Madden Room – South Windsor Town Hall
Special Meeting

1. Call Meeting to Order

The meeting was called to order at 4:32 p.m.

2. Roll Call

Members Present: Hank Cullinane, Resident
Anitha Elango, Town Treasurer (left at 5:12 p.m.)
Mike Gantick, Director of Public Works
Athena Loukellis, Resident
Sherman Tarr, Resident
Stephen Wagner, Resident

Members Absent: Larry Brown, Resident
Robert Dickinson, Resident
Patrick Hankard, Board of Education
Councilor Mary Justine Hockenberry, Town Council
Councilor Cesar Lopez, Town Council
Councilor Janice Snyder, Town Council

3. Approval of Minutes (September 24, 2019)

No action was taken on this item due to a lack of a quorum.

4. Next Meeting

Regular Meeting – November 19, 2019, 4:30 p.m., Madden Room

5. Business

A. CT Energy Network Gathering Report

Chairman Wagner informed the Committee that he attended a meeting on September 28, 2019. Chairman Wagner reviewed some of the items that were discussed at the meeting, such as a proposal from the Clean Energy Task Force of a template Energy Plan that could be used by each Town, as shown in attached **Exhibit A**. Committee members discussed some of the items in the template.

5. Business

B. Energy Savings Account

a. Meeting report
b. Possible Council resolution for use of energy cost savings to fund energy-related capital improvement projects

Committee members discussed the ability to use energy cost savings to fund energy-related capital improvement projects. It was the consensus of the Committee that this would be complicated and felt it would be better to inform Town employees that the Energy Committee is willing to work with each department on energy-saving projects.

C. $25K/$50K Community Match Fund from Sustainable CT

Chairman Wagner informed the Committee that the Town has the opportunity to apply for a grant up to $25,000 for a project whose budget is up to $50,000. The Town would have to fund $25,000 or 50% of a project through crowd sourcing. Committee members were asked if they had any ideas to inform the Committee.

D. $75 for Home Energy Solutions thru 12/31

Chairman Wagner announced that home owners could get a home energy solution assessment of their homes for $75.00 through the end of the year. The assessment usually costs $149.00. This information will be put on the Town website and Facebook.

F. Energy Tips

Mrs. Loukellis informed the Committee that the Energy Tips have been updated to September and felt that the Energy Tips should be on the front page of the website in the scrolling pages. Chairman Wagner asked if the Town could change the slide every month. Mrs. Reid, Clerk of the Council, said she would ask the Information Technology Department about this request.

G. Business Outreach

Chairman Wagner stated that Councilor Snyder said she would contact Rotary about business outreach. Councilor Snyder is absent tonight, so this item can be discussed at a future meeting.

5. Business

H. Residential Outreach 2020

Committee members discussed the idea of doing residential outreach with a survey. Mrs. Loukellis will contact Hampton to see how they sent their survey out to residents.

I. Zero Net Energy School Update

Chairman Wagner explained that he had discussions with a number of individuals about trying to make Pleasant Valley a zero net energy building. Unfortunately, there are a number of difficulties doing this, but it remains to be seen what can be done without raising the cost of this project which will be stated in a referendum.

6. Miscellaneous

Chairman Wagner informed the Committee that the proposed Virtual Net Metering project is being proposed to be split between Enfield and Rocky Hill. The Committee will have to come up with ten accounts to absorb $500,000 of electricity. Eversource gives the Town credit, which is used to reduce the electric bill.

