

An aerial photograph of a dense forest of evergreen trees, likely spruce or fir, with a rich green color palette. The trees are packed closely together, creating a textured, layered appearance. The lighting is soft, highlighting the individual tree tops and creating subtle variations in green tones.

TOWN OF HANOVER + 3DEGREES

Renewable Energy Supply Options

June 21, 2018

01

CONTEXT

02

**RENEWABLE
ENERGY
OPTIONS**

03

EVALUATION

04

DISCUSSION

01

Context

OVERVIEW

Town of Hanover Objectives

100% reliance on renewable sources of electricity by 2030
and renewable sources of fuel for heating and transportation by 2050

Objectives for Engagement with 3Degrees:

- + Clearly articulated criteria for determining path forward to meeting 2030 goal
- + Well-defined options for meeting 2030 goal, including municipal aggregation
- + Thorough analysis and evaluation of municipal aggregation as viable option

Initial Engagement Goal:

Informed Hanover team, enabled to confidently determine a thoughtful pathway to meeting the 2030 goal



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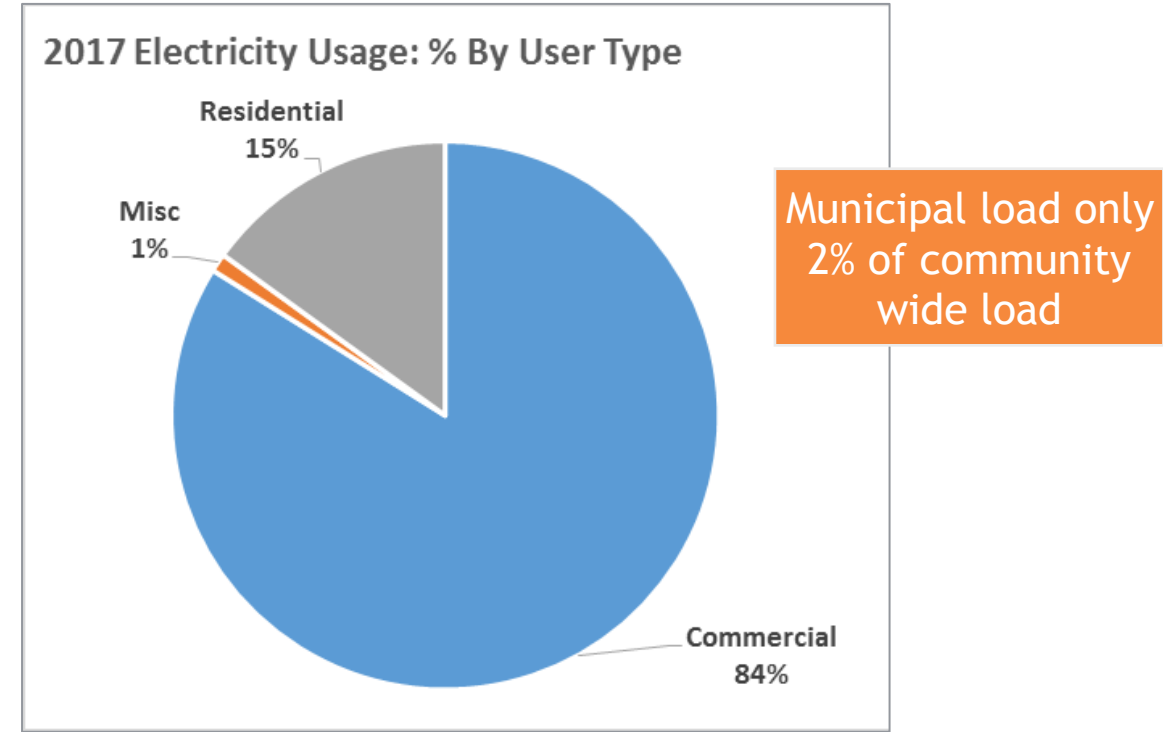
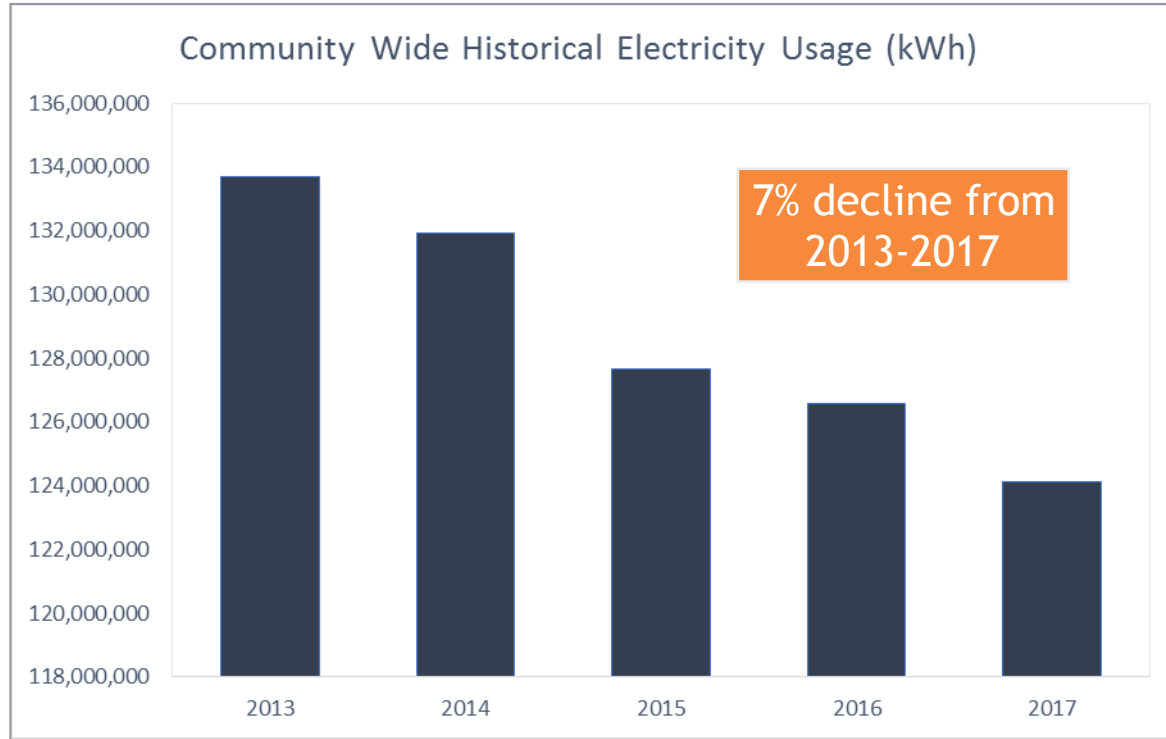
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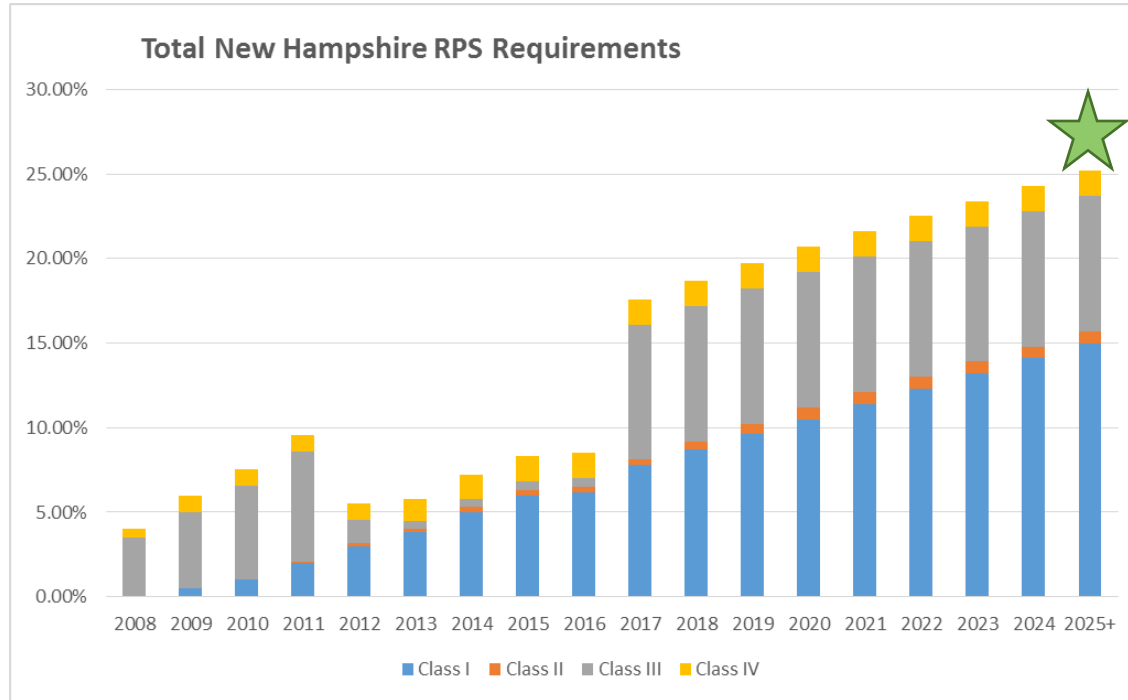
Town of Hanover Context



