

Memorandum



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To: Chan U Paek, SoCalGas

CC: Henry Liu, PG&E; Ed Reynoso, SDG&E; Cassie Cuaresma, SCE

From: Peter Biermayer - Utilities Engineer, Industrial/ Agricultural Programs and Portfolio Forecasting Section, Energy Efficiency Branch, Energy Division, CPUC

Subject: Non-standard Disposition for the commercial electric and gas fryer workpaper SWFS011-01

1. Summary

Provided here is notification to all Program Administrators (PAs) that a statewide workpaper SWFS011-01 for commercial food services electric and gas fryers requires revisions with resubmission by October 1, 2019 to facilitate the disposition review and approval cycle for 2020 implementation.

2. Background

A fryer is an appliance, including a cooking vessel, in which oils are placed to such a depth that the cooking food is essentially supported by displacement of the cooking fluid rather than by the bottom of the vessel. Heat is delivered to the cooking fluid by means of an immersed electric element or band-wrapped vessel (electric fryers), or by heat transfer from gas burners through either the walls of the fryer or through tubes passing through the cooking fluid (gas fryers).

Two fryer attributes – width and energy-input rating – suggest the approximate amount of food a fryer can prepare within a given period, which is one of the most important factors in choosing the proper fryer for a kitchen. Large vat fryers have fry pots ranging from 18 x 14 inches to 34 x 34 inches; the most common is the 18 x 18-inch size. Large vat fryers are becoming more common in restaurants as they replace smaller (14 inch) fryers to increase production capability while maximizing the available space in the kitchen.

Energy-efficient commercial fryers reduce energy consumption primarily through advanced burner and heat exchanger design, advanced controls, and insulation. ENERGY STAR®-rated fryer models enable the

differentiation between high-efficiency and standard-efficiency models. ENERGY STAR-qualified fryers offer shorter cook times and higher production rates, and frypot insulation reduces standby losses resulting in a lower idle energy rate.

This measure specification follows the American Society for Testing and Materials (ASTM) Standard Test Method for the Performance of Open Deep Fat Fryers (F1361) and the ASTM Standard Test Method for the Performance of Large Vat Fryers (F2144) for calculation of energy use and demand, based on testing in an approved and qualified laboratory.

A 30% adjustment factor is currently applied to this measure, based on Decision 11-07-030, and comments in Attachment A, which stated “Energy Division believes that operating hours, food production rates and baseline efficiencies contribute to overly optimistic UES calculations and recommend a 30% reduction in UES values.”

3. Critical Review Issues

Additional information and analysis are required to support the Ex Ante savings values in the statewide workpaper. The critical issues are:

- Accuracy of participant operating characteristics
- Industry standard practice baseline of fryer equipment
- Equipment performance baseline and eligibility requirements
- Consistency of calculations

3.1. Determine accurate participant operating characteristics

Decision 11-07-030 identified uncertainty in the operating hours and production rates of food used in calculating savings for this measure. Operating hours and product throughput, measured in pounds of food cooker per day, will vary widely between a high school and a high-volume fast food chain. The current workpaper assumes an average operating hours and production rates for all fryers based on FSTC databases and “professional judgement” that are not necessarily representative of the participant population.

Improved accuracy requires acquiring participant primary data through telephone surveys of a statistical sample of participants. The sample size should be adequate to attain 90/10 precision for each population segment of interest. The PAs may choose to use a single average value or may choose to define multiple segments (i.e. schools, high-volume fast foods), where each segment sample meets a similar precision target. The surveys should be designed to capture the fryer annual production and operating profile.

3.2. Determine Industry Standard Practice Baseline

Decision 11-07-030 identified uncertainty in the average efficiency of the normal replacement or new construction baseline. The current workpaper identifies the baseline as the average nominal efficiency of a sample of economy-grade fryers based on Food Service and Technology Center’s (FSTC)¹ proprietary

¹ <https://fishnick.com/about/overview/> The FSTC has developed over 40 Standard Test Methods for evaluating commercial kitchen appliance and system performance. It is operated by Frontier Energy and funded by PG&E.

database. This baseline does not necessarily reflect standard purchasing practices which may include higher efficiency equipment as well as refurbished used equipment.

An industry standard practice study which consists of research elements² that entail measure prevalence, purchase requirements, alternative measures, applicable codes and standards, subject matter expert interviews and discussions with the CPUC, Program Administrator and Implementer, third party implementers, EM&V, evaluators, etc., should be adequate to define the mix of equipment constituting the baseline.

3.3. Equipment performance baseline and eligibility requirements

The fryer measure is supported by laboratory testing data contributed by the Food Service and Technology Center (FSTC) and the Food Service Equipment Center (FSEC)³. This data source consists largely of program qualified units with limited testing data for baseline units. The workpaper SWFS011-01 source for key baseline characteristics is a proprietary database and data drawn from a sample of economy-grade equipment tested by the Food Service and Technology Center (FSTC). These data appeared to be obtained from the Commercial Cooking Appliance Technology Assessment in 2002.

