Distributed generation, also commonly known as on-site generation or decentralized energy, refers to power generation at the point of consumption; that is, generating power on-site, rather than centrally, often to eliminate the cost, complexity, interdependencies, and inefficiencies associated with traditional energy transmission and distribution.
Distributed Generation Gaining Ground

Distributed generation is not a new phenomenon, yet it is no surprise that in the age of decentralization, it is being relied upon as strongly as ever. On the renewable energy side, new technology is providing more megawatts from local wind turbines and rooftop photovoltaic cells. On the fossil fuel side, record cheap natural gas prices have resulted in the installation of many small combined heat and power systems (CHPs).

Demand–response engines, mostly diesel-fueled, currently account for a significant portion of U.S. electricity demand, although their future is grim given recent court decisions striking down regulations by the U.S. Environmental Protection Agency (EPA) that were favorable to demand–response participation.

Distributed generation sources vary considerably in age and emissions profile, and have an unpredictable schedule. If the recent court cases are any indication, the traditional approach to controlling emissions from large industrial sources does not directly apply to these emissions sources. Additionally, since distributed generation plays such an important role in electricity markets, the Federal Regulatory Energy Commission (FERC) and Regional Transmission Organizations need to be involved in any discussions.

The articles in this issue of EM address these concerns. The first article by Anna Chittum and Meegan Kelly of the American Council for an Energy-Efficient Economy discusses the ever-growing role of natural gas CHPs and the emission reductions of traditional pollutants natural gas CHPs provide. The authors argue that there are climate change-related regulatory incentives for using CHPs for electricity generation. The recent binding agreement at COP-21 in Paris, and the Clean Power Plan, though recently stayed by the U.S. Supreme Court, suggest a bright future for CHPs.

The other three articles approach the demand–response question from three different angles. Energy consultant Frank Lacey reviews, from the perspective of the electricity market, the recent court decision remanding the emergency demand–response portions of 40 Code of Federal Regulations Part 63, Subpart ZZZZ – Reciprocating Internal Combustion Engines (also known as the “RICE MACT”). The article discusses the basic business models behind the U.S. electricity markets and the potential impacts of the decision on these markets.

The third article by Certified Consulting Meteorologist Don DiCristofaro analyzes the dispatch data for all major wholesale capacity markets before and after the finalization of EPA's RICE rule in 2013. DiCristofaro concludes that the EPA regulations have not resulted in an increase in the hours of operation for emergency demand–response generators, and subsequently, have not resulted in an emissions increase.

Lastly, there is an article from state regulators, David Healy with the New Hampshire Department of Environmental Services, Mark Prettyman with the Delaware Natural Resources and Environmental Control, and John Barnes and Eric Zalewsky with the New York State Department of Environmental Conservation, who are members of the Ozone Transport Commission (OTC) workgroup to quantify and model emissions from demand–response emission sources. They have provided their initial estimate of nitrogen oxides emissions and model results in the Pennsylvania–Jersey–Maryland (PJM) Interconnection region. The workgroup continues to refine their study. I would like to recognize David Healy's efforts to obtain permission from the OTC to share these preliminary results with our readers.

I sincerely appreciate the time and effort that all of the authors put into writing these articles and sharing their perspectives on this complex technical and regulatory issue. em

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