



Doosan Fuel Cell America, Inc.
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Massachusetts Department of Energy Resources (DOER)

Comments regarding amended draft regulations to the Alternative Portfolio Standard (APS)

Doosan Fuel Cell America, Inc.

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Doosan Fuel Cell America appreciates the opportunity to provide comments regarding the amended draft regulations to the Alternative Portfolio Standard (APS). Doosan supports the inclusion of fuel cells as an eligible technology, pursuant to Chapter 188 of the Acts of 2016.

Doosan Fuel Cell America is a global leader in providing clean, continuous-duty, cost-competitive stationary fuel cell energy systems. Our PureCell[®] systems operate 24/7 with high efficiency and ultra-low emissions, allowing our customers to generate their own electricity and heat on-site while reducing their utility expenses and environmental emissions. With over 12 million fleet operating hours, PureCell[®] phosphoric acid fuel cell (PAFC) systems have demonstrated unparalleled durability and reliability.

Doosan Fuel Cell America was founded in 2014 on the strength of the people and technology developed at United Technologies over the past fifty years. We are building on the value of the organization and aspire to be the technology and market leader in the fuel cell industry. Our headquarters are in South Windsor, CT at the site of our world-class fuel cell R&D and manufacturing facilities where we currently employ 300 people with plans for expansion.

Doosan Corporation is a global company with 42,000 employees and worldwide revenue of more than \$20 billion. Our global businesses span a range of products and services in infrastructure support and power generation, including nuclear power, steam turbines, power plant boilers, water desalination, construction equipment, machine tools and engines for a variety of applications. Doosan's U.S. operations include Bobcat Company construction equipment and total over 3,000 employees and \$3 billion annually.

The State of Massachusetts is an emerging market for our energy systems, and fuel cells have the potential to contribute greatly to State's goals of reducing greenhouse gas emissions, reducing peak load, and improving the reliability of the electric utility system. Doosan fuel cells are currently supplying clean and secure power to a diverse set of customers in a variety of industries across the northeast and California such as hospitals, universities, industrial manufacturers, municipalities and high schools, supermarkets, residential buildings and waste water treatment facilities.

Stationary fuel cell applications offer these customers a clean and efficient method of producing energy that provide resiliency, reliability and price stability, while reducing stress on the electric



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grid. A wider deployment for distributed generation (DG) will lead to clean, efficient electric generation and will alleviate the need for additional transmission facilities, when developed where the demand is needed.

Doosan also has significant experience in multi-MW fuel cell projects. Our PureCell[®] Model 400 system is highly scalable and can be used effectively to generate electricity from 460 kW up to 50 MW and more. Our largest operating site is 30 MW installed in Busan, South Korea in 2016. By operating with no combustion, fuel cells have negligible emissions of criteria air-pollutants such as NO_x, SO_x, CO, VOCs, and particulate matter.

Doosan appreciates the opportunity to weigh in on the draft regulations to the APS with some suggestions.

Doosan agrees with the proposed eligibility requirement detailed in 225 C.M.R. 16.05(1)(e), Net Carbon Dioxide Emission Rate:, stating a "...Generation Unit shall not exceed a net carbon dioxide emissions rate equal to the average emissions rate of existing natural gas plants in Massachusetts at the time when the Generation Unit is qualified." The additional eligibility requirement proposed in 225 C.M.R. 16.05(1)(a)(7)(b) of "...an overall efficiency of 60%...", would limit eligible fuel cell projects to combined heat and power applications with high thermal usage, which are currently already eligible within the APS. Doosan believes the legislative intent of adding fuel cells to be eligible within the APS was to increase the on-site production of clean electricity with negligible criteria air pollutant emissions.

Doosan agrees that an attribute multiplier defined in 225 C.M.R. 16.05(1)(a)(7)(c) is imperative to enable the deployment of fuel cells in Massachusetts. A multiplier of two would allow for a much broader cross section of customers to take advantage of clean generation and help meet the state's APS goals.

Doosan is additionally concerned that because of the large capital investment required for fuel cell projects, uncertainty in future AEC trading prices once the APS targets are met, could hamper project development as it adds financial risk. A fixed or minimum AEC price for 15 to 20 years would provide much greater certainty to project viability.

Doosan appreciates the opportunity to weigh in on these important draft regulations. Our company looks forward to working with all clean energy stakeholders committed to providing the Commonwealth of Massachusetts cleaner, cheaper and more reliable energy.