ITEM NO:  5  (Postponed from December 2019 meeting)
DEPARTMENT:  Appointments Committee  Date November 14, 2019
CONTACT:  John Eddy  203-550-7122  john.eddy@greenwich.ct.org
REFERRED TO:  Appointments, Land Use and Public Works Committees
VOTES:  7/10 nominating votes

RESOLVED, that the following named person, nominated by the Appointments Committee, be appointed an Alternate Member (A1) of the Flood and Erosion Control Board for a term beginning upon appointment and expiring October 31, 2023.

DONNA LAVIOLETTE

EXPLANATORY COMMENTS
Donna Laviolette, of 5 Morgan Avenue Ave, Greenwich, has been a resident of Greenwich since 2018.

Ms. Laviolette has a Juris Doctorate from, The Massachusetts School of Law, an MBA from Providence College, and a Bachelor of Science degree in Biology from Framingham State College in Massachusetts

Ms. Laviolette is employed as Manager of Global Sustainability by Xylem. Inc of Rye Brook, New York, and has over a decade experience in corporate sustainability including beta testing a course for the technical basis for seal level rise planning for land-use planners and public officials. She has experience in working with various stakeholders (property owners, lenders, public officials) with financial interests and assets in coastal zones.

ITEM NO:  6
DEPARTMENT:  Technology Advisory Group
CONTACT:  Elizabeth Perry  (347) 831-4075  perryrtmD7@gmail.com
REFERRED TO:  All Committees
VOTES:  Board or commission name  vote (y/n/a)
RESOLVED, that the Rules of the Representative Town Meeting be amended to include a new committee, as follows: VI. Special Committees, C. Technology Committee

1. Function. The Technology Committee shall:
   a. Serve as a liaison between the RTM and the Town IT Department.
   b. Evaluate and recommend new technologies, processes, and practices that improve efficiency of the RTM.
   c. To support RTM members in adopting and using recommended technology.
   d. Consider Call items that require technological knowledge and expertise.

2. Composition. The Technology Committee shall consist of nine delegates and four alternates, all of whom shall be members of the RTM and who shall be appointed by the RTM on nomination of the Appointments Committee for terms expiring at the end of the term of the RTM during which they are appointed, provided that the term of each delegate and alternate shall continue thereafter until a successor shall have been appointed, and further provided that said delegate or alternate continues to be a member.

3. Election of Officers. A chair, vice chair, and secretary shall be elected by the delegates of the Technology Committee from among their number as soon as convenient following their appointment. Alternates shall not be eligible to serve as Chair or Vice Chair. After appointment of the Technology Committee by the RTM, the Town Clerk shall notify the delegates and alternates of the organization meeting. At the first meeting of the committee after its inception, the delegate having the longest continuous tenure on the RTM shall act as temporary chair until a chair is elected. After the next and all subsequent municipal elections, the preceding chair, vice chair or the senior delegate on the committee in that order, shall act as temporary chair of such meeting until a chair is elected. All voting for such offices shall by written ballot, and a majority of the committee delegates shall constitute a quorum. The newly elected chair shall promptly notify the Town Clerk of such elections, and the Moderator shall announce the election of the committee chair at the next meeting.

4. Meetings. The chair shall convene meetings of the committee as is necessary in order to fulfill the committee’s function. The chair shall notify the Town Clerk of this meeting in order that it may be properly posted on the Town Hall bulletin board and website as a public meeting. Only delegates may vote, except that alternates may vote in the absence of committee delegates. Alternates will be chosen on a rotational basis so that each alternate has an equal opportunity to vote.

5. Minutes. The minutes of each public meeting of the committee, in the form of the recorded votes of the delegates, shall be kept by the chair and shall be filed with the Town Clerk.

6. Attendance. A record of attendance of the individual delegates and alternates at each committee meeting shall be kept by the secretary and filed with the Town Clerk no later than the
EXPLANATORY COMMENTS

In March of 2018, the RTM Moderator convened a special advisory group on Technology (TAG). That group has met at least monthly with a mission of proposing ways to use technology to:

- Improve internal digital communications of the RTM
- Improve external digital communications between the RTM and the Community
- Increase RTM efficiency through technology innovation
- Develop technology training (with a goal to drive adoption of electronic documents)
- Archive RTM materials - Video, Documents, etc.

To date, TAG has:

- Helped update the RTM Website and provided training for District and Committee website content stewards
- Developed a system for projecting Call Items and Votes at the RTM
- Proposed new templates for an Electronic Call and Explanos
- Researched options for Town Emails and proposed a revised resolution
- Explored Meeting Efficiency & Automated Voting
- Discussed Technology Training challenges and piloted some training

Current TAG members are self-selected volunteers representing 7 different districts and a range of technology expertise - from database management and security to digital communications and training.

This month, TAG brings before the RTM a resolution that would establish Technology as a permanent special committee of the RTM.

The rationale for establishing Technology as a permanent special committee of the RTM is as follows:

1. Recognize the importance of technology to the future health and sustainability of the RTM
2. Adequately resource a Technology Committee with enough participation to support the goals of modernizing digital communications and record-keeping:
   a. Serve as Content Stewards for RTM website where Content Stewards have not emerged; and/or support District or Committee Content Stewards.
   b. Provide email support as needed for Districts and Committees
   c. Prepare and present Call materials at Meetings
   d. Tally and project votes at Meetings
   e. Provide training and support for RTM members adopting new technologies - from email to the electronic Call.
3. Evaluate needs of RTM as a body and propose solutions to improve efficiency as technology continues to evolve
4. Work on long-term projects, including video and video archiving
5. Improve and update the RTM Website in conjunction with the Town IT Department
6. Recommend ways the RTM can leverage technology to communicate with constituents
7. Consider and vote upon any potential resolution or Call item that might have a technological angle and be referred to the Committee.

The current TAG group considered a range of options in arriving at this proposal. A permanent special committee structure is the best option because RTM members in smaller districts will not be unduly burdened by this change, and Technology committee members need specific skills. Ideal delegates and alternates to a Technology Committee will have relevant experience in information technology, database management, website design, communications technology, technology education, or similar fields. Other RTM members will be encouraged to participate and assist the committee in performing its function

ITEM NO:  7
DEPARTMENT: Department of Public Works
Law Department
CONTACT: James Michel, Deputy Commissioner, 203-622-7767
Eugene McLaughlin, Esq., Assistant Town Attorney, 203-622-7876
REFERRED TO: Legislative & Rules, Public Works and Transportation Committees
VOTES: Board of Selectman 3-0-0

RESOLVED, the First Selectman is authorized to sign all Grant Agreements related to the Connecticut Department of Transportation (CTDOT) Local Bridge Program substantially in the form attached in the explanatory comments to this call.