7. Adjournment

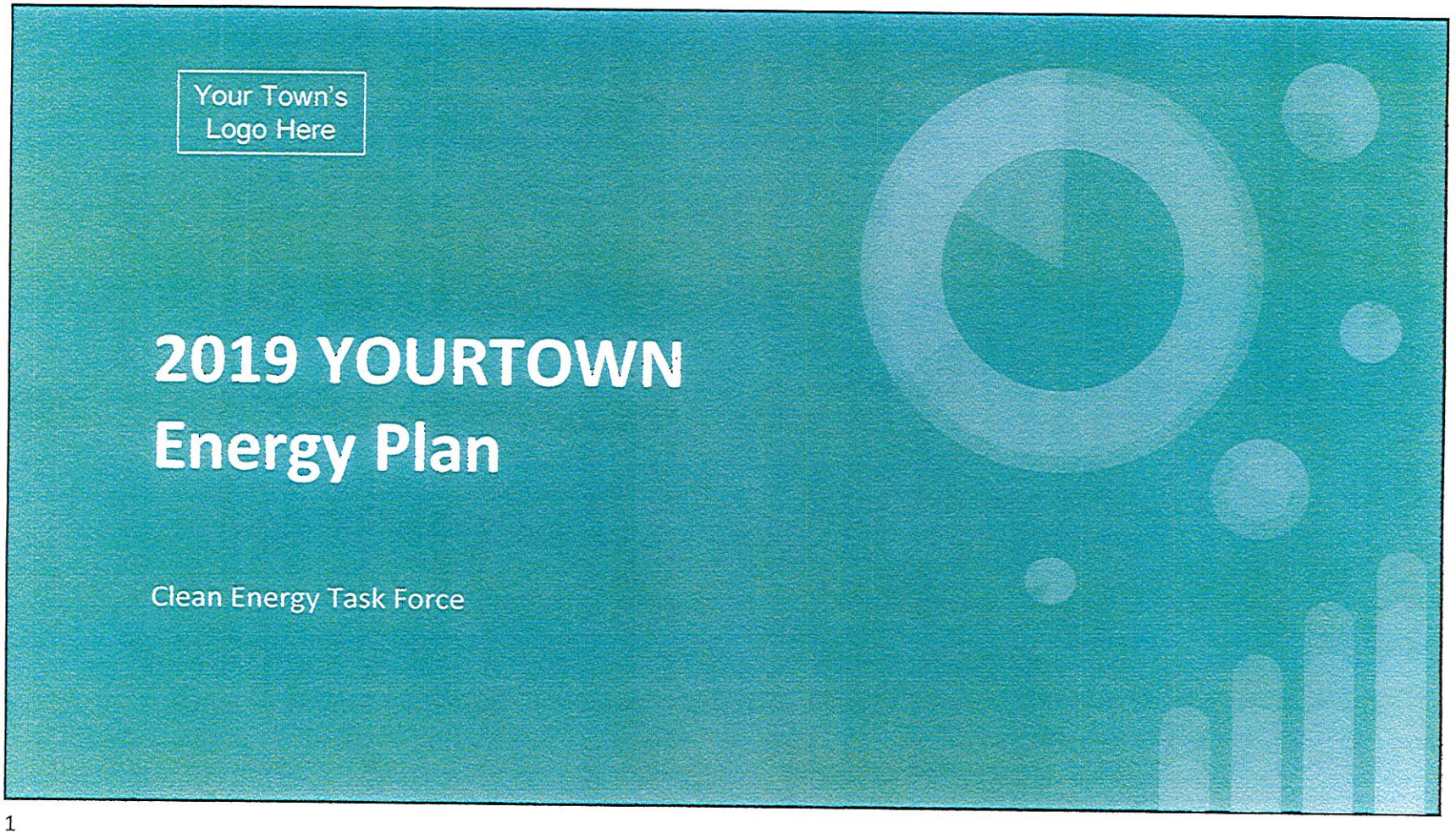
At 6:08 p.m. the meeting adjourned.

Respectfully submitted,

Deborah W. Reid

Deborah W. Reid
Clerk of the Council

Exhibit A



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9-19-19

Introduction

Energy is the lifeblood of life in YOURTOWN. We use it to heat and cool our homes and business, to run our appliances and to travel to work and play. It is also one of the largest expenditures for our residents and businesses.

