

Pacific Gas and Electric Company (“PG&E”) offers the following comments concerning the California Council on Science and Technology’s (“CCST”) draft report entitled “Health Impacts of Radio Frequency from Smart Meters” (the “Report”).

## INTRODUCTION

PG&E is hopeful that CCST’s independent, fact-based confirmation of PG&E’s representations about the safety of SmartMeters™ helps to answer customers’ questions and bolster their confidence that this burgeoning and beneficial technology is indeed safe.

Previously, some PG&E-customers expressed concern that the very low Radio Frequency (“RF”) emissions from PG&E’s SmartMeters™ might cause adverse health effects. To address these concerns, PG&E has shared company information as well as resources from third-party health experts demonstrating that the RF emissions from SmartMeters™ are safe – far below the safety standard that the federal government has set and far below that of many ubiquitous appliances and other items, such as cellphones and microwave ovens, that are a part of modern daily life. In its Report, CCST has found that PG&E’s SmartMeters™ are indeed safe – safe by every known scientific standard, and safe even assuming a 100% duty cycle (i.e., the SmartMeter™ hypothetically transmits non-stop for 24 hours per day) rather than its actual less-than-1% duty cycle (on average, PG&E’s SmartMeters™ transmit for only 45 seconds per day).

The bottom-line conclusions that CCST reached in its Report support and validate that SmartMeters™ are safe:

1. The Federal Communications Commission (“FCC”) has promulgated a standard that provides an acceptable safety-factor against any known RF-related health effects. *See* Report at p. 26.
  - a. Scientists have established that high levels of RF can produce thermally-induced health effects. The RF that SmartMeters™ emit, however, are at exposure-levels ***well below*** the thresholds for any known thermal effects. Indeed, the RF from SmartMeters™ “result in much smaller levels of radio frequency (RF) exposure than many common household electronic devices, particularly cell phones and microwave ovens.” *Id.* at p. 4.
  - b. Scientists have not identified nor confirmed any negative non-thermal health effects from RF. *Id.*

2. There is *no evidence* that additional standards are needed to protect the public from SmartMeters™. In fact, given the absence of any such evidence, there is no basis even on which to recommend additional standards. *Id.* at p. 26 (emphasis added).

CCST's Report thus confirms the scientific foundation upon which the Smart Grid, with all its attendant benefits, can be promoted and implemented. *Id.* at pp. 11-13.

### COMMENTS

**A. CCST's Conclusions Are Consistent With The Vast Majority of Scientific Evidence: The Low RF That SmartMeters™ Emit Are Safe**

CCST's conclusions provide further scientific validation that the minimal RF emissions on which PG&E's SmartMeter™-system relies are safe. CCST, quite literally, has found that there is no scientific basis for the proposition that low-level RF, such as that from SmartMeters™, could cause adverse health impacts. In this regard, the Report is consistent with the findings of such national organizations as the FCC and the World Health Organization ("WHO"), and such international organizations as the International Commission on Non-Ionizing Radiation Protection ("ICNIRP").

The Report likewise is consistent with a recent report from the Maine Center for Disease Control & Prevention ("Maine CDC"), which that organization published just before the CCST issued its report and which the CCST may not have had an opportunity to review. *See* [http://www.maine.gov/dhhs/boh/smart\\_meters.shtml](http://www.maine.gov/dhhs/boh/smart_meters.shtml). The Maine CDC report is based on "numerous materials sent to [the Maine CDC project team] by both opponents and proponents of smart meters" as well as "on health studies and assessments by government agencies and some affiliated private and academic organizations." The project team concluded:

[O]ur review of these agency assessments and studies do not indicate any consistent or convincing evidence to support a concern for health effects related to the use of radiofrequency in the range of frequencies and power used by smart meters. They also do not indicate an association of EMF exposure and symptoms that have been described as electromagnetic sensitivity.

Maine CDC Executive Summary of Review of Health Issues Related to Smart Meters (November 8, 2010), p. 4.

CCST's conclusions also are consistent with the detailed research that noted scholar and RF-expert Richard Tell (of Richard Tell Associates, Inc. ("R. Tell")), on behalf of the Electric

Power Research Institute (“EPRI”), published in December 2010 concerning the safety of the RF from smart meters. In their 200+ page technical report, Tell and EPRI concluded as follows: “The results indicate that RF field[s] from the investigated smart meter[s] are well below the Maximum Permitted Exposure (MPE) established by the [FCC].” They also found that “[e]ven at very close distances, such as one foot directly in front of the meter, with an unrealistic assumption that the transmitters operate at 100% duty cycle, the resulting exposure is less than the FCC MPE.”

See [http://my.epri.com/portal/server.pt?Abstract\\_id=00000000001021126](http://my.epri.com/portal/server.pt?Abstract_id=00000000001021126).

**B. PG&E Supports CCST’s Recommendation To Provide Consumers with More Information About RF**

CCST recommends that “[c]onsumers should be provided with clearly understood information about the radio frequency emissions of all devices that emit RF including smart meters.” See Report at p. 4. PG&E supports this recommendation. PG&E already has provided substantial information about SmartMeter™-technology on its website ([www.pge.com/rf](http://www.pge.com/rf)), including several studies that it commissioned, substantial comparative data, links to numerous external websites that address RF-safety, and a link to the CCST Report. PG&E will make additional information available on its website, as well.