EXPLANATORY COMMENTS
The CTDOT Local Bridge Program was created to provide state funding for bridges less than 20 feet in span located on Town owned roadways. The Town currently has 63 such bridges. Connecticut General Statute Section 13a-175p-u requires a Grant Agreement be signed for each bridge project. These agreements are required to be signed and on file with CTDOT for Town Local Bridge Projects to obtain grant funding. In 2017 CTDOT informed Town staff they were required to sign the Municipal Master Agreement for all grant funded projects. However, in 2019, CTDOT legal staff informed the Town that due to legislation specific to this program, individual agreements are needed for the local bridge projects. The agreements contain language related to indemnification and insurance that will require the Town to obtain additional coverage within its self-insured retention. The intent of this resolution with the RTM is to address all current and future Local Bridge Program projects.
In July of 2016, Public Act No. 16-151 defined the grant reimbursement for each eligible bridge project to be 50%. There is approximately $550,000 in grant funds due to the Town for recently completed bridge projects. It is anticipated that the Town will receive additional reimbursements of approximately $1.25M for design, construction and inspection for bridge projects projected to be completed within the next few years.

In September of 2018, the RTM approved a similar CTDOT Municipal Master Agreement. Additional insurance was obtained that covers the self-insured retention amount on Town policies and names the State of Connecticut as additional insured. The liability policy also has contractual liability coverage to cover the indemnification of the State by the Town. The cost for this insurance is approximately $30,000 annually and is currently in place through Risk Management. Future year expenses will be covered out of the Town’s operating budget. Attached to this memo is the template of the Grant Agreement for the Local Bridge Program.

On December 12, 2019 the Board of Selectmen voted unanimously to recommend to the RTM to approve this agreement as submitted.

ATTACHMENTS
Grant Agreement – online at www.greenwichct.gov

ITEM NO: 8
DEPARTMENT: Health 0105HD / Shellfish Commission
CONTACT: Roger Bowgen Caroline C. Baisley 203-622-7836 roger@c2trans.com cbaisley@greenwichct.org
REFERRED TO: Finance and Town Services Committees
VOTES: Board of Estimate & Taxation (12-0-0)

RESOLVED, that the sum of $25,000 be and the same is hereby appropriated from “Shellfish Commission’s Reserve Restricted Account D187-35024 to account Operating Expenses D187-59260, for purchasing a new 2019 Yamaha 25” mechanical engine for the Commission’s 2008 boat.

EXPLANATORY COMMENTS
In 1991, the State of Connecticut Department of Agriculture, Division of Aquaculture opened the Town of Greenwich’s recreational shellfish beds. The Shellfish Commission has been managing the Town’s shellfishing beds since.

The Shellfish Commission’s boat, which operates 12 months out of the year collecting required water samples within the shellfishing grounds, has become inoperable due to an engine failure. The boat was built in 2008 and purchasing a refurbished engine is not practical. Therefore, the Shellfish Commission is seeking approval to obtain $25,000.00 from their Reserve Restricted
Account (D187-35024) in to the operating expenses account (D187-59260) to cover the purchase of a new boat engine.

ITEM NO.: 9
DEPARTMENT: Environmental Affairs 2001denn
CONTACT: Patricia Sesto  203-622-6467  psesto@greenwichct.org
REFERRED TO: Finance, Legislative & Rules and Public Works Committees
VOTES: N/A

RESOLVED, the proposed ordinance to create an Energy Commission, dated December 1, 2019, be adopted

Proposed Ordinance Text
Town of Greenwich Energy Management Commission

Established; composition.

(a) There shall be an Energy Management Commission composed of seven (7) electors of the town to serve as an executive commission to the Board of Selectmen on matters relating to energy. Said seven (7) members shall be persons who have expressed a concern and interest for and/or demonstrated expertise in energy and energy conservation. The Board of Selectmen shall make recommendations to the Representative Town Meeting for their appointment.

(b) In addition to the seven (7) regular members of the commission, the first selectman, or designated representative, a Representative Town Meeting member, the Board of Education chair, or designated board member, the Board of Estimate and Taxation chair, or designated board member, the town administrator, or a designated representative, and a representative of Nathaniel Witherell, shall be ex officio members of the commission. Ex officio members shall have voting privileges.

Terms of members; filling of vacancies; removal.

(a) Electoral members shall serve terms of three (3) years each, commencing on April 1, provided, however, the initial term of each member shall be as follows: three (3) members for four (4) years; two (2) members for three (3) years, and two (2) members for two (2) years.

(b) In the event of any vacancy, the Board of Selectmen shall appoint, by majority vote, a successor to fill the unexpired portion of the vacant term.
Officers.

A chairman, vice chairman, and secretary shall be elected annually by the members of the commission.

Duties.

(a) The commission shall hold regular meetings. A schedule shall be filed annually with the town clerk no later than December 31.

(b) The commission shall interact as necessary with other town departments, boards, and commissions having an impact on energy-related issues and shall seek to coordinate the activities of and cooperate with responsible organizations concerned with promoting energy conservation.

(c) The commission shall be responsible to the Board of Selectmen on matters relating to energy consumption and conservation and as such shall:
   (1) Set an energy reduction goal for municipal buildings and the community of 20% for the near term and 40% for the longer term. And determine dates for milestones and devise a strategy to reach measurable outcomes.
   (2) Research and evaluate current energy requirements, costs and consumption of municipal buildings and services via energy audits for town buildings and other means as determined to be appropriate.
   (3) Research and evaluate appropriate energy conservation technology, renewable energy options, and their adaptability to municipal use.
   (4) Facilitate an evaluation and propose changes of existing procurement processes and budgeting criteria to accommodate systems and maintenance uniformity, performance basis, and maximize energy conservation, and submit report to the Board of Selectmen and Board of Estimate and Taxation.
   (5) Develop target standards of energy efficiency against which existing buildings will be measured and establish target standards for new or rehabilitated buildings. Recognizing these standards cannot be reasonably applied uniformly across all buildings and projects, the commission shall evaluate each project against these target standards and:
      i. Make recommendations regarding suitability of target standards of energy efficiency for major facility renovation and new construction. Among other uses, these standards shall be used in association with requests for qualification, proposals, and bids, as relevant;
      ii. Review, evaluate, and comment on facilities capital improvement projects proposed and submit recommendations to the First Selectman;
   (6) Review, evaluate, and comment on energy-related capital items in the capital budget upon submission of the budget to the Board of Selectmen but prior to action by the board to adopt.
   (7) Research and evaluate regional, state and federal resources, incentives, and grants which relate to energy and energy conservation which may be available to both municipal government and the townspeople.
(d) The commission shall be authorized to enter into contracts, employ consultants and other assistants, and to receive and expend funds for equipment, supplies, and staff to carry out their duties. Any contracts to be entered into by the Energy Management Commission shall be first approved by the Board of Selectmen and shall be subject to the town’s purchasing policies and procedures.

