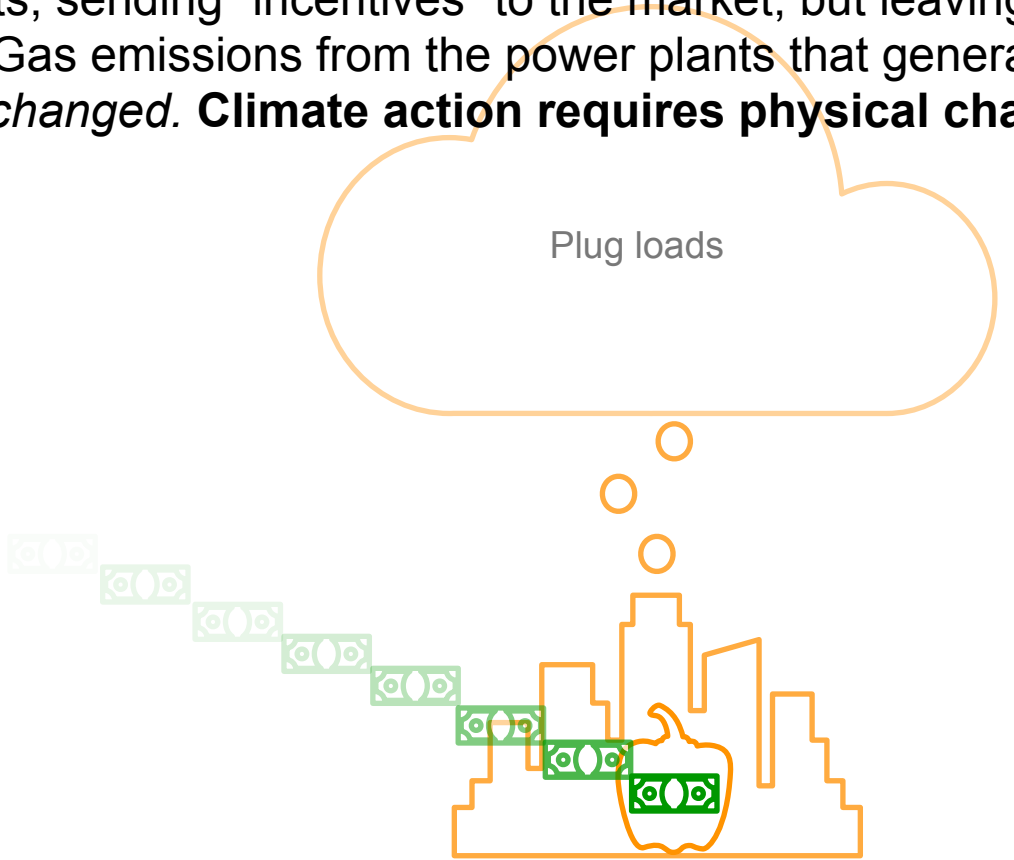
CCA 2.0 - *2D*

CCA 3.0 - *3D*



Carbon Strategy

CCA 1.0's outsourced "paper" model results in significant purchases of Renewable Energy Credits, sending "incentives" to the market, but leaving the actual physical Greenhouse Gas emissions from the power plants that generate a CCA's power, *physically unchanged.* **Climate action requires physical change.**



CCA 2.0 improved on the CCA 1.0 model by (1) shifting from the out-sourced operations model in Massachusetts and other states to an in-sourced model in California - and (2) shifting from *buying* renewable credits to *building* local renewable *generation*, resulting in ***67 of the 72*** *US* Cities and Counties with 100% Clean Energy Achievements as of December, 2019 (the remaining 5 are municipally-owned utilities).

Appendix

LIST OF CITIES AND COUNTIES WITH 100% COMMITMENTS AND ACHIEVEMENTS AS OF NOVEMBER 2019

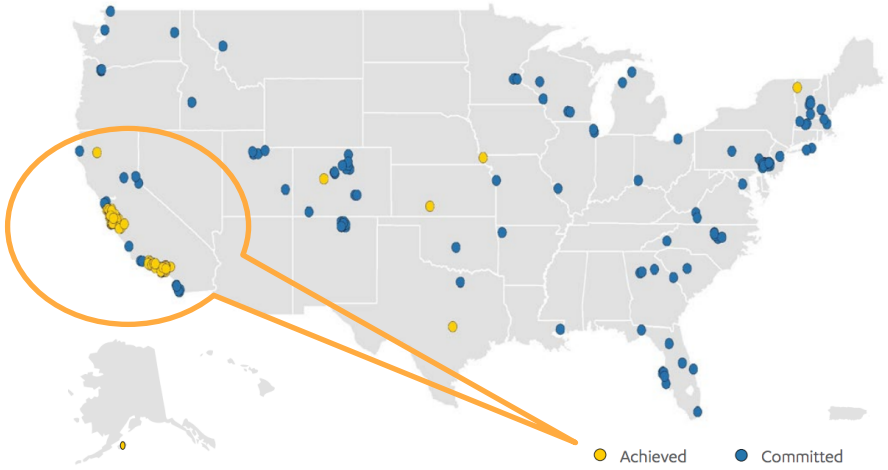
TABLE A-1. CITIES AND COUNTIES WITH 100% ACHIEVEMENTS[21]

