DOCKETED	
Docket Number:	19-DECARB-01
Project Title:	Decarbonization
TN #:	231482
Document Title:	Mitsubishi Electric Comments - Are Exclusions in CEC's Decarbonization Baseline Metrics Fair to All Parties
Description:	This document was erroneously filed in 17-EBP-01 on January 10, 2020; TN 231466
Filer:	System
Organization:	Mitsubishi Electric
Submitter Role:	Public
Submission Date:	1/13/2020 4:05:48 PM
Docketed Date:	1/13/2020

Comment Received From: Mitsubishi Electric
Submitted On: 1/13/2020
Docket Number: 19-DECARB-01

Are Exclusions in CEC's Decarbonization Baseline Metrics Fair to All Parties

Additional submitted attachment is included below.

DOCKETED	
Docket Number:	17-EBP-01
Project Title:	Improving Energy Compliance of Central Air-Conditioning and Heat Pump Systems
TN #:	231466
Document Title:	Mitsubishi Electric Comments - Are Exclusions in CEC's Decarbonization Baseline Metrics Fair to All Parties
Description:	N/A
Filer:	System
Organization:	Mitsubishi Electronic/Bruce Severance
Submitter Role:	Public
Submission Date:	1/10/2020 5:00:26 PM
Docketed Date:	1/10/2020

Comment Received From: Bruce Severance
Submitted On: 1/10/2020
Docket Number: 17-EBP-01

Mitsubishi Electric Comments- Are Exclusions in CEC's Decarbonization Baseline Metrics Fair to All Parties

Additional submitted attachment is included below.

Are Exclusions in CEC's Decarbonization Baselines Fair to All Parties?

Mitsubishi Electric Comments by Bruce Severance
Submitted to the CEC docket# 19-DeCarb-01, January 9, 2020

Dear Commissioner McAllister and CEC Staff,

I greatly appreciate your concern for equity and the vision you have brought to the CEC as it charts a course to strengthen the California economy while addressing climate change impacts. In June 2019, Mitsubishi Electric published "Environmental Sustainability Vision 2050" to clarify the company's stance on addressing long-term environmental issues. This corporate vision asserts that "The Mitsubishi Electric Group shall utilize diverse technological assets throughout wide-ranging business areas to solve various environmental issues, including climate change…" We consider ourselves partners in this effort.

Support Alignment of CARB and CEC Baselines

Mitsubishi Electric agrees with AHRI's position that ozone depleting substances (ODS) should be included in the 1990 emissions inventory. Ozone depleting substances were regulated in 1987 and were still being phased down in 1990 with significant inventories still in use in the field by that date. Ignoring their contribution to climate impacts is tantamount to a position that refrigerants did not exist prior to 1987. The CFC alternatives were still in their infancy at that point. Although the argument that CFCs are in limited use today is well founded, all of these variables can be placed on the same level playing field using GWP ratings and equivalencies. Otherwise, the actual progress made since that time is significantly skewed. If appropriate (honest and fair) placement of this benchmark results in less stringent compliance goalposts in 2030, that should be addressed by moving the goalposts, not by fudging the benchmark. Clearly, all stakeholders can work as a team to meet goals despite interpretive differences, but the goals should not be clouded by fuzzy benchmarks and metrics. The public, industry, IOUs and regulators need and deserve clear metrics as the basis of all public discussion and negotiation on setting the goalposts.

Secondly, Mitsubishi Electric also supports the need to align CEC and CARB benchmarks so that multiple agencies are not using conflicting metrics. This seems fundamental to "all parties looking at the same sheet of music", so that rational discussion can proceed. There may be aspects in which this second point may appear to conflict with the first above, in which case, it is in the interest of all stakeholders to have the CEC and CARB embrace benchmarking strategies that are consistent with each other, as well as integrate, as accurately as possible, estimates of ODS emissions inventory for the 1990 benchmark. We agree with AHRI's assessment that: "Ignoring the contribution of refrigerants and other high-GWP gases in the 1990 building stock and baseline is misleading and incorrect. It also does not attribute appropriate credit for early reductions in the HVACR sector – a core tenant of AB 32". Lacking the breakdown of emissions data from the 1990s time period, opens this negotiation to interpretation, but fairness and clarity of metrics is critical to multi-party stakeholder discussions that will be ongoing for the coming decades. CEC and CARB should collaborate to assess emissions inventories from this time period as accurately as possible. This is foundational work and critical to regulatory discussions for decades to come. Similarly, it does not make sense to exclude 1990 electric generation emissions from the baseline because it may make accounting of emissions inventories more convenient, as suggested on page 2 of the Staff Report (TN230833).

