

**BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA**



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*Order Instituting Rulemaking to
Investigate and Design Clean Energy
Financing Options for Electricity and
Natural Gas Customers*

Rulemaking 20-08-022
(Filed September 4, 2020)

**OPENING COMMENTS OF MITSUBISHI ELECTRIC US
PRESENTED TO THE CALIFORNIA PUBLIC UTILITY COMMISSION
REGARDING THE ORDER INSTITUTING RULEMAKING (OIR) TO
INVESTIGATE AND DESIGN CLEAN ENERGY FINANCING
OPTIONS FOR ELECTRICITY AND NATURAL GAS CUSTOMERS**

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Submitted by Mitsubishi Electric September 25, 2020 by:

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I. INTRODUCTION

Mitsubishi Electric greatly appreciates the Commission's efforts to consider layering incentives in a manner that is equitable with the goal of transforming the market to comply with the states decarbonization goals as set out in SB350 and AB3232. Mitsubishi Electric US, Inc., Heating and Air Conditioning Division (MEUS HAD), is a leading manufacturer of ductless and Variable Refrigerant Flow (VRF) heat pumps and air conditioning systems. We appreciate the Commission's efforts to mitigate the impacts of buildings on climate change and recognize the importance of rapid mobilization strategies that produce measurable reductions in GHGs over the next thirty years as well as the broader goal to transform California's economy to carbon free and carbon negative alternatives. On issues of climate mitigation strategies Mitsubishi Electric is an outspoken advocate.

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...”

Mitsubishi Electric regards climate mitigation a primary mission and service to our customers, and in furtherance of the goals of the Paris Accords, we desire to be reliable and consistent partners in the global climate mitigation efforts.

In the opening paragraphs, the CPUC’s OIR states: “This rulemaking is designed specifically to examine options that encourage larger-scale and deeper investments in one or more clean energy resources at customer sites. In addition, this rulemaking will examine options for multiple sources of funding by combining and leveraging ratepayer funds with private financing to support these more comprehensive investments.” (OIR, pg.2)

For some time, Mitsubishi Electric has supported and advocated for a Tariff-on-Bill (TOB) Electrification model as outlined in the Building Decarbonization Coalition’s recent report, “Towards Accessible Finance”. Within such a TOB Electrification program framework, the homes which will have the highest energy savings and carbon reduction benefits are targeted first, which opens a number of market transformation and societal benefits simultaneously:

- a) A TOB Electrification model that qualifies loans based on the security of projected energy savings rather than on the resident’s loan qualifications allows private sources of financing to be extended to low-income families who may not otherwise qualify for home improvements. The security of the energy savings is used to qualify a project, rather than qualify the resident for a loan. The resulting loan is called a “tariff” because it is tied to the meter of the home and paid back through the monthly utility bill, and for various reasons, is transferrable to future renters or owners of the property. The utility bill reduction guarantee is used to make the value to future residents immediately apparent and to secure their agreement to assume the TOB funding arrangement.
- b) If a guarantee of a reduced monthly utility bill burden can also be extended for either partial or full electrification projects, then a TOB electrification program can also bridge the split incentive barrier, by guaranteeing through a disclosure statement that a new incoming renter will enjoy the same reduced utility benefits.

- c) The ability to use projected energy savings while fuel switching to electric heat pumps for domestic hot water and space conditioning extends electrification benefits to those who need it most: low-income families who often reside in rental units which in many cases have the highest returns on investment because of building age and significant deferred maintenance.
- d) Extending the benefits of electrification to low-income rental households as well as middle and higher income households addresses the energy equity quotas mandated by SB350 and SB1477. By reaching a high ratio of low-income households from the outset of the state's electrification efforts will also guarantee that this segment is not the last to transition, and left paying higher gas infrastructure costs that are projected to occur in the coming decade once significant segments of the California market have already been electrified.
- e) Demonstrating the ability to reach low-income rental properties with a first of its kind TOB Electrification program will open pathways to broaden market acceptance across other segments and will serve as a model for other states contemplating the same electrification challenges.
- f) Most importantly, TOB Electrification holds out the promise of focusing private sector investment dollars on high ROI projects – with a low reliance on ratepayer incentive funding, thereby leveraging incentive dollars to accomplish a broader market penetration in using the lowest-risk investment strategy. Critical to this strategy and program benefit is the development of project risk assessment and energy modeling tools that are capable of very precise targeting of “priority”, high ROI projects. (The XeroHome software that has been developed for this purpose will be discussed in section VII below.)
- g) If private capital and green bond funds can be attracted to TOB program investment secured by projected energy savings, TOB Electrification becomes a key Green Stimulus strategy, creating up to 70,000 jobs in California and up to 660,000 jobs nationally*¹. The promise of accurately projected energy savings becomes a revenue stream that spurs investment and job growth. There should be coordination with the CSLB and CEC to fast-track on-the-job training programs to facilitate job growth in low-income communities.
- h) The ability to leverage incentive program dollars offers the prospect and promise of ramping up electrification and fuel switching by 50-fold over past energy upgrade and weatherization programs. TOB pilots pioneered in eight states have enjoyed up to 40% acceptance rates among low-income families when a “no-money-down” offer is made in combination with a

rate reduction guarantee. Many of these programs were designed by Holmes Hummel of Clean Energy Works who has been a contributing author of the above cited BDC report “Towards Accessible Finance”².