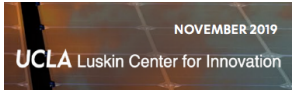
Location	State	Date Signed	Target Year	Renewable or Clean
Aspen	CO	2007	2015	Renewable
Burlington	VT	2012	2014	Renewable
Georgetown	TX	2015	2018	Renewable
Greensburg	KS	2008	2013	Renewable
Kodiak Island	AK	2005	2012	Renewable
Rock Port	MO	2008	2008	Renewable
Culver City	CA	2018	2018	Clean
Ojai	CA	2017	2018	Clean
Oxnard	CA	N/A	2018	Clean
Portola Valley	CA	N/A	2017	Clean
Rolling Hills Estates	CA	N/A	2018	Clean
Santa Monica	CA	N/A	2018	Clean
South Pasadena	CA	N/A	2018	Clean
Thousand Oaks	CA	N/A	2018	Clean
Trinity County (parts served by Trinity PUD)	CA	N/A		Clean
Unincorporated Ventura County	CA	N/A	2018	Clean
Ventura City	CA	N/A	2018	Clean
West Hollywood	CA	N/A	2018	Clean
Agoura Hills	CA	N/A	2018	Clean
Alhambra	CA	N/A	2018	Clean
Arcadia	CA	N/A	2018	Clean
Beverly Hills	CA	N/A	2018	Clean
Calabasas	CA	N/A	2018	Clean
Camarillo	CA	N/A	2018	Clean
Campbell	CA	N/A	2017	Clean
Capitola	CA	N/A		Clean
Carmel	CA	N/A		Clean
Carson	CA	N/A		Clean
Claremont	CA	N/A		Clean
Cupertino	CA	N/A	2017	Clean
Downey	CA	N/A		Clean
Gilroy	CA	N/A	2017	Clean

21. Data compiled from the Sierra Club (2019) and additional research from the UCLA Luskin Center for Innovation.

FIGURE 4.

CITIES AND COUNTIES WITH 100% CLEAN ENERGY COMMITMENTS AND ACHIEVEMENTS





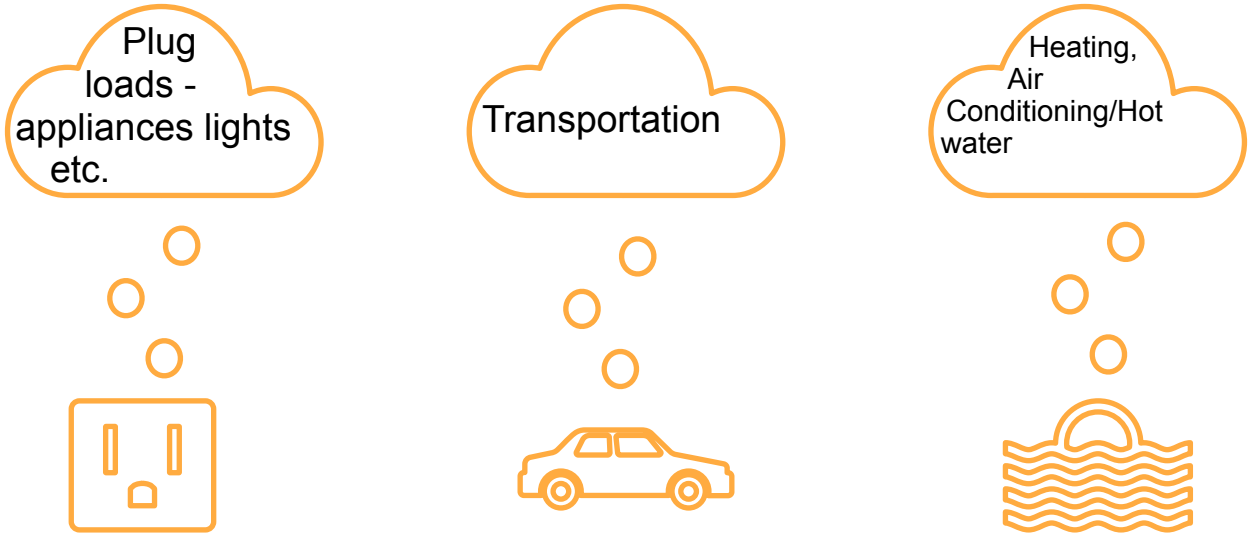
https://innovation.luskin.ucla.edu/wp-content/uploads/2019/11/100-Clean-Energy-Progress-Report-UCLA-2.pdf

Location	State	Date Signed	Target Year	Renewable or Clean
Gonzales	CA	N/A		Clean
Greenfield	CA	N/A		Clean
Hawaiian Gardens	CA	N/A		Clean
Hawthorne	CA	N/A		Clean
Hollister	CA	N/A		Clean
Los Altos	CA	N/A	2017	Clean
Los Altos Hills	CA	N/A	2017	Clean
Los Gatos	CA	N/A	2017	Clean
Malibu	CA	N/A	2018	Clean
Manhattan Beach	CA	N/A	2018	Clean
Marina	CA	N/A		Clean
Milpitas	CA	N/A	2017	Clean
Monte Sereno	CA	N/A	2017	Clean
Monterey	CA	2017		Clean
Moorpark	CA	N/A		Clean
Morgan Hill	CA	N/A	2017	Clean
Mountain View	CA	N/A	2017	Clean
Pacific Grove	CA	N/A		Clean
Palo Alto	CA	2013		Clean
Paramount	CA	N/A	2018	Clean
Redondo Beach	CA	N/A	2018	Clean
Salinas	CA	N/A	2018	Clean
San Juan Bautista	CA	N/A	2018	Clean
Sand City	CA	N/A		Clean
Santa Cruz	CA	N/A	2018	Clean
Saratoga	CA	N/A	2017	Clean
Scotts Valley	CA	N/A	2018	Clean
Seaside	CA	N/A	2018	Clean
Sierra Madre	CA	N/A	2018	Clean
Simi Valley	CA	N/A	2018	Clean
Soledad	CA	N/A	2018	Clean
Sunnyvale	CA	N/A	2017	Clean
Temple City	CA	N/A		Clean
Unincorporated Los Angeles County	CA	N/A	2018	Clean
Unincorporated Monterey County	CA	N/A	2018	Clean
Unincorporated San Benito County	CA	N/A	2018	Clean
Unincorporated Santa Clara County	CA	N/A	2017	Clean
Unincorporated Santa Cruz	CA	N/A	2018	Clean
Watsonville	CA	N/A	2018	Clean
Whittier	CA	N/A	2018	Clean

