

Dynamic Operations of Distributed Data Center Electricity Load for use as Distributed Energy Resource (DER)

David D Gower

Department of Systems Science and Industrial Engineering
Binghamton University
Binghamton, NY 13902, USA
dgower1@binghamton.edu

Abstract

We evaluate the potential of utilizing the dynamic operations of a geographically distributed network of Distributed Edge Data Center units as Dispatchable Load (DL) to support the electricity grid independently and in coordination with traditional Distributed Energy Resource (DER) assets (e.g. Wind, Solar, and Energy Storage). Traditional Data Center operations represent a very stable and high-density electrical load on a 24/7/365 basis with little fluctuation in demand. If the electrical load of a datacenter is dispatched (i.e. removed/reduced from the grid), this Demand Response (DR) can provide an automated, immediate and flexible load balancing value to the grid. In addition, using Modular Edge Data Center units to serve as an anchoring host for interconnection of traditional DER assets leverages the interconnection investment, can alleviate grid capacity constraints and more efficiently utilizes renewable energy generation produced on site.

Keywords

Demand Response, Dispatchable Load, Distribute Energy Resources, Data Center, Electricity Grid Transformation.

Biography

David D Gower is a PhD student in the Systems Science and Industrial Engineering program at Binghamton University. He holds a Bachelor of Arts degrees in Economics and Political Science from the University of Rochester, an MBA from the University of Kansas, and a Master of Science in Environmental Science and Engineering from Clarkson University. He has over 10 years experience in renewable policy, project design & development, siting & land acquisition, community engagement, product certification and creating strategy to overcome barriers that exist between concept, prototype and commercialization. David wrote the business plan and led the development of a \$4.3 million grant from NYSERDA to establish the Center for Evaluation of Clean Energy Technology (CeCeT). This public/private consortium included several research universities that provided commercialization assistance, testing, and evaluation services; and included the establishment of testing facilities for Solar PV and a Wind in New York State. Prior to dedicating his efforts to advancing clean technology David spent several years studying and supporting tech start-ups in California, Italy, Germany, and the U.K.