Thirdly, there is an element of absurdity to the fact that the current CEC Staff Report (TN230833) omits any inclusion of fugitive methane emissions from well sites or gas infrastructure other than those "behind the meter" which are likely to be negligible by comparison to leaks occurring during extraction,

processing and transmission to end users. These assumptions are summarized in a chart on page 5 as well as in the text. This omission of fugitive emissions does not align with the CEC's own stated objectives or AB3232. According to the Environmental Defense Fund that has had a history of collaboration with the gas extraction industry on methane leak monitoring, "25% or more of today's global warming is driven by methane pollution". (EDF's Solutions Magazine, Spring 2019 edition, page 15) If the HVAC industry has already made concessions to collaborate with regulators on HFC phase down on an accelerated schedule, is it fair or reasonable to not include the bulk of fugitive methane emissions that may be responsible for several times greater climate impacts?

Fugitive Emissions

NRDC's 12-18-19 docket post criticizing the lack of specificity in AB3232 regarding fugitive emissions is well founded. Any assessment of impacts should include a full life-cycle cost analysis:

"… the law does not specify whether the commission should account for "direct" emissions or "holistic" emissions when conducting this assessment. Direct emissions analysis includes on-site fuel combustion (like gas and propane), substitutes for ozone-depleting substances (hydrofluorocarbons and HFCs from refrigeration and air conditioning), and onsite fugitive methane emissions. Holistic emissions analysis includes all emissions attributable to buildings, including emissions from electricity generation, fugitive methane emissions from upstream natural gas production and distribution infrastructure, and behind the meter methane emissions from leaks and incomplete combustion." (TN231280, submitted 12-18-19 to *Docket Number: 19-DECARB-01)*

Although natural gas power generation is cleaner than coal, and it has substantially reduced emissions over the last decades, the fact that all infrastructure emissions are not monitored and the Trump administration has deregulated the need to do so, does not bode well for control of fugitive emissions of methane either in California or nationally. All eyes should be turned towards EDF's imminent launch of the MethSAT (Methane Satellite) that will finally be able to quantify these fugitive emissions and provide incentives for their curtailment.

The HVAC industry is already transitioning to lower GWP refrigerants and has argued in favor of compliance with Kigali and uniform regulations across all fifty states. Industry stakeholders on the whole, with AHRI at their center, should be commended for continued strong support for GWP phase down on a feasible, but accelerated timeline. AHRI deserves credit for leading the charge nationally to support the AIM act and compliance with Kigali HFC phase down timelines. They have also partnered with CARB to accelerate these timelines in California. It is time for our friends in the petroleum industry to recognize the environmental advantages as well as cost savings that curtailing fugitive methane emissions is likely to produce rather than seeming to oppose all regulation. In a world of undeniable climate science, we have no further time for denial. Let's meet the challenges in partnership, head-on.

The Imminent Launch of MethSAT Brings Opportunities

The launch of the MethSAT brings with it incentive opportunities:

1) Monitoring and quantifying methane leaks will allow industry and regulators to perform cost-benefit analyses to target the most cost-effective fugitive emissions reduction scenarios and technologies.
2) This will bring into focus near term technological solutions that are going to provide the greatest societal benefits at the lowest cost.
3) Implementation of incentive programs to quickly deploy these resources where they are most needed will mitigate the biggest leakage sources.
4) Measured reduction of fugitive methane emissions over time will restore credibility to the gas industry which has had some high profile events in the news in recent years.

5) Tightening of the gas pipeline infrastructure will create jobs, improve public safety and save money as well as provide environmental benefits.
6) A focus on tightening the gas infrastructure would improve the viability of introducing hydrogen into the gas pipeline infrastructure. Hydrogen, being a "thinner molecule" is subject to higher leakage rates.

The launch of MethSAT in short, is a game changer. Where there has been limited monitoring of methane leaks at multiple infrastructure points using drones and land-based sensors, suddenly the lights will be turned on. It is actually to the gas extraction industry's advantage to fix leaks now before those true leak levels are known. Certainly, plans should be made to ramp up infrastructure maintenance in advance of the MethSAT launch.

Methane Leak Reduction Opportunities

The CEC Staff Report clearly recognizes the methane leak reduction opportunities:

> "Methane emissions from natural gas infrastructure leaks have emerged to become a major concern as a source of GHG emissions. Methane is a powerful greenhouse gas and is 25 times more effective than carbon dioxide at trapping heat over a 100-year period. The California Methane Survey, funded partly by CARB and the Energy Commission, conducted over several months spanning from 2016 and 2018, found that just 10 percent of the point sources were responsible for 60 percent of the total methane emissions detected (Duren et al. 2019). The researchers found that less than 0.2 percent of infrastructure in the state (based on a survey of 272,000 facilities and components) are responsible for 34-46 percent of total methane emissions in California." (TN230833, pg. 7-8)

Given the growing recognition of the need to monitor and address this issue, benchmarking of baseline emissions, even if projected based on current data, is necessary for a level playing field as well as setting reasonable goals and incentive structures.

