Nationwide Activity and Interest in Community Power

**Authorized**
1. MA 1997
2. RI 1999
3. OH 1999
4. CA 2002
5. NJ 2003
6. IL 2009
7. NY 2016
8. NH 2019

**Under Consideration**
9. CT
10. VA
11. CO
12. OR

**Expressions of Interest**
13. VA
14. CO
15. OR

Source: CCPartners
California Overview

(Note that “Community Power” is called “Community Choice Aggregation” or “CCA” in California)
California (r)Evolution

- **Rapid expansion:**
  - 2014 = 0.5% of utility load
  - 2019 = 38%
  - 2020 = 50%
  - 2025 = 85%

- **15 agencies to-date:**
  - 170 municipalities
  - 4 million customers
  - 200 staff & counting
  - ~45,000 GWh load

- **Impact:**
  - Lower rates & customer bills
  - 3,000+ MW new renewables
  - 240 MW / 788 MWh batteries
  - Local programs, microgrids, Virtual Power Plants
  - ‘Decarbonization Plans’
Oakland to Swap Jet-Fuel-Burning Peaker Plant for Urban Battery
The deal with Vistra will be the largest standalone storage facility contracted for a community-choice aggregator in California.

JULIAN SPECTOR
JUNE 26, 2019

Bay Area CCAs Solicit 30MW of Distributed Batteries to Weather Grid Outages
As PG&E blackouts for wildfire prevention leave millions without power, community-choice aggregators seek behind-the-meter solutions.

JEFF ST. JOHN
NOVEMBER 05, 2019

When the Oakland Power Plant fires up, jet fuel exhaust emerges into the urban environment.

Local authorities in PG&E territory are seeking 30 megawatts of behind-the-meter batteries, plus solar, to cope with power outages.
Silicon Valley Clean Energy and UtilityAPI Want to Free Your Meter Data

Why is it so hard to get a quick, accurate online quote for a rooftop solar system, backup battery or EV charger?

JEFF ST. JOHN
OCTOBER 16, 2019

California’s Community Choice Aggregators are Filling the Gaps in EV Charger Investment

CCAs haven’t invested as much as utilities in EV charging infrastructure. New state grants for Silicon Valley CCAs, munis will help close the gaps.

JEFF ST. JOHN
AUGUST 14, 2019

Checking his solar quotes.

A state grant will jump-start an EV charging program for Bay Area community choice aggregators, with other CCAs to follow.
Sunrun Wins Another Capacity Contract for Aggregated Home Storage

The deal opens a new market for residential storage: California’s rapidly expanding community-based electricity buyers.

JULIAN SPECTOR

JULY 18, 2019

Goldman Sachs Becomes Solar Supplier to California CCAs as Its Acquisition Spree Continues

The purchase of Recurrent Energy’s equity stake in the 100 MW Mustang project adds to Goldman subsidiaries’ growing solar portfolios.

JEFF ST. JOHN

MAY 16, 2019

The contract represents a second win for Sunrun’s theory of using residential energy assets for grid services.
In New Challenge for California’s Utilities, Rating Agency Warms to Community Aggregators

Peninsula Clean Energy became the second of California’s CCAs to obtain an investment-grade credit rating from Moody’s. More could be coming, with implications for the renewables market.

KARL-ERIK STROMSTA
MAY 07, 2019

San Diego’s Quest to Achieve 100% Renewable Energy Through Community Choice

On this week’s Political Climate: how San Diego’s Republican mayor pushed through a bold climate action plan.

JULIA PYPER
OCTOBER 24, 2019

Two-year-old CCA Peninsula Clean Energy expects a boost from its credit rating as it buys more renewables.

Are cities the world’s best hope for combating climate change?
California Community Choice Aggregator Sees Promise in Floating Offshore Wind

Monterey Bay Community Power is exploring the possibility of a huge floating offshore wind project with developers EnBW and Trident Winds.

JEFF ST. JOHN
AUGUST 16, 2019

Unlocking Northern California’s Offshore Wind Bounty

Building a multi-gigawatt offshore wind farm in Northern California requires linking to a market. Is a subsea cable to San Francisco the answer?

JUSTIN GERDES
SEPTEMBER 30, 2019

California’s untapped offshore wind market holds enormous promise and challenges.