(e) The Town of Greenwich may appropriate funds to the commission, as provided by and subject to Charter Article 2, section 21, budgetary process of the town.

(f) The commission shall provide the Board of Selectmen with an annual written report on or before September 1 of each fiscal year concerning commission activities and shall present short- and long-range recommendations for action to the Board of Selectmen, Board of Education, and other appropriate officials of the town.

(g) Establish and implement methods to generate community support for an effective town-wide reduction in energy consumption.

The commission shall assume any other energy-related matters as may be assigned to it by the Board of Selectmen

**EXPLANATORY COMMENTS**

The Town of Greenwich spends $6,000,000 annually on energy for its buildings, or nearly 1.5% of its operating budget. The potential for real savings and reduced emissions through reduced energy consumption exists, with a noteworthy portion of this being achievable without major systems upheaval. However, maximized savings are unlikely unless the Town adopts energy savings goals, the plan to achieve them, and creates an entity to implement the plan. To date, Greenwich has not approached the effort to reduce energy consumption in a coordinated manner.

In 2017, an ad hoc Energy Committee was formed to provide direct focus on the management of demand generated by municipal buildings. Thoughtful and consistent monitoring of energy usage will help the Town in maintaining the community’s infrastructure needs and energy resiliency. While the Town has a well-established history of energy initiatives dating back to 2008, including citizen and commercial building owner education programs, energy consumption has not seen appreciable reduction. Persistent and focused work conducted by a codified Energy Commission has a far greater likelihood of affecting measurable demand reduction, offering the Town meaningful savings.

The attached Strategic Energy Management Plan details the objectives for the proposed Energy Commission as well as the resources utilized by the ad hoc Energy Committee to make its recommendations. Included in these resources are a benchmarking report for town hall, Committee interviews with the Superintendents of Town and Board of Education buildings and the Director of Purchasing. These interviews identified procedural obstacles to achieving
energy efficiency within the procurement process stemming from proposal and bidding conditions, as well as the budget review process of the Board of Estimate and Taxation. The Plan was approved by the Board of Selectmen in June 2019.

An Energy Commission would consistently and cohesively pursue energy surveys for all buildings and set measurable outcomes for energy savings upgrades. The Commission would remove impediments to the acquisition of energy-efficient equipment and systems in consultation with the BET to develop criteria for approving energy upgrades and work with the Purchasing Department to optimize the procurement process. The Commission's short-term goal would be a 20% reduction in energy consumption (a saving of $1.2MM) and a 40% long-term goal (nearly $2.5MM).

**Strategic Energy Conservation Plan**

**Town of Greenwich**

**June 4, 2019**

Prepared by Energy Committee of the Conservation Commission

Members: Robert Brady, Patricia Sesto, director
Steve Hall, Sarah Coccaro, conservation resource manager
Frank “Rusty” Parker, Denise Savageau, ret.
Skip Parker
Urling Searle

With participation from:
Sandy Litvak, selectman
Jill Oberlander, chair, Board of Estimate and Taxation
Executive Summary

The Town of Greenwich spends $6,000,000 annually on energy for its buildings, or nearly 1.5% of its operating budget. The potential for real savings and reduced emissions through reduced energy consumption exists, with a noteworthy portion of this being achievable without major systems upheaval. However, maximized savings are unlikely unless the Town adopts energy savings goals, the plan to achieve them, and creates an entity to implement the plan. To date, Greenwich has not approached the effort to reduce energy consumption in a coordinated manner.

In 2017, an Energy Committee was formed by the Town's Conservation Commission to provide direct focus on the management of demand generated by municipal buildings and to encourage the community to reduce consumption. The decision to form the CC Energy Committee came about as a result of the Town's inability to defeat Eversource's application to extend the Cos Cob substation into Greenwich based on non-credible projections of demand growth. Thoughtful and consistent monitoring of energy usage will help the Town in maintaining the community’s infrastructure needs and energy resiliency. While the Town has a well-established history of energy initiatives dating back to 2008, including citizen and commercial building owner education programs, energy consumption has not seen appreciable reduction. Persistent and focused work conducted by a codified Energy Commission has a far greater likelihood of affecting measurable demand reduction, offering the Town meaningful savings.

This report details the objectives for the proposed Energy Commission as well as the resources utilized by the current CC Energy Committee to make its recommendations. One of the first objectives was to review a 2011 energy benchmarking study of the Town Hall building. With the support of Eversource, a more comprehensive energy survey was commissioned in 2018. Unfortunately, the output was suboptimal as it inadequately assessed the potential of behavioral changes, systems management opportunities, lighting upgrades, and life-cycle costs. To gain more elemental insight, the Committee interviewed Superintendents of Town and Board of Education buildings, which then led to an interview with the Director of Purchasing. These interviews identified procedural obstacles to achieving energy efficiency within the procurement process stemming from proposal and bidding conditions, as well as the budget review process of the Board of Estimate and Taxation.

An Energy Commission would consistently and cohesively pursue energy surveys for all buildings and set measurable outcomes for energy savings upgrades. The Commission would remove impediments to the acquisition of energy-efficient equipment and systems in consultation with the BET to develop criteria for approving energy upgrades and work with the Purchasing Department to optimize the procurement process. The Commission's short-term goal would be a 20% reduction in energy consumption (a saving of $1.2MM) and a 40% long-term goal (nearly $2.5MM).
1.0 Introduction

Responsible energy consumption is the obligation of the municipality of Greenwich, as well as its residents. In acknowledgement of this, a Strategic Energy Committee of the Conservation Commission was assembled to evaluate how municipally-owned buildings measured up in their energy consumption and how the greater community of Greenwich could reduce its consumption.

There are significant financial advantages to the reduction of energy consumption by the municipality and its residents. Likewise, the use of renewable energy sources can bring greater resiliency and security. A reduction in energy consumption can reduce the tax burden, support the protection of natural resources, and increase reliability.

There have been obvious opportunities to reduce energy expenditures without substantial upheaval to existing systems and yet the Town has not chosen to pursue them. Additionally, well known energy savings opportunities for new construction/renovation projects have not been prominent within the building design specifications. The Energy Committee clearly has determined there is a need to bring energy efficiency to the attention of all town officials: Energy efficiency must become an embedded consciousness.

