Comparison and Comments on Different Recommendations between the 2008 AEC and the 2016 AEC

The 2016 Alternative Energy Committee (AEC) was requested by members of the Town Council to comment on key differences in the recommendations, specifically geothermal heat pumps and solar energy. We reviewed the excellent report put together by an earlier committee in 2008. The 2008 report shows in great detail the distribution of energy consumption by the various departments in Cape Elizabeth. It further compares Cape Elizabeth to the national average of similar functions. This work is still valid to a large extent as Cape Elizabeth's population change in the last 10 years was negligible and the demographic profile did not change much.

The 2008 report focused on data collection of the various municipal energy consumers to be able to prioritize, and to focus on conservation. The conservation measures are still valid and the economically feasible ones have been implemented or are planned to be by the towns Facilities Department (LED lighting, CFL lighting, insulation, boiler efficiency, etc.) Some of the recommendations, such as wood chip heating, natural gas heating, insulation of older building stock, and change of heating systems to include heat pumps, were not implemented for economic reasons.

It is important to recognize that none of the 2008 recommendations are related to the generation of electricity. The Purpose sections of the Charge for each committee are nearly identical with two important additions that appear only in the 2016 Charge: (1) *"This includes a look at utilization of town and school land and buildings for solar energy opportunities;"* and, (2) *"…a risk section which identifies and quantifies all risks associated with the use, lease, rental or financing of a system including operation, performance,* maintenance, guarantees, indemn*ities (including taxes and changes to the Tax Law and/or Net Metering) and credit(vendors and financing parties).*"

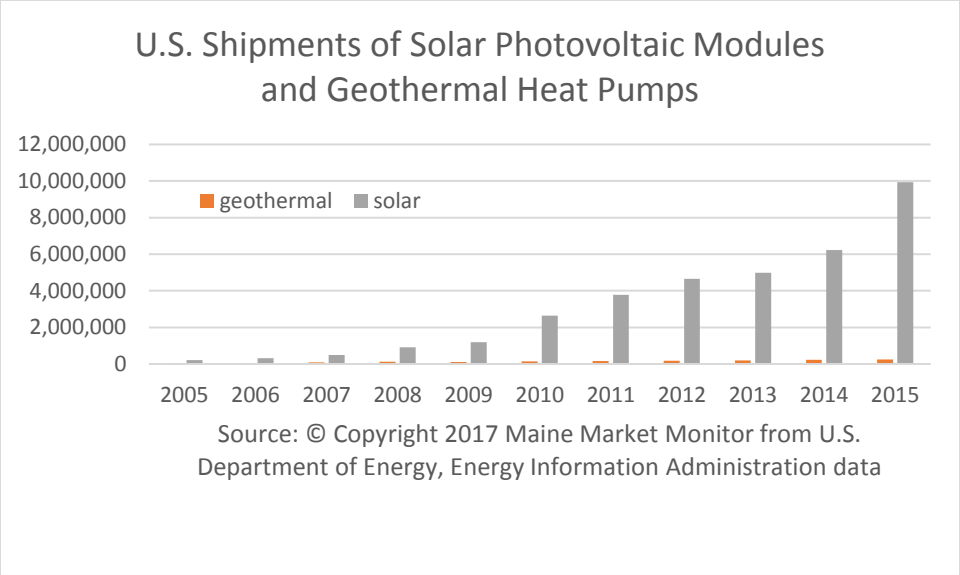
The 2016 AEC was charged not to repeat the excellent and detailed work of the 2008 committee, but rather to build on it by focusing on the generation and use of clean electricity and fuels and the identification of doable and economically rewarding measures. We are keenly aware that the first order is to improve efficiency as that offers the best return on the investment. Using the findings of the 2008 report, we picked the schools and the pool as targets for our recommendations.

Of the renewable energy supply technologies, we focused on those with either short term payback or the availability of a finance solution that would largely unburden the town of up-front cash outlay. Solar PV and Solar Thermal emerged as having the best economics as they experienced a significant efficiency improvement over the last ten years, a substantial cost decline (steep learning curve) and the availability of solid finance models and incentives in addition to a substantial Green House Gas (GHG) emission reduction.

Solar and Geothermal Market Trends, 2005 - 2015

The 2016 Committee was requested to comment on why certain recommendations, in particular one in favor of the geothermal heat pump, and one not in favor of solar Photovoltaic (PV) or solar thermal, differed between the two reports. As this is a great question, we did some research to address it factually.

The following chart, created from Federal government data, shows that the shipments of geothermal heat pumps remained relatively stable at a low level, (2010 – 2015 extrapolated from trend 2005 – 2009), while shipments of solar PV panels grew over 48x or 4800% over the 11 year period between 2005 and 2015. We also realized that while geothermal is an energy source, heat pumps do not generate electricity, rather they use it efficiently. The 2016 AEC felt that its efforts were expected to focus on clean sources of energy (generation) rather than the efficiency of use of energy (consumption) addressed by the 2008 committee.



<u>This dramatic shift enabled the 2016 AEC to consider solar because economies of scale had driven down the cost significantly in just the period between the two reports.</u>

Respectfully Submitted
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