Conservation Commission Energy Committee Meeting
Thursday, July 26th, 2018
Human Services Department Conference Room, 3rd Floor, Town Hall

In attendance: Rusty Parker, Robert Brady (by phone), Steve Hall, Skip Parker, Urling Searle

Also in attendance: Patricia Sesto (by phone), director; Sarah (Nahabedian) Coccaro, conservation resource manager; Sandy Litvak, Selectman; Robert Chew, Partner & Business Manager AssocEnergy- EV charger presentation speaker; Mike Stratton, business partner with Mr. Chew; Katie DeLuca, director of Planning and Zoning; Amy Siebert, Commissioner of DPW

1. **Call to order**- 9:03 am by Ms. Sarah Coccaro
2. **Approval of Minutes**
   a. July 12th, 2018- revised minutes approved
3. **Presentation by Robert Chew RE: ZEV Energy Centers**

   Mr. Robert Chew began his presentation by giving 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 began looking at putting Level 3 charging stations in Stamford, Darian, and Westport, but there was no excess parking and land was too expensive.

   Mr. Chew proceeded to explain the differences in Level 1 and Level 2 changing stations (see table below). 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. Mr. Chew explained that "range anxiety" is a real thing: people are concerned how fast it will take them to charge their vehicle and how many more miles there is left in their trip. Mr. Chew believes his company found a niche in providing Level 3 "fast charging" stations.

Charge Level	Power Level	Charge Time	Description
AC Level 1 Basic, "slow," "trickle" charging	110-120V AC (alternating current)	Full charge: 10-20 hrs	The power level is equivalent to plugging into a household electrical outlet. It is best suited for smaller battery sizes such as those in PHEVs or when longer charging time is available.
AC Level 2 Fast, or "quick" charging	208-240V AC	Full charge: 4-8 hrs	The power level is equivalent to plugging into a household electric clothes dryer socket. This is the most common public charging level.
DC Level 3 Very fast charging	Converts 3-phase AC to DC	Full charge: 20-30 minutes	Best-suited for fast turnaround locations and fleet vehicle charging. DC Level 3 requires significant panel and service upgrades and consequently is the most expensive to deploy.

Mr. Chew also described the car manufactures and their charge connector plug types: Tesla, CHAdeMO, SAE…etc. Level 3 chargers- Asian: Nissan Leaf, Mitsubishi i-Miev, etc. These cars use the CHAdeMO connector standard. American / European: Chevrolet Volt, Chevrolet Spark, BMW i3, Mercedes, Volkswagen, etc. These cars use the SAE Combo CCS standard. Tesla: Model S and Model X. Tesla uses its own Tesla connector standard.

In general, EVs are less expensive to own than gas vehicles due to less cost for maintenance, less parts to care for, but until there are more charging stations available, we won't see an increase in EVs on the road. In general, EVs operational cost is around 22% less than a gasoline powered car.

Mr. Sandy Litvak asked about the number of EVs in Greenwich. Mr. Chew stated that there are around 600 EVs registered in Greenwich out of roughly 60,000 vehicles in Greenwich (about 1%). Total EVs in Fairfield County is around 6,000. Mr. Chew stated he projects EV sales to grow 40% a year.

Discussion went on to discuss locations of charging stations in Greenwich, such as on the Merritt Parkway, Delmar hotel, BMW dealership, to name a few. With the increase in EVs predicted by 2020, there should be an increase in EV charging stations too.

Mr. Litvak asked about the battery size in each of the EVs (Tesla vs. Nissan Leaf vs. Chevy Bolt) The Leaf is the smallest battery, around 150 miles from a 40kwh battery pack. The Bolt has a 60 kwh battery giving it around 238 miles of range. The Tesla model 3 will have a 72 kwh battery for 310 usable miles.

At this point, Mr. Chew began his PowerPoint presentation (see attached pdf). He did not go through every slide, especially the slides with a lot of text.

On page 4 in the presentation, "EV Car Markets and EV Station Sites Being Developed" Mr. Chew described his company's data map that showed EV concentrations and EV station sites. Most of the EV concentrations were along the CT coastline: Greenwich, Stamford, New Haven, and Hartford. For Massachusetts, the concentration was centered around Falmouth, Holyoke, Amherst, and Eastern MA in and outside of Boston.

The next slide on page 5, "Rendering of the ZEV Center" showed an example of a 160 kwh charger and a 50 kwh charger. Mr. Chew explained that each of these chargers run around $100,000, as "your selling electricity and time". He envisions charging a flat rate of $7 to plug in and $0.47 per kwh to charge. Mr. Chew stated that he sees the future being 350kwh charging stations to charge an EV 80% in under 10 minutes.

Mr. Chew's company would like to build a network of chargers across the state. He already has plans for a charging station in Bridgeport, New London, Wilton, and Enfield, CT. He described putting charging stations in particular half-way points to major cities where people might work or go for trips (for example NYC or Boston).

Mr. Chew then directed the conversation to funding for these charging stations. One option is indirectly through an off-site solar field. However, he also envisions each station to have 12 kwh of solar power on top of the station canopy and a storage battery close by to hold up to 220kwh. He explained that the solar power would go into the battery storage, which would then be used to offset the load during peak times of charging station use. A complete station cost would be around $350,000. Mr. Rusty Parker asked "why so much?"