In a recent survey of town residents, over 80% of respondents agree or strongly agree that YOURTOWN should be a leader in promoting energy efficiency and renewable energy in both town buildings and also among residents and businesses.[1] [2017 POCD, p. 94]

The YOURTOWN Clean Energy Task Force has prepared this Energy Plan to help guide the town toward greater energy efficiency and sustainability. Carrying out this plan will yield many benefits to town residents and businesses, including:

- **Savings**: We estimate that the town can reduce its energy expenditures significantly. And, we can keep more of the money we spend right here in town.
- **Health**: By reducing our reliance on fossil fuels and electrifying heating, cooling and transportation, we will improve air quality, leading to a range of health benefits, including notably lower asthma rates.
- **Comfort**: By making our homes and businesses more energy efficient, they also become more comfortable.
- **Resiliency**: Through greater reliance on local energy generation and a more modern electric grid, the town can weather storms, outages and natural catastrophes longer and more safely.

In 2018, the State of Connecticut's set a goal of producing 40% of its electric power through renewables by 2030. This energy plan aims to achieve this goal for YOURTOWN as well. Our ultimate goal is to get to 100% renewable energy for YOURTOWN and the state by 2050.

[1]2017 Plan of Conservation and Development, p. 94]



YOURTOWN High School Principal John Principal showcases the new 15 kW solar array atop the school

We recognize that it will be difficult to achieve this vision. But, it is both achievable – even with today's technology – and realistic – as other cities and states have set similar aspirations and timelines. By fostering a culture of conservation throughout the entire community and by making the right choices, YOURTOWN can address energy and climate change challenges in a meaningful way. Now is the time for the Town to lead by example and launch our community into an affordable, resilient, and clean energy future.

YOURTOWN Clean Energy Task Force
September 2019

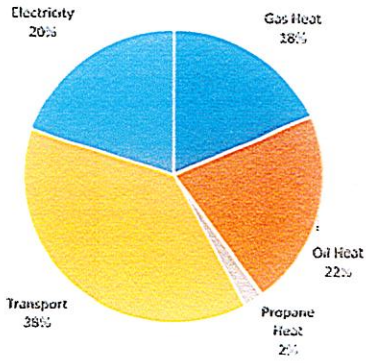
YOURTOWN's Energy by the Numbers

We estimate that in 2018, YOURTOWN:

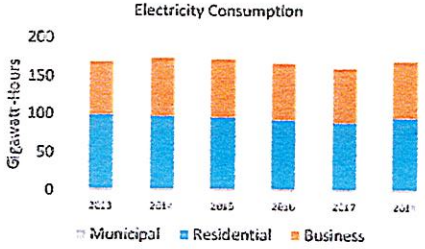
- spent $78.5 million on energy, or $3,230 per person.
- consumed the energy equivalent of 844,594 megawatt-hours, or 35 per person.
- generated 228,783 tons of greenhouse gases (GHG), or 9.4 tons per person.

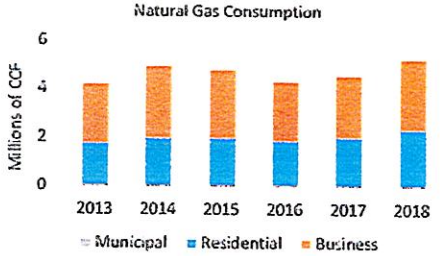
These amounts include the entire town (i.e., residents, businesses, the Town of YOURTOWN and the Board of Education), and they include heating, transportation and electricity. These figures are shown in detail in the appendix to this report.

As seen in the graph below, 40% of the town's energy is spent on heating, split fairly evenly between natural gas and oil. Another 38% goes to transportation and 20% to electricity. (Source: YOURTOWN Clean Energy Task Force Analysis)



Both electricity and natural gas consumption declined slightly between 2014 and 2016, but have increased since 2017. Natural gas usage has increased by 21% in just two years. (Source: Energize CT)





YOURTOWN has roughly 175 solar arrays in town, capable of producing roughly 2.3 gigawatt-hours of electricity each year, or 1.4% of current consumption. Roughly half of these arrays were added in 2014, when YOURTOWN conducted a "Solarize" campaign. (Source: CT Green Bank) We estimate that the town could locally site 120 gigawatt-hours of solar energy.