The committee is making five main recommendations.

1. Create a permanent Energy Commission to achieve energy savings. This will be accomplished in part, by satisfying the recommendations below.

2. Conduct energy audits of all of the Town's large buildings to measure existing consumption and costs.

3. Facilitate an evaluation and propose changes to existing procurement processes and budgeting criteria to accommodate systems and maintenance uniformity.

4. Develop standards of energy efficiency against which existing buildings will be measured and establish standards for new or rehabilitated buildings.

5. Establish and implement methods to generate community support for an effective town-wide reduction in energy consumption.

2.0 Recommendations
The future of energy demand in Greenwich will increase as electric vehicles become more prevalent, efficiencies wane in existing equipment and buildings, and the consumptive nature of the population grows. Conversely, energy consumption will fall with new Energy Star appliances, conversion to LED lighting, and increased reliance on renewable energy sources, such as solar. Over the course of the Committee’s work, it is evident that there are additional opportunities within the municipal buildings and within the community to reduce our power demands by at least 20%, without major infrastructure or logistical changes. This reduction can be achieved through behavioral changes, incorporating building management systems, and integrating both low and high tech solutions.

In Town buildings, every effort should be made to reduce the $6M annual energy expense. The goal of a 20% to 40% reduction is achievable for existing buildings, and even to Net Zero Energy is achievable for new or substantially renovated buildings. Resources are available in Connecticut and with our utility provider, Eversource. The Energize CT Electronic Blueprint Program has incentives that will pay for energy modeling with incentives ranging up to $3.00 per square foot for buildings designed for the goal of Net Zero Energy. The Institute for Sustainable Energy, National Renewable Energy Lab, and Seventhwave, a team of nationally recognized experts, will support Connecticut building owners by integrating performance-based procurement into their new construction or major renovation projects. This approach has been proven to help owners achieve high performance buildings or even Net Zero Energy buildings at little or no additional cost.

The Town is no exception and should start purposefully working towards this goal with the Eastern Greenwich Community Center (EGCC), the Dorothy Hamill Ice Rink, and Byram and Sound Beach Fire Stations. The EGCC and the others could be designed and built to zero energy, if the Town had the will to do so.

None of these changes is likely to be implemented to a meaningful extent without a dedicated Energy Commission charged with formulating goals and overseeing the path forward for both municipal buildings and the community.

Recommendations

2.1 The first and most essential recommendation of the committee is to have an Energy Commission created through the Board of Selectman. With an annual energy bill of
$6,000,000 for all building fuel types combined, the Town should feel the obligation to pursue reductions in this expense in a long-term, comprehensive, state of the art approach. The Commission should be comprised of a cross-section of knowledgeable residents, with support from designated Town departments. The Commission, among other tasks, will establish energy saving plan for the Town via interaction with DPW, BOE, BET, and the BOS, at a minimum. The resulting goals and program for achieving those goals will be ones that represent the consensus of the Commission and consulting town entities and will belong to the Town for each entity to support under the stewardship of the Energy Commission. It will be the charge of the Energy Commission to take action and reach the energy saving goals.

The creation of an energy commission is essential to define and implement a long-range vision and plan. Changes in energy consumption do not occur quickly and will not occur without education and consensus building. Disjointed efforts of the past have been ineffective and reinforce the need for a comprehensive approach under a united goal.

The work of the CC Energy Committee has identified several tasks and topics for the permanent Energy Commission to pursue. This list is not intended to be all-inclusive and it is expected the Commission will build on these.

a. Set an energy reduction goal for the municipal buildings and the community and devise a strategy to obtain measurable outcomes. The CC Energy Committee recommends a minimum goal of 20% in the short term and 40% for longer range planning.

b. Establish standards for incorporating substantially enhanced energy efficiencies within Town building renovations and new construction. This expectancy should be explicitly incorporated in requests for qualifications and requests for proposals, and should move beyond energy savings realized just due to new equipment, modern insulation, windows, etc.

The omission of energy as an item in the checklist for the RFQ may well not attract the attention of architects with energy efficiency expertise and likely that will not be addressed in their submissions. It is widely known that, at present, many architects as well as engineers do not have the requisite interest or expertise. This is mainly a result of their clients not being educated and demanding it.

c. Conduct energy audits on all municipal buildings.

Ideally, audits would occur over a discreet period of time to provide the commission the ability to compare the results and prioritize projects. This unified approach could also address issues associated with multiple vendors managing our HVAC/lighting systems. The ability to swiftly complete the audits will be a function of budgeting and manpower. Once the commission is established, the commissioners can investigate the most efficient and acceptable means to accomplish the audits.
d. Prioritize programs to promote behavior changes and implement Building Management Systems.

e. Develop and implement a community energy reduction program

Building on the success of the CC Energy Committee’s Winter 2019 program, continue to help commercial and residential customers understand the options available to reduce their energy consumption and explore renewable energy sources.

f. Work with BET, and the Law and Purchasing Departments to evaluate purchasing/contract protocols for the purpose of finding opportunities to foster greater consistency in equipment purchased and maintenance agreements, without compromising fairness in awarding contracts. As described by Town and BOE facility managers, current protocols appear to lend themselves to HVAC systems consisting of a variety of equipment manufacturers and an equally diverse set of maintenance contracts from a variety of vendors. The purchasing department has a responsibility to the community of vendors and our residents to award contracts fairly and cost effectively. A means to reduce the number of different contractors without comprising the Purchasing Department’s obligations should be explored. Further, proactive initiatives by the Purchasing Department staff to teach entities how to better utilize the processes for requests for qualifications, proposals, and bids would help produce more desirable outcomes of products and services.

g. Pursue performance-based procurement as an option to existing procurement tools for the Town and promote this tool to the community. Performance-based procurement empowers building owners and developers to achieve high energy performance goals by changing the way they procure their buildings. Building owners would prioritize project goals, specify an energy performance requirement, and select the design and contractor teams based on their ability to meet it. Then they measure energy performance to verify that the contract requirement is met.

h. Establish CO₂ reduction as a factor of consideration for proposal selection and bid specifications.

i. Work with Eversource, or if necessary, elected officials to modify the billing account set-up. With an individual account and associated service charge for virtually all Town buildings, the benefits from net metering are diminished as the surcharges extend the return of investment period for smaller buildings. (“Net metering” is a system in which solar panels or other renewable energy generators are connected to a public-utility power grid and surplus power is transferred onto the grid, allowing customers to offset the cost of power drawn from the utility.)

j. Pursue assessments for solar arrays on Town buildings. This work has occurred intermittently and needs a more focused evaluation to deal with legitimate barriers to maximizing this renewable resource. With various funding and contractual arrangement...
available, more needs to be done to bring down our CO₂ emissions and save on energy costs.