	FY2018 Budget	FY2019 Proposed Budget
Total General Fund	\$15,231,750	\$15,428,887
Electricity Costs	\$310,350	\$305,005
Electricity % of Budget	2%	2%

OVERVIEW

New Hampshire Context



25.2% RPS Requirement for 2025 and beyond

biomass, new geothermal, etc
 Class II: "New" solar (COD > 2006)
 Class III: Existing Biomass/ Methane

+ Without any additional action by Hanover, the electricity supply will be 25% renewable by 2025 and remain there to help meet the 2030 100% goal

Technology	Equivalent Installed Capacity to meet <u>75%</u> Goal	
	Community	Municipal Load
<i>Annual Load</i>	<i>124k MWh/year</i>	<i>2.7k MWh/year</i>
Wind	30 MW	0.7 MW
Solar	53 MW	1.1 MW

02

Renewable Energy Options

Renewable Energy Procurement Options

3Degrees explored the following renewable energy procurement options for the Town of Hanover:

- 1) Renewable Energy Retail Supply
- 2) Virtual Power Purchase Agreement
- 3) Community Solar
- 4) Formal Municipal Aggregation
- 5) Purchasing Model: Buyer's Aggregation

Renewable Energy Retail Supply

Renewable Energy Retail Supply

- + **What is it:** New Hampshire allows consumers to choose their own electricity supplier—either from the incumbent electric utility or a competitive energy supplier (CES). If a consumer elects to receive its electricity supply from a CES, the utility continues to provide distribution services (Liberty Utilities for Hanover). The option to elect a CES is open to commercial and residential customers.

Opportunities

- + All community members in Hanover are eligible to elect supply from a CES
- + Ability to solicit specific supply portfolios (e.g. 100% renewable without hydro) for CES proposals
- + Standard pricing for residential & small commercial accounts is readily available with a few renewable energy supply offerings (but may not meet Hanover preferences)
- + CES are seeking new ways to attract customers and are getting increasingly creative in providing renewable energy supply options
- + Hanover could aggregate community load and coordinate specific renewable energy supply offering from a CES, improving economies of scale

Challenges

- + Requires pro-active election by all community members which may impact participation levels
- + Many CES companies do not serve Residential and Commercial accounts: Only 2 registered to service all account types
- + Hanover would no longer purchase wholesale electricity from NEPOOL and thus likely cost more
- + Pricing for renewable energy supply is customized and not readily transparent
- + Retail contracts are typically 3-5 years and do not provide long-term price certainty
- + Clear line of sight to renewable energy supply will be limited and not visible to local community; may be supplied via unbundled RECs and/or hydro

Renewable Energy Retail Supply: Suppliers

- + These competitive energy supply entities are currently registered in NH to provide retail services and serve Liberty Utilities customers
- + These entities are required to meet the state RPS levels in their supply portfolio

CES Entities	Account Type			Standard Supply Offerings ¹
	Residential	Small Commercial	Commercial & Industrial	
Agera Energy	✓	✓	✓	System Power
Power New England	✓	✓	✓	System Power
Ambit Northeast	✓	✓		System Power
E.N.H. Power	✓	✓		Pure Green Product: 87% “Other” renewables, 5% hydro, 3% wind, 1% solar
North American Power & Gas	✓	✓		25% Product: 29% hydro, 2% wind 100% Product: 98% hydro, 2% wind
Summer Energy Northeast	✓	✓		N/A

Note: Small Commercial and Commercial & Industrial are not well defined but expect all three account types are present in the Hanover community

¹<https://www.puc.nh.gov/Consumer/Environmental%20Disclosure%20Labels.html>

Virtual Power Purchase Agreement

Virtual Power Purchase Agreement

+ **What is it:** A virtual power purchase agreement (VPPA) is a long-term, fixed price contract for renewable energy from a specific project. The buyer does not take possession of the electricity but does receive the environmental attributes (e.g. the renewable energy certificates or RECs). A VPPA is available in organized independent system operator (ISO) markets (e.g. CAISO, ERCOT, MISO, PJM, SPP, ISONE) and a buyer can choose a project located in any market irrespective of where the load is located.