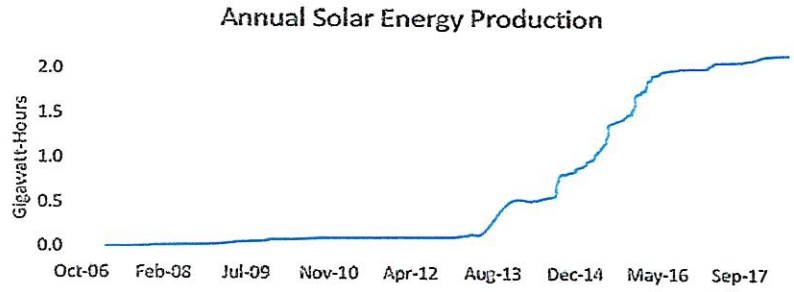


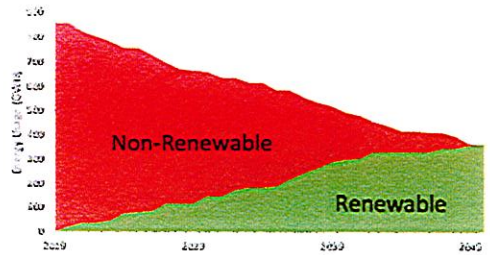
Exhibit A

YOURTOWN aims to use 100% renewable energy by 2050

The path to 100% renewable energy comprises two complementary actions:

- Overall energy consumption must be decreased dramatically by a combination of energy efficiency and electrification of heating, cooling and transportation.
- Electricity consumed in town must come from clean, renewable sources.

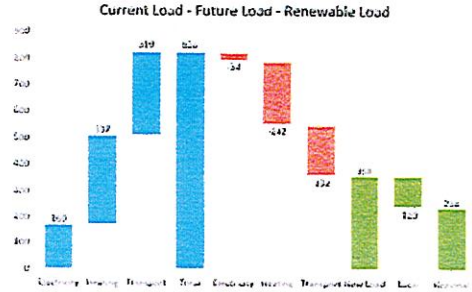
These complementary actions are visible in the declining overall consumption and increasing renewables in the chart below.



The key elements of this energy plan are:

1. Reduce our energy usage by improving the efficiency of our buildings, both public and private.
2. Transition heating and cooling to high-efficiency heat pumps.
3. Promote the responsible development of renewable energy in town, including residential rooftop solar, community shared solar, commercial solar and solar carports. For remaining energy needs, pursue regional solutions and advocate for a cleaner grid.
4. Promote public transportation and the transition to electric vehicles through various measures, including planning for sufficient charging opportunities.
5. In collaboration with Eversource, modernize the local electric grid to enable higher levels of renewable energy

The chart below is another way of visualizing YOURTOWN's path to 100% renewable energy. The blue bars on the left side of this graph represent the town's current energy usage, expressed in a common unit: gigawatt-hours. The red bars represent the potential reduction in energy usage through efficiency and electrification, resulting in a vastly reduced energy load. The green bars represent the sources of local and regional renewable energy to meet this need.



Energy Reduction Targets

As seen in these two graphs, YOURTOWN aims to reduce energy consumption by over half in roughly thirty years. Because these reductions will be accomplished in part through "fuel switching" (e.g., from gasoline to electric vehicles), we do not set reduction targets for each fuel type. In fact, we expect electricity usage to more than double over this period.

YOURTOWN's 2050 energy target can be achieved through modest annual reductions of 2.8% per year. **Based on our initial analysis, we are selecting a 3% annual reduction target for all town sectors: residents, businesses and municipality. Over a five-year period, the targeted reduction is therefore just under 16%.** As our analysis of the town's energy usage develops, we may differentiate this target by sector and year. Together with the Dept. of Public Works, the Clean Energy Task Force will monitor town energy usage using existing online monitoring tools and update this analysis annually.