Piercing the “Redwood Curtain”: Humboldt County lacks the power demand to support a big project.
In New Challenge for California’s Utilities, Rating Agency Warms to Community Aggregators

Peninsula Clean Energy became the second of California’s CCAs to obtain an investment-grade credit rating from Moody’s. More could be coming, with implications for the renewables market.

KARL-ERIK STROMSTA

MAY 07, 2019

Two-year-old CCA Peninsula Clean Energy expects a boost from its credit rating as it buys more renewables.
Data platform being developed & shared:
“Develop the right product for the right customer at the right place and at the right time.”

How Is It Built… And Why?

We built the EBCE Analytics Platform using open cloud technologies.

Why?

- **Performance**
  - Industrial-strength performance
  - Access to cloud-only capabilities

- **Cost**
  - Minimal Overhead Required
  - Low Cost of Entry & Operation

- **Accessibility & Expandability…**
  - Access to Cutting-Edge Technologies
  - Open API and Integration Options
  - Highly Scalable (up and out)

**EBCE Data Assets:**
- 86+ Billion Rows / 3.3+ Terabytes of Data / 100+ Tables
- Hourly Aggregation of 500K+ Meters over 1 year: < 10 seconds
- Same as above + 5 dimensions: <= 1 minute
- Current Monthly Fees: < $2K / month

**Dedicated EBCE Staff:**
1.5 FTE

**EBCE Platform 101…**

**Foundational Principle**
Synthesize all customer, usage and transaction data into one common environment in order to have full visibility into system conditions at any point in time and at any aggregation level.

**Classic Analytics**
- Slice & Dice
- Past, Present, Future
- Reporting & Compliance
- Shadow Reporting

**Load Analysis**
- Profiling & Settlement
- Weather Normalization
- Short Term Forecast
- Long Term Forecast

**Rate Design**
- Cost of Service Analysis
- Rate Modeling what-if
- Rate Optimization
- Optimal Load Shift / Build

**Products & Services**
- Customer Segmentation
- Product Design
- Program Operation
- Customer Data Access

**Already Paying Dividends…**

- **Load and Revenue Forecasting and Settlement**
  - Daily output of last 90 days and next 10 day forecast delivered to SC
  - Shadow validation of settlement data submitted to the ISO
  - Visibility into future loads and revenues, and scenario analysis (PCIA impact)

- **Customer Service and Program Design**
  - Customer Segmentation
  - Evaluation of the impact of upcoming TOU changes
  - Implementation of pilot Demand Response Program
  - Customer usage and billing reports and access to meter data
Big Picture:

Market Transformation & New Hampshire Overview
Market Transformation 101

Power sector is entering a technology-driven “Optimization Phase”:

- Wind and solar growth → wholesale price volatility
- Customer-driven growth in DER technologies (EVs, PV, smart thermostats, etc.)

New England: 5% RE in 2018 → 40% by 2030

- Average prices will decline
- More price volatility (higher highs, lower lows, rapid swings)

PRIORITY: allow DER & flexible demand to intelligently balance renewables!

- Allow customers to profit off of price volatility
- Lower “upstream” costs: distribution, transmission, generation capacity & wholesale market price spikes
- Enhance reliability during cyberattacks, natural disasters / winter storms, etc.
Unleashing market-based decarbonization requires...

1. **Advanced Meters**: record customer usage at same interval that market uses
2. **Prices**: that reflect costs (dynamic rates)
3. **ICT**: “block and tackle” Information & Communication Technology

These 3 steps allow the market (tech companies & customers) to self-optimize.
NH is falling short…

1. **Advanced Meters**: penetration = ~22% of customers (NHEC, Unitil)
   - Eversource installed the wrong meters… now requesting $50 million for it

2. **ICT**: Utility “Grid Modernization” proposals are off-track
   - Utilities oppose SB 284 implementation of “statewide data platform”

3. **Prices**: are outdated / socialized:

<table>
<thead>
<tr>
<th>Cost Factor</th>
<th>Costs Incurred @:</th>
<th>Priced to Retail @:</th>
<th>% bills</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy</td>
<td>Hourly &amp; 5-minute</td>
<td>6 mo. hedged average</td>
<td>~30%</td>
</tr>
<tr>
<td>Capacity</td>
<td>1 hr/ yr (summer peak)</td>
<td>Annual average</td>
<td>~10%</td>
</tr>
<tr>
<td>Transmission</td>
<td>12 hr/ yr (monthly peak)</td>
<td>Annual average</td>
<td>~20%</td>
</tr>
<tr>
<td>Distribution</td>
<td>Black box</td>
<td>Same</td>
<td>~40%</td>
</tr>
</tbody>
</table>