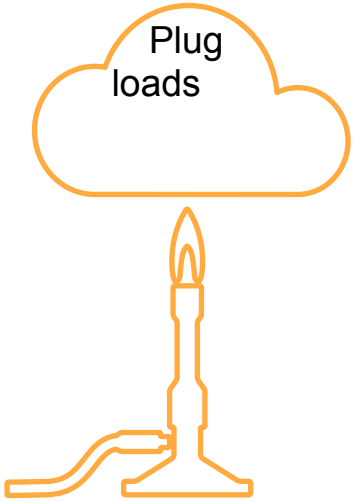
While creating physical carbon reductions, large grid-connected renewables also have limited carbon-reduction impacts:

- CCA 2.0 in California has caused massive “additionality” of renewables to the grid, building 2-3GW ($4-6B) of new renewables in 3 years
- Even these require fossil backup power due to intermittency of the sun and wind, massively diluting carbon benefits - thus creating the need for CCA 3.0.
- **CCA 3.0 localizes development within a CCA’s jurisdictional boundaries, onto buildings, and behind-the-meter, eliminating the need for backup fossil fuel generators: *“subtractionality.”***

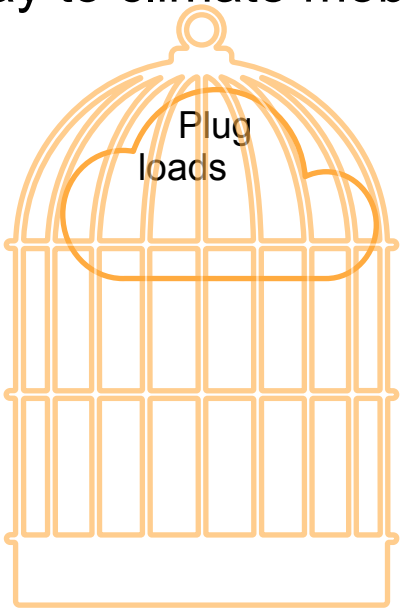
But 2/3 of Climate Change is caused by three energy sectors, not one.



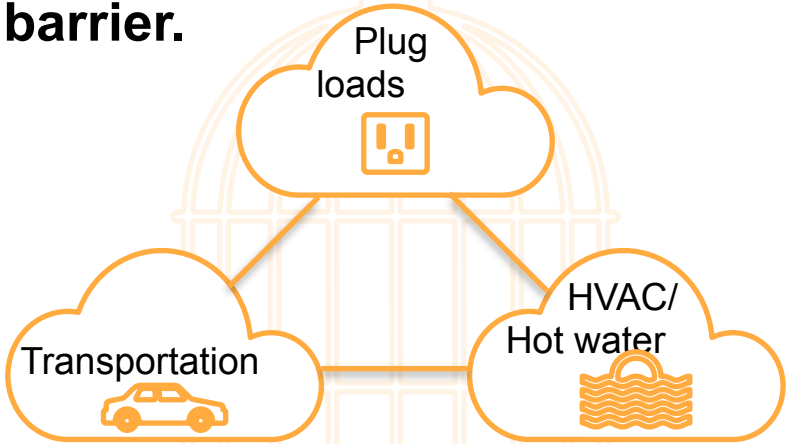
All three need transforming for climate impact, but so far CCA 1.0 and 2.0 have addressed plug loads only, limiting their carbon impacts to a *30% horizon.*



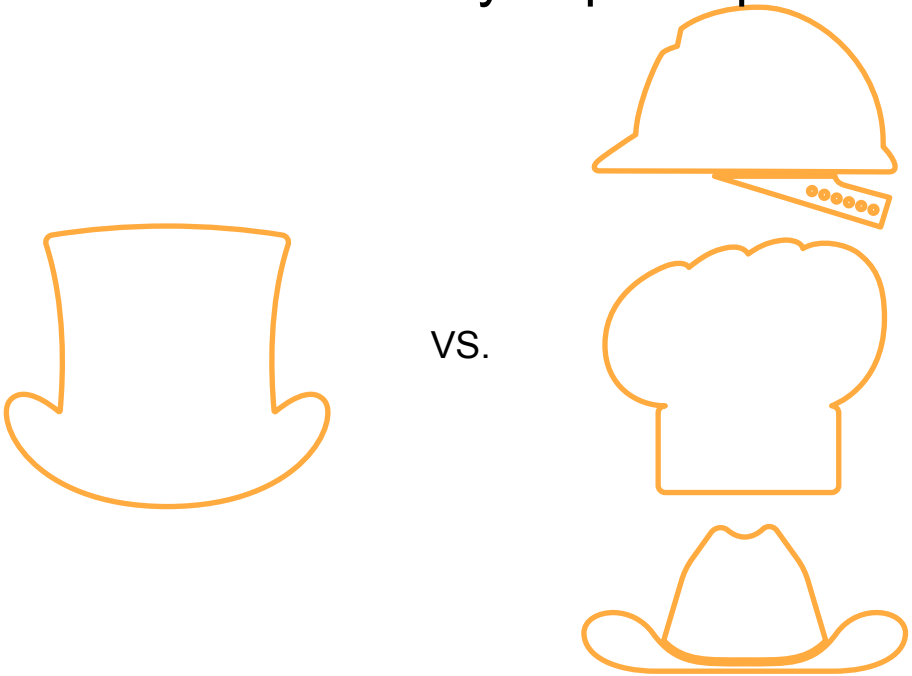
Conventional methods of building local solar also fell short. Even Germany's *EnergieWende* collapsed in 2012 because too much exporting of Feed in Tariff power from solar panels caused a traffic jam of congestion on the grid. For this reason, Net Energy Metering export tariffs in the US are generally limited to ***5%*** of utility system load: hardly a Renewable Energy Pathway to climate mobilization.