Exhibit A

Energy Efficiency in Buildings

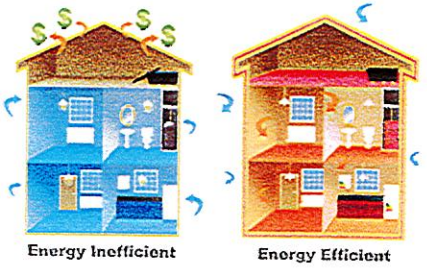
Energy efficiency is sometimes referred to as the "first fuel" because it offers the possibility of reducing energy consumption before turning to expensive and complex energy generation. Efficiency also offers some of the highest investment returns in reduced energy costs over many years. A range of programs and incentives exist for both residential and commercial buildings to make measures such as weatherization, insulation and building controls more achievable and profitable. Savings estimates vary widely, but it is realistic to expect reductions in energy usage of 25-50%. Before looking to increased generation of electricity and expansion of natural gas lines, the town should look for ways to educate and incentivize residents, businesses and the municipality to first reduce energy needs through common sense efficiency measures.

Progress to date:

- Purchased streetlights and converted to LED
- Insulation of several town-owned properties occupied by low- and moderate-income residents
- Small Business Energy Advantage (SBEA) energy upgrades in town buildings
- Energy upgrade to Water Pollution Control Authority (WPCA)
- 24% of households and 21% of businesses participated in Energize CT Efficiency programs

Benefits:

- Savings for residents and businesses
- Reduced need for energy production
- More comfortable and healthy living and work environments
- Greater resiliency during extreme weather
- Lower CO2 and greenhouse gas emissions
- Creates local jobs



Efficient buildings save money and are healthier and more comfortable to live and work in.

Actions:

- Monitor and benchmark energy usage in buildings over multiple years, separately for town, schools, residents and businesses.
- Conduct inventory of efficiency upgrade status of public buildings.
- Create schedule of efficiency upgrades in town properties.
- Offer information session on energy services available to low- and moderate-income residents
- Evaluate feasibility of municipal efficiency upgrade performance contract or bond.
- Conduct residential HES audit campaign.
- Restart Small Business Energy Advantage (SBEA)
- Promote C-PACE financing of commercial projects
- Explore town efficiency incentives through building and/or tax codes
- Analyze interval energy usage on town buildings and develop plan to reduce peak demand

2024 Goals:

- 50% of residential homes conduct HES audit; 25% carry out energy retrofits
- 25% of town businesses conduct energy audits; 20% implement efficiency measures
- New building/tax codes for new construction

2039 Goals:

- 80% of residences and businesses conduct energy audits and implement efficiency measures

Exhibit A

Heating and Cooling

Heating and cooling account for almost half of the energy use in a typical U.S. home. In YOURTOWN, the vast majority of homes heat with oil (~70%) or natural gas (~23%). Air-source heat pumps offer an opportunity for homeowners to lower their energy costs, and at the same time reduce greenhouse gas (GHG) emissions. Long used for cooling in warm climates, heat pumps are now able to provide efficient heating in cold climates even at outdoor temperatures as low as -15 °F.

Air-source heat pumps are capable of not only heating in the winter (by extracting heat from outside air) but also cooling in the summer (by extracting cold from outside air.) Heat pumps use the same technology as a refrigerator or air conditioner.

Heat pumps can be used alongside existing heating systems to address specific needs and lower costs.

Benefits:

- Lower heating and cooling costs
- Comfort – With advances in controls, heat pumps can maintain very constant temperatures.
- Safety – Because heat pumps are electrically powered, there is no risk of combustion gas leaks.
- Improved air quality – Heat pumps filter indoor air all year and dehumidify it in the summer,
- Room-by-room control
- Reduced greenhouse gas emissions

Actions:

- Create schedule of upcoming HVAC upgrades on town buildings, including schools.
- Ensure heat pumps are considered in town building upgrades.
- Carry out town-wide campaign to educate about and promote heat pumps
- Work with town staff and zoning and planning commissions to promote heat pumps in new construction.
- Publicize examples of heat pump installations, both new and retrofits, for town buildings, households and businesses.

Progress to date:

- Multiple municipal installations
- Prominent commercial application of large-scale heat pumps



An illustration of a ductless mini-split system.

2024 Goals:

- 10% of homes (800) using heat pumps

2039 Goals:

- 90% of homes using heat pumps

Exhibit A

Renewable Energy

YOURTOWN currently derives approximately 1.4% of its electricity from roughly 175 solar arrays in town, including both households, businesses and public buildings. As prices for solar panels continue to decline, ever more households and businesses will seek to lower their energy costs by going solar.