Opportunities

- + A single transaction can be utilized to cover community wide renewable energy needs
- + Requires no capital investment yet provides the financial support to cause the build of a new project
- + Secures attractive long-term economics by locking in historically low renewable energy project costs
- + Requires no action on behalf of community to meet goal
- + A local project *may* provide hedge value for current ISONE wholesale power purchases being made in the real-time market for Hanover operational load

Challenges

- + Does not change the supply of the physical power received by the Hanover Community
- + Not a highly visible option even if local region
- + Most economically-advantageous projects are not located near Hanover or in the region (e.g. Texas, Oklahoma) nor would they offer hedge value
- + Hanover would bear the risk of the VPPA on behalf of the community
 - + Wholesale power market exposure based on settlement structure (contract-for-differences) and can cause cash flow volatility

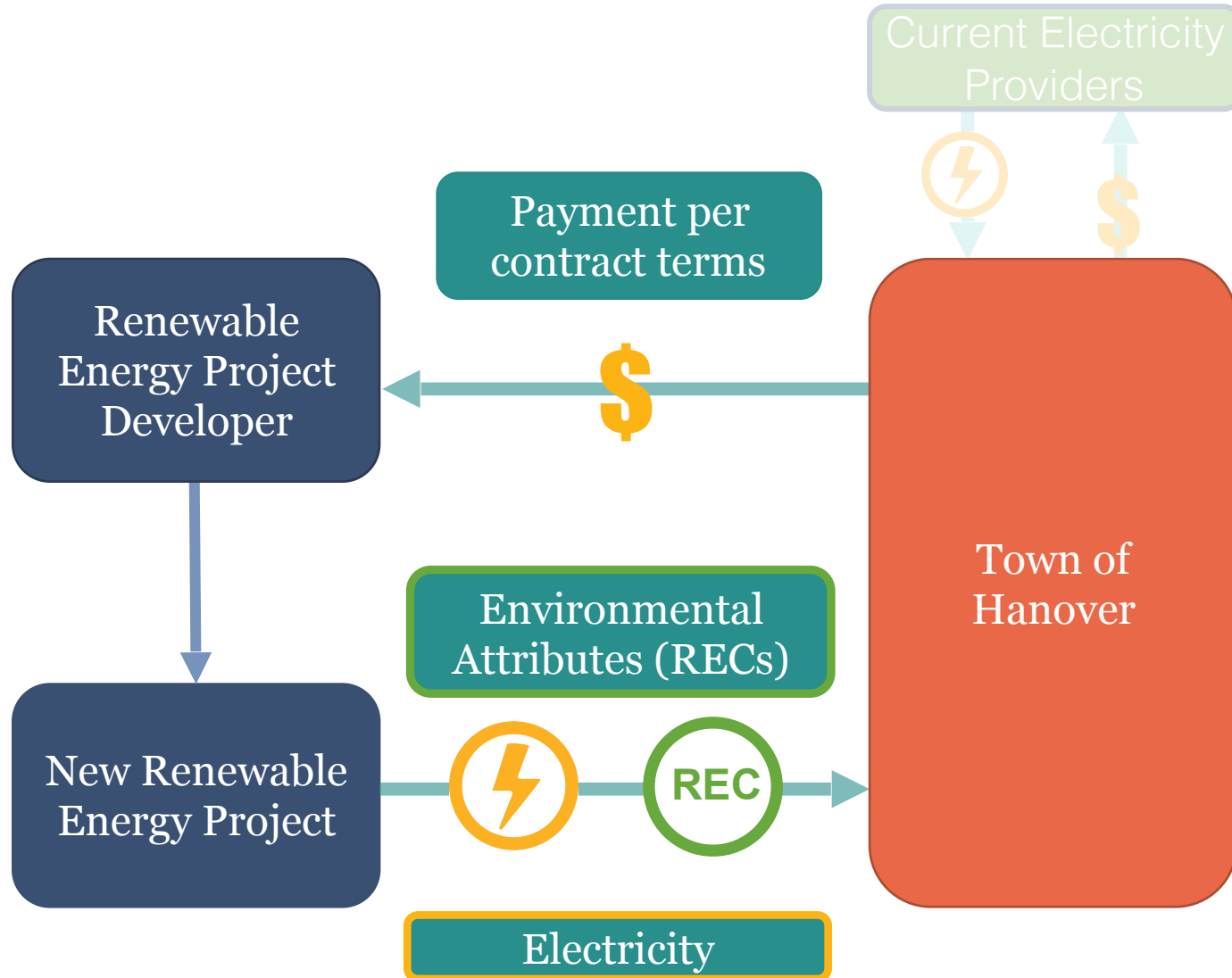
Status Quo Electricity Supply

All ratepayers continue to receive electricity from their current supplier (e.g. ISONE for municipal load and Liberty Utilities or CES for residential and commercial accounts)



- + A VPPA sits alongside and does not disturb current electricity supply arrangements
- + Hanover would continue to buy its electricity on the wholesale power market and all other consumers would continue with their current electricity provider

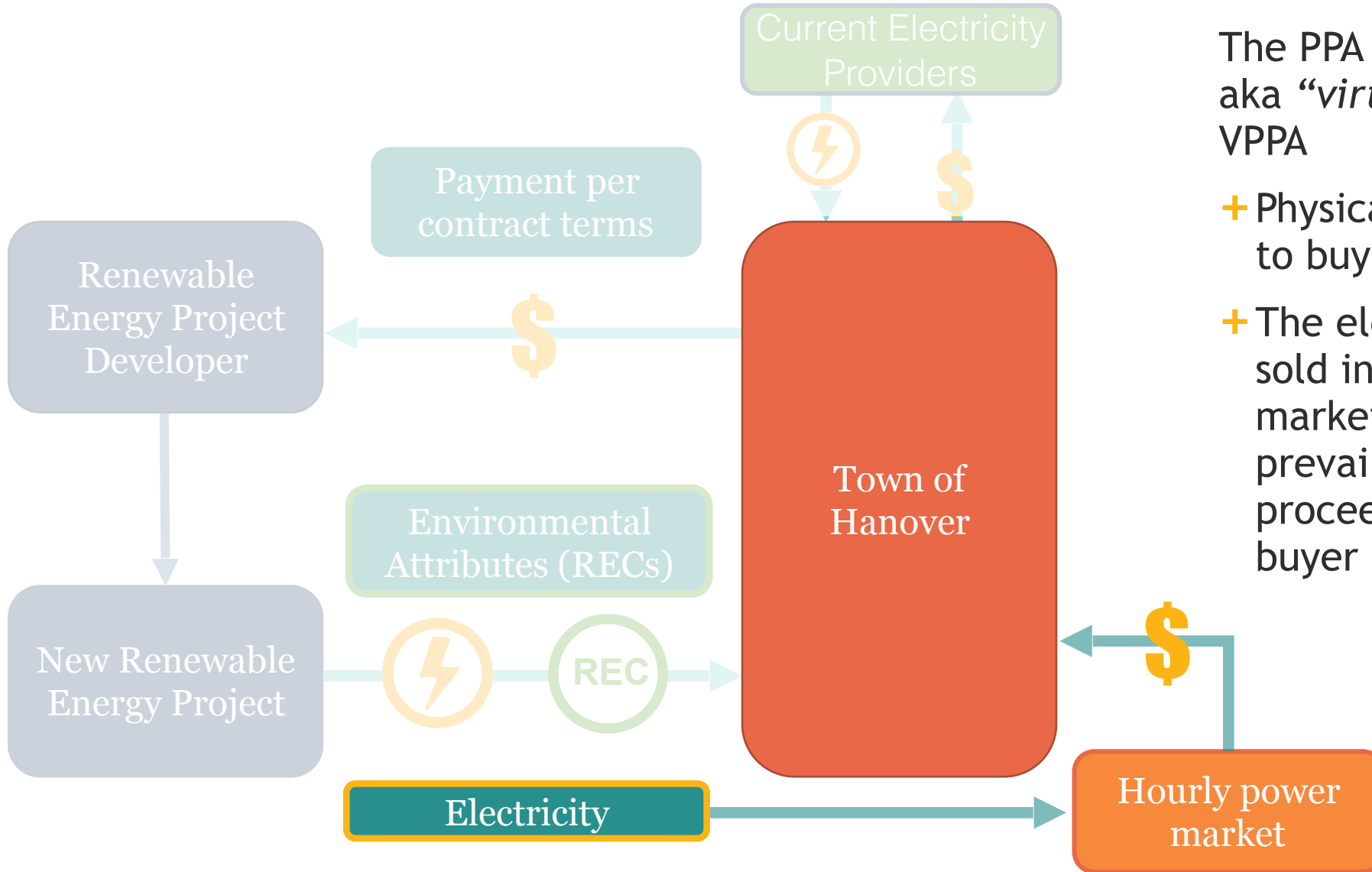
VPPA Foundation: PPA (slide 1/3)



