



Smart Electric  
Power Alliance

# **Resilience & the Importance of DCFC Load Modeling**

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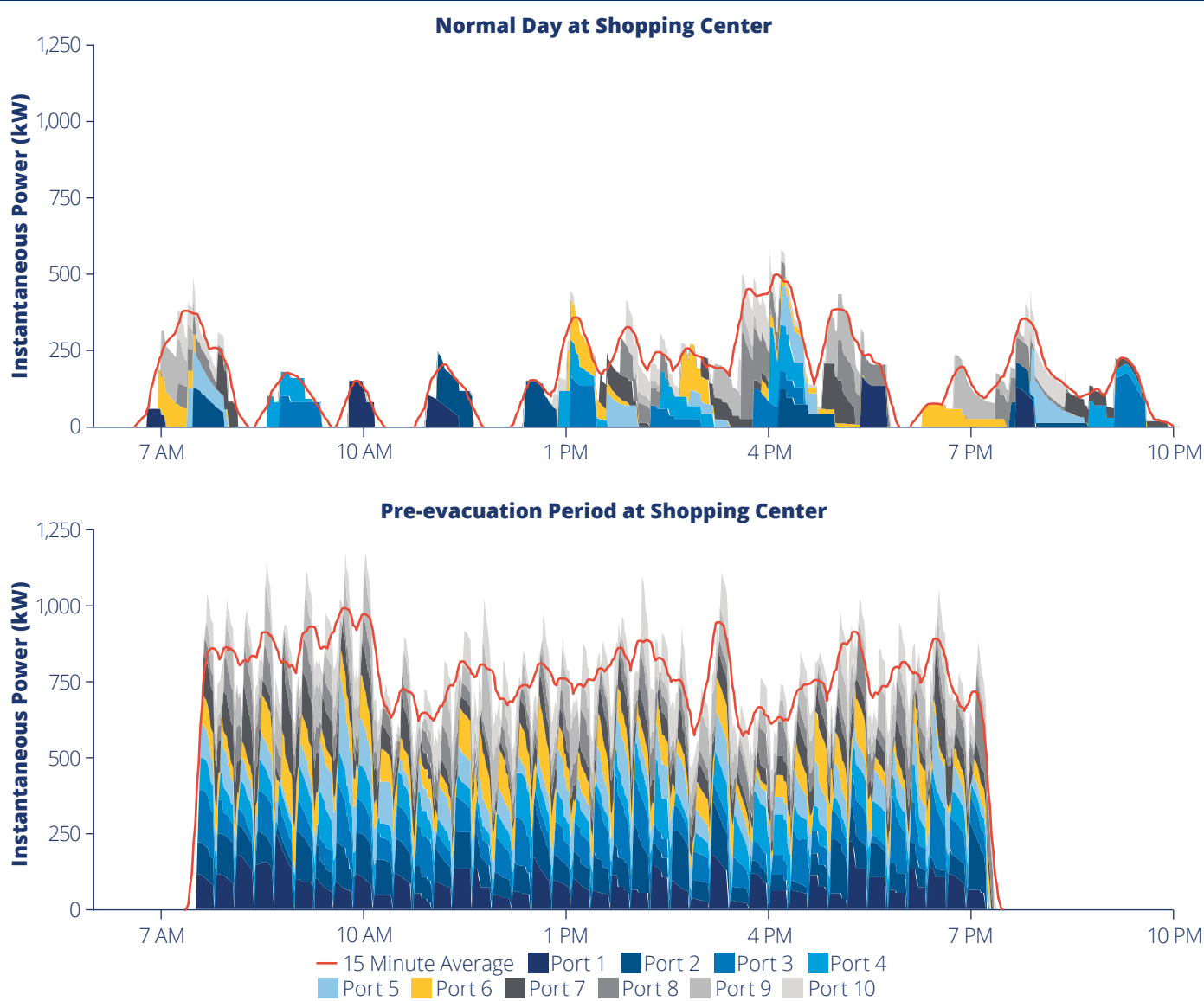
June 2023

# Resilience & the Importance of DCFC Load Modeling

U.S. utilities need to plan for hundreds of thousands of DC fast charging (DCFC) ports to meet the energy needs of over 26 million electric vehicles (EVs) by 2030. Over time, these charging ports are expected

to function similarly to traditional petroleum stations. Local governments and regulators will need to consider how to incorporate public charging into resilience and other emergency planning. SEPA's newest report

Figure 1. Effects of Pre-evacuation Events on DCFC Sites



Source: SEPA, 2023. Based on 350 kW per port capacity and current vehicle charging curves.

