DOCKETED	
Docket Number:	21-ESR-01
Project Title:	Energy System Reliability
TN #:	247834
Document Title:	HyAxiom, Inc. - A Doosan Company Comments - RFI Clean Energy Resources for Reliability
Description:	N/A
Filer:	System
Organization:	HyAxiom, Inc. - A Doosan Company
Submitter Role:	Public
Submission Date:	11/30/2022 3:20:25 PM
Docketed Date:	11/30/2022

Comment Received From: HyAxiom, Inc. - A Doosan Company
Submitted On: 11/30/2022
Docket Number: 21-ESR-01

RFI Clean Energy Resources for Reliability

Additional submitted attachment is included below.

HyAxiom, Inc. – A Doosan Company
101 East River Drive
East Hartford, CT 06108
(860) 727-2200

November 30, 2022

California Energy Commission
Docket Unit, MS-4
Re: Docket No. 21-ESR-01
715 P Street
Sacramento, CA 95814-5512

Subject: Request for Information Clean Energy Resources for Reliability: Docket No. 21-ESR-01

HyAxiom, Inc. – A Doosan Company (formerly 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 onsite while reducing their utility expenses and environmental emissions and unparalleled durability and reliability. Worldwide Doosan has more than 550 MW operating, under construction or awarded.

Stationary fuel cell applications offer customers a clean and efficient method of producing energy that provide resiliency, reliability, and price stability, while reducing stress on the electric 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. Hydrogen is the key to meeting our climate goals and HyAxiom can also offer a fuel cell product that runs on direct hydrogen, which will ultimately result in even more GHG reductions. It is important to remember, that fuel cells, with all their positive attributes, are replacing traditional combustion generation, not other renewable resources. Fuel cells are a more efficient way to produce power, than traditional centralized generation.

HyAxiom fuel cells operate with a 95% capacity factor, while reducing and eliminating GHG emissions and producing zero criteria air pollutants. We create resilient power that can operate independent of the grid. Our fuel cells can operate on renewable gas, hydrogen, and natural gas with increased energy efficiency. HyAxiom also provides load-following capability in either behind-the-meter or utility-scale applications.

The State of California is one of the most important markets for the emerging fuel cell sector, and fuel cells are contributing greatly to California's goals of reducing greenhouse gas emissions, reducing peak load, and improving the reliability of the electric utility system. HyAxiom fuel cells are installed customer sites across California, supplying clean and secure power to a diverse set of customers in a variety of industries.

HyAxiom, Inc. – A Doosan Company
101 East River Drive
East Hartford, CT 06108
(860) 727-2200

Responses to the Questions

HyAxiom is pleased to provide responses to the questions from the California Energy Commissions' RFI with regards to clean energy resources that provide grid stability:

List of Resource types and Evaluation Attributes

1) Are the categories (indicated in Tables 1, 2 and 3) appropriately representing how the CEC should be evaluating resources?

No. From HyAxiom's standpoint, we would prefer have Fuel Cells specifically mentioned in all three categories, otherwise we run the risk of being totally overlooked by the entities looking for guidance from this document to make their decisions regarding clean energy power resources.

2) Are there resources that should be added to or removed from the preliminary list under each of the categories (shown in Tables 1, 2, and 3)?

Fuel Cells should be added to Tables 1 & 2 as well.

3) Are there other attributes that should be considered, in addition to the ones listed in Table 4? If so, should those be considered for the qualitative and/or quantitative evaluation?

The attributes described in Table 4 appear adequate.

4) How should the attributes be weighted relative to each other? Should some attributes be weighted more than others?

Technology maturity, features, reliability, product support, low emissions certified by AQMD, CARB etc. are all attributes that need to be considered.

5) What data/information sources can help inform characterization and evaluation (both qualitative and quantitative) of the different resources?

Number of years in the Fuel Cell business, local manufacturing, R&D, 24/7 monitoring, sales and service, matured technology and robust supply chain are good information to base your technology decision.

HyAxiom, Inc. – A Doosan Company
101 East River Drive
East Hartford, CT 06108
(860) 727-2200

Resource Characterization

1) Please provide a general overview of the resource, including the following: a. Resource category (e.g., supply, demand) and type (e.g., solar) and scale (e.g., utility, distributed)?