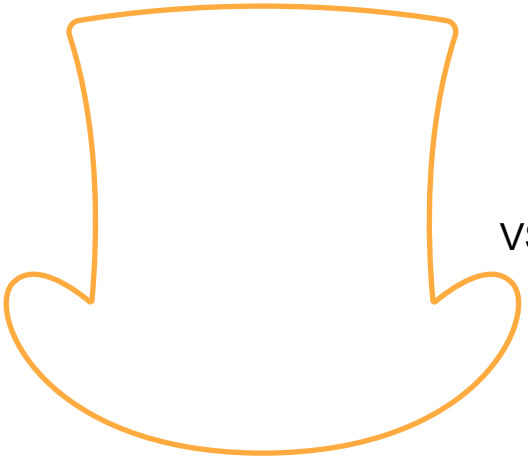
Onsite energy storage can solve this problem to make Distributed Energy Resources widely deployable. Thus, CCA 3.0 integrates electric vehicles and electric heat pumps as *Flexible Storage* to facilitate *non-exporting* Distributed Energy Resources behind the meter - taking grid impacts out of the equation. **Integrating "all energy" as DER storage, CCA 3.0 gets past the grid barrier.**



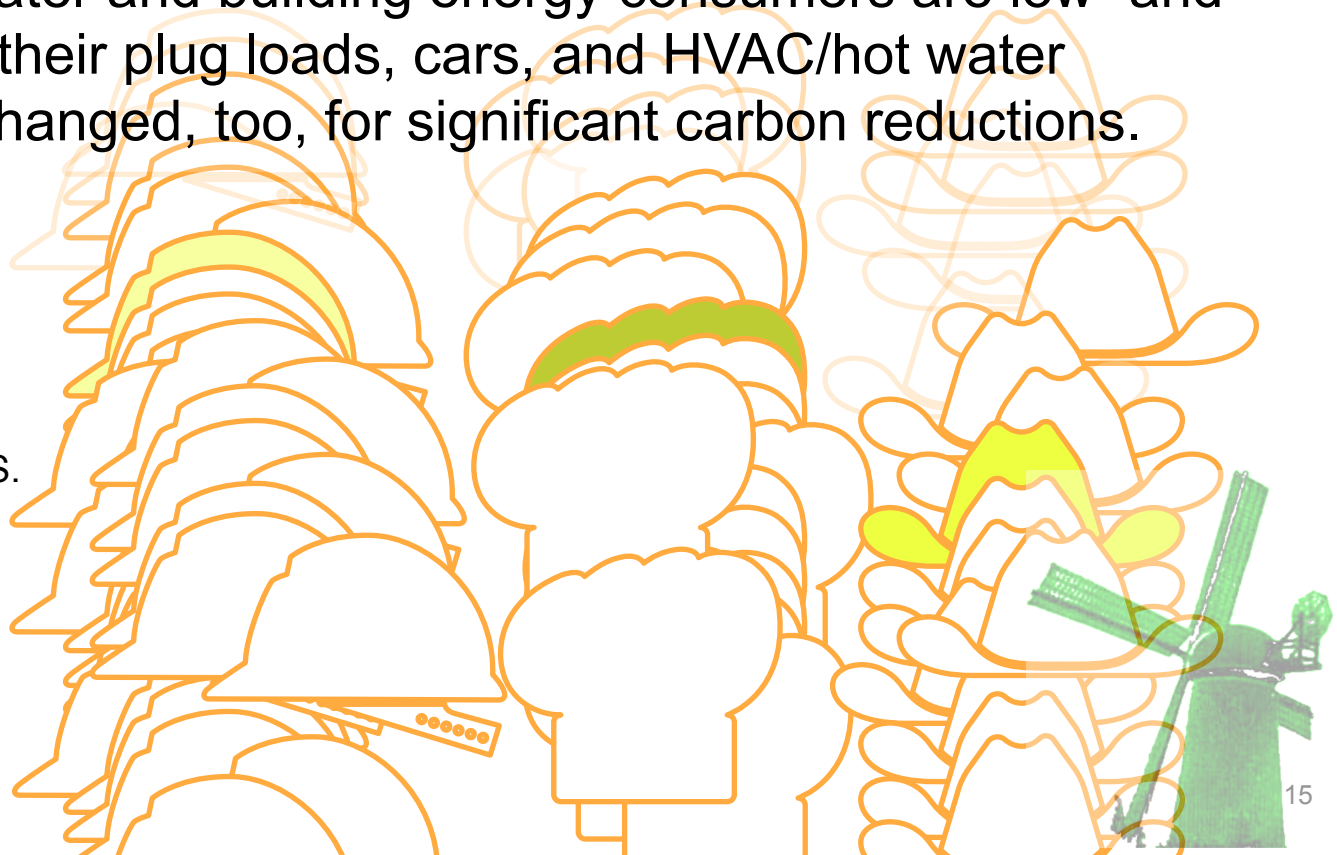
But you still have the *human* problem. Conventional solar ownership models exclude disadvantaged communities by requiring building ownership and good credit for eligibility, denying the majority of residents and businesses the ability to participate.