“Exploring DC Fast Charging Load Profiles: Implications for Utilities, Operators, and Regulators,”<sup>1</sup> identifies key takeaways that regulators and local governments should consider:

## Evacuation & Resilience Planning

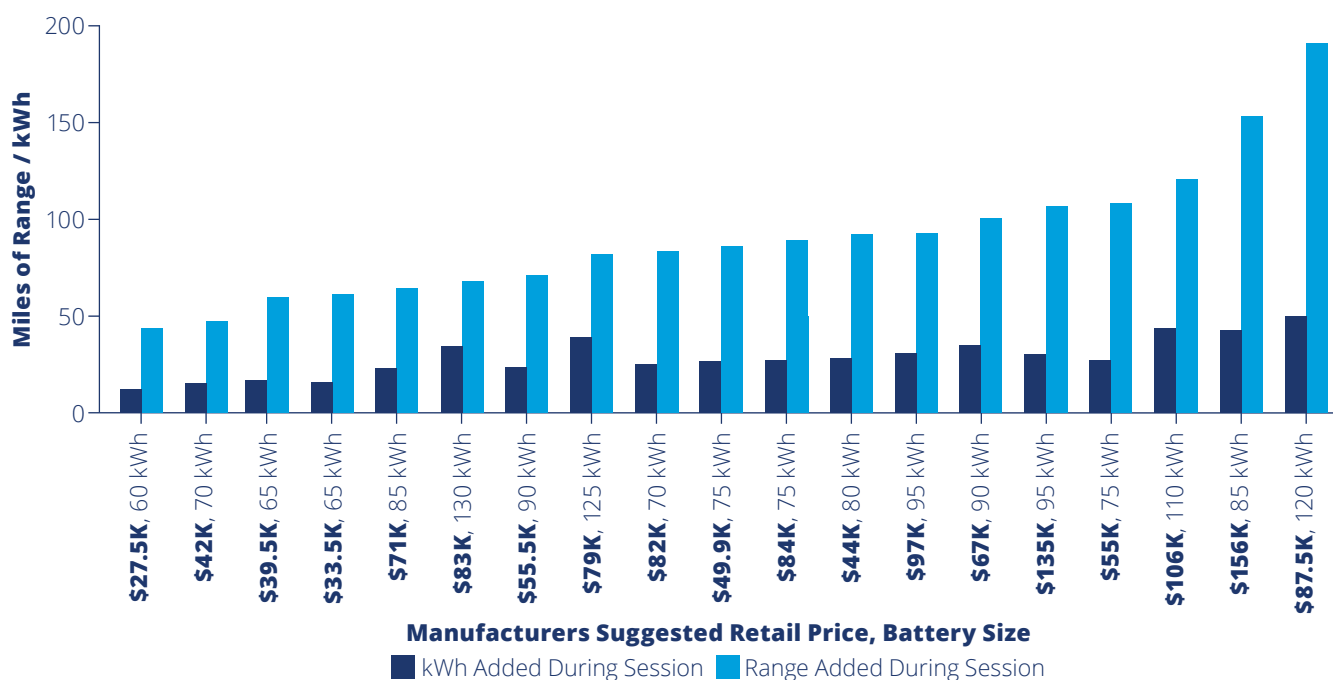
Existing and future charging stations will be used for emergency events. Planners will need to consider the impact emergency charging has on a site’s monthly peak and subsequently the site’s utility bill, the energy and power required for these charge sessions, and the impact of policies, such as limiting the time on charge sessions, on the community’s ability to respond to emergency events. Evacuation events have further implications for upstream distribution infrastructure if there are multiple DCFC plazas on the same distribution circuit or substation. During evacuations, these sites could all be experiencing higher loads than normal, which could overload and/or put pressure on the distribution system. [Figure 1](#) represents

how 400 vehicles could use an existing 10-station charging depot and change a site’s overall load profile, notably shifting the peak demand from 14% of the nameplate capacity to 32%.<sup>2</sup>

## Policy Implications

Limiting charge sessions may become an important component of emergency charging. Local governments and city officials will need to model how these policies will affect customers. In the case of limiting charging to 15-minute sessions during evacuations, there are unequal impacts on drivers ([Figure 2](#)). This creates implications for people leaving the evacuation zones, and has additional equity implications for people driving smaller, more affordable EVs that shoulder greater secondary burdens from the policy. Governments will need to effectively model and use charging characteristics to inform policy development.

**Figure 2. Impact of 15-minute Charging Sessions on Vehicle Range**



Source: SEPA, 2023. Based on 350 kW port capacity and current vehicle charging curves.

1 The full version of this report is available for free by the Coordinating Research Council (CRC).

2 These are illustrative scenarios with hypothetical load profiles and peak demand.

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