3.0 Background

Reducing energy consumption can be as simple as turning off the lights or it can be as complex as retrofitting a building. Understanding the variables that drive the cost of energy and consumption of energy is paramount to making well informed, consequential decisions. The Conservation Commission, recognizing reduction of energy usage has distinct ecological benefits, appointed a committee of individuals representing the commission and citizens at large who are versed in various disciplines within the energy field. Members from pertinent town boards were also invited to participate.

A significant impetus for the creation of the committee, was a proposal to increase demand capacity with an upgrade to the Cos Cob substation and the associated installation of high voltage cables through Bruce Park. This proposal met with substantial opposition by the municipality and its residents. The Siting Council, after denying the first application, challenged Eversource and the Town to collaborate on a second substation application and develop a clean energy strategy, i.e. energy efficiency and alternative energy sources. While the Town tried to work with Eversource on a mutually agreeable plan, ultimately the Siting Council approved Eversource’s second application for a substation. During the Siting Council review, there was some temporary progress made with clean energy strategies.

The conservation arm of Eversource worked with the town in 2016-2017 on a series of programs to engage the community and update the town benchmarking. Programs included a partnered outreach to residents to sign up for the home energy audit program, Home Energy Solutions. The program was publicized through various methods, including at three light bulb-swap events. The work also included the development of a strategic energy management plan and added incentives for the Town and residents.

Notable incentives included a 50/50 matching grant for audits of Town Hall and Greenwich High School. If the town followed the audits’ recommendations, Eversource would cover the entire cost of the audit. An audit of the wastewater treatment plant was also offered, at no cost to the Town. Of these incentives, only the Town Hall audit was completed. Eversource, did however, complete an energy use benchmarking report to set the foundation for future targeting and measuring success.

The level of support and involvement by Eversource was dramatically reduced at the end of 2017, when the Energize CT program funds were diverted to other purposes by the legislature. To make up for the shortfall of financial sources, Eversource directed any available funding to implementation projects and terminated funding outreach efforts, including assisting the Town with its development of a strategic energy management plan.
Being largely on its own by the spring of 2018, the committee endeavored to complete its research and develop an introductory Strategic Energy Management Plan. With the persistent evolution of this field, this plan will certainly be only the first in a series of plans to help the community of Greenwich save money and resources as it responds to changing needs and technologies.

4.0 Purpose

The purpose of the Energy Committee was three-fold. One, to look discreetly at town-owned buildings to understand the constraints and opportunities to make buildings more energy efficient. This information would provide the foundation for building managers and the Board of Estimates and Taxation to make long-term decisions to effect long-term reductions in energy consumption for the benefit of taxpayers and the environment.

Secondarily, the Town has a responsibility to lead by example. Steps taken to increase energy efficiency in our buildings will allow us to use our experience to encourage residential and commercial building owners to be forward thinking and proactively work to reduce their energy consumption.

Lastly, town-wide energy consumption loads have direct implications on the development and infrastructure of Greenwich. We have recently seen the approval of a new substation to fulfill current peak demand, are aware of concerns regarding grid security, and understand the conceivable growth in demand associated with new technologies, including the overnight charging of electric cars. As part of our community planning, these factors must be accounted for.

Electric Consumption in the Town of Greenwich, 2015

Source: Eversource Clean Energy Communities
5.0 Process

The initial goals of the committee were to promote residential and commercial outreach programs, assess town buildings through compilation of benchmark data and audits, and compose a Strategic Energy Management Plan. Recognizing the breadth of the topic, the committee successfully broadened their membership over time to include residents who have expertise in the field, and others to represent the Board of Estimate and Taxation and Board of Selectmen.

Eversource was instrumental in supporting the committee, as well. Eversource brought programs and funding to the table, which the committee in turn utilized to gather information regarding the town facilities and to initiate public outreach programs.

Specifically, in 2017, Eversource and the Town partnered to develop a Strategic Energy Management Plan. Eversource conducted a charrette with various municipal stakeholders. The represented departments included Public Works and their waste water treatment and facilities divisions, Conservation, and the Board of Education. Members of the Energy Committee likewise participated, including a Selectman.

The purpose of the charrette was to identify energy efficiency projects Eversource and their funding partners could help the town initiate. The charrette indicated that the town required assistance to identify prudent energy efficiency projects via audits of town buildings, which were pursued.

Later in 2017, with the loss of funding for Energize CT, the partnered work with Eversource largely stopped. Factoring this change and information already gathered, the energy committee reassessed their desired outcomes for the Strategic Energy Management Plan.

In 2018 and coincident with conducting the Town Hall audit, the committee focused more attention on guest speakers to gain critical understanding of the town hall processes that guide building management and various energy topics. The intent was to prepare members to more fully assess how the recommendations of the town hall audit could be implemented and how to navigate the process of bidding and funding the various projects. The audit was finalized in November 2018 and is discussed in greater detail later in this report.

6.0 Energy Saving Efforts to Date

6.1 Clean Energy Program

In operation since 2000, the Clean Energy Fund has aimed to develop, invest in, and promote clean, sustainable energy sources. A surcharge on Connecticut ratepayers' utility bills provides the funding for the Clean Energy Fund, and the charge currently stands at "not less than" $0.001 per kWh (1 mill per kWh). In 2008, the Town of Greenwich began participating in Connecticut’s Clean Energy Program. Initial work on this program included a town-wide energy fair with other Town departments to establish baseline energy consumption for Town buildings with the goal of reducing energy consumption through efficiencies. An Energy Management Team, led by the Conservation Commission, was created to look at both
Town energy and also community outreach. The Board of Selectmen formally adopted an energy resolution focusing on town facilities. Beginning in 2011, the Town hired interns to benchmark energy usage in all municipal buildings. The Board of Education led the way with comprehensive benchmarking and an energy conservation strategy.

The Town renewed its Clean Energy Community pledge in six years ago to reduce the Town’s energy consumption by 20%. Also at this time, the Town joined C-PACE, Commercial and Industrial Property Assessed Clean Energy.

Of the 162 communities who pledged a 20% reduction through this program, 28 have achieved a 10% or 20% reduction in energy consumption. Among these 28 towns, all but three have an energy commission to facilitate reaching the Town’s goals.

