

DR12.17: Field Testing of Climate Appropriate Air Conditioning Systems

Opportunity

What have previous studies demonstrated about the potential for climate appropriate air conditioning systems?

30% Load Shed Potential

Field test results demonstrate that variable capacity¹ rooftop unit (VC-RTU) systems achieve superior high-energy efficacy at full and part load conditions. The load shed potential is for peak load conditions vs. a minimum standard unit during a demand response curtailment scenario.

Technology

How do variable capacity air conditioning systems work?

Variable capacity equipment can modulate cooling or heating output at infinite levels within rated capacity to meet real-time load conditions.



M&V

Where did Measurement and Verification occur?

The VC-RTU system was installed and commissioned during August and September 2014. Additional adjustments to the thermostat were made past the commissioning date (by the occupants, as thermostat was not locked). The monitored data for year 2015 was used in this analysis. Data from 2014 was not analyzed as data was skewed during the commissioning process.

Results

How did variable capacity air conditioning systems perform in M&V?

~30% less electricity

used at peak vs a minimum standard unit at the same conditions.

Efficiency

Field tests indicate exceptional part-load efficiency, averaging 17.5 EER for operation below 50% capacity.

Deployment

Where does M&V recommend deploying VC-RTU's?

EDUCATION

The research team recommends that any efforts to advance market adoption of this product type should be accompanied by strong education components, such as facilitating proper setup and commissioning.

¹Field Testing of Climate Appropriate Air Conditioning Systems, Emerging Products, December 2017, p.45