**C. PG&E Supports CCST’s Recommendation For A Cost-Benefit Analysis Regarding Alternative SmartMeter™ Configurations**

CCST recommends that “[c]onsideration should be given to alternative smart meter configurations (such as wired)...” It also expressly recognizes that such “considerations would likely require a cost/benefit analysis.” See Report at p. 4 (emphasis omitted). PG&E appreciates the Report’s recommendation and certainly would cooperate with any cost/benefit review that the Legislature or California Public Utilities Commission recommends concerning offering such alternatives. Indeed, PG&E voluntarily has begun to review whether any cost-effective, technologically-feasible alternatives exist that would address customers’ concerns regarding RF while still fully-supporting the Smart Grid and California energy policy.

**D. There Are Several Areas In The Report That PG&E Believes Require Clarification**

- *The potential for non-thermal effects:* Readers of the Report might infer that the federal government did not research or consider the possibility that RF might induce non-thermal health effects. That is not the case. In fact, the FCC – with input from the Environmental Protection Agency (“EPA”), the Food and Drug Administration (“FDA”), the National Council on Radiation Protection and Measurements (“NCRP”), the Institute of Electrical and Electronics Engineers, Inc. (“IEEE”), and the American National Standards Institute (“ANSI”) – considered **all potential health effects** of RF exposure, including non-thermal effects in analyzing the science and formulating its guidelines.<sup>1</sup> And while the FCC found sufficient scientific basis to formulate guidelines regarding thermal effects, it found no similar scientific basis regarding non-thermal effects. Indeed, research into the possibility of adverse biological effects of low intensity RF energy exposure (i.e., non-thermal effects) began in the mid 1950’s and continues to this day.<sup>2</sup> PG&E asks that the CCST clarify the Report by recognizing that the FCC has, in fact, researched and considered this subject matter.

- *Assumption of 100% Duty Cycle:* In calculating the RF-exposure from SmartMeters™, the Report assumes a “worst-case scenario” in which a meter “is stuck in the ‘on’ position, constantly relaying, at a 100% duty cycle.” See Report at p. 17. A 100% duty cycle, however, is neither realistic nor (PG&E believes) physically possible. First, because SmartMeters™ both send **and receive** transmissions, the theoretical maximum duty cycle for such a device could not exceed 50%.<sup>3</sup>

Second, SmartMeters™ currently operate at a duty cycle well below 1%. At 45 seconds per 24 hours, the actual duty cycle of a PG&E SmartMeter™ is approximately 0.05% – a mere fraction of even the 4.0% duty cycle that R. Tell assumed in its 2008 analysis, to which the Report refers. See Report at p. 17.<sup>4</sup>

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<sup>1</sup> As recently as August 2010, the FCC reiterated that it “has taken a very conservative approach to RF exposure compliance for low-power network devices such as Wi-Fi base stations and Smart Meter transceivers.” See Report at p. 40 (Appendix E), *FCC Letter* (August 6, 2010).

<sup>2</sup> Gordon ZV, Lobanova YA, Tolgskaya MS. *Some data on the effect of centimeter waves (experimental studies)*. *Gig Sanit* 1955;12:16-8.

<sup>3</sup> This is so because of the design data transmission verification that occurs when a meter communicates with the network, and the half-duplex nature of the radio.

<sup>4</sup> The Report raises questions about the 4-hour period that R. Tell references. However, CCST’s concern appears based on a misinterpretation of the FCC’s allowance for “time-averaging.” There are two types of averaging allowed, depending on the circumstances: (1) source-based time-averaging, which is a function of the duty cycle of a given device and which the FCC permits if this quantity is well-defined (as is the case for SmartMeters™); and (2)

Lastly, under CCST’s hypothetical there are at least two ways in which the SmartMeter™ system would identify the malfunctioning device and report it to PG&E so as to enable PG&E to repair or replace it with a working meter: (1) Because such a defective SmartMeter™ would not receive transmissions from the network (and thus not engage in the requisite network “handshaking”), PG&E’s system would identify the broken SmartMeter™ as disengaged; (2) a PG&E SmartMeter™ hypothetically “stuck” in an “always-transmit” position would likely shut down as a result of a failed power supply (as the meter is not designed to support a high-transmit duty cycle), similarly prompting the system to identify the meter as inoperable.

PG&E asks that the Report reflect that the actual duty cycle of a PG&E-SmartMeter™ is well below 1% and that its hypothetical assumption of a 100% duty cycle – while relevant for analytic purposes – is not realistic and likely physically impossible.

- *One Watt Power Limit:* The Report makes several references to the FCC’s “one watt” power limit for SmartMeters™. However, one watt is the limit for *peak* power output, not average power output. The FCC’s RF-exposure limits are based on average power, which is significantly lower than peak power. PG&E thus asks that the Report reflect the FCC’s one-watt power limit as applicable to peak power, not average power.

### CONCLUSION

Consistent with the conclusions that CCST reached in its Report, PG&E remains confident in the safety of its SmartMeters™ and is steadfast in its commitment to safety. PG&E appreciates the opportunity to comment on the CCST Report.

Sincerely,



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exposure-based time-averaging, which refers to an average exposure over a given interval (30 minutes for the general public), but *only* when there is sufficient knowledge to predict how and when the exposure will occur. R. Tell assumed a 4-hour period to analyze the duty cycle of SmartMeters™ in connection with source-based time-averaging. The 4-hour period is unrelated to the 30-minute interval relevant to exposure-based time-averaging.