6.2 **C-PACE**

C-PACE is a financing opportunity to assist commercial entities with clean energy programs. Municipal officials administer and promote C-PACE to help businesses in their municipality stay competitive. Elected officials, economic developers and clean energy task forces drive their community’s participation in the program while tax collectors enable C-PACE to be repaid through a benefit assessment.

Municipalities must pass a resolution and “opt in” to C-PACE to join the program and this enables their building owners access green energy financing. Greenwich “opted in” in 2013 and First Selectman Peter Tesei and the Energy Management Team kicked-off this program.
Contractors are now able to develop and finance projects that reduce energy usage, including: lighting, heating and cooling, insulation, motors, pumps, solar panels and other green energy upgrades.

The Connecticut Green Bank manages the financing awards and C-PACE financing is repaid through an assessment that is placed on a building owner’s property by their municipality, similar to a sewer assessment, that can be transferred if there is a change of ownership.

According to Green Bank, as of May 2019, two entities have taken advantage of the program; the Sacred Heart School and the Greenwich YMCA.

6.3 Solarize Greenwich

The Town participates in Solarize Greenwich, a town and state sponsored program designed to dramatically increase residential solar. Solarize leverages community outreach and the power of group purchasing to encourage residential solar installations. The more homeowners who participated in Solarize Greenwich, the lower the price dropped for all Greenwich homeowners. This 20-week program helped 48 residents go solar, generating 280kW of power and more than doubling the number of solar installations in Greenwich.

Intentions to assemble a cadre of “Solar Ambassadors” to promote the program have not come to fruition.

The program remains available and additional information can be found on the Town’s website,
6.4 **Energize CT Program**

In 2016, Greenwich engaged with Eversource and the Energize CT Program to accelerate the clean energy program. Energize Connecticut is an initiative of the Energy Efficiency Fund, the Connecticut Green Bank, the State, and your local gas and electric utility company and is financed by a charge collected with the utility bill.

From 2016 to 2017, the Town, in coordination with Energize CT, launched the Home Energy Solutions (HES) program. As part of the outreach effort, the Town held two light-bulb swaps that also included opportunities for residents to learn more about the HES program. This resulted in over 200 home energy audits and 2,944 LED light bulbs distributed. This program continued through December 2017 and a third light bulb swap was held in October 2017.

Following the Siting Council decision on the Cos Cob substation project and cable through Bruce Park, the Town and Eversource worked together on solutions.

### 7.0 ENERGY AUDITS

In the course of protesting Eversource’s plans for the Cos Cob substation, the Town questioned whether implementing energy conservation measures in the public and private sector would reduce energy use and dissipate the need for another substation. To document energy use and identify areas in need of conservation, the Town, with assistance from Eversource’s Clean Energy Communities team, benchmarked energy usage across all municipal buildings. Overall, when the 2015 Energy Use Index (electric and natural gas) for the Town and BoE buildings were compared to the EPA Portfolio Manager Median Value of high performing schools and office buildings, Greenwich’s buildings underperformed by 35%.

As part of the negotiations between Eversource and the Town, both parties worked together to educate Town staff and to create a Town-wide energy plan to reduce energy use and reduce peak demand. Eversource encouraged Town officials to compose a comprehensive energy plan, which Eversource would then guarantee a low rate for energy conservation costs (for example, Eversource would support XX% of implementing energy conservation measure costs). To obtain these incentives, Eversource required the Town to enter a contract of understanding.

**Electric Consumption in Municipally-owned Buildings, in kWh, 2015**
Once energy-use data on all municipal buildings had been gathered, three municipal buildings were shown to use the most energy: Greenwich High School, Waste Water Treatment Facility, and the Town Hall. The energy committee and Eversource focused energy conservation efforts on the Town Hall building, to lead by example. A Level I walkthrough audit was commissioned by Eversource in February 2017, as part of the Eversource Clean Communities Municipal Technical Assistance Program. The Level I walkthrough audit identified eighteen (18) potential energy conservation measures.

In addition to implementing energy conservation measures, there was significant funding the Town could take advantage of through the Connecticut Energy Efficiency Fund (CEEF). CEEF works to advance the efficient use of energy; reduce air pollution and negative environmental impacts; and promote economic development and energy security. CEEF supports a variety of programs that provide financial incentives to help CT consumers reduce the amount of energy used in their homes and businesses. CEEF is supported by Green Bank, municipalities, and all electric and natural gas utility customers.

As a follow-up to the Level I walkthrough, a Level II energy audit was performed by Steven Winter Associates, Inc. (SWA) in February 2018. The Level II audit performed by SWA also investigated additional measures not included in the Level I walkthrough audit.
Shortly after the Level II energy audit was completed on the Town Hall building, the CT legislature redirected sweeping amounts of CEEF funds, which resulted in the halt of all Clean Energy Community programs (such as light bulb swaps, Home Energy Solutions (HES) and Small Business Energy Advantage (SBEA)) Due to the loss in CEEF, Eversource was unable to fulfill its commitment to assist the Town with energy conservation improvements.

7.1 Steve Winters Audit of Town Hall

The resulting energy audit report by SWA on the Town Hall building identified and recommended five additional energy conservation measures [from the 18 identified in the Level I audit], with three supplementary observations but did not present any quantifiable overall energy saving opportunities but were worth noting for use in strategic planning related to building operations and management. SWA did note the numerous heating and cooling and lighting systems operating and controlled independently in the building.

The initial assessment of the report was that the recommendations “played it safe,” and did not include a deep examination of energy saving options. Instead of presenting a wide variety of options, with return of investment information and/or more aggressive systems replacement possibilities, SWA self-determined levels of tolerance and omitted options pursuant to their self-imposed boundaries.

The SWA report fell short of expectations in one principal respect, it was not a holistic evaluation of the building with all potential measures and results to bring the building to current 21st century standards of energy efficiency and management controls. It did not address demand management, the value of control systems with the use of integrated, effective performance reporting for the management of all systems. Furthermore, SWA stated they do not have the in-house expertise on the costs and feasibility of implementation of more comprehensive and complicated measures than those they did address. Additional qualified expertise will be needed for the town to consider if it wishes to bring the building to current performance standards.

8.0 2019 Winter Program Summary

In an effort to begin the public outreach process, the Committee hosted a program geared towards our largest
commercial consumers of energy and garnered 80 attendees. The program introduced best practices and innovative technology solutions through case studies to help building owners save money, be more competitive, and meet sustainability goals. The program featured a large-scale, inspirational case study as presented by Anthony Malkin, Chairman and Chief Executive Officer of Empire State Realty Trust, Inc. and renowned as a leader in existing building energy efficiency retrofit.