A VPPA begins with a *Power Purchase Agreement*:

- + The renewable project developer seeks a contract to sell project energy over a long term - a prerequisite for obtaining project finance.
- + The corporate buyer seeks to enable new renewables on the grid for sustainability goals, at a price that's cost-effective over the long term
- + To accomplish these goals, the buyer contracts for electricity with its RECs, typically over a 12+ year period

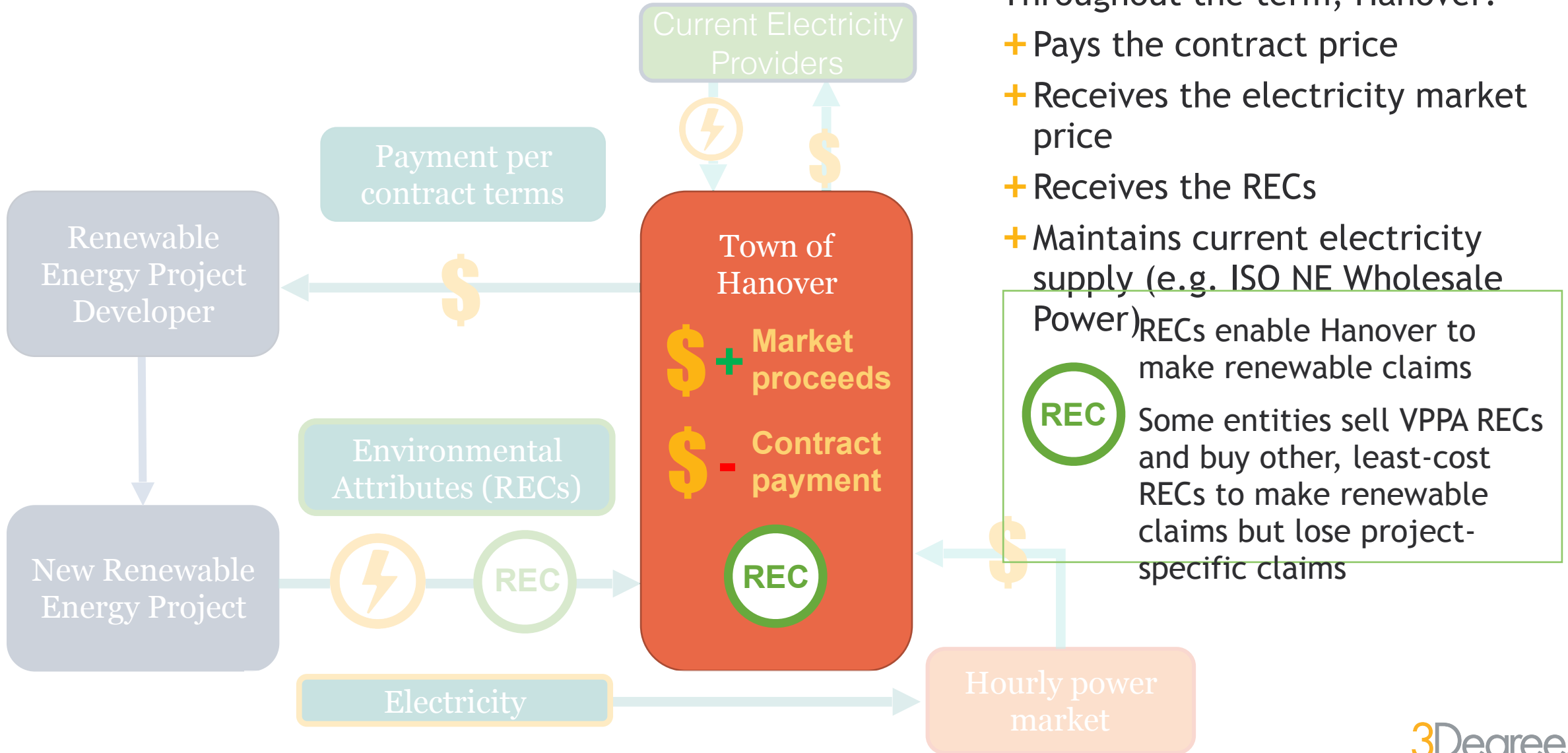
What makes it a VPPA? (slide 2/3)



