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PG&E presentation

Commercial and industrial fans and blowers presentation for staff workshop in response the the staff report and analysis.

Additional submitted attachment is included below.

Commercial & Industrial Fans and Blowers

CEC Staff Workshop

July 11, 2018

Developed by Energy Solutions
on behalf of the California IOUs

July 11, 2018

Pacific Gas and Electric Company®

SDGE
A Sempra Energy utility®

SOUTHERN CALIFORNIA EDISON®
An EDISON INTERNATIONAL® Company

IOU Involvement in C&I Fans and Blowers

2011 – U.S. DOE issues Request for Information

2012 – IOUs participate in Efficiency Advocate/AMCA private negotiations

2015 – IOUs participate in U.S. DOE ASRAC negotiations

2016 – IOUs comment to U.S. DOE on NODA III

2017 – CA IOUs responded to CEC ITP and signed on to Joint Advocate/AMCA stand-alone fans proposal and Joint Advocate embedded fans proposal.

2018 – AMCA 208-18 finalized, IOUs continue conversations with efficiency advocates and fan industry, work on updating key data inputs to assist CEC

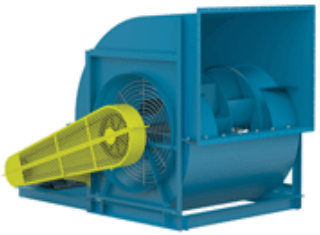
IOUs Broadly Support CEC Staff Proposal

IOUs broadly support the CEC staff proposal and believe the proposed standards are cost-effective, achievable, and will lead to significant savings statewide (~1,800 GWh).

All benefit-to-cost ratios are 3:1 or greater.

CEC staff report covers stand-alone and embedded fans (with exceptions as outlined in U.S. DOE ASRAC Term Sheet), test procedure based on AMCA 208-18, 1.0 FEI as the standard level.

IOUs supported standards for stand-alone and embedded fans in September 2017 proposals.



Source: http://www.tcf.com/products/centrifugal-fans

Source: http://www.trane.com/commercial/north-america/us/en/products-systems/equipment/chillers/air-cooled-chillers.html

IOUs Support the Inclusion of Embedded Fans

Many fans sold as “stand-alone” fans end up in embedded in other equipment. IOUs support inclusion of “embedded” fans as CEC Staff has proposed which will:

- Level playing field for fans in OEM equipment
  - Fans would be treated the same whether purchased as stand-alone fan (in testable configuration) or manufactured in-house by OEM manufacturer
- Make the fan standard more enforceable
  - Exempting embedded fans could lead to loopholes
- Capture additional energy savings for CA
  - Embedded fan energy savings are very significant statewide

IOU Recommendations for Fan Shipments

IOU team reviewed various feedback from stakeholders in response to CEC invitation for proposals and plan to docket updated shipment information to provide more accurate estimate of impact in CA

- Rooftop unit shipments
  - CA Title 24 requires economizers; impacts on prevalence of return/exhaust fans
- Revised air handler unit shipments
- Revised air-cooled chiller fan shipments
- Add new shipments of embedded fans not in NODA III:
  - Dedicated Outdoor Air Supply fans (DOAS)
  - Fan Coil Units (FCUs)
  - Heat/ Energy Recovery Ventilators fans (HRV/ERV)

IOU Proposed Updates to Fan Unit Energy Consumption (UECs)

Updated UECs reflect the proposed changes in the representative sample of shipments and slight changes to reflect AMCA 208.

Product Class	Average Per-Unit Electricity Use for Non-Qualifying Scenario (kWh/yr)	Average Per-Unit Electricity Use for Qualifying Scenario (kWh/yr)	Average Per-Unit Electricity Savings (kWh/yr)
Axial Cylindrical Housed	40,115	39,299	816
Panel Fans	6,081	5,766	314
Centrifugal Housed	21,341	21,031	310
Centrifugal Unhoused	27,382	27,310	72
In-line Mixed	16,669	15,369	1,300
Radial	46,117	44,655	1,462
Power Roof Ventilator	9,023	7,864	1,160
Shipment Weighted Average	17,580	17,156	424

Note: Separated embedded and stand-alone UEC values will be included in IOU written comments

IOU Proposed Updates to Fan Incremental Measure Costs (IMCs)

Updated installed IMCs reflect the proposed changes in the representative sample of shipments and slight changes to reflect the finalized AMCA 208.

Product Class	Average Per-Unit Installed Cost for Non-Qualifying Scenario ($/unit)	Average Per-Unit Installed Cost for Qualifying Scenario ($/unit)	Average Per-Unit Incremental Installed Cost ($/unit)
Axial Cylindrical Housed	$6,488.07	$6,835.34	$347.27
Panel Fans	$1,749.05	$1,803.91	$54.86
Centrifugal Housed	$2,263.01	$2,385.12	$122.11
Centrifugal Unhoused	$3,307.27	$3,349.28	$42.01
In-line Mixed	$3,572.87	$4,263.06	$690.19
Radial	$1,931.19	$2,150.47	$219.28
Power Roof Ventilator	$3,223.04	$3,817.27	$594.23
Shipment Weighted Average	$2,487.01	$2,634.175	$147.16

Note: Separate embedded and stand-alone IMC values will be included in IOU written comments

Other Recommendations to Improve Staff Report

IOU are still reviewing staff report and will work with other stakeholders to develop improvements to staff report.

- Suggested improvements may include, but are not limited to:
  - Labeling
  - Reporting

Table 6-3: Additional MAEDbS Reporting Fields

Static or Total Pressure (in. wg)	Min Air Flow (CFM)	Max Air Flow (CFM)	Air Density (lbm/ft^3)	Min FEP Actual (kW)	Max FEP Actual (kW)	Min Fan Shaft Power (HP or N/A)	Max Fan Shaft Power (HP or N/A)	Min FEP_{ref} (kW)	Max FEP_{ref} (kW)	Min FEI	Max FEI
0	7,500	12,500				1.65	3.86	1.23	2.88	1.67	1.18
1	7,500	17,500				3.07	10.7	2.29	7.98	1.54	1.01
2	7,500	20,000				4.6	17.22	3.43	12.85	1.46	1.02
3	7,500	20,000				6.18	20.48	4.61	15.28	1.40	1.11
4	10,000	20,000				10.23	23.86	7.63	17.80	1.38	1.17
5	10,000	20,000				12.29	27.34	9.17	20.40	1.36	1.21

Source: Energy Commission staff

In Summary

IOUs commend CEC on a strong and thorough staff report that will lead to significant energy savings statewide.

IOUs support the current CEC scope of coverage including stand-alone and embedded fans.

IOUs plan to docket updated data and information that will assist CEC is developing a more accurate estimate of impact on CA.

IOUs will continue to engage with stakeholders and work to develop recommendations for improvement.