Mr. Malkin described the profitable retrofit of the Empire State Building. He detailed the process of determining which projects to proceed with by examining the value in terms of financial saving, dollar to metric ton of CO₂ reduced, and measurability. He cautioned against relying on LEED standards, as these “green” standards do not necessarily equate to energy savings. Lastly, the building owner’s relationship with tenants and providing incentives for stakeholder participation was critical.

The second case study occurred closer to home, as presented by Bruce Becker, architect, Becker + Becker. He highlighted how energy efficiencies made good sense for his clients and the reasons why energy efficiency is often not included in initial design work. He noted clients tend to incorrectly favor a low construction bid without assessing the longer-term costs of operating the building.

Lastly, the program provided financing information. Anthony Clark of CT Green Bank and Andrew Brydges of Eversource spoke to funding strategies and the tools to help achieve energy efficiency goals.

The event attendance exceeded expectations and the interest in the subject matter reached well beyond Greenwich to towns throughout Fairfield Co. and Westchester Co. CT Energy Network participated in conference preparations. GreenBank, Eversource, Newmark, and Avison Young provided sponsorships.
One tangible and positive outcome from the event was a decision by a large local commercial developer to investigate energy efficiency measures in their portfolio of properties and to initiate action on one new construction project.

9.0 Speaker Summaries

Speaker summaries are provided in relative detail to help those implementing this report’s recommendations an understanding of the origin of those recommendations and hopefully avoid duplicative efforts. Even greater detail can be found in the CC Energy Committee minutes. (https://www.greenwichct.gov/288/Clean-Energy-Community)

9.1 Alan Monelli, Building Superintendent

Mr. Monelli was invited to speak with the committee to allow committee members to understand more fully the energy considerations associated with Town Hall and other town buildings.

Town Hall was converted from the high school in 1980. The building supports 350 employees, with an average of one computer person. The building operates from 8 am and has no set closing due to numerous night meetings. In 1998, renovations were needed to eliminate cubicles for more efficient ventilation and lighting distribution.

Annually, Mr. Monelli budgets $200,000 for capital supplies for renovations, with labor supplied by staff. The Human Resources office was the most recent renovation. The ventilation system remained in place; however, due to the new layout, it is more effective.

The Town Hall ventilation system was considered progressive in 1980, being a water-cooled compressor with glycol that needs to be kept at 85 degrees. A constant temperature for the glycol is maintained by electricity; a big energy draw. The pumps cannot be turned off to save energy as there are severe consequences should there be a failure.
The compressors are supplemented with office units for AC and heat. These automatically shut off three times a day as a means to reduce waste when employees are not in their offices.

Contracts are not awarded with any preferential allowance for energy efficient equipment, or projected life cycle cost. Per purchasing protocol, the winning bid is the low bid, unless there is a qualitative justification otherwise. Life cycle costs and lower energy costs are not factored into the project cost with regards for budget proposals to BET. This aspect is a function of how the BET reviews budgets; looking at changes to a department’s budget year over year without substantive consideration of a return on investment for these projects. When return of investment is considered for other improvements, it is thought the BET’s tolerance is no more than 5-7 years.

Lighting has been upgraded as technology progresses. However, the technology keeps changing. LED have been installed in many parts of Town Hall, with the Assessor’s office being the most recent. While there is no payback on the investment, there are fewer kWh being used. Mr. Monelli believes the building could reduce 20% of its energy use by changing over all the lights to LED. This change over is expected in FY2020.

Light management is otherwise dependent on custodial staff to turn off lights, which Mr. Monelli believes is efficient. Retrofitted motion sensors were described as problematic and are only in place sporadically. All new construction has motion sensors. Night lights are strategically left on for security.

Planned Capital Upgrades:

The FY2020 capital budget passed the project to upgrade Town Hall and its parking facilities with LED lighting.

The expectation is a 66% annual savings in electricity, valued at $17,955. This project has a return of investment of 5 years.

The superintendent has 117 building he oversees, with 14 of those being leased out. The Dorothy Hamill Ice Rink, Byram and Sound Beach Fire Stations, and Eastern Greenwich Civic Center are all in line for renovation/reconstruction. The use of modern building materials and construction will yield energy savings.

9.2 **Daniel Watson, Director of School Facilities**

Mr. Watson indicated there are 15 buildings under the BoE, with seven different building management systems. In most cases the selection of the system was based on the preference of the designing engineer and was also driven by low bid. These processes
have also contributed to having six different major HVAC systems. Currently, there is no real proactive maintenance program to prevent premature failure and replacement of equipment. The constraints associated with the public-bid bidding process and the reluctance to sole source procurement options add to the problem. The process restricts proprietary specifications in RFP’s and energy efficiency is sometimes sacrificed in favor of initial cost savings.

There is no cost preference provided at the time of acquisition in favor of long-term savings. Likewise, the process does not properly account for initial costs vs. lifetime costs of projects. As of spring 2018, there are a number of energy-related projects for BoE buildings to be implemented over the 2018 summer pursuant to the plan prepared by KG+D. It was noted energy efficiency is not a prominent theme in the plan.

There is a 20-year old geo-thermal system at Hamilton Avenue School that no longer serves as the primary system. The system is unreliable, and maintenance has to be performed by an outside vendor, as there is no in-house certified engineer. This system should be returned to operational status.

The solar panels on Glenville School are not operating anywhere near their capacity. This was attributed to not having staff or a vendor under contract to operate and maintain the system. If properly functioning, the system is capable of providing 97.5kW, which is substantial.

With a capacity of 97.5kW and an expectation the Glenville system would operate at about a 10% capacity factor, the system would generate about 85,000 kWh/yr, for savings of about $13,700 per year.

Eversource should have a net-metering setup at Glenville. Ideally, energy outflows would be netted against all Town meters’ energy inflows.

A subsequent pro bono review by engineer Ed Stein at the request of the CC Energy Committee confirmed the panels are not connected properly. The manufacturer of the panels declared bankruptcy, and the equipment is no longer under warranty. Planned renovation of various schools may yield energy efficiency benefits. If so, it will occur as an aside, not due to prioritization.
Mr. Watson supported ASHRAE Level 1 BOE energy audits for buildings he is responsible for.

9.3 **Charles Zsebik, Director of Purchasing, Town of Greenwich**

Mr. Zsebik explained the process of procuring contracts is multifaceted and a clear understanding of the request for qualification (RFQ), request for proposal (RFP), request for bids (RFB), and how they differ is essential to obtaining the desired end product. Above all, the process for procurement must be transparent.