The Clean Energy Task Force has helped to promote solar by conducting a "Solarize" educational campaign and working with town officials to put solar arrays on several town buildings. In fact, almost half of the town's arrays were installed during the 2014 Solarize campaign. There is more we can do, including educational campaigns, solar arrays on public buildings, schools and over parking lots, promoting Community Shared Solar, and more.

We also need to have a public discussion about how to promote solar responsibly and sustainably. For example, which lands and buildings should we preserve due to their aesthetic, historic or agricultural value?

Progress to date:

- Total 175 arrays with total capacity of 2.0 MW
- 2014 Solarize campaign: 80 homes, 643kW
- High School Solar Array: 15kW
- Arrays on two town buildings: Public Works and YOURTOWN skating rink: X kW
- YOURTOWN ranked #4 in state for impact on solar development

Benefits:

- Reduces and stabilizes electric bills
- Improved public health from decrease in pollution from fossil fuel plants.
- Creates jobs and economic growth
- Presents an educational opportunity, especially with school arrays
- Reduces climate change
- Lowers energy imports
- Helps the state meets its renewable energy and greenhouse gas emission goals



The 2014 Solarize YOURTOWN campaign led to 80 households installing rooftop solar arrays.

Actions:

- Explore additional solar arrays on town and school buildings and parking lots
- Pursue Community Shared Solar project
- Engage the community in a discussion of responsible and sustainable solar development
- Conduct educational campaign(s) (e.g., Solarize)
- Review local regulations, permitting process and incentives for renewables
- Adopt a solar policy for new construction
- Advocate for solar access rights in CT
- Adopt Community Choice Aggregation (when enabling state legislation is passed)

2024 Goals:

- Double current solar capacity to 4 MW
- At least 500 kW installed capacity on town and school buildings and parking lots
- Two additional town-wide solar campaigns
- Two community shared solar projects
- Solar-friendly policy for new construction

2039 Goals:

- Total capacity of 50 MW
- Community Choice Aggregation adopted

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Exhibit A

Transportation

Transportation is a large source of greenhouse gases in the United States. According to the EPA the increase in emissions coming from transportation increased move over the last 2 decades than any other greenhouse gas source and now accounts for 27% of total emissions.
Decreasing transportation-generated emissions in a community can have an immediate effect on local air quality in a way that other sustainability activities may not. Encouraging people-powered transportation (bikes, walkways), increasing public transportation access, and supporting non-fossil fuel transportation options (electric cars) are all ways to move toward this goal

Benefits:

- Improve local air quality and noise levels
- According to the National Association of Realtors (NAR), walkable/bikeable communities are prefered by homeowners (2017)
- Communities with available and easy to use public transportation access show resilience in property values even in times of volatility (NAR, 2013)

Actions:

- Expand local bike trail
- Electrify town vehicle fleet
- Develop plan for expanding charging infrastructure in town
- Add additional charging stations on municipal properties
- Tax incentives for electric vehicles
- Improve YOURTOWN's Plug-In Electric Vehicle Readiness Scorecard (US DOE)
- Increase YOURTOWN residents' awareness and use of local public transportation options
- Conduct no idling campaign



Progress to date:

- Silver Bicycle Friendly Community
- Electric Car Charging Stations: two at Town Hall and several at local businesses

2024 Goals:

- Completed assessment and plans for EV charging infrastructure
- Five EVs in town fleet
- One electric school bus

2039 Goals:

- Charging stations at key locations across town
- Fully electric town fleet
- Electric school bus fleet

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Exhibit A

Microgrids

All of us in YOURTOWN rely on the electric grid to provide electricity to our homes, businesses and town facilities. Our current grid performs exceptionally well, but was built and designed before the advent of solar panels, allowing individual houses and businesses to generate their own electricity, and batteries, allowing them to store it. Moreover, it is vulnerable to blackouts during major storms and attacks.

If we want to continue to encourage more renewable energy and greater resilience, we need to re-think the grid. A key building block of the future grid will be microgrids, consisting of smaller subsets of power sources, users, wires and controls. Microgrids are capable of operating while connected to the wider grid, or they can "island" or operate separately in the event of a grid outage.

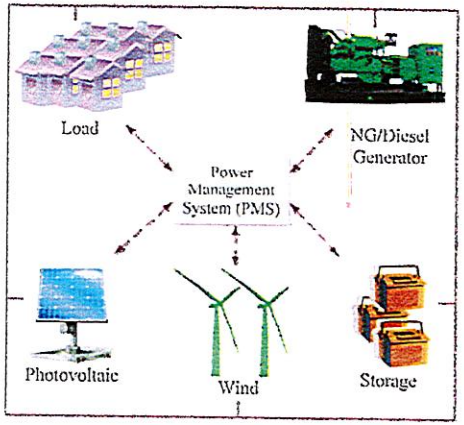
An example of a microgrid could be a collection of key town facilities, a solar array, battery storage and a backup generator. In the future, the grid might consist of a series of interconnected microgrids.

Progress to date:

- On two occasions, YOURTOWN explored the feasibility of creating microgrids in town:
  - One in the center of YOURTOWN
  - One built around the High School
- On both occasions, for different reasons, the projects did not proceed.
- In the process, though, we gained a great deal of knowledge on microgrids and have potential future projects in store.

Benefits:

- Enables more renewable energy through integration of storage and smart controls. Electricity can flow in multiple directions.
- Greater resiliency, allowing the microgrid or key facilities (e.g., emergency shelter) to operate even when the broader grid is down.
- As prices of solar and batteries decline, microgrids offer cost savings.
- Gives local residents greater flexibility and control of their energy usage and generation.



Actions:

- Educate residents and businesses about microgrids.
- Build a pilot microgrid around key municipal facilities.
- Develop a master plan for multiple microgrids in town.

2024 Goals:

- Two microgrids operational in town.

2039 Goals:

- 50% of town electricity usage provided through microcrids.

Exhibit A

YOURTOWN's Energy Action Plan

Municipal

2020

1. Complete schedule of upcoming municipal building HVAC and roof upgrades
2. Issue RfP for solar arrays on school buildings and parking lots
3. Analyze interval energy usage on town buildings and develop plan to reduce peak demand
4. Complete assessment and plans for EV charging infrastructure.
5. Review feasibility of shared solar facility on town land (e.g., landfill)
6. Study the feasibility of hiring an energy manager for town.
7. Conduct annual update on municipal energy usage using the town's energy monitoring toolkit.
8. Explore town efficiency incentives through building and/or tax codes

2025

1. Submit five proposals for shared solar facilities on town lands.
2. Purchase five electric vehicles on town fleet.
3. Issue energy efficiency upgrade performance bond.
4. Purchase two town electric school buses.
5. Develop pilot renewable energy microgrid around critical town properties.
6. Consider implementing Community Choice Aggregation
7. Retrofit a town building with a heat pump and monitor results for future installations.

Residential & Business

2020

1. Conduct residential heat pump campaign
2. Consider conducting energy survey of town residents
3. Propose renewable energy/energy efficiency policy for new construction in town
4. Conduct annual update on residential and business energy usage using Clean Energy Task Force benchmarking toolkit
5. Consider a moratorium on new natural gas service in town.

2025

1. Conduct residential Home Energy Audit (HES) audit campaign.
2. Restart Small Business Energy Advantage (SBEA)
3. Promote C-PACE financing of commercial projects
4. Engage the community in a discussion of responsible and sustainable solar development
5. Run another Solarize campaign
6. Expand local bike trail
7. Work with town staff and zoning and planning commissions to promote solar, heat pumps and EV-readiness in new construction.

Exhibit A

Additional Resources

Energy Efficiency in Buildings
"A Citizen's Guide to Reducing Energy Waste", Environment America
https://environmentamerica.org/sites/environment/files/resources/AME_Fact-Sheet_EE_Sept2018_PRINTv1a.pdf

Heating and Cooling
"Exploring Climate Solutions: Renewable Thermal Technologies: Heat Pumps"
https://www.ct.gov/deep/lib/deep/climatechange/gc3_webinar_series/heat_pumps_4_8_16.pdf

Solar Energy
"Ten Ways Your Community Can Go Solar", Environment America
https://environmentamerica.org/sites/environment/files/resources/AME_Solar-booklet_Mar2019_Overview_PRINTv1a_0.pdf

Transportation
https://www.plugshare.com/location/89998
https://www.YOURTOWN-ct.gov/culture-parks-recreation/pages/YOURTOWN-silver-bicycle-friendly-community
https://www.afdc.energy.gov/uploads/publication/guide_ev_projects.pdf
http://waytogoct.org/YOURTOWN/

Microgrids
Meet the microgrid, the technology poised to transform electricity
www.microgridknowledge.com
http://www.clean-coalition.org/our-work/community-microgrids/





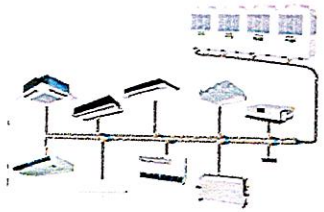




Exhibit A

Appendix: YOURTOWN's 2018 Energy Consumption

		Unit	Municipal	Residential	Business	Total	Per Capita
Current Energy Used	Natural Gas	CCF	78,489	2,322,416	2,909,256	5,310,161	
	Oil	Gallons	7,155	3,869,658	600,774	4,477,587	
	Propane	Gallons	28,595	663,854	0	692,449	
	Transport	Gallons	61,186	8,352,441	1,145,539	9,559,166	
	Electricity	MWH	4,240	94,059	71,053	169,353	
Current Energy in Gigawatt-Hours	Natural Gas	MWH	2,300	68,047	85,241	155,588	6
	Oil	MWH	290	157,071	24,386	181,747	7
	Propane	MWH	765	17,769	0	18,535	1
	Transport	MWH	2,044	279,055	38,272	319,372	13
	Electricity	MWH	4,240	94,059	71,053	169,353	7
	Total	MWH	9,640	616,002	218,952	844,594	35
Current Greenhouse Gas Emissions	Natural Gas	GHG - tons	460	13,598	17,034	31,091	1.3
	Oil	GHG - tons	80	43,340	6,729	50,149	2.1
	Propane	GHG - tons	182	4,214	-	4,395	0.2
	Transport	GHG - tons	600	81,854	11,226	93,680	3.9
	Electricity	GHG - tons	1,239	27,475	20,755	49,468	2.0
	Total	GHG - tons	2,559	170,481	55,743	228,783	9.4
Current Energy Expenditure	Natural Gas	$	98,112	2,903,020	3,636,570	6,637,701	273
	Oil	$	20,034	10,835,042	1,682,168	12,537,244	516
	Propane	$	85,785	1,991,561	-	2,077,346	85
	Transport	$	171,321	23,386,836	3,207,508	26,765,665	1,101
	Electricity	$	763,280	16,930,707	12,789,512	30,483,500	1,254
	Total	$	1,138,532	56,047,166	21,315,757	78,501,455	3,230

Notes:

Natural gas and electricity figures provided by Energize CT. Municipal data is provided by the Dept. of Public Works. Oil and propane figures are estimated using data from the YOURTOWN Grand List and U.S. Census Bureau American Community Survey.

Conversion factors for each fuel type to MWH are:

- 1 CCF Natural Gas = 0.0293 MWH
- 1 Gallon Heating Oil = 0.04059 MWH
- 1 Gallon Propane = 0.02677 MWH
- 1 Gallon Gasoline = 0.03341 MWH

Greenhouse gas emission rates are:

- 1 CCF Natural Gas = 0.005855 tons GHG
- 1 Gallon Heating Oil = 0.01120 tons GHG
- 1 Gallon Propane = 0.006348 tons GHG
- 1 Gallon Gasoline = 0.00980 tons GHG
- 1 MWH Electricity = 0.0000292 tons GHG

Costs per unit of fuel are:

- $1.25 per CCF natural gas
- $2.80 per gallon heating fuel
- $3.00 per gallon propane
- $2.80 per gallon gasoline
- $0.18 per KWH el;ectricity