SoCalGas Comments on Proposed Rule for Energy Conservation Standards for Commercial Packaged Boilers

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Background

The Department of Energy has proposed a new rule for Energy Conservation Standards for Commercial Packaged Boilers on 3/24/2016[1].

The signatory of this letter, SoCalGas, represents one of the largest natural gas utility companies in the Western United States. As the nation's largest natural gas distribution utility, we deliver clean, safe and reliable energy to 21.6 million consumers through 5.9 million meters in more than 500 communities. Our service territory encompasses approximately 20,000 square miles in diverse terrain throughout Central and Southern California, from Visalia to the Mexican border[2].

As an energy company, we understand the potential of appliance efficiency standards to cut costs and reduce consumption while maintaining or increasing consumer utility of the products. We have a responsibility to our customers to advocate for standards that accurately reflect and do justice to the circumstances of our service areas, so as to maximize these positive effects.

SoCalGas appreciates this opportunity to make the following recommendations about the aforementioned proposed rule.

1. SoCalGas is concerned about selection of TSL 2 in light of unknown impact of updated Test Procedure, and in light of undue burden to California customers

SoCalGas is supportive of changes to efficiency standards that reduce energy consumption and benefit consumers. However, SoCalGas recommends the adoption of Trial Standard Level (TSL) 1 for this rule instead of TSL 2.

Firstly, we are concerned that by selecting TSL 2, DOE may be inadvertently disqualifying a significant amount of non-condensing equipment, and in some cases may be forcing a shift to condensing equipment, due to upcoming changes to the commercial packaged boiler test procedure.

SoCalGas and the other California IOUs are of the opinion that the new test procedure may have an impact on efficiency ratings, and that the DOE's contention of no impact has not been fully demonstrated[3].

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[1] https://www.regulations.gov/document?D=EERE-2013-BT-STD-0030-0043

[2] https://www.socalgas.com/about-us/company-profile

[3] Notably, due to thermodynamic heat transfer principles, we expect the changes to the inlet water temperature for non-condensing boilers to result in slightly reduced thermal efficiency ratings. See also our comments at https://www.regulations.gov/contentStreamer?documentId=EERE-2014-BT-TP-0006-0048&attachmentNumber=1&disposition=attachment&contentType=pdf.

In the event that the test procedure updates will result in a rating decrease, even at the smallest possible level of 1%, the new standard would then effectively require small and medium sized gas boilers to be 86% efficient. Yet, the DOE's own analysis has shown that there is very little non-condensing equipment available at the 86% level, and that the 86% level is too assertive for this rule; hence the DOE's proposed selection of TSL 2 at 85% for small and medium gas fired boilers. Please also reference the figures shown below, cited from DOE's Technical Support Document for this rulemaking[4].

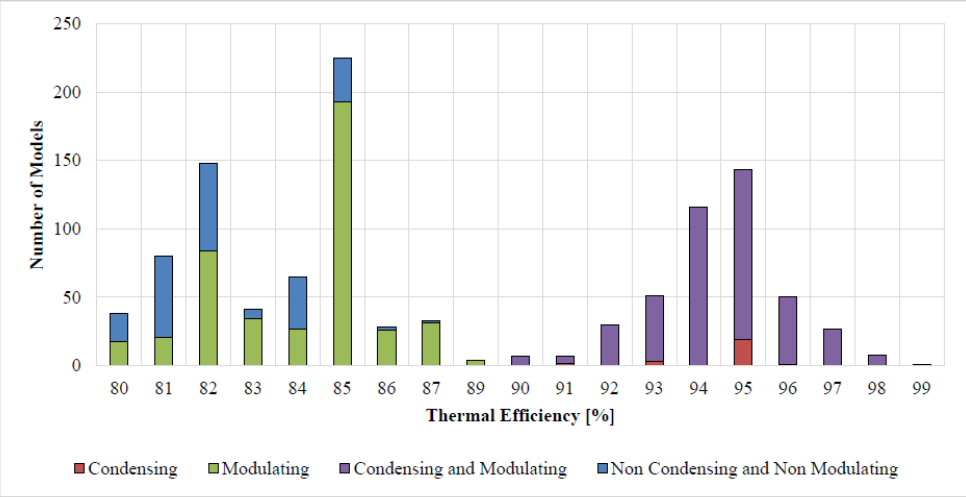

Figure 3.2.4 Distribution of Small Gas-Fired Hot Water Commercial Packaged Boilers Based On Thermal Efficiency