The leading cause of the problems cited by those who are dissatisfied with the system is poorly scoped RFPs. Evaluation committees have a good deal of latitude in evaluating submitted proposals and the specificity of the RFP will significantly increase the opportunity to attract quality consultants/vendors. There is no requirement to go with the low bidder in response to an RFP. The individuals evaluating the proposals determine which proposal best meets the needs of the project. Energy efficiency and Life Cycle Cost Analysis (LCCA) can be listed and used as an important decision-making item in the criteria.

Conversely, the Town is obligated to select the lowest bidder responding to an RFB. This makes it especially important to be as precise with the specifications as possible.

9.4 **Robert Chew, ZEV Energy Centers for fast charging of electric vehicles (EVs)**

There are 600+ EVs registered in Greenwich, or about 1%. Total EVs in Fairfield County is approximately 6,000. Mr. Chew projects EV sales to grow 40% a year.

With many notable car companies increasing the number of electric car models available, if not switching over completely, the number of charging stations in Greenwich are far too few and the number must increase. Presently, there are four Tesla charging stations, two of which are in the Merritt Parkway rest area, and two charging stations on West Putnam Avenue.

In order to understand the logistical needs of this growing demand, Mr. Robert Chew was invited to provide an overview of his electric vehicle (EV) charging station business, ZEV Energy in association with Associated Energy Developers (AED). His company began in March 2018 and targets installing Level 3 charging stations. He looks for places with excess parking, as purchasing or leasing land is too expensive.

Level 1, 2, and 3 changing stations charge cars at different rates. Typically, people with EVs use a Level 1 “trickle charge” at home in their garage overnight. Level 2 “quick chargers” are most commonly found in parking garages and strip malls. Level 3 are the fastest; charging a car in 20-30 minutes. This would more readily address “range anxiety” for people who are concerned about
how fast they can charge their vehicle and how many more miles there are left in their trip. Mr. Chew believes his company found a niche in providing Level 3 “fast charging” stations.

The intent of Mr. Chew’s company is to build a network of ZEV charging centers across the state. There are plans for charging stations in Bridgeport, New London, Wilton, and Enfield, CT. Due to the cost of land, Greenwich is not currently under consideration.

A rendering of the ZEV Center showed an example of a 160 kwh charger and a 50 kwh charger. Each charger costs $100,000+. As the center is selling electricity in the least amount of time, the cost would be a flat rate of $7 to plug in and $0.47 per kwh to charge. Mr. Chew projects the future service level being 350kwh charging stations to charge an EV 80% in under 10 minutes.

Relative to the concerns surrounding demand, Mr. Chew noted he didn’t think electric companies were giving this aspect of a growing EV market enough attention. In Greenwich, he expected the new substation will meet the new demand.

9.5 **Mitch Mailman, General Manager, Electric Lines Division, Welsbach Electric Corp.**

Mr. Mailman met with the committee as an interested citizen, having previously worked with the Town regarding the Cos Cob Substation project and its impact. He offered his thoughts on the Town’s energy consumption.

The Town should be processing each of its building’s energy usage data, including meeting with Eversource customer service representatives and asking for weekly energy consumption readouts. Electricity is a major expenditure and as such, it is worthwhile to audit every building. Beyond electricity, the Town should have an understanding of all fuel types, building by building, so square footage costs can be compared and prioritized. Meters should be replaced every ten years to ensure accurate readings.

He acknowledged there are passive and active means to reduce costs and consumption. Passively speaking, less energy is being consumed due to upgrades to energy efficient appliances, light bulbs, etc. The Town should also be actively reducing consumption through systems management, e.g. shutting off lights appropriately without human intervention and utilizing staggered lighting. Through behavioral and systems management alone, the Town could reasonably expect to reduce consumption by 20%. Mailman urged the committee to pursue changing mindsets before changing equipment.

Mailman stated the Town has no substantive reason not to pursue solar. This requires sizeable up front commitment, but the payoff is there. He cautioned this should not be prioritized over behavioral and systems management changes.

Regarding electric vehicles, Mailman opined there is no shortage in electricity; transmission
capacity exceeds our needs, even if 100% of the cars were electric.

9.6 **Ed Stein, CEO, GES Developers, LLC**

In September 2018, Ed Stein provided a pro bono assessment of the solar array at Glenville School. The Energy Committee had information that led it to believe the system was not functioning at full capacity, if at all. Understanding why this system was not function properly was believed to be germane to understanding the viability of alternative energy use for the Town.

Below is a summary of Mr. Stein’s findings.
(1) The solar system is still operating and producing some solar electricity but is vastly under-producing what it is capable of producing.
(2) The solar system has not been maintained at all over the years.
   (a) There are an inordinate number of electrical connectors, that should connect the solar panels in daisy-chain fashion, that are unconnected, jumpered, and in disarray. An inordinate number of the wire management trays on the solar panels had broken off.
   (b) No panels appeared broken based on a visual inspection.
   (c) Dan Watson confirmed the school district does not buy maintenance contracts, thus it was unlikely a maintenance contractor was at fault. The maintenance manual provided is bare bones.
(3) The 11 inverters on the system all appeared to be working, but the output coming from each inverter (which should have been about the same) was materially different, reflecting the state of the electrical connectors in the last point.
(4) The manufacturer of the solar panels (Solyndra) is bankrupt. Unclear today who would be warranting the panel performance.
(5) The installer of the solar panel system (based in Stamford) also appears to be out of business. Phone number out of service, web site no longer maintained.

Mr. Stein recommends:
1) Track down the business who took over the workmanship warranty from the system installer, if anyone. Get them out to fix warranty issues if possible.
2) Find the original installation contact and so it can be evaluated for any additional recourse that the school may have. With the installer out of business, there is likely no recourse.

3) Find a professional solar Operations and Maintenance (O&M) contractor to provide a quote for:
   a. a complete rejuvenation of the installation to get the system producing back up to its capacity and a calculation whether that is worth doing.
   b. a quote for an annual O&M contract. This is a very cost effective use of money for the school district.

10.0 Conclusion

The Town of Greenwich has a vested interest in reducing energy consumption as a means to manage the Town budget and reduce unnecessary CO₂ emissions. While this is a generally agreeable premise, the effort to achieve this through a coordinated, goal-specific, accountable entity has not been made. The potential for energy savings crosses many Town departments and in-house expertise does not fully meet the level of expertise available in the specialized fields of energy consultants. To bridge departments and incorporate outside expertise, an Energy Commission needs to be established to bring oversight and accountability to Greenwich. The Energy Commission would also have the means to engage residents regarding energy as a public expenditure and value consumption reduction. The public also needs to be engaged regarding their role in the community and the value of their reduction in consumption for infrastructure stability and resiliency.