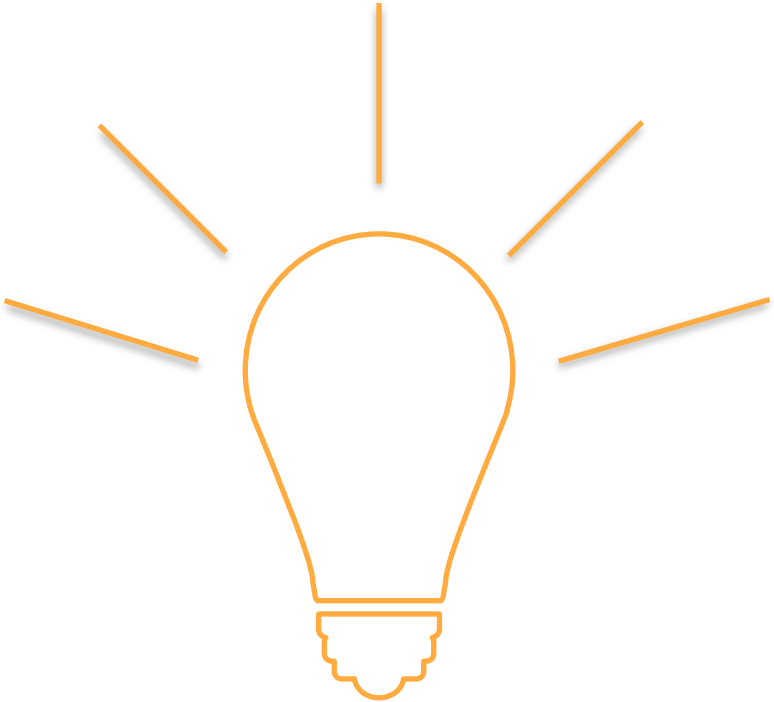
Carbon math: the vast majority of users of cars, heating/air conditioning, hot water and building energy consumers are low- and middle income, so their plug loads, cars, and HVAC/hot water systems must be changed, too, for significant carbon reductions.



VS.



In other words, distributional equity is mathematically necessary for climate mobilization.

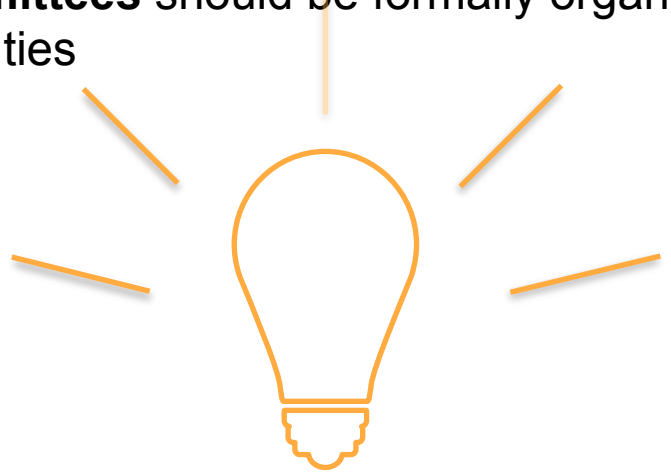


Thus CCA 3.0 employs two key methods of extending participation to all customers:

- ***Renewable+storage shares*** in neighborhood facilities on municipal and commercial buildings to engage low-income residents, renters and residents/businesses in unsuitable buildings to participate in virtual ownership of neighborhood DERs, and
- ***Renewable+storage cooperatives*** to engage groups of neighbors in dense residential and commercial areas with the resources to physically share resources in and on their buildings

But in order to engage the public widely in shares and cooperative ownership, they must also be engaged as citizens in an informed, transparent, *trusted* community initiative. **Thus, procedural equity is necessary to achieve distributional equity:**

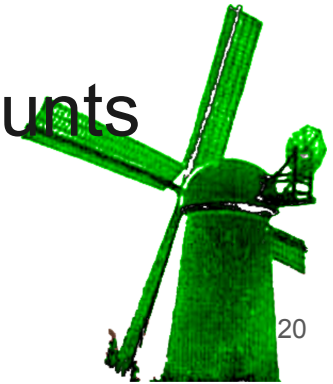
- **CCA program staff**, not contractors, must manage the billing, web site, call center, and communications relationship to customers
- **Municipalities** (not contractors) must manage the investment relationship to customers
- **Citizen advisory committees** should be formally organized as a key, ongoing part of CCA board activities



CCA 3.0 Program Design Description

Paradigm shift: add options for *voluntary customer investment* or “opting up” to CCA’s traditional opt-out enrollment structure:

- All customers eligible for sharing
- CCA approves cooperatives for account administration and direct assistance
- Municipality manages customer loan accounts