**Consequences**: NH is only New England state forecasted to have Peak Load Growth

(NH’s efficiency and PV forecast = <50% of other NE states!)
New Hampshire Recommendations: Leveraging Community Power to Modernize the Market
California Insights & Best Practices

• Being a “credible off-taker” for developers & financiers requires:
  • Strong balance sheet
  • Robust, long-term financial projections
  • Industry risk-management expertise
  • Political cohesion
  • Customer loyalty

• Innovation to accelerate DER and retail customer services requires:
  • Holistic “systems-thinking” expertise
  • Control & insight over customer data and operational business processes
  • Political coordination & regulatory engagement to modernize rules
NH Proposal for Strategic Implementation

**Local Governance**
Each Community Power program governs local process for authoring plan, setting goals, making program decisions, etc. (management capacity and expertise of local programs expected to grow w/ time)

**'Shared Back-Office'**
Operational expertise, staff and services housed jointly and shared across Community Power programs
'Toolbox of services' for launch of Community Power programs
Services provided by 3rd party vendors or staff / “as agent” performance contracts

**Oversight**
Community Power programs establish a governing board to oversee 'Shared Back-Office' (and evolution of services as technology changes)

Source: Clean Energy New Hampshire

- **SCALE**: communities w/ similar goals → form Community Power programs together
- **EFFICIENCY**: Community Power programs work together to create a “shared back-office”
- **EXPERTISE**: contract with multiple vendors & integrate their services into a competitive power enterprise
- **LOCAL POLICY CONTROL**: each Community Power program controls its own rates, portfolio, programs, etc.
- **FISCAL STABILITY**: put in place robust Energy Risk Management Policy, Committees, Reserve Funds, etc.
New Hampshire: 71 Local Energy Committees

- Municipalities are grouped by county (red headings)
- Size based on population
- Green has Energy Committee
Number of ‘Energy Actions’ Being Taken Already:

Simple addition of:

1. Local energy committees
2. Regional collaborations
3. Clean Energy NH member
4. “Ready for 100” policy
5. “Mayors for Climate” pledge
6. PV / weatherize programs
7. Local biomass plants
8. Muni/school PV projects
9. Muni hydro procurement
10. Energy managers
11. Community Power interest

(Greener = more actions)
116 communities are served by 2+ distribution utilities
Communities with (some) Advanced Meters

No Interval Meters

Some Interval Meters

New Hampshire

No Interval Meters

Some Interval Meters

Concord

Merimack

Hooksett

Hopkinton

New London

Boscawen

Hinsdale

Wolfeboro

Wakefield

Newport

Canaan

Carrabassett Valley

Andover

Chichester

Ahoskie

Gloucester

Northfield

Epsom

Webster

Sutton

Allentown

Bow

Franklin

Hamsland

Dublin

Londonderry

Derry

Manchester

Nashua

Seabrook

Plaistow

Fremont

Deerfield

Northwood

Greenland

Hampton Falls

Durham

Barrington

Farmington

Haverhill

Canas

Ashland

Lyme

Newmarket

Milton

New Durham

Carrington

Brattleboro

Orange

Wickford

Lee

Somersworth

Rochester

Lebanon

Plymouth

Enfield

Littleton

Hanover

Concord

Merriam

Goffstown

Wilton

Antrim

Amherst

Litchfield

Milford

Pelham

Weare

Bedford

Goffstown

Hillsborough

Rockingham

Stafford

Grafton

Hanover

Littleton

Enfield

Lebanon

Plymouth

Grafton

Merriam
Lebanon’s “Transactive Energy” Partnership

Lebanon Community Power’s Transactive Energy Municipal Aggregation Pilot
Clifton Below
City Councilor & Chair of the Lebanon Electric Aggregation Committee, a.k.a. Lebanon Energy Advisory Committee (LEAC)
City of Lebanon, New Hampshire

See more at: https://lebanonnh.gov/DocumentCenter/View/6981/TESC-18-Presentation-Clifton-BELOW---LCP
Questions?

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