

Testimony Supporting HB 579, Informational Only

Economic Matters

February 22, 2024

Dear Chair C. T. Wilson and Members of the Committee,

I have a Masters in Electric Power Engineering from Rensselaer Polytechnic Institute. I analyzed the NYC grid for Con Edison and investigated blackouts for the Federal Energy Regulatory Commission.

I am not against datacenters and very much pro unions. I am against locking Maryland into 19th century technology.

The governor's bill is portraying this issue as a simple business matter. It is far more complex and entangled than that. As an electric power engineer, I implore you to engage in much further engineering research. First, there is already a shortage of electric power in the state. Last summer PJM declared a Phase 1 Emergency. Little has changed since then. The prospect for new and additional power is fraught with difficulty and likely to take many years to resolve.

Second, is the issue of Maryland's environmental laws such as the *Climate Solutions Now Act* versus the datacenter's request to use polluting diesel generators for emergency backup power without any oversight or consideration of compensation or mitigation for the greenhouse gas emissions from hundreds of these machines.

Local utility First Energy's most recent projection of available power to Quantum Loophole (QL) is 250 megawatts in the next few years with another 300 megawatts some years thereafter. QL's projections of power requirements at full buildout have increased from 1200 megawatts to 2400 megawatts to a gargantuan 3000-5000 megawatts.

Since all of a datacenter's operations are considered critical load, enough diesel generators would be required for emergency backup power to equal normal power levels from the utility grid. Therefore 2400 megawatts of power would require 800 diesel generators, 3000 megawatts of power would require 1000 diesel generators. And that is for just one campus.

Meanwhile, great advances are being made in clean emergency power systems. In the years it will take to build the transmission lines and other infrastructure to make this power available, clean emergency power systems will be available and emergency diesel generators can be phased out.

But by removing the Public Service Commission from its legal oversight and removing backup generation of any size from Maryland's environmental laws this bill as currently written would lock Maryland into keeping dirty diesels for years to come. It would prevent the state from transitioning to nonpolluting emergency backup systems. There

is no need to rush to conclusions about emergency diesel generators. Further engineering review is warranted.

During monthly testing and certainly during an emergency, many hundreds of diesel generators will produce harmful greenhouse gas emissions, fumes, and noise. (See additional testimony on the harmful effects of noise.)

Clean backup power technology is currently available, although not in sufficient quantities to replace hundreds of diesels. However, the pace of design is driven by a worldwide desire for sustainable datacenters. Among currently available clean power methodology is:

- Demand side response - activities that reduce or shift electricity demand in response to real-time events on the grid, therefore addressing short-term fluctuations in demand or supply
- Fly wheels - mechanical devices which use the conservation of angular momentum to store rotational energy; A flywheel's stored energy will donate a surge in power output upon a drop in power input and will conversely absorb any excess power input (system-generated power) in the form of rotational energy.
- Battery Energy Storage Systems (BESS) Utility scale batteries - A number of companies including ABB, GE, Hitachi, Caterpillar and Schnieder now offer backup batteries that could be used to augment diesel generators. (See as testimony ABB product material.)

Developing Technologies include

- Flow Batteries - A flow battery, is a type of electrochemical cell where chemical energy is provided by two chemical components dissolved in liquids that are pumped through the system on separate sides of a membrane. A flow battery manufacturing plant is being built in West Virginia.

It would be a travesty to rush into locking in 19<sup>th</sup> century technology when we are so close to developing sustainable datacenters. Moreover, it is only through regulatory measures that all datacenters will conform to modern backup power technology.

If you remove hundreds of diesel generators from both the CPCN Process and the CPCN Exception Process, shouldn't these emergency generation systems fall under some form of Public Service Commission oversight? Perhaps a new procedure needs to be formulated for this exotic industry.

#### Role of the Public Service Commission

The role and authority of the Public Service Commission and Maryland Department of the Environment should be specified including the nature of the "Permit to Construct" from the Maryland Department of the Environment.

The mechanisms for public notice, participation, and involvement when any power generating system that produces more than 20 megawatts is planned should be specified. If outside the CPCN Process, what specifically is the process for datacenter emergency power requests? The rights and opportunities for public comment shall be described.

Generation systems for emergency power that cumulatively provide more than 20 megawatts should be reviewed by the Public Service Commission on a periodic basis of five years to obtain approval to continue operations. This would allow for the move from diesels to clean, sustainable emergency backup systems.

In the meantime, datacenter facilities should be encouraged to replace some portion of its diesel generators with renewable backup power such as utility scale batteries, battery microgrids and generators that run on hydrogen gas. What would be the procedure to do this?

Defining an Electrical Emergency: Multiple generating units designated for emergency backup power should only be operated in electrical emergencies or during periodic testing.

Diesel generating units should not be operated to provide power in non-emergency situations to reduce stress on the electrical system during high energy use periods. Because diesel fuel releases more than 55kg per million BTU, it should not be an energy source used for baseload power.

#### Environmental Issues due to hundreds of diesel generators at any one facility:

Considering that all diesel generators at the facility will be operating simultaneously in an emergency:

- The generator fuel shall be specified when the facility applies to the Public Service Commission.
- Require the use of "green diesel" or Hydrotreated Vegetable Oil or (HVO) or equivalent.

When generation units are fueled with diesel fuel, the datacenter facility shall report to the Public Service Commission:

- The number of generators that will be required to operate simultaneously and the expected megawatts to be generated in an electrical emergency shall be specified.
- The greenhouse gas emissions that will be produced though monthly testing.
- If an emergency operation is required because the facility has separated from the utility, the amount of greenhouse gas emitted and as monitored shall be recorded and reported.

The facility should report to the Public Service Commission and Maryland Department of the Environment, how it will compensate for greenhouse gas emissions.

Tier IV or equivalent diesel generators should be mandated, or best available technology at the time, to the extent available/practicable.

Air monitoring and reporting to the PSC should be conducted prior to operation of the facility and as a consequence of periodic testing and any use during an emergency of diesel generators.

Noise limits for diesel generators at the perimeter of the facility property should be determined by the Public Service Commission and Maryland Department of the Environment for periodic testing of a specified number of diesel generators tested at one time and during emergency operations when hundreds of diesel generators will be operating. (The Frederick County Data Center Working Group is recommending a limit of 55 decibels during operation per generator.)

Testing for Noise: Independent testing is necessary to determine the decibel level when all diesel generators are running in an emergency. This information should be reported to the Public Service Commission and local public officials. The public should have access to this data on a regular basis. Periodic testing times should be limited to between the hours of 8 - 5 Monday through Friday.

Safely storing diesel fuel: The facility should report in its application to the Public Service Commission, the method by which fuel will be safely stored, where it will be located, the use of leakage resistant fuel-storage containers, fire-fighting equipment will be present at the site and hazmat training that will be provided.

Thank You,  
Elizabeth Law, Electric Power Engineer  
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