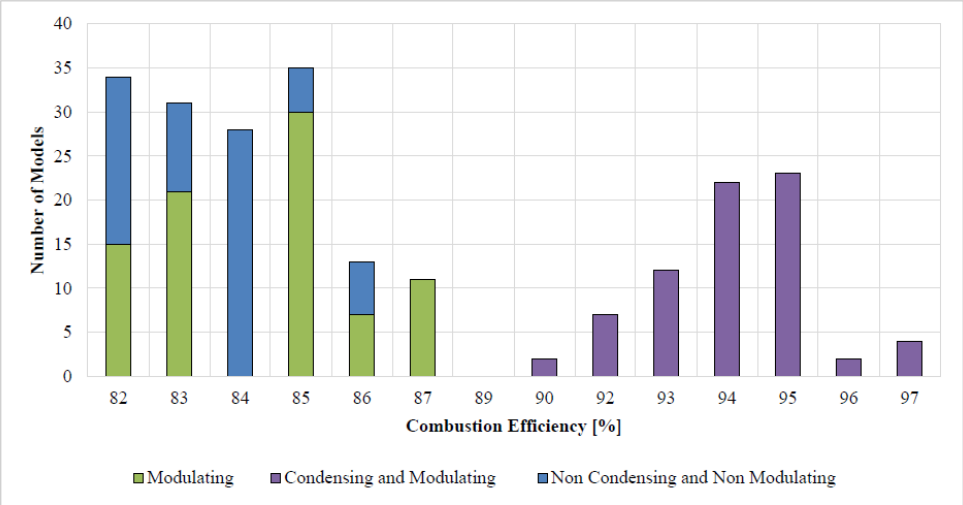

Figure 3.2.9 Distribution of Large Gas-Fired Hot Water Commercial Packaged Boilers Based On Combustion Efficiency

[4] https://www.regulations.gov/#!documentDetail;D=EERE-2013-BT-STD-0030-0044

As researched by the DOE[5], TSL 1 would yield a significant energy savings of 0.255 quadrillion Btu (quads) over a 30-year period. TSL 1 would result in significant economic benefits to consumers, ranging between $0.269 billion (at a 7% discount rate) to $1.09 billion (at a 3% discount rate). TSL 1 would also yield significant environmental benefits, and result in the reduction of 15 million metric tons of CO_2, 103 thousand tons of NO_X, and 151 thousand tons of CH_4 over the analysis period (also per TSD).

The TSL 1 figures may in fact turn out to be conservative, if the test procedure results in losses to efficiency ratings. In that case the effective benefits of a new standard at the TSL 1 level would be closer to the benefits estimated by DOE for TSL 2, due to the TSL 1 with "new ratings" being comparable to TSL 2 with "old ratings".

Secondly, we are concerned that the proposed ruling places an undue burden on California customers in particular. We have taken the liberty to modify the LCC analysis for two California scenarios. One scenario includes buildings from ASHRAE Climate Regions San Francisco and Los Angeles. Another scenario includes only the latter. The first scenario represents most of the population of California, with some sparsely populated mountainous and hot desert regions excluded. The second scenario is a good representation of SoCalGas' territory. Residential buildings are ignored for lack of sufficient building data. Only the most relevant technologies for California, small and large gas-fired hot water boilers (SGHW and LGHW, respectively), are analyzed. The results show negative LCC savings for LGHW in both ASHRAE Climate Region approaches for all TSL levels. The effect is more pronounced in Southern California (Los Angeles climate region), as can be expected due to the warmer climate. These results represent a potentially significant burden to California and in particular to SoCalGas customers. Please see the tables below for details. Table 1 shows the unmodified LCC results for gas-fired hot water boilers (residential and commercial). Table 2 and Table 3 show the two California scenarios.

We recognize the LCC spreadsheet has not been designed to allow for user-based filtering by climate zone or region, and the scientific validity of our filtering method and of the above results are therefore difficult to demonstrate with reasonable effort. To ensure the best possible result, we have performed the same 10,000 simulations that are recommended for the federal default analysis, and have not made any modifications to other parts of the spreadsheet. We are confident that the approach clearly identifies a significant issue, even if the results shown may have slightly higher uncertainty and variability than the default federal results.

In sum, SoCalGas feels the adoption of TSL 1 is a reasonable request that minimizes the uncertainties and risks associated with the introduction of the new test procedure, and the risk of negative economic impact to California customers.

[5] TSD sections 10.7.4, 10.7.6, and 10.7.8.