HyAxiom Fuel Cells would certainly fall under the 'supply resource' category, due to our proven ability to deliver from 460kW to 50MW, in-front-of-meter as well as behind-the-meter category, with load-following and dispatchable output, rapid ramp-up and ramp-down etc. Bulk of our more than 550 MW of fuel cells installed globally, are in the utility sector.

2) How does the resource compare to conventional generation in terms of greenhouse gas and priority pollutant emissions?

HyAxiom Fuel Cells are certified by CARB as a low-GHG emission power source using natural gas as a fuel, and the potential for no-GHG emissions when using hydrogen. We also provide electrolyzers for on-site production of green hydrogen, if 100% clean energy is desired at a fraction of the footprint required for solar PV or wind + BESS.

3) How does the resource support reliability (e.g., supply, permanent load reduction, net peak reduction, or emergency asset?) (List all that apply.) a. How can the resource be used as an incremental on-call resource during emergencies?

The inherent features of HyAxiom PureCell Fuel Cells operating off natural gas, LPG or hydrogen cater to always-on permanent load reduction, net peak reduction, microgrid formation, and grid-resilience. With multiple units connected in parallel and N+x configuration HyAxiom fuel cells can match the energy demand with rapid ramp-up and ramp-down capability.

4) How many new MWs and MWhs can the resource provide per year, considering resource characteristics and known barriers between now and 2035? a. How is that different if used incrementally as an emergency asset during an extreme heat event?

Our PureCell ® Model 400 unit operates baseload or in load following mode. In the baseload mode, we can produce roughly 3707 MWh per year. As a load following fuel cell, we can produce less than the baseload capacity as desired by the end-user.

5) What is the levelized cost for the resource in $/MW-yr. and $/MWh-yr. from 2023 to 2035?

Our cost ranges can provide after execution of an NDA.

HyAxiom, Inc. – A Doosan Company
101 East River Drive
East Hartford, CT 06108
(860) 727-2200

6) What is the average length of time from ordering or purchasing the resource to operation? How long does that typically take in today's market? What conditions must be met to deploy the technology rapidly? (e.g., transmission interconnection, building electrification or upgrades, etc.)

6-12 month depending on the complexity of the installation. We can in most cases interconnect with a simple process thereby avoiding lengthy delays

7) For an emerging technology, when will it be ready for deployment, and at what scale?

Our PureCell ® Model 400 unit is available for deployment today at 50-100 MW scale

8) Is the target customer primarily residential, commercial, agricultural, or industrial?

Our target customers are primarily Utility, State, Municipal, Commercial, Agricultural, and Industrial.

9) What are the key non-financial barriers to the development and implementation of this resource (including, but not limited to, permitting, interconnection, supply chain, customer acceptance, and alignment with policy goals)?

The key non-financial barriers include permitting, interconnection, supply chain, departing-load penalty imposed by utilities, customer acquisition, etc.

10) What are the key financial barriers to the development and implementation of this resource?

There are no key financial barriers.

11) What types of benefits or impacts is the resource anticipated to have on low income and disadvantaged communities, and tribes, if any in terms of development and deployment?

The benefits include a reduction in GHG emissions and elimination of criteria air pollutants, grid-resilience during PSPS, less production interruptions & associated losses, and avoided demand charges lead to better overall quality of life.

HyAxiom, Inc. – A Doosan Company
101 East River Drive
East Hartford, CT 06108
(860) 727-2200

Input on Distributed Electricity Backup Assets Program Design

1) What size of resource and what types of customers should the program target?

1-5 MW for Utility, State, Municipal, Commercial, Agricultural, and Industrial customers.

2) What types of incentive structures and amounts are needed to accelerate the development and deployment of this resource?

Continuation of FC-NEM, grants for schools and educational institutions, and incentive for demand reduction.

3) What types of conditionalities and measurement and verification requirements should the program include to ensure funded resources participate and deliver during emergency events?

Collect event-driven data from installed assets to ensure effectivity of the program.

4) In general, please provide any specific proposal or recommendation on the design and implementation of the DEBA program.

Reduce instances of high GHG emissions by decoupling generators from thermostats.

Conclusion

HyAxiom appreciates the opportunity to comment on the Request for Information Clean Energy Resources for Reliability Docket.

By: /s/ David Giordano

David Giordano
Government Relations
HyAxiom, Inc. – A Doosan Company
101 East River Drive
East Hartford, CT 06108
(860) 727-2491
david.giordano@doosan.com

Date: November 30, 2022