- i) If electrification is combined simultaneous energy efficiency upgrades, reduced HVAC loads allows equipment to be a smaller size (lower capacity) which both reduces equipment costs and peak loads on the grid which are generally driven residential HVAC loads. Equipment downsizing and deeply burying ducts in attic insulation generally: increases project ROIs and energy savings, while reducing project costs and grid impacts. Consideration should be given to allowing HVAC contractors to consider burying ducts as within the scope of their license so that they can profit from this work and be motivated to produce these synergistic effects.

II. TOB Qualification Criteria Limits Application to High-ROI Projects

While TOB Electrification holds promise for broader private and public funding for a specific profile of single and multi-family residences, the financial model has certain constraints that limit the projects that may qualify:

- 1) Homes in very mild climate zones have relatively low heating costs and coastal climates have almost no cooling costs, so there are projects that do not have the energy savings opportunities to produce the ROI’s necessary to repay the upgrade investment.
- 2) Where central heat pump installation costs are comparable to a furnace plus AC and may in some cases be lower cost, a central heat pump will generally cost more than replacing an existing furnace that is not paired with AC.
- 3) Homes that do not already have air conditioning and only have central heating will require additional circuits and possible electrical panel upgrades.
- 4) Heat pumps installed in homes in regions where there are low natural gas costs and with low gas equipment replacement costs (areas without ULN furnace standards like those adopted recently by SCAQMD) will most likely not generate sufficient energy savings to create the paybacks necessary to use the TOB finance model.
- 5) Inductive stoves, although lightyears ahead of resistance cooktops and gas stoves, are still expensive and do not generate sufficient energy savings to offer significant returns on investment (ROI). For this reason, TOB Electrification projects which must maximize ROI to qualify, may only in limited cases and favorable climate zones have sufficient project

margins to cover the cost of inductive stoves, but it is advisable to make these appliances “electric ready” and run circuits in attics prior to blowing new insulation.

Despite the fact that the TOB model may only be able to fund 3 of the 10 million residences that need energy efficiency and electrification improvements, it nevertheless has the ability to greatly expand decarbonization strategies in the state without requiring “direct incentives” to pay for them all. No other financing model offers funding opportunities to upgrade rental properties that constitute 45% of the total residences in the state that can virtually pay for themselves. No other model offers the promise of bridging the “split incentive” gap posed by rental properties, wherein residences are not motivated to improve properties that they do not own, and landlords do not want to upgrade homes for which they do not pay the energy bills. So despite the limitations and programmatic constraints of using projected energy savings to secure a loan or tariff tied to the meter, the opportunities are significant. One program manager in the California’s Central Valley stated that he was “extremely confident” that the TOB Electrification model can be used to retrofit homes through the length of the Juaquin Valley: “Nearly every home will produce energy savings while also fuel switching, and the home that does not will be the exceptional case”. This assertion has yet to be borne out, but it deserves the merit of a good “educated guess”. The XeroHome energy modeling referenced in section VII below will provide the acid test.

Given that statewide there will be a significant number of homes that fall into a “marginal ROI” category, traditional incentive funds can be used to focus on qualifying these marginal projects. This is one way that TOB electrification programs could be “layered” with other funding sources to leverage ratepayer dollars and open opportunities for homes that may not otherwise qualify. If we are to assume that the most economic solutions that leverage taxpayer and ratepayer funds are best, and that we should focus program dollars where the GHG reductions are highest, TOB Electrification provides a foundation of public and private funding opportunities that have the ability to rapidly accelerate energy efficiency programs from 12,000 homes per year to 120,000 in three years and 250,000 per year in five years. This may be the only funding strategy that will allow us to energy retrofit 10 million residences by 2050 while also providing an economic stimulus. Even if it does not have the reach to fund all 10 million of those projects, it has the capability of transforming the market and providing the consumer and contractor awareness necessary to reach this eventual goal.

II. The Role of Incentive Layering

The reason that the TOB Electrification model is limited in scope is that projects must focus on upgrades that directly produce energy savings, but as many energy contractors know, there are often mitigating cite conditions that must be addressed that can add to project costs, but which do not produce energy savings, and which therefore lower the return on investment of the energy upgrades performed. Given the limitations of the TOB Electrification finance model outlined above, it is critical to the success of the model that high ROI projects be accurately targeted and that any projects that only marginally qualify for TOB electrification either be excluded or alternatively, they are “co-funded” either by the home owner, the landlord or through “layering” or qualification of other program incentive dollars. Such co-funding may be necessary as a result of regional or market conditions, such as climate zone variables and the absence of existing AC systems, or co-funding may be necessary because of site conditions such as water damage, rodents, asbestos, the absence of an accessible attic space or the need for costly panel upgrades. “Wrap-around incentives” or layering incentives to address such pre-existing conditions can qualify a “marginal” project that