Mr. Chew explained that today, it's hard to predict the income one of these stations would make. Big car companies have committed to increasing their EV production and technology. Mr. Chew is competing with charging networks like EVgo. It is evident that with an increase in EV production and technology, we will see an increase in demand for electricity.

Mr. R. Parker asked if electric companies can prepare for the increase in demand? Mr. Chew stated that municipalities or companies can invest in solar fields, which have a profitable payback over a number of years. Massachusetts has a number of solar farms through the SMART Program. https://www.mass.gov/solar-massachusetts-renewable-target-smart Mr. Steve Hall recommended watching an upcoming CT Green Bank webinar about support for electric vehicles: https://www.ctgreenbank.com/news-events/events-calendar/

Next, Mr. Chew discussed using wind power as a source of energy. Ms. Katie DeLuca asked where the industry is going in terms of electric commercial trucks? Mr. Chew stated that he predicts commercial vehicles focusing on the hydrogen power niche and not necessarily using electric batteries.

Mr. Hall asked Ms. DeLuca about multi-use parking spaces in Town. Ms. DeLuca stated that Planning and Zoning has been working with a consultant to do a parking study and there were some interesting conclusions, especially in the Byram area. Mr. Hall and Mr. Litvak discussed parking vs. charging time while parked at a charging station.

Mr. Litvak left the meeting.

Ms. Pat Sesto asked what happens if someone finishes charging but doesn't move their vehicle? Mr. Chew explained that there are phone notifications a person can receive to alert them when their vehicle is finished charging. Also, he envisions

charging someone for the time they are plugged into a charging station, so it's in the consumer's best interest to move their vehicle when finished.

Ms. DeLuca asked Mr. Chew about the future of portable chargers. He believes portable chargers will be difficult to sell due to the fact that a buyer has to essentially purchase a battery similar in size (and weight) to the battery that already exists in their car. He said it's fair to say that it's undesirable for someone to want to have two batteries.

Ms. DeLuca left the meeting.

Ms. Coccaro asked how Mr. Chew's company plans to compete with other charging stations, especially when there are some that don't cost the consumer anything right now. Why would someone want to pick his charger over another? Mr. Chew stated that he believes it's about location and he plans on putting his charging stations in convenient locations for EV drivers.

Mr. Hall asked Mr. Chew "why put a station in Greenwich?" Mr. Chew responded that 1. He grew up in Greenwich and feels connected to this Town, 2. There are EVs in Greenwich (a demand exists), and 3. People are driving here, either for work, home, or pleasure.

Mr. Skip Parker asked about 5 to 10 years down the road, how will the increase in charging stations and EV drivers impact our electricity load? How will night charging and if everyone in a neighborhood owned a Tesla, how will that impact our peak demand? Mr. Chew explained that utility companies are just waking up to the presence and demand from EVs and are starting to plan for their electricity demands. Discussion ensued around the substation on Railroad Ave. It was the committee's consensus that the new substation will be able to support the demand for anticipated EV growth. Mr. Hall recommended the committee not forget about regenerative energy and micro-grids.

The presentation ended and Mr. Chew, Mr. Stratton and Ms. Siebert left the meeting.

4. Update on Town Hall audit and other Eversource topics

a. Mr. Bob Brady believes SWA made a mistake estimating cost savings. Mr. Brady will provide Ms. Coccaro with some language to respond to SWA with follow up questions. Also, Mr. Hall asked Ms. Coccaro to follow up with SWA with why didn't SWA incorporate savings from replacing old equipment with newer equipment?
b. Ms. Coccaro updated the group on a few Eversource topics. We are still waiting to hear from Eversource on the WWTP energy efficiency measures

recommended, possible incentives with the GHS, a comprehensive bonus incentive for combining HVAC and lighting in Town Hall. Mr. Al Monelli, Ms. Siebert, Ms. Sesto and Ms. Coccaro have a meeting on Monday to discuss a proposed lighting project in Town Hall. Finally, we have given Eversource a deadline for a final Town Hall energy report.

5. **Strategic Energy Planning**
    a. **Report on stakeholder engagement**
        i. Ms. Sesto will follow up to get Andy D. and Jill O. to attend the next meeting.
        ii. Mr. R. Parker has a contact on solar. Ms. Sesto will follow up with coordinating Glenville school and solar contact.

    b. **Identification of desired presentations, needed information**
        i. Mr. Hall will send over some questions for Chuck (for the next meeting).

6. **Next meeting – Chuck from purchasing**

    Mr. S. Parker will not be attending the next meeting.

    The meeting ended by recapping EV charging station presentation by Mr. Chew and some initial thoughts from the Committee. Ms. Coccaro described the EV mentality while driving and planning a trip. EV drivers think about how many miles it will take them to get to their destination and if they need to charge. Ms. Coccaro uses an app to find charge stations and look at how much it costs to charge, preferring to go to free charge stations. Mr. Brady's said Mr. Chew has preset opinions on Greenwich drivers and the cost he would charge. Mr. R. Parker believes that most drivers would charge overnight at their homes, which led Mr. S. Parker to inquire about the changes it will force on Eversource and peak demand.

7. **Adjourn-** 10:36 am