A local, organic business model

- Partnership of CCA with Muni:
  - CCA does rate charge collection
  - Municipality does finance and loan account
  - Goal is to help customers own

Voluntary investment is the critical path

- Basic program design principles:
  - No justice, no carbon reduction
  - Reduced load
  - Bottom-up
  - In-building
  - Non-exporting
  - Savings-based
  - Ubiquitous

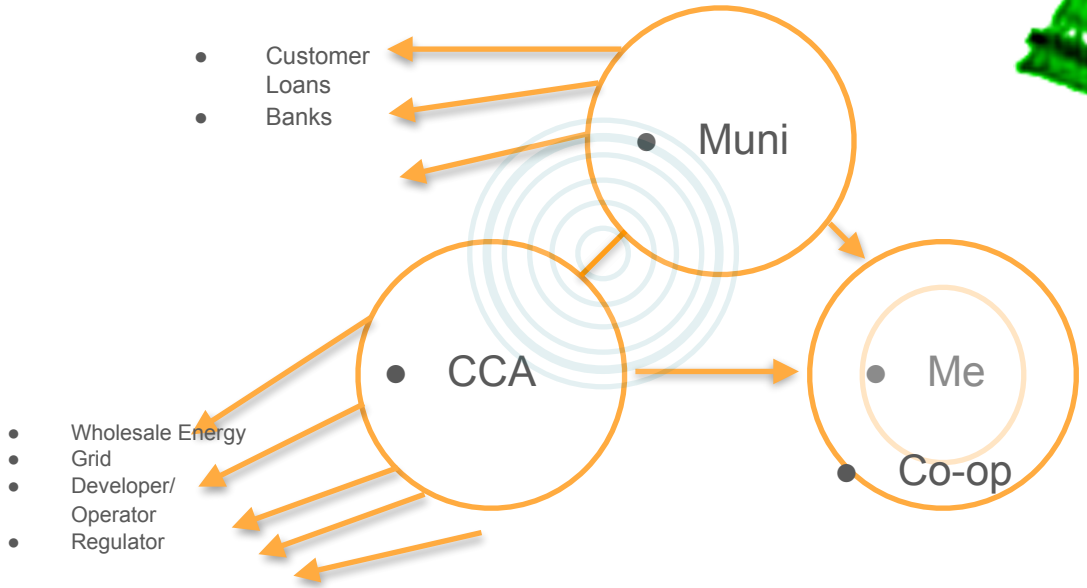
Voluntary investment value stack

- Customer
- Green Bond Buyer
- Local Credit Union
- Local Cooperative Bank
- Small Local Bank
- Local in-CCA Project Finance Investor

Keep default rates simple and financing terms transparent

- Meet-or-beat average default “opt-out” rate goal
- Pay-for-benefits approach to “opt-up” product options based on customer return-on-investment estimate