Average LCC Results											
PC Code	Description	Installed Price	Incremental Installed Cost	Lifetime Oper. Cost*	First Year Oper. Cost	LCC	LCC Savings	Net Cost	No Impact	Net Benefit	Simple Payback
SGHW	80% TE - Baseline	$25,571	$0	$218,155	$12,551	$243,727	NA	0%	100%	0%	NA
SGHW	81% TE	$26,427	$856	$215,863	$12,420	$242,290	$106	2%	92%	6%	6.5
SGHW	82% TE	$27,350	$1,779	$213,627	$12,292	$240,977	$318	4%	84%	13%	6.9
SGHW	84% TE	$30,302	$4,731	$209,326	$12,046	$239,627	$223	20%	67%	13%	9.4
SGHW	85% TE	$31,573	$6,002	$207,252	$11,927	$238,826	$521	23%	58%	19%	9.6
SGHW	93% TE	$40,896	$15,325	$202,027	$11,587	$242,924	-$2,031	46%	40%	14%	15.9
SGHW	95% TE	$41,637	$16,066	$198,263	$11,371	$239,901	$302	42%	22%	36%	13.6
SGHW	99% TE - Max Tech	$47,145	$21,574	$191,355	$10,969	$238,500	$1,656	56%	2%	42%	13.6
LGHW	82% CE - Baseline	$94,053	$0	$842,932	$49,620	$936,985	NA	0%	100%	0%	NA
LGHW	83% CE	$99,700	$5,647	$832,857	$49,025	$932,556	$924	10%	76%	14%	9.5
LGHW	84% CE	$106,020	$11,967	$823,055	$48,445	$929,074	$2,419	21%	53%	26%	10.2
LGHW	85% CE	$113,093	$19,040	$813,516	$47,881	$926,609	$3,647	27%	46%	27%	11.0
LGHW	94% CE	$169,571	$75,518	$779,745	$45,655	$949,315	-$13,074	57%	28%	15%	19.0
LGHW	97% CE - Max Tech	$178,725	$84,672	$755,202	$44,197	$933,927	$2,062	56%	2%	42%	15.6

TABLE 1 UNMODIFIED LCC

Average LCC Results											
PC Code	Description	Installed Price	Incremental Installed Cost	Lifetime Oper. Cost*	First Year Oper. Cost	LCC	LCC Savings	Net Cost	No Impact	Net Benefit	Simple Payback
SGHW	80% TE - Baseline	$26,012	$0	$162,504	$10,281	$188,515	NA	0%	100%	0%	NA
SGHW	81% TE	$26,862	$850	$160,642	$10,165	$187,503	$80	2%	92%	6%	7.3
SGHW	82% TE	$27,778	$1,767	$158,827	$10,052	$186,606	$241	5%	84%	12%	7.7
SGHW	84% TE	$30,709	$4,697	$155,337	$9,834	$186,045	-$101	23%	67%	11%	10.5
SGHW	85% TE	$31,971	$5,959	$153,655	$9,729	$185,625	$46	26%	58%	15%	10.8
SGHW	93% TE	$41,179	$15,167	$142,819	$9,032	$183,998	$874	36%	40%	24%	12.1
SGHW	95% TE	$41,914	$15,902	$139,999	$8,856	$181,913	$2,498	36%	22%	42%	11.2
SGHW	99% TE - Max Tech	$47,378	$21,366	$134,833	$8,526	$182,211	$2,208	59%	2%	39%	12.2
LGHW	82% CE - Baseline	$104,772	$0	$497,314	$28,884	$602,086	NA	0%	100%	0%	NA
LGHW	83% CE	$111,300	$6,528	$491,206	$28,525	$602,505	-$97	19%	76%	5%	18.2
LGHW	84% CE	$118,606	$13,834	$485,269	$28,176	$603,875	-$742	38%	53%	9%	19.5
LGHW	85% CE	$126,784	$22,012	$479,501	$27,835	$606,284	-$2,028	45%	46%	9%	21.0
LGHW	94% CE	$191,811	$87,039	$441,841	$25,397	$633,652	-$21,815	61%	28%	10%	25.0
LGHW	97% CE - Max Tech	$202,394	$97,622	$428,055	$24,574	$630,449	-$18,664	78%	2%	20%	22.6