The PPA is settled financially - aka “*virtually*” - thus making it a VPPA

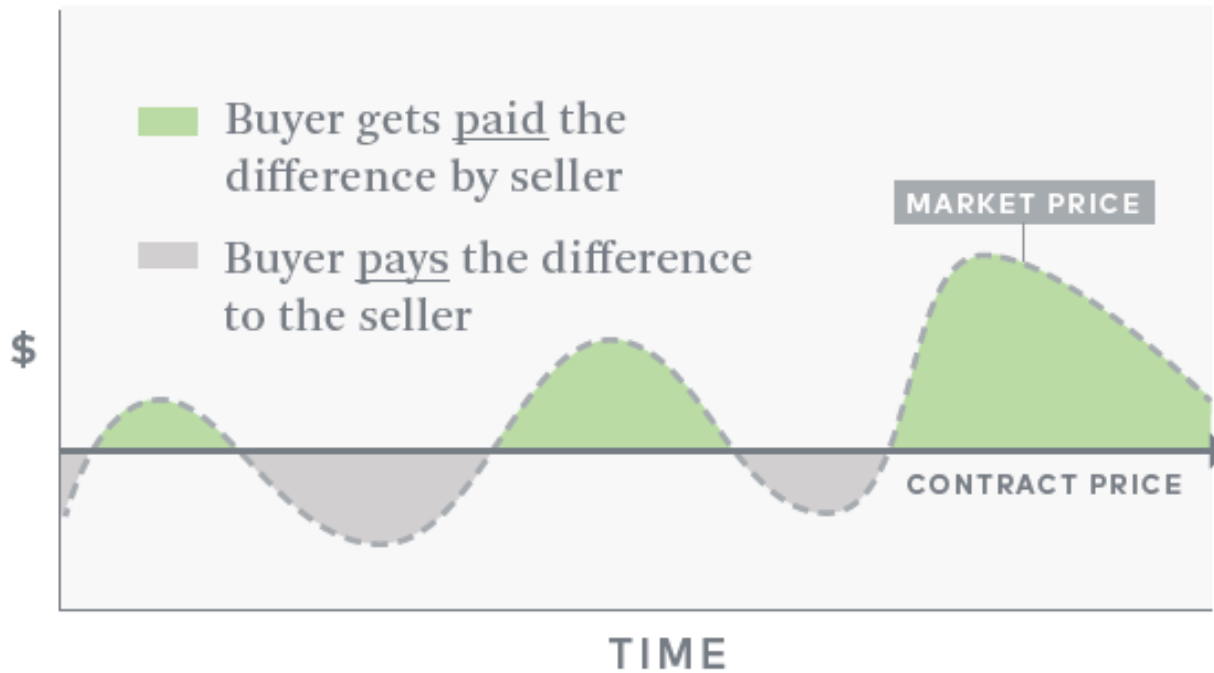
- + Physical energy is not provided to buyer under the VPPA
- + The electricity generated is sold into the wholesale power market every hour at the prevailing market price; the proceeds are returned to the buyer

End Result of VPPA (slide 3/3)



- Throughout the term, Hanover:
- + Pays the contract price
 - + Receives the electricity market price
 - + Receives the RECs
 - + Maintains current electricity supply (e.g. ISO NE Wholesale Power)

VPPA Cash Flow Example



	Hour 1	Hour 2	Hour 3
VPPA Price	\$30.00	\$30.00	\$30.00
Market Price	\$35.00	\$28.00	\$32.00
Difference	+\$5.00	(\$2.00)	+\$2.00
Project Output	100 MWh	115 MWh	200 MWh
Settlement	+\$500	(\$230)	+\$400
Payment	Seller Pays	Buyer Pays	Seller Pays
<i>Net Settlement: Seller Pays Buyer \$670</i>			

- + For Hanover, a VPPA in ISONE *could* act as a long-term price hedge against buying electricity in the real-time market
 - + If wholesale prices increase, the cost of the electricity supply will increase but *could* be offset by proceeds from the VPPA
 - + This correlation will weaken as the project's location moves further away from Hanover

VPPA Representative Financial Summary

- + The price of a VPPA is not an indicator of the potential cost or value of the contract
 - + The Levelized Cost per REC provides a clear indicator of what the expected cash flow will be for the buyer
- + This pricing assumes no REC swap: Hanover keeps all Facility RECs
 - + REC swaps will lower the cost of the REC but impact ability to make project-specific claims

State	Technology	Contract Size	Annual Output	Start Date	PPA Term	PPA Price (\$/MWh)	Levelized Cost per REC
NH	Solar	50 MW	87,600 MWh	Jan 2020	20 years	\$75.00 Annual escalation: 2%	\$35/REC
ME	Wind	50 MW	~166,000 MWh	Jan 2020	20 years	\$55.00 Annual escalation: 2%	\$15/REC
PA	Wind	110 MW	~340,000 MWh	April 2020	15 years	\$31.00 No escalation	\$11/REC
NY	Wind	100 MW	~330,000 MWh	Jan 2020	20 years	\$55.00 Annual escalation: 2%	\$24/REC
NY	Solar	90 MW	~183,000 MWh	Jan 2020	15 years	\$55.00 Annual escalation: 2%	\$16/REC
KS	Wind	110 MW	~475,000 MWh	Jan 2019	15 years	\$16.70 No escalation	Net Positive: \$3.50/REC

*All figures are for illustration purposes and not necessarily indicative of future results.

Community Solar

Community Solar

- + **What is it:** A solar-electric system that allows community members to support a specific solar project, up to 1 MW in size, by sharing the electricity generated by the facility (“Subscription Model”). An alternative community solar structure allows participants to own a portion of the facility (“Ownership Model”). Community members can participate in lieu of installing solar panels on their home or commercial building.

Opportunities

- + Improved economies of scale versus smaller-scale rooftop/onsite solar
- + Expands access of direct renewable energy purchasing to more community members
- + Local, visible facility (or facilities)
- + Increased community involvement and understanding with educational opportunities for public and university students
- + Potential local job creation
- + Hanover could pursue on a stand-alone basis or offer as part of municipal aggregation offering

Challenges

- + Limited to installed capacity of 1 MW thus will need to be part of a larger portfolio of solutions for meeting 100% goal
- + Ownership model can create barrier-to-entry due to capital required to participate
- + Likely need 3rd-party to own the asset in order to take advantage of Investment Tax Credit (ITC)—common model but need to go through selection process
- + Limited examples completed in NH, thus currently a lack of price transparency

Community Solar: Net Metering in NH

- + In June 2017, the NH PUC adopted a “new” net metering tariff¹
 - The tariff was adopted on an “an interim period of several years” while additional data is collected and analysis completed
 - Customers that are eligible for the new rate and design are grandfathered through December 31, 2040
 - Prior statewide limit of 100 MW of community solar was eliminated²
- + The value of the excess generation sold to the grid is dependent upon the size of the project:
 - Small (100 kW or less): 100% of retail rate of energy & transmission and 25% of distribution charge
 - Large (>100 kW up to 1 MW cap): Current utility default service energy rate
 - Facility host must consume 20% of facility output or must register as group host in order to qualify for new tariff
- + Small charges (e.g. system benefits, stranded cost recovery charges) will be charged actual usage, not the net amount
- + Hanover could act as “group host” on behalf of community participants to provide for group net metering (all participants must be Liberty Utilities customers)
- + Liberty Utilities is allowed to collect lost revenues attributable to net metering, following a PUC-approved process

¹ <http://www.puc.state.nh.us/Regulatory/Orders/2017orders/26029e.pdf>

² <http://www.govtech.com/fs/New-Hampshire-Lifts-Net-Metering-Limits-Opens-Doors-For-Solar.html>

Formal Municipal Aggregation

Formal Municipal Aggregation

- + **What is it:** Since 1996, New Hampshire municipalities and counties can aggregate retail electric customers to access competitive electricity market supply. A municipality, such as the Town of Hanover, can aggregate the electricity load of the community with customers located “within its boundaries” which includes both residential and commercial accounts.