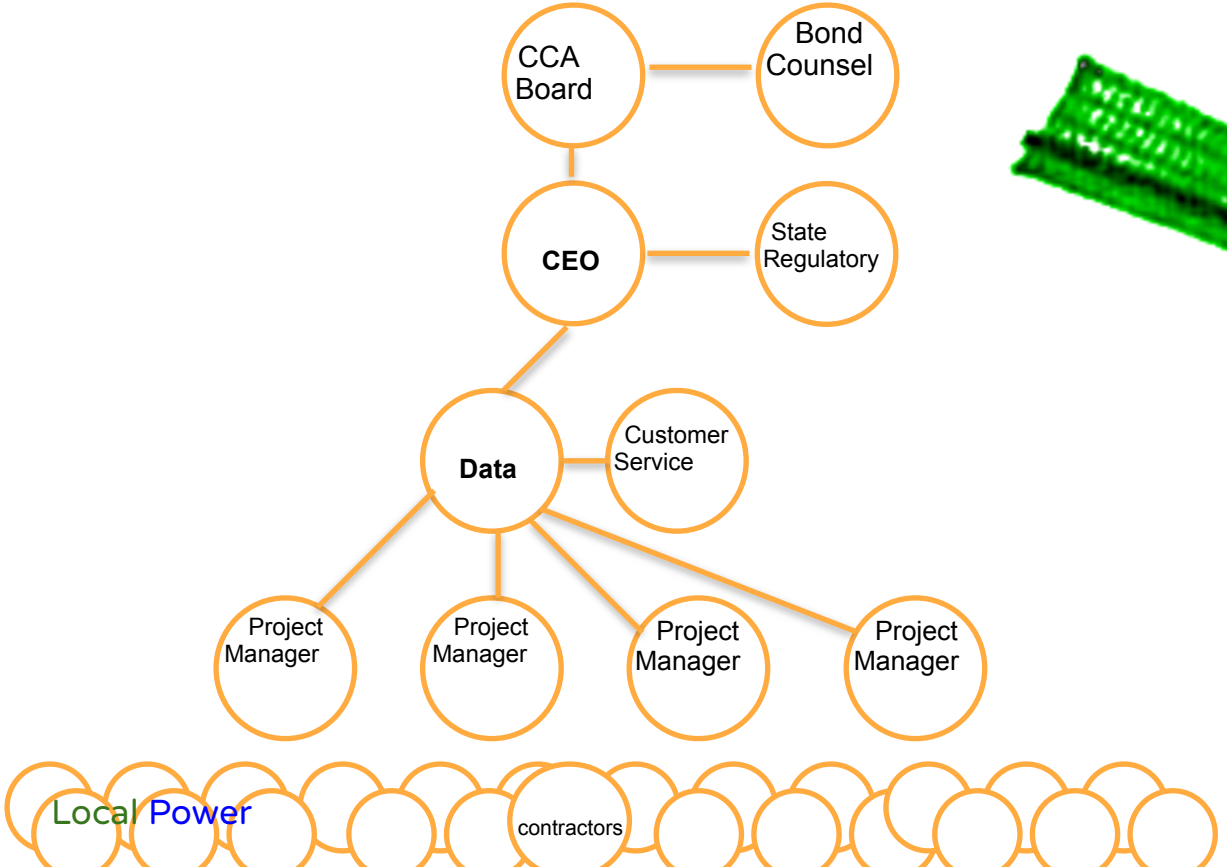
Roles: CCA, municipality, customer



CCA roles (in-sourced)

- Grid energy sources (retail or wholesale)
- New local energy sources
- Data analysis/matching
- Redevelopment planning/management
- DER monitor/billing administration
- Market “opt-in” energy products to large commercial customers

CCA organizational chart



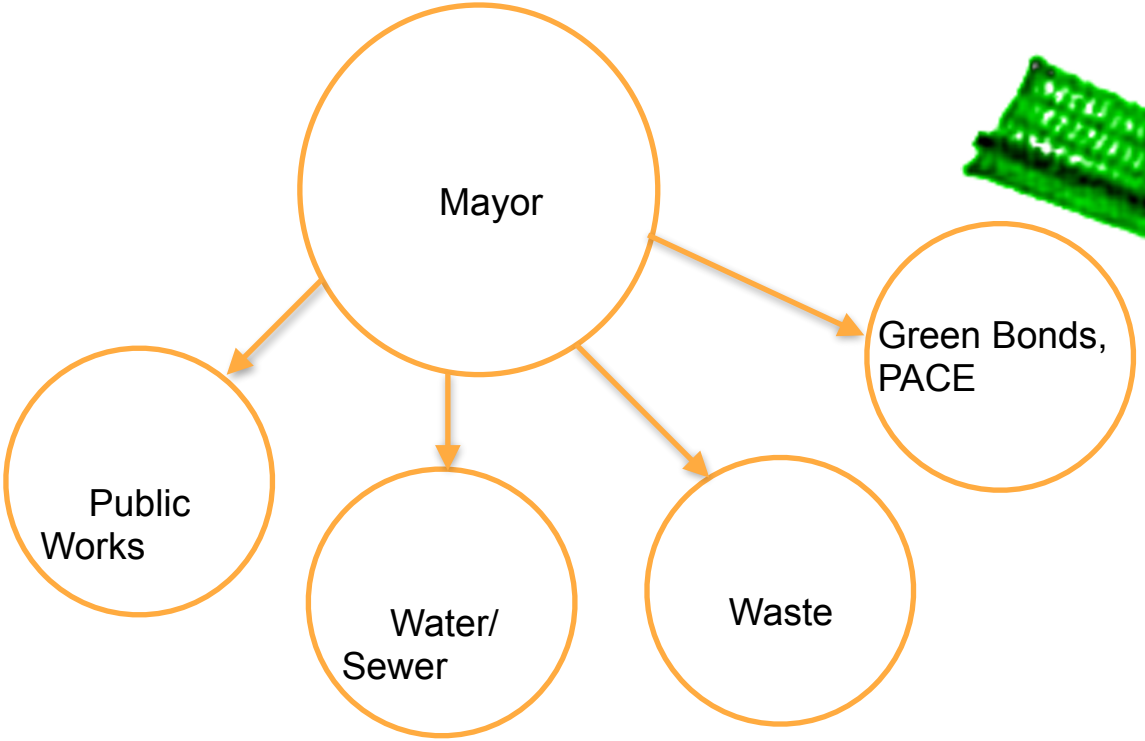
Municipal role (1): facilitate customer investment