Fostering the Hydrogen Economy (at Last)

There have been excited discussions about the imminent "hydrogen economy" since the mid 1980's. Now it appears, a group of industry and technology experts who spoke at the NASEO conference in October 2019 are in agreement that the viability of a hydrogen economy is only 5 to 10 years away. Perhaps it is possible for hydrogen to transition from the lab to the street, and from greenwashing to actual climate mitigation. All stakeholders should embrace the possibility thinking and allow the possibility that this last promise is not once again a mirage. Incentives and policy need to be put in place to facilitate pilot programs, and market implementation in order to achieve the economies of scale that will be necessary to allow this hydrogen technologies to quickly take root in the market place.

Advocates for SoCal Gas such as George Minter, have made speeches saying they intend to be the greenest gas company in the nation and they are serious about hydrogen and working on prototype systems with UC Irvine. Enviro groups have been naturally skeptical because of the decades-long trend of greenwashing around hydrogen. It may be time to be supportive and "see what happens". The hydrogen economy may just finally materialize.

Despite all of these encouraging developments, policy analysts, the CEC, CARB and Cal EPA need to take a step back and evaluate the viability of RNG and hydrogen replacing natural gas in the residential gas infrastructure. Given San Bruno, and other high-profile accidents, doesn't it make sense to put in place an evaluation system for assessing the cost benefits of decommissioning at least some of the residential gas infrastructure and using an upgraded electric grid to distribute electricity to all-electric neighborhoods? There has been much discussion around this at workshops and among researchers, but now we need policy consensus and legislation to support a methodology for decommissioning the residential gas

infrastructure in the neighborhoods where it makes economic, business and emissions sense to do so. Certainly, where PGE is concerned, there is a good business case for substantial upgrade of one infrastructure (the grid) rather than two. Maintaining the existing industrial gas infrastructure, reducing leaks and perhaps expanding it for hydrogen fueling stations at ports, airports and truck stops is the logical next step.

In SoCal Gas territory, the dynamics of market transition are distinct because they operate both as partners with and in competition with SCE. They are partners because they supply gas to SCE's gas generation plants, making SCE one of their largest customers. They are in competition, because they are both interested in maintaining their residential market base. The prospect of an actual (and not fictitious) hydrogen economy emerging in the next 15 years can change those dynamics. There is a big picture here, and we must all step back and "see the forest for the trees". SoCal Gas may actually become the greenest gas company in the US and we should foster the market transitions that will make that possible, and do so with a clear vision of the macroeconomics and societal benefits.

Tony Seba, a Stanford professor who studies market transformation, and whose YouTube videos on "clean disruption" make it clear that historically, companies that don't catch the next technological wave go the way of Kodak and Nokia. A realistic transition to hydrogen as a means to power gas peaker plants, trucking, shipping and aviation would represent a net market expansion for the natural gas interests that see the opportunities. These are much vaster opportunities than clutching onto the residential gas infrastructure that may or may not be a good fit for introduction of hydrogen blends anytime soon. There are bigger fish to fry, and to know how these huge market players should hedge their bets and formulate strategy and policy, we need a clear residential gas infrastructure assessment policy, a decommissioning strategy with clear criteria and consumer protections, and we need to support the implementation of EDF's MethSAT so the societal costs and benefits can be clearly quantified.

Tightening the EPA 608 Belt

For years, manufacturers have been spending billions on product development advances that address environmental impacts in multiple categories, and then the quality of installation and field practices regarding refrigerant recapture have negated many of these advances. EPA 608 training is minimalistic, and doesn't inform contractors sufficiently about the hazards of releasing ODS and HFC refrigerants to the environment, and why the GWP phase down is critical to the fight against climate change. The US EPA requirement is to be certified once, and thereafter, recertification is never required again. These are simple, one-time online courses that take only a few hours to complete.

The result is that refrigerant contamination in the field is rampant, with some estimates as high as 5%, and mishandling of refrigerants are complicating recycling efforts, increasing recycling costs and reducing the intended ozone and climate mitigation impacts. This is complicated by the fact that some segment of the population believe the false narrative that climate change is not the result of human activity. Will technicians follow EPA 608 protocols if they believe false climate narratives? These are questions that merit closer examination, contractor surveys, and consideration of more comprehensive training and recertification requirements in California. They are particularly relevant in light of the fact that CARB's rules allow recycling of existing high-GWP refrigerants and their reuse in the existing products in the field for years to come.

The importance of refrigerant handling is magnified by the introduction of slightly flammable lower-GWP refrigerants in 2023. Unless we tighten the EPA608 requirements, the advances we make in implementing GWP phase downs are readily nullified. If we are serious about meeting these goals, full life-cycle impacts must be considered.

The Wrap Up

It is clear from the data on hand, that heat pumps for space and water heating are clean and cost competitive compared to natural gas appliances in both new and existing construction in residential applications, and this will be even more the case in territories adopting the Ultra-Low NOx standards. We are on the cusp of significant market transformation, and the economic winds have shifted so clean tech is moving with full sails. Market transitions are happening quickly, and gas interests are and should be our partners in crafting a world for the betterment of posterity. Having consistent, data-based metrics is critical to fostering those partnerships and creating fair and equitable incentives and implementation goals for hydrogen and RNG as well as heat pump technologies.