Opportunities

- + Ability to create program that has supply specifically designed to meet the Hanover’s goals
- + Can support local, renewable supply
- + Hanover would be a leader as first-of-its-kind renewable energy municipal aggregation in New Hampshire
- + Hanover can leverage its experience of buying wholesale power from the ISO New England
- + Other communities across the US to learn from (CCAs in California; Boulder, CO)

Challenges

- + Additional research needed to understand cost implications
- + Requires consumers to “opt-in” to program which can impact participation rates and decrease the expected economies of scale benefits
- + Additional Hanover resources (staff and funding) required for design, creation and operation of aggregation program
 - + Can also hire outside firm to manage program implementation and operations

Municipal Aggregation Requirements

- ① Create Electric Aggregation Committee (EAC)  Completed
- ② EAC develops Aggregation Program Plan
- ③ Approval of Aggregation Program Plan
- ④ Written notice to all citizens and host public hearing
- ⑤ Town enters into required contracts (electricity supply, etc.)
- ⑥ Town hires third-party or increase staff to manage aggregation requirements

② Specific Aggregation Program Plan Requirements

These Plan requirements are included in the statute but do not include any additional details - thus, Hanover has discretion and flexibility in program design:

Requirement	Concepts
Program organizational structure	May include: Governance (i.e. officers, committees), program goals (i.e. renewable energy levels, stable rates, etc.), supply resource planning, outreach plans and opt-in periods, reporting plans, participant departure procedure, dedicated website and marketing materials
Operation and funding	<ul style="list-style-type: none"> • Operation: Procurement plans, risk management, load forecasting, communication plans, customer service, data collection and security, billing, staffing • Funding: Financial planning and budgeting (tied to rate design)
Rate setting and other participant costs	Rate development plans and approval structure; rate design (varying pricing by usage levels); creating departure fees (if any); identification of all fees included in rates (administrative and management fees)
Process for program termination	Requirements for terminating the program, including required approvals and notice periods; communication plans and support for participants to return to default service or competitive supply
Methods for entering & terminating agreements with other entities	Hire attorney to advise on contract negotiations; create solicitation guidelines, requirements and evaluation criteria; determine credit support, if any, willing to provide electricity sellers; determine preferred contract terms, conditions and acceptable termination rights

Opt-In Requirement

84% Usage

Residential Customers

15% Usage

- Current State: Most residential customers receive default energy service¹
- Top voluntary green power programs in US have less than 20% participation rate²:

Utility	Participation Rate
Portland General Electric (OR)	19.44%
Sacramento Muni (CA)	11.61%
Farmers Electric Cooperative (IA)	10.78%
Wellesley Municipal Light Plant (MA)	10.56%
River Falls Municipal Utilities (WI)	10.00%

Dartmouth College

- Dartmouth’s electricity usage makes up much of the commercial load in the community (*waiting on data for %*)
- College has its own renewable energy supply goals that differ in their timing:
 - 50% by 2025
 - 100% by 2050
- Hanover’s 100% goal is **20 years ahead** of the College’s goals and may impact their level of participation

Other Commercial Customers

Seven entities make up the remaining commercial load:

- Sheridan Press
- Kendal at Hanover
- Create
- US Army Corps of Engineers CRREL
- Coop Food Stores
- Hanover Schools
- Hypertherm

¹ Per NH PUC - <http://www.puc.state.nh.us/Electric/electric.htm>

² Per NREL - <https://www.nrel.gov/analysis/assets/pdfs/utility-green-power-ranking.pdf>

Lebanon RFI for Municipal Aggregation

The City of Lebanon drafted an RFI seeking “Services to Support Lebanon Community Power”

“LCP is a proposed municipal aggregation under NH RSA 53-E that will pilot the use of real time hourly pricing for net metering and retail energy supply in conjunction with the development and operation (indefinitely into the future) of a transactional platform that supports direct retail purchases and sales of power from distributed generation and storage, including net metered customer-generators, and potential support of demand response services.”

- + RFI responses are intended to influence the creation of an RFP in the next year
- + RFI also includes requests for Smart LED Street Lighting Conversion and Advanced Metering Infrastructure (AMI) for Electric Pilots

Partnership Opportunity with Lebanon

ADVANTAGES

- + Natural synergies based on existing relationship and close geographic location of Hanover and Lebanon
- + Larger pool of potential aggregation participants increases to total potential required electricity supply, thus improving buying power and economies of scale
- + Shared program, administrative, advisor and legal costs
- + Larger impact than go-it-alone due to larger number of participants and required supply
- + Leverage experienced City of Lebanon staff

CHALLENGES

- + Both communities must vote to approve the aggregation, which requires:
 - Alignment of goals and timelines
 - Coordinated education and outreach plan for larger population
- + Need for ‘governing’ board to ensure both parties needs met with clearly defined roles & responsibilities, thus additional coordination and potential for bureaucracy
- + Unclear if goals are aligned:
 - Lebanon focused on real-time pricing pilot with less of a focus on renewable energy supply
 - RFI not seeking advisor for aggregation program creation and its corresponding requirements

Purchasing Model: Buyer's Aggregation

Purchasing Model: Buyer's Aggregation

- + **What is it:** A joint procurement effort between like-minded organizations with a desire to procure renewable energy and work together to combine their buying power to improve the cost by taking advantage of economies of scale.
- + **Aggregation could be:**
 - + **Municipal Aggregation:** Join with City of Lebanon or other communities served by Liberty Utility
 - + **Virtual Power Purchase Agreement:** Join with other buyers (e.g. Dartmouth) for larger VPPA
 - + **Renewable Energy Retail Supply:** Hanover could play an organizing role in aggregating community load and seeking renewable energy supply from a competitive energy supplier.
 - + **Community Solar:** Hanover can act as Group Host for community wide participation

Opportunities

- + Decreased cost to procure renewable energy through economies of scale
- + Reduce transaction costs by sharing the work and fees for supporting resources (legal, consultants, etc.)
- + Demonstrate leadership in collaboration/aggregation (emerging model in the renewable energy space)
- + Ability to amplify the message through a larger audience

Challenges

- + Finding partners at the same point in the maturity curve with the authority to move forward
 - + Need similar objectives, expectations and state of readiness
- + More partners require more coordination, stakeholder engagement as well as trust and transparency
 - + Herding cats takes time & resources
 - + Pre-existing relationship helps mitigate hurdles

