

DR18.11 ADR Capabilities of VRF Technologies Manufacturer Outreach

TECHNOLOGY

What type of technology was evaluated?

Variable refrigerant flow (VRF) systems are well suited for automated demand response (ADR) because of their variable speed inverters, inherently zone-based design, and integrated controls available from the factory.

A 2017 market characterization study of ADR capabilities of VRF technologies found that the control functions of these systems can manually carry out demand reduction strategies but are not sufficiently integrated to perform ADR. The study found that this was because many VRF manufacturers were waiting on client and utility demand for ADR features. VRF manufacturers were generally interested in utility incentive programs but were not familiar with the specific requirements in both the current Title 24 requirements and ADR program requirements.

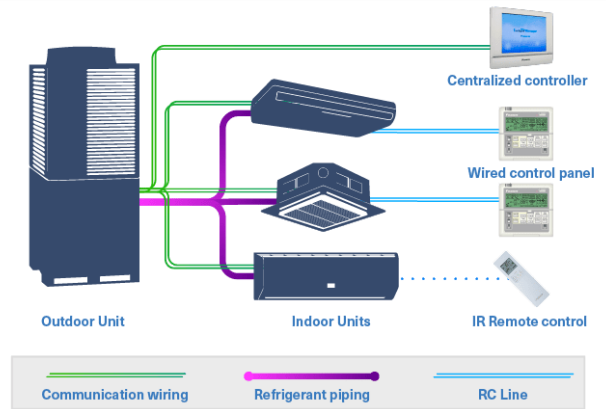


Figure 1: Diagram of VRF system structure

VRF MANUFACTURER ENGAGEMENT

How was VRF manufacturer outreach conducted?

In November 2019, Southern California Edison (SCE) hosted an in-person ADR Enablement of VRF Controls Workshop with the following goals:

- Review regulatory, policy, and program context for demand response in California and how VRF systems fit in.
- Review Title 24 and SCE ADR Program baseline requirements.
- Agree on a common set of solutions for making VRF systems ADR-capable out-of-the-box for Small and Medium Business (SMB) customers who don't have the resources to spend on custom programming.
- Provide information needed to move forward on agreed solutions.



Image 1: SCE's Energy Education Center

KEY TAKEAWAYS

What were the major findings at the VRF Workshop?

- Manufacturers need more guidance and a standard approach from utilities on OpenADR signals including when and how often signals would be set, which customers would receive these signals, and the event details contained in the signal.
- SCE offered to provide a 24-hourly day ahead pricing signal along with a load dispatch indicator (e.g. % load reduction). Manufacturers agreed that this would be sufficient data to develop optimized DR control strategies.
- Manufacturers recommended that SCE incorporate their input into DR programs as a path to fully leverage DR-enabled technologies.

NEXT STEPS

What are the next steps?

- Follow up meetings will be held between SCE and VRF manufacturers.
- SCE is developing clearer and more specific guidance on OpenADR signals in a way that allow manufacturers to push the changes within their own companies.
- SCE is exploring conducting similar outreach to other technologies such as HVAC controls more broadly, energy storage, electric vehicle charging, or smart inverters.