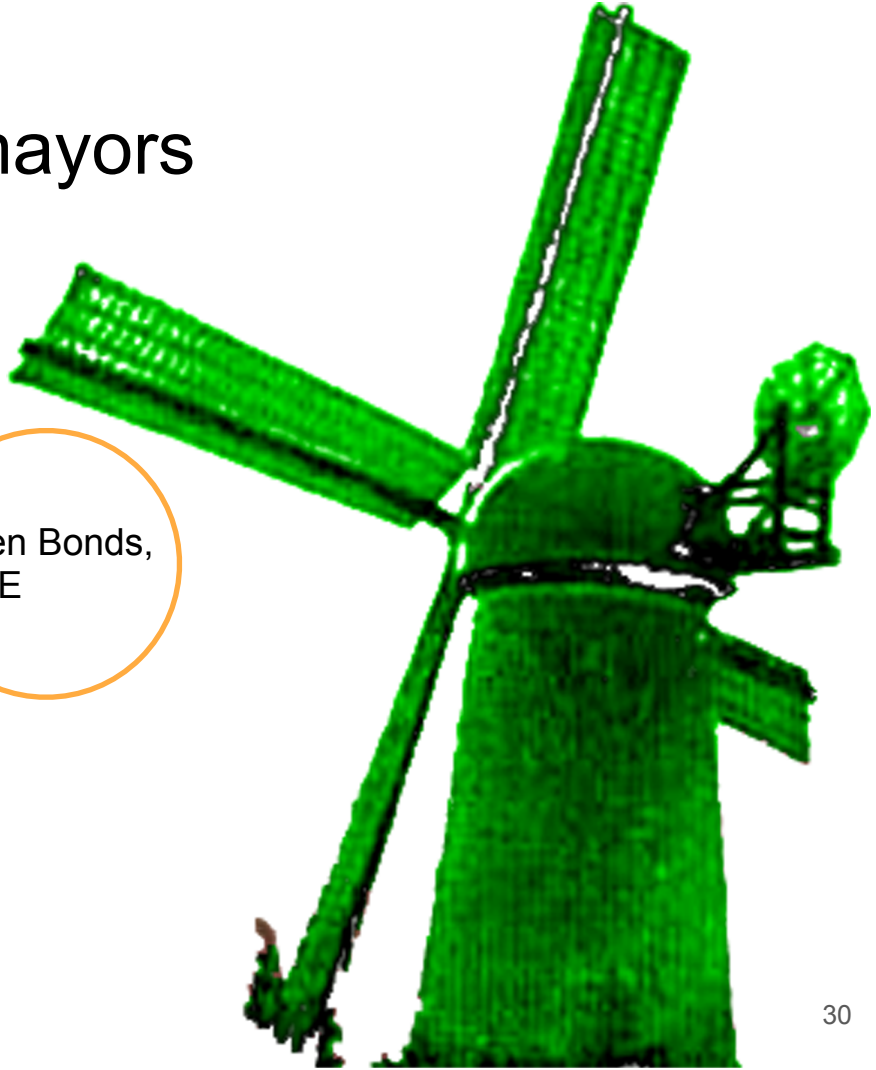
- Requires DER financing through Green Bonds or other sources
- Requires municipal billing platform (e.g. water/ sewer)

Municipal role (2): lead as “big consumer”

- Municipalities lead the community as engaged consumers
  - Opt-in to CCA
  - Retro-commission public facilities as “shares” sites
  - Convert municipal vehicle fleets into flexible storage

Key 3.0 municipal partner: mayors





Examples of CCA 3.0 components in the report

- CCA staff Energy Manager collects, manages and analyzes customer usage and related data
- Customer net savings-centered (vs. premium) approach
- Energy Efficiency programs funded by Energy Efficiency surcharge funds
- Direct Investment Strategy
- CCA (staff) Energy Manager applies for and acquires state grant funds for electric vehicle chargers
- CCA staff Energy Manager applies for and acquires state funds for and installs individual residential solar hot water and air source heat pumps
- Funding onsite renewable heating mini splits and solar hot water
- CCA bill adder funds CCA-sourced PV rooftop generator
- CCA staff Energy Manager startup funded by Green Communities Act funding or other state funding

- CCA Energy Manager Big Roof (business, nonprofits) Solar VNM/Shares Program
- Targeting of VPP-type reduced capacity charges and transmission upgrades
- Adder for revolving loan fund for individual customer PV rebates
- Energy Efficiency office funded by municipal general funds
- CCA staff Energy Manager engagement of local contractors
- CCA bill adder funds municipally owned facility with RECs required to be sold to CCA Retail Supplier
- CCA adder to fund community solar shares (planned)
- CCA program “causes” new, 1-megawatt wind turbines in state

- RFP For Solar Referral Service
- Local job creation and customer equity planned in Local Development Business (Plan)
- Residential Pay for Performance
- Early Adopter Program
- Urban solar arrays
- Offshore wind
- Microgrid projects
- Energy Efficiency
- Transportation Program and Innovation Onramp
- Clean Energy Drive EV/Grid Savvy program
- Offshore Wind development
- CCA staff Energy Manager issues RFP for a Microgrid/VPP
- STEP -- Savings Through Efficiency Program -- $5k-$100k 3% loans with a term of up to 10 years for small businesses, including PV, Solar Thermal, Geothermal projects and Energy Efficiency measures

- CCA Solar Plus Storage product
- CCA administers limited energy efficiency funding
- CCA collects, manages, manages data
- CCA routine direct mail to customers
- CCA PPAs with project developers (many)
- CCA staff Energy Manager partnered with PACE program
- CCA use of Solar Bonds or other public financing
- 100% CCA-wide in-state wholesale power supply portfolio
- Suite of pilots EE/DR/local labor incentives/local innovation grants/ building and transportation electrification/replacing gas peakers with storage and DER/ 4 different models of community solar developed by one CCA
- Carbon Tax to fund local on-building solar development and energy efficiency measures
- CCA defined customer rate ready billing rate set to include revolving loan fund charge

- PACE $100k-$500k fixed rate loans for a wide variety of DER measures for commercial customers.
- Carbon Tax to fund local on-building solar development and energy efficiency measures
- CCA defined customer rate ready billing rate set to include revolving loan fund charge
- CCA electricity and gas aggregation with biofuel offsets -- "100% Carbon Free" heat
- Web-based customer site screening and referral for solar installation suitability
- STEP -- Savings Through Efficiency Program -- $5k-$100k 3% loans with a term of up to 10 years for small businesses, including PV, Solar Thermal, Geothermal projects and Energy Efficiency measures
- PACE $100k-$500k fixed rate loans for a wide variety of DER measures for commercial customers.
- Local community landfill gas generation project with 600 subscribers
- CCA bill adder to directly fund customer energy efficiency measures
- CCA electricity and gas aggregation with biofuel offsets -- "100% Carbon Free" heat
- Web-based customer site screening and referral for solar installation suitability

Questions/Comments?

Our new project web site

localgreennewdeal.org

Local Power