Buyer's Aggregation Examples: Not Many

- + MIT, Boston Medical Center and Post Office Square Redevelopment Corporation¹
 - + 25 year VPPA
 - + Virginia Solar: New 60 MW project (Summit Farms)
 - + Project Developer: Dominion
 - + Capacity Allocation:
 - + MIT: 44 MW (73%)
 - + Boston Medical Center: 15.6 MW (26%)
 - + Post Office Square Redevelopment Corporation: 0.4 MW (1%)
- + Four Corporations (*Not yet public*)
 - + 3Degrees led aggregation efforts for two VPPAs
 - + Illinois Wind: New 125 MW project
 - + 13 Year VPPA
 - + Virginia Solar: New 165 MW project
 - + 15 Year VPPA

03

Evaluation




Decision Criteria































Criteria	Details
Verified	Source from Green-e® qualified facilities (e.g.: wind, solar, small hydro)
Cost-Effective	<ul style="list-style-type: none"> Minimize cost premiums for renewable energy component Minimize ratepayer impact: Affordable, stable and predictable rates Reliable supply with ability to mitigate impact of outlier events <i>Optional: Continuing to buy Hanover municipal electricity from wholesale market</i>
Impact	Cause new build (“additionality”); maximize grid GHG reduction (“subtractionality”)
Local	Visible project that demonstrates Hanover’s commitment
Leadership	Create replicable process and/or solution for other towns & communities in NH
Education	Provide education opportunities for staff, community (Sustainable Hanover, public schools), university (undergraduate and graduate students), and other towns & communities in the region

■ **ADDITIONAL CONSIDERATIONS.**

- + Risk Profile: Hanover vs. community wide; Dartmouth appetite
- + Scalability: Ability to meet community wide needs
- + Tenor of solution: Number of years of supply




Evaluation Scorecard






-  Meets criteria
-  Uncertain if will meet criteria
-  Does not meet criteria

Criteria	Municipal Aggregation	Renewable Retail Supply	VPPA		Community Solar
			Local Region	National	
Verified					
Cost-Effective					
Impact					
Local					
Leadership					
Education					




*Buyer’s Aggregation can be used for any of these options: We recommend Hanover decides on its best-fit solution and then determine if adding partners makes sense or would be beneficial


























Municipal Aggregation Considerations

	Meets criteria
	Uncertain if will meet criteria
	Does <u>not</u> meet criteria

Concept	Scoring	Details
Hanover Role		<ul style="list-style-type: none"> Aggregation means Hanover takes on all buying responsibilities on behalf of the community
Participation Reliance		<ul style="list-style-type: none"> Aggregation requires <u>pro-active</u> participation by residents and businesses due to the opt-in requirement Hanover will need a specific strategy for targeting residents and businesses in order to reach the 100% goal and create a strategy for non-participants
Risk Profile		<ul style="list-style-type: none"> Municipal Load: Given the current real time market buying practice, aggregation is unlikely to change risk profile Community - Residential & Business: Cost and stable rates can be offered with long-term solution instead of default or short-term competitive supply arrangements; dependent on current & future rates
Scalability Ability to meet community wide needs		<ul style="list-style-type: none"> Aggregation is intended to cover all electricity consumers in the town Opt-in requirement likely to impact ability to meet 100% coverage
Tenor of solution Number of years of supply		<ul style="list-style-type: none"> Aggregation is a long-term solution for meeting 100% goal Hanover will be responsible for creating the supply portfolio and can create one with differing contract terms to diversify pricing risk

Additional Considerations (All)

 Meets criteria
 Uncertain if will meet criteria
 Does <u>not</u> meet criteria

Criteria	Municipal Aggregation	Renewable Retail Supply	VPPA		Community Solar
			Local Region	National	
Hanover Role					
Participation Reliance					
Risk Profile					
Scalability Ability to meet community wide needs					
Tenor of solution Number of years of supply					

04

Discussion

Discussion Questions

What procurement role does Hanover want to play for meeting the 100% renewable energy supply goal?

Aggregator Role	Community Solar & Renewable Retail Supply require Hanover to bring consumers (commercial & residential) together but no additional financial requirements
Buyer Role	VPPA & Municipal Aggregation require Hanover to procure renewable energy on behalf of consumers

How much does Hanover want to rely on participation from consumers (businesses and residents) to meet its goal?

Passive Participation	VPPA could be executed by Hanover to meet community wide load in single transaction
Active Participation	Municipal Aggregation, Community Solar & Renewable Retail Supply all require “opt-in” election by consumers

More Discussion Questions

- + What level of internal resource dedication does Hanover want to allocate to supporting the renewable energy goals - both in the short-term and the long-term?
- + What is the community and business appetite for supporting the 100% efforts?
- + What is the coverage plan for naysayers and/or non-participants?

Annex

Municipal Aggregation Details

Municipal Aggregation in New Hampshire

Source Legislation: 2013 New Hampshire Revised Statutes

Title III - Towns, Cities, Village Districts, and Unincorporated Places

Chapter 53-E - Aggregation Of Electric Customers By Municipalities And Counties

Statement of Purpose

The general court finds it to be in the public interest to allow municipalities and counties to **aggregate retail electric customers**, as necessary, to **provide such customers access to competitive markets for supplies of electricity** and related energy services. The general court finds that aggregation may provide small customers with similar opportunities to those available to larger customers in obtaining lower electric costs, reliable service, and secure energy supplies. **The purpose of aggregation shall be to encourage voluntary, cost effective and innovative solutions to local needs with careful consideration of local conditions and opportunities.**

Key Definitions:

- + **Aggregation:** Grouping of retail electric customers to broker or contract for electric power supply and energy services for such customers
- + **Aggregator:** A municipality or county that engages in aggregation of electric customers within its boundaries

Municipal Aggregation Requirements

- ① Create Electric Aggregation Committee (EAC)
- ② EAC develops Aggregation Program Plan
- ③ Approval of Aggregation Program Plan
- ④ Written notice to all citizens and host public hearing
- ⑤ Town enters into required contracts (electricity supply, etc.)
- ⑥ Town hires third-party or increase staff to manage aggregation requirements

Creation of Committee & Program Plan

1 Electric Aggregation Committee Formation

- + Option to form the committee
- + Responsible for creating the Aggregation Program Plan
- + Plan can be developed jointly with other municipalities or counties
- + Public input must be solicited as part of planning process, including public hearings

2 Aggregation Program Plan Requirements

- + Provide universal access, reliability, and equitable treatment of all classes of customers
- + Be cost neutral for non-participants (exception for cost to supply municipal load)
- + Meet state and NH Commission standards (e.g. RPS)

Specific Aggregation Program Plan Requirements

These Plan requirements are included in the statute but do not include any additional details - thus, Hanover has discretion and flexibility in program design:

Requirement	Concepts
Program organizational structure	May include: Governance (i.e. officers, committees), program goals (i.e. renewable energy levels, stable rates, etc.), supply resource planning, outreach plans and opt-in periods, reporting plans, participant departure procedure, dedicated website and marketing materials
Operation and funding	<ul style="list-style-type: none"> • Operation: Procurement plans, risk management, load forecasting, communication plans, customer service, data collection and security, billing, staffing • Funding: Financial planning and budgeting (tied to rate design)
Rate setting and other participant costs	Rate development plans and approval structure; rate design (varying pricing by usage levels); creating departure fees (if any); identification of all fees included in rates (administrative and management fees)
Process for program termination	Requirements for terminating the program, including required approvals and notice periods; communication plans and support for participants to return to default service or competitive supply
Methods for entering & terminating agreements with other entities	Hire attorney to advise on contract negotiations; create solicitation guidelines, requirements and evaluation criteria; determine credit support, if any, willing to provide electricity sellers; determine preferred contract terms, conditions and acceptable termination rights
Rights and responsibilities	Creation of written documentation that clearly describes notice provisions, departure fees (if

Program Plan Approval & Notice

③ Approval of Aggregation Program Plan

The Program Plan created in ② must be submitted to Hanover’s “legislative body” (e.g. Annual Town Meeting)

+ Plan must be approved by a “majority of those present and voting”

Public Notification

④ Upon Program Plan approval, Hanover must:

+ Mail written notification to each retail electric customer within the municipality, including:

- Program description
- Implications to the municipality
- Rights & responsibilities participants will have under the program

+ Host public hearing within 15 days of notification for Q&A

+ Collect an *affirmative* response to the notification or written request to be *included* in the program from all community members (e.g. “Opt-In” Requirement)

5 Aggregator Role



Opt-in Requirement:

Aggregate the retail electric customers within its boundaries who **consent** to being included in an aggregation program



Enter into agreements for:

- + The supply of electric power
- + Meter reading
- + Customer service
- + Demand side management
- + Conservation
- + Other related services

} Only as applicable/needed

Hanover can enter in these agreements on a stand-alone basis or with other entities (e.g. Lebanon)

Aggregator Role Agreements

Electricity Supply	<ul style="list-style-type: none">+ Hanover must create a long-term electricity procurement plan in order to enter into electricity supply contracts to meet the Community's needs and update the plan at regular intervals+ Procurement includes:<ul style="list-style-type: none">▪ Creating competitive solicitation(s), evaluating responses and negotiating contracts▪ Dictating the renewable energy content of such supply▪ Buying and paying for the electricity, irrespective of changing participation levels in the community (contractually obligated)
Meter Reading	<ul style="list-style-type: none">+ Collect monthly usage data from all participants' meters<ul style="list-style-type: none">▪ Requires field personnel, coordination with Liberty and/or upgrading current meters+ Create and maintain database system to securely store all meter data and allow for interface for billing requirements
Customer Service	<ul style="list-style-type: none">+ Billing: Expect consolidated billing (e.g. Liberty continues to manage all invoicing), but no guidance in rules<ul style="list-style-type: none">▪ Coordinate with Liberty for data sharing and funds exchange+ Call center to answer all participants questions in a timely, prompt and professional manner



⑥ Implementation Options

- + Build in-house expertise:
 - Utilize existing employees and hire for specific expertise
- + Hire outside advisor with municipal aggregation formation experience
 - + Initial research did not result in firms with New Hampshire experience:
 - LEAN Energy US (Local Energy Aggregation Network): Non-profit that offers consulting to municipalities interested in forming their own CCA program
 - Good Energy: Over 200 community energy aggregation programs in US
 - Local Power Inc.: Founder is pioneer in aggregation; worked on San Francisco's implementation plan, among others
 - Colonial Power Group: 60 communities in MA (may only have MA expertise)

Many communities start with an advisor and choose over time what to migrate in-house, if anything

Given the size of the Hanover team, 3Degrees recommends a competitive solicitation for an experienced advisor




Sample Implementation

- + Metropolitan Area Planning Council, serving the Boston area, created a “Start a Community Choice Aggregation Program” implementation guide shown here
- + The rules in MA differ from NH (namely, opt-out but also coordination with Department of Energy Resources) but provides relevant overview of the steps needed to form an aggregation
- + Additional resources:
 - Marin Clean Energy
 - NY State Energy Research & Development Agency

Implementation Steps	Objectives	Key Implementers	Estimated Time Frame
Initial research	Learn about CCA and the potential role it could play in your community.	Town Administrator or Relevant Municipal Staff	
Authorize CCA	Authorize development of an aggregation plan by majority vote in city council or town meeting.	City Council or Town Meeting	1 month
Issue RFP for energy broker (optional)	Hire a broker for assistance in the design, implementation, and ongoing monitoring of the aggregation plan.	Town Administrator or Energy Planner	2 months
Develop aggregation plan with DOER	Draft a plan with the input of DOER that meets the goals of the community and the requirements of the DPU.	Broker, Town Administrator or Energy Planner	2 months
Approve aggregation plan	Authorize plan to be filed with the DPU.	City Council or Board of Selectmen	1 month
Submit aggregation plan to DPU	Petition the DPU to authorize the CCA.	Broker	6 months
Issue RFP for competitive supplier	Solicit competitive bids for the CCA contract.	Broker	1 month
Execute contract with supplier	Choose supplier for the CCA.	Town Administrator or Energy Planner	
Notify customers	Inform customers about the CCA and the opt-out period.	Broker	2 months
Begin automatic enrollment	Enroll basic service customers who have not opted out.	Utility	1 month

Benchmarking

 Most successful examples

State	Format	Program Health
 California	Opt-out	<ul style="list-style-type: none"> 11 operational CCAs; 13 expected launches in 2018; 13 programs under consideration Exit fees are key, contentious issue
Illinois	Opt-out	<ul style="list-style-type: none"> Significant savings in 2011-2013 made programs very successful - more than 720 communities at its peak but incumbent utilities lowered their rates, thus removing cost advantages and many aggregations ceased operations City of Chicago voters created aggregation by vote in 2012 but returned to incumbent service in 2015 Currently ~1.9M customer accounts served by aggregation
 Mass	Opt-out +	<ul style="list-style-type: none"> Law passed in 1997 (influenced by Paul Fenn, Local Power founder) Approximately 145 cities and towns have programs in place or have planning underway
New Jersey	Res: Opt-out Comm & Muni: Opt-in	<ul style="list-style-type: none"> Updated Opt-Out legislation led to first programs in 2012 Approximately 12 operational programs State statute requires aggregation rates to be below default rate, unless includes more renewables
 New York	Res & Small Biz: Opt-out Large Biz & Ind: Opt-in	<ul style="list-style-type: none"> 1 operational program (Westchester, started in 2016) with at least 2 others under consideration 2016 laws allow for gradual roll-out in large cities (e.g. NYC)
Ohio	Effectively opt-out	<ul style="list-style-type: none"> Over 250 communities use aggregation for both gas & electricity Program must be approved through local ballot measure Local governments facilitate the aggregation contract but do not assume day-to-day administration

Source: <http://www.leanenergyus.org/cc-a-by-state>