MEMORANDUM

TO: Kelly Cunningham, PG&E

FROM: Neil Bulger, A2 Efficiency (Neil@a2efficiency.com)

DATE: June 5. 2026

RE: Scoping Proposal Air-Cooled Chiller Performance Curves: Space Conditioning, Data Center, and Process Cooling Applications

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Background

CBECC models chiller performance using biquadratic and quadratic curve sets that define how a chiller's capacity and energy input ratio vary with operating conditions and part load. For air-cooled chillers, these curve sets were developed from older equipment data and do not reflect current product generations, particularly inverter-driven screw chillers and the emerging class of magnetic bearing air-cooled centrifugal. The result is a measurable gap between what the curves predict and what modern equipment actually delivers at part load.

Problem

This expansion, combined with the broader role air-cooled chillers already play in space conditioning for commercial buildings, means the equipment class now spans a wide range of applications and operating profiles in CBECC. One example of near term needs is the the 2028 Title 24 cycle, potentially introducing new baseline systems for data centers and process cooling spaces, including Systems 11a, 11b, and 11c, that rely on air-cooled chiller plants as a primary compliance pathway.

Currently, CBECC has only a single curve set for air-cooled chillers representing one compressor type at one configuration. There is no curve set for multi-compressor or staged configurations, and no curve set at all for magnetic bearing air-cooled centrifugal. This gap affects standard commercial cooling submittals today and will directly undermine the new data center and process cooling baselines when the 2028 code takes effect.

Proposed Change

This project would develop updated and expanded air-cooled chiller curve sets for CBECC covering the full range of applications where the technology is used: space conditioning, data centers, and process cooling. This includes updated curve sets for air-cooled screw and scroll chillers reflecting current inverter-driven product performance, new curve sets representing multi-compressor staged configurations typical of larger commercial and process plants, and a first-ever CBECC curve set for magnetic bearing air-cooled centrifugal. On the standard design side, the project would coordinate with the CEC to ensure the new baseline systems introduced in the 2028 cycle are supported by curve sets that correctly represent the equipment assumed in those baselines.

Estimated Impact

Analysis of the current gap shows that at a code-minimum full-load EER input, CBECC curves predict an IPLV/EER ratio of approximately 1.43 for air-cooled screw chillers against a prescriptive requirement of 1.66, a 16% understatement of part-load efficiency. For the data center and process cooling market, where air-cooled chiller plants are increasingly the dominant

configuration and where part-load performance drives most of the annual energy story, this error is material. The 2028 baselines will be wrong from day one unless the underlying curves are updated.

Request

We are requesting IOU review and, if supported, elevation to the CEC for funding consideration in connection with the 2028 code cycle. If this is of interest, we would propose a budget, scope, and timeline for your consideration.