COMMENTS ON THE PROPOSED

DRAFT 2019 NEW JERSEY ENERGY MASTER PLAN

Policy Vision to 2050

by Alfonso Gandica

I started developing my comments below as we were flying over Athens, Greece for an extended vacation with my wife, two daughters and their families. It always amazes me to fly into the Athens Airport and to see from the airplane solar water heaters in almost all the roofs. This scene is repeated as one travels in the countryside. Solar panels are as common at cyprus trees. A stark contrast to the US landscape. This reminds me of the words of George Bernard Shaw: "You see things; you say, 'Why?' But I dream of things that never were; and I say, 'Why not?'" Mr. Shaw was a famous Irish playwright, critic, polemicist, and political activist. He became the first person to win both a Nobel Prize and an Oscar and was a founder of the London School of Economics in 1895 with Sydney and Beatrice Webb and Graham Wallas ...not a bad accomplishment for an Irish fellow at the height of the Victorian era!

I read with interest the ***Draft 2019 New Jersey Energy Master Plan: Policy Vision 2050 (Draft 2019 NJ EMP)*** and I commend its developers for their vision and courage to coordinate the work of several state agencies, private industry, academic institutions, local governments, and consumer organizations by first soliciting their comments, refining them and develop the final version of the Policy Vision 2050

My comments refer to areas not mentioned specifically in the ***Draft 2019 NJ EMP*** that, in my opinion, complement its seven strategies and are key factors in attaining their success.

1. **Solar Domestic Water Heating (SDWH)**

   There is no mention whatsoever of this excellent technology in the ***Draft 2019 NJ EMP***. According to the U.S. Department of Energy (USDOE) "water heating accounts for 18% of a typical U.S. home energy use"[1] and "solar water heaters can be a ***cost-effective way*** to generate hot water for your home. They can be used in any climate, and the fuel they use -- sunshine -- is **free.** "[2] There is a great deal of potential economic and environmental benefits if New Jersey promotes the use of SDWH systems.

   There is no specific goal in the ***Draft 2019 NJ EMP*** that can be supported by this technology, but SDWH helps to reduce the demand for valuable resources and its fuel source is completely **free**!

2. **Fuel Cells (FC) for Power Generation**

   Most of the instances that refer to FC in the ***Draft 2019 NJ EMP*** are related to the use of FC technology for electric vehicles. However, there is a significant amount of

both economic and environmental benefits in using FC for power generation including its use in the development of ***distributed electric generation*** especially as old central station generating plants are being retired due to either the current economics of electricity generation and/or obsolescence like in the case of the September 2018 closing of the 636 MWe boiling water reactor Oyster Creek Nuclear Generating Station in Ocean County, NJ after 49 years of operation. This Exelon owned nuclear generating station operated without a cooling tower that was always a bone of contention every time that its water discharge permits came up for renewal.

This technology supports **Goal 2.1.1 Establish a 50% RPS by 2030** of the ***Draft 2019 NJ EMP*** and it can play a significant role as a distributed generation resource.

3. Gas Engine-driven Heat Pumps (GEHP)

This is another technology that is not mentioned at all in the ***Draft 2019 NJ EMP*** even though it has great benefits in reducing electricity demand and consumption and GEHPs are more efficient than air-to-air heat pumps. "A review of gas engine driven heat pumps (GEHPs) for residential and industrial applications" that appeared in the January 2009 issue of ***Renewable and Sustainable Energy Review*** states "Main applications of GEHPs are for space and water heating/cooling purposes. However, they can be integrated to other applications, especially to drying processes."[3]

There is no specific goal in the ***Draft 2019 NJ EMP*** that can be supported by this technology, but it suffices to say that GEHP are more efficient than air-to-air heat pumps and help reduce the peak demand for electricity.

4. Ground Source Heat Pumps (GSHP)

Another technology that is not mentioned in the ***Draft 2019 NJ EMP*** that can make a significant contribution to the reduction of electricity demand and consumption. GSHPs are more efficient than air-to-air heat pumps. "A **geothermal heat pump** or **ground source heat pumps (GSHPs)** is a central heating and/or cooling system that transfers heat to or from the ground. It uses the earth all the time, without any intermittency, as a heat source (in the winter) or a heat sink (in the summer)."[4]

This technology supports **Goal 4.2.1 Incentivize transition to electrified heat pumps, hot water heaters and other appliances** of the ***Draft 2019 NJ EMP.***

5. Waste-To-Energy (WTE) Plants

This technology is mentioned three times in the ***Draft 2019 NJ EMP*** without mentioning its major benefits

a. Reduction of 90% of the municipal solid waste (MSW) volume to an inert ash saving a significant amount of land dedicated to landfills.

b. Complete elimination of the highly toxic leachates that are produced in existing landfills, most of which are not lined. These leachates percolate into the ground and contaminate the groundwater used for domestic consumption.
c. Reduction in the amount of Greenhouse Gases (GHG) emissions Professor Nicholas J. Themelis, Director of the Earth Engineering Center at Columbia University has demonstrated that for each ton of MSW processed at a WTE plant there is a one-ton reduction in GHG emissions compared to the burning of fossil fuels.
d. Operation within the strictest environmental controls for both air and water emissions.

