SCE DRET Findings
December 2012

DR12SCE2.06: DR-READY LED LIGHTING SYSTEMS WITH ADVANCED CONTROLS IN FAST FOOD RESTAURANTS

OPPORTUNITY

How do Advanced Lighting Control Systems (ALCS) react to certain demand reduction signals in a real-world setting?

The main objectives of the project were to:
• Determine whether the ALCS can be scheduled for reliable control of lighting loads as part of Manual DR test events.
• Determine whether the ALCS can be scheduled for reliable control of lighting loads as part of an Automated Demand Response (AutoDR) test events.

TECHNOLOGY

How does automated demand response in data centers work?

Four different Advanced Lighting Control Systems developed by Daintree, Enlighted, nLight and WattStopper were evaluated. Two of the sites used the same Enlighted product. The four different ALCSs used provide dimming, daylight harvesting, and demand response control of interior lighting. To achieve the project objectives, electric load monitoring was conducted for the interior lighting in each participating restaurant. Manual DR and AutoDR testing events were conducted and results analyzed to quantify the demand reduction at each restaurant.

M&V

Where did Measurement and Verification occur?

Five fast food restaurants, in the Inland Empire region in southern California, were selected to test the ALCSs and to monitor the demand reduction associated with these technologies. Two of the sites used the same Enlighted product.

Location (City – Street)	Controller Manufacturer	Site Square Feet
Corona – Magnolia Avenue	WattStopper	2,967
Rancho Cucamonga	Daintree Networks	2,251
Corona – Temescal Canyon	Enlighted, Inc.	3,111
Upland	Enlighted, Inc.	2,555
Montclair	Acuity nLight	2,651

Table 1: Summary of Lighting Control Products by Location

RESULTS

How did the DR-Capable refrigerator perform under High and Critical price events in M&V?

MANUAL DR TEST RESULTS

The average demand reduction for the five restaurants was 0.12 W/sf at the 30% DR level.

All controllers were able to reliably reduce lighting loads by means of a manually initiated test.

AutoDR TEST RESULTS

The WattStopper and Daintree products showed very similar demand reductions. For both products, a 30% level AutoDR event sheds almost 0.09 W/sf.

The only two systems that responded to the AutoDR testing were the WattStopper (Corona – Magnolia Avenue) and the Daintree Networks (Rancho Cucamonga).

NEXT STEPS

What additional development is needed prior to deploying ACLSs?

DEMAND REDUCTIONS ARE POSSIBLE

The results of the field evaluation show that demand reductions can be achieved by dimming lighting in response to a DR request and is a viable option during a DR event. However, as with some new technologies, there are compatibility issues that need to be addressed during specification of equipment prior to installation.

ADDITIONAL RESEARCH STILL NEED NEEDED

While demand reduction was successful, it was only successful in two of the ALCSs. Further studies should be conducted to determine whether it is possible for all five of these ALCSs to reliably provide AutoDR strategies. Additionally, future studies should include the customer/employee response during the DR events and to the new systems in general.