TABLE 2 MODIFIED LCC FOR COMMERCIAL BUILDINGS IN ASHRAE CLIMATE REGIONS LA & SF

Average LCC Results											
PC Code	Description	Installed Price	Incremental Installed Cost	Lifetime Oper. Cost*	First Year Oper. Cost	LCC	LCC Savings	Net Cost	No Impact	Net Benefit	Simple Payback
SGHW	80% TE - Baseline	$26,881	$0	$171,047	$10,823	$197,928	NA	0%	100%	0%	NA
SGHW	81% TE	$27,773	$893	$169,070	$10,699	$196,843	$85	2%	92%	5%	7.2
SGHW	82% TE	$28,736	$1,856	$167,142	$10,579	$195,878	$255	5%	84%	11%	7.6
SGHW	84% TE	$31,792	$4,911	$163,435	$10,347	$195,227	-$17	23%	67%	10%	10.3
SGHW	85% TE	$33,118	$6,237	$161,648	$10,235	$194,767	$152	27%	58%	15%	10.6
SGHW	93% TE	$42,804	$15,924	$150,049	$9,488	$192,853	$1,202	37%	40%	23%	11.9
SGHW	95% TE	$43,577	$16,696	$147,060	$9,301	$190,637	$2,950	38%	22%	40%	11.0
SGHW	99% TE - Max Tech	$49,320	$22,440	$141,582	$8,950	$190,903	$2,689	61%	2%	37%	12.0
LGHW	82% CE - Baseline	$101,293	$0	$384,625	$21,754	$485,918	NA	0%	100%	0%	NA
LGHW	83% CE	$107,628	$6,335	$380,237	$21,503	$487,866	-$453	21%	76%	3%	25.2
LGHW	84% CE	$114,719	$13,425	$375,978	$21,258	$490,696	-$1,761	41%	53%	5%	27.1
LGHW	85% CE	$122,655	$21,361	$371,842	$21,020	$494,497	-$3,792	49%	46%	5%	29.1
LGHW	94% CE	$185,852	$84,559	$345,247	$19,267	$531,099	-$30,478	65%	28%	6%	34.0
LGHW	97% CE - Max Tech	$196,123	$94,830	$335,479	$18,696	$531,602	-$30,975	84%	2%	14%	31.0

TABLE 3 MODIFIED LCC FOR COMMERCIAL BUILDINGS IN ASHRAE CLIMATE REGION LA

2. SoCalGas does not expect a "rebound effect" to occur should DOE adopt stronger boiler efficiency standards.

In response to "(7) DOE requests comment and seeks data on the assumption that a rebound effect is unlikely to occur for these commercial applications.": The American Council for an Energy Efficient Economy (ACEEE) defines the "rebound effect" as the postulate that people increase their use of products and facilities as a result of gains in energy efficiency[6]. SoCalGas

[6] http://aceee.org/files/pdf/white-paper/rebound-large-and-small.pdf

understands the rebound effect to be more pronounced in residential applications where comfort has not yet been fully achieved with low efficiency equipment. For example, the higher operating costs of an inefficient furnace could lead residents to reduce the furnace hours of use for economic reasons. If the resident replaces that furnace with a high efficiency condensing furnace, some of the gains in efficiency might be canceled out by higher runtime hours to finally achieve occupant comfort.

In contrast to residential applications, commercial space heating applications place tenant comfort at the highest priority, above economic considerations. A building owner would lose business if they required space temperatures to be set below the comfort threshold in order to save money. Therefore, any gains in efficiency of commercial packaged boilers will directly result in fewer runtime hours or more time spent in part load. While SoCalGas does not formally collect data on this effect, through informal conversations with commercial building operators, we believe that occupant comfort is not compromised by energy costs and that more efficient boilers would not result in greater equipment usage.

3. SoCalGas urges DOE to use the most recent Commercial Building Energy Consumption Survey (CBECS) and Residential Energy Consumption Survey (RECS) data for the final rule.

On May 17, 2016, the Energy Information Administration (EIA) released microdata from the 2012 CBECS survey[7]. SoCalGas understands why the 2012 CBECS data was not used to perform the Energy Use Analysis in support of the commercial packaged boilers NOPR, because the analysis predates the release of the 2012 CBECS microdata. However, we urge DOE to ensure that the Energy Use Analysis and Shipments Analysis in the final rule be completed using the new 2012 CBECS data. In the 9 years since the 2003 CBECS data, a building's energy use profile is expected to have changed significantly. For example, trends in commercial heating away from single large boilers toward smaller modular boilers might not be fully captured if the older 2003 CBECS data is used. The trend is illustrated in the graph labeled "Saturation: Gas Boilers" on slide 103 from the DOE public meeting presentation given on April 21, 2016[8].

In addition to CBECS, the Technical Support Document (TSD) indicated that 2009 RECS data was used in the Energy Use Analysis[9]. As of June 2016 the most recent 2015 RECS survey has not been released. Should that data be released before the commercial packaged boilers final rule is published, we would urge DOE to also incorporate the most recent RECS dataset.

Thank you for your consideration.

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[7] http://www.eia.gov/consumption/commercial/data/2012/index.cfm?view=consumption
[8] https://www.regulations.gov/#!documentDetail;D=EERE-2013-BT-STD-0030-0054
[9] https://www.regulations.gov/#!documentDetail;D=EERE-2013-BT-STD-0030-0044