WTE plants are flourishing in Europe and Asia but they have not been accepted as well in the U.S.A. In our own Camden County, we have a WTE plant at the Camden Energy Recovery Facility (CERF) that processes 1,050 tons of MSW daily or about 378,000 tons of MSW annually with a 21 MW net electricity production capacity. For air pollution control CERF uses semi-dry flue gas scrubbers injecting lime, fabric filter baghouses, nitrogen oxide control system, mercury control system, and continuous emissions monitoring system (CEMS). CERF started operating commercially in July 1991 by Foster Wheeler that sold it to Covanta in August 2013.[5]

The U.S. Environmental Protection Agency (EPA) says that, per unit of electricity produced, WTE plants generate fewer greenhouse-gas emissions than coal or oil, but slightly more than natural gas. And certainly, more than clean-energy sources.

CERF is the pink building at the fork in the North-South Freeway going towards Philadelphia from Southern New Jersey where it splits into two branches: one branch goes to the Walt Whitman Bridge and the other to the Benjamin Franklin Bridge.

Fig, 1 CERF plant in Camden, NJ

I took my Energy and Ethics classes at Stockton University on a tour of CERF every semester for twenty years before I retired as an Adjunct Professor in December 2017. Not everybody is pleased with the presence of WTE plants in their neighborhoods and they have some very active campaigns to close them down including our very own Sierra Club president, Jeff Tittel. I believe all of us are entitled to their own opinion, but I am personally convinced that WTE plants are **not incinerators** because they must operate within very strict environmental controls in a special Best Available Control Technology (BACT) group for both air emissions and water discharges.

Denmark is the most advanced country in the deployment of WTE plants with the latest addition of the Amager-Bakke plant in Copenhagen.[6] This plant processes 2 x 35 tons of MSW per hour or about 400,000 tons of MSW annually produced by 500,00 - 700,000 residents and at least 46,000 companies. It supplies a minimum of 62,500 households with electricity and 160,000 households with district heating and its nameplate electric generation capacity is 57 MW.

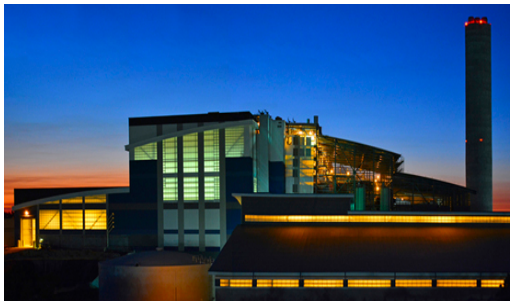
The Danish people are environmentally conscious and these WTE facilities are operated safely under strict environmental measures and controls.

The Danish architect for the Amager Bakke plant decided to make the shell of the plant building as a ski slope (Fig.2) that is becoming a European tourist attraction. It is also interesting to note that the steam emissions are not coming out continuously but are being released like puffs that look like halos (Fig.3).

This plant was designed and built by Volund, the Scandinavian subsidiary of Babcock & Wilcox which is headquartered in Barberton, Ohio.

Fig. 2 Amager-Bake Plant ski slope

Fig. 3 Amager-Bakke plant halo emissions



Volund also designed and built the current largest WTE plant in the world in West Palm Beach, Florida, for the Solid Waste Authority of Palm Beach County.[7] This three-line plant processes 113.4 tons of MSW per hour or about 990,000 tons of MSW annually with a gross electric output of 95.3 MW.

Fig. 4 WTE plant in West Palm Beach, Florida

WTE plants also help to reduce the amount of MSW that currently goes to landfills, especially the unlined type, which are significantly more polluting than WTE plants. WTE technology supports **Goal 2.1.1 Establish a 50% RPS by 2030** of the ***Draft 2019 NJ EMP*** and it deserves a more significant role in the renewable energy portfolio for New Jersey. "Why not?"

I appreciate this opportunity to submit my comments for the ***Draft 2019 NJ EMP*** and hope they are considered. In case of questions I can be contacted by phone at **(609) 742-8428** and/or via e-mail at ***ssafuture1@gmail.com.***

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