

The Western Cooling Challenge

Partnering to develop and market new rooftop cooling units optimized for dry climates

Western Cooling Challenge
6/05/08

University of California, Davis
WCEC
WESTERN COOLING
EFFICIENCY CENTER

RESEARCH • INNOVATION • PARTNERSHIP



Electricity Demand: Cooling is the Culprit

- California peak demand is 35% higher in July than in January
- Cooling loads cause electricity peaks
- It's time to consider cooling peak reducers as the best new peaking plants
- Long-term incentives based on “peak value” spur investment in advanced cooling technologies

Overall WCEC Goals

- By 2030, reduce cooling demand and energy use in the Western States (RE: 2007 baseline):
 - New buildings-
 - peak demand 100%
 - energy use 50%
 - Existing buildings:
 - peak demand 50%
 - energy use 25%

Why Focus First on Rooftop Units?

- Rooftop Units (RTUs) cool 70% of non-residential floor space in the Western US
- Current RTUs are not optimized for dry climates
- RTU improvements can quickly affect significant capacity in both new and retrofit applications

Dry-Climate RTU Opportunities:

- Reduce over-dehumidification
- Reduce blowers sized for peak cooling
- Apply direct evaporative cooling to condensers and indirect evaporative cooling to ventilation air
- Utilize heat recovery from exhaust air (the “regenerative braking” of HVAC!)
- Improve economizers



Why the Challenge?

- Emphasize the cooling opportunities in dry climates
- Create publicity that conveys the needs and potential
- Encourage development of new RTU concepts
- Bring focus on removing the “water adversity” barrier that limits efficiencies in packaged cooling equipment
- Create a partnership that achieves success by implementing a comprehensive campaign

Performance Targets at 120 cfm/ton Outdoor Air

- Nominal capacity range, tons: 3 – 30
- Sensible EER (w/all parasitics):
 - At 105db/73wb: 14.0
 - at 90db/64wb: 17.0
- CFM/ton at 0.7" external static 350
- Max gal/ton water use/hr at 90/64: 4
(with 200 ppm hardness mineral content)

The WCCC

(Western Cooling Challenge Committee)

- Committee members from 4 Utilities, SWEEP, NBI, NEEA, NRDC, ACEEE, CEC, CPUC, DOE, WCEC
- Committee works confidentially with stakeholders to resolve technical issues and support technical development
- Committee arranges and evaluates lab and field testing using qualified, impartial technical experts
- Committee approves all press releases and other public documents about the project

Anticipated Reward Structure

Rewards for participating manufacturers include:

- Independent lab and field test verification
- Purchases through major retailers
- Anticipated GHG credits (path to be determined)
- Anticipated extra credits for LEED projects
- Partnership support on maintenance, code and other implementation issues
- Utility Incentive Support (MOUs from three major utilities already in hand)

Efficiency Assessment

- Tests to be approved by the WCCC
- Based on measurements at defined conditions monitored by the WCCC
- WCEC will support development of simulations that accurately estimate performance by application and climate (Not required for Challenge evaluation)

Challenge Schedule

- Announced 6/05/08 - interested parties submit comments/questions to WCEC website by 7/5/08
- WCEC hosts Webcast to cover responses to questions on 7/18/08
- Manufacturers submit letters of intent by 8/15/08
- Lab testing can begin by January 2009
- Demonstrated Field testing can begin by June 2009
- Product delivery can begin by January 2010

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