There is a need to evaluate the appropriateness of this legacy data source using a more recent set of data. The update process steps should include:

- Assemble all available testing data from the FSTC and FSEC both 2002 (the source for this workpaper) and the most recently available data. Combined the data into a comprehensive database including useful parameters characterizing the ovens, including: fryer type (standard versus large fryers⁴) and configuration, cooking efficiency, gas versus electric, idle energy rate, preheat energy, cooking time per batch, production capacity, date of testing, vat size, oil weight, and so forth. Compile the data in a spreadsheet to support analysis.

For each category summarize the sample size, minimum, maximum, median, average, and examine each sample for trends, and clusters or patterns.

Summarize the findings addressing Gas Fryers characteristics in a memo and submit with the revised workpaper including all the underlying data and analysis findings for inspection by reviewers.

- Assemble and review secondary sources that can contribute to knowledge surrounding the performance and the differential between program and base case equipment. The secondary resource shall include, but are not limited to:
 - SCG/Lincus field study
 - California Energy Commission studies
 - Energy Star sources

² <http://www.cpuc.ca.gov/WorkArea/DownloadAsset.aspx?id=5315>

³ <https://www.socalgas.com/for-your-business/education-and-training/food-service-equipment-center> The FSEC is a test kitchen operated by SCG.

⁴ Currently all fryer claims reflect a standard 14" vat, but larger units are also eligible, and it might be possible to separately support calculations/tracking/claims by size category.

These resources and findings and conclusions should be summarized in a second memo that addresses any contradiction between testing-based findings/calculations noted above, and these other secondary sources.

- Reformulate baseline efficiencies and eligibility requirements

After gathering the primary and secondary data, the baseline efficiencies and eligibility requirements should be reformulated to:

- Identify any substantive distinctions in fryers as a function by configuration following with consistent savings calculations and/or equipment eligibility.
- Use the results of the ISP research to select the mix of products constituting the standard practice baseline and any further market segmentation (for example, by building type)
- Revise eligibility efficiency thresholds consistent with program objectives.
- Revise implementation application data collection process as necessary to support measure configuration
- Documentation of data sources in support of baseline fryer characteristics/performance.

The findings and conclusions should be summarized in a third memo that addresses the final values and rationale for the baseline and eligible measure requirements.

3.4. Alignment with Energy Star

For standard gas fryers Energy Star states that EE units are 30% more efficient than baseline units, while the workpaper says the EE units are 22% more efficient than the baseline units. There is also a reported differential of energy use per day of 241,000 versus 454,000 Btu/day in the workpaper. It is unclear what the source of the differential energy use is.

3.5. Ex Post Impact Evaluation

A PY2017 impact evaluation is underway that includes a gross impact assessment of gas fryers. Study results will be available in Q2 2019, and it is anticipated that evaluation results will identify areas for improvement to workpaper methods and savings claims. The evaluation data sources include telephone/field/metering data for a sample of program projects, along with baseline equipment monitoring and data collection where feasible.

4. Direction

Based on the critical review items, the IOUs are directed to conduct the indicated research, revise the workpaper, and resubmit for 2020 implementation. In order to ensure timely completion of the workpaper, the IOUs shall formulate and submit a workpaper workplan by January 31, 2019 with a schedule that results in time for an October 1, 2019 revised workpaper submission. The workplan will identify mutually agreed upon interim delivery dates for each work product so that these can be reviewed as the work is completed. The workplan should also include a stakeholder communications plan.

4.1. Conduct a Survey of Past Participants to Determine Key Operating Parameters

The PAs are directed to initiate and complete a study to determine key participant operating parameters consistent with the research outlined in Section 3. The PAs should coordinate the survey with the Ex Post Team's survey activities. The PAs shall offer the Ex Ante WP Team an opportunity to review interim work products including the study a scope of work, sample plan, survey instruments, and other pertinent details on proposed research activities.

4.2. Conduct ISP research

The PAs are directed to initiate and complete a study to determine industry standard practice for fryers with the research outlined in Section 3. The PAs shall offer the Ex Ante WP Team an opportunity to review interim work products including the study a scope of work, sample plan, survey instruments, and other pertinent details on proposed research activities.

4.3. Revise Baseline and Eligibility Requirements

The IOUs are directed to revise the baseline and eligibility requirements for fryers consistent with the findings and conclusions of the research outlined in Section 3.

The final workpaper submission should incorporate the data, findings, and conclusions from the memos and complete sets of source data as described in Section 3 of this disposition.

4.4. Resolve Inconsistencies in Calculations

The PAs are directed to review and revise the parameters used in calculations for the baseline and eligible equipment and to realign qualification standards with EnergyStar efficiency and idle rate specifications.

The PAs are also directed to document the workpaper assumptions and inputs in the workpaper or support calculation spreadsheets.

4.5. Use evaluation results from PY2017 impact evaluation of gas fryers.

During Q2 2019 all findings and recommendations related to savings calculations should be addressed/incorporated as part of the workpaper stage 2 update process.

4.6. Stakeholder communication strategy

The PAs shall propose a communication strategy for their stakeholders. This strategy should be comprehensive to ensure all information is timely and easily accessible. Lack of communication or delayed communication can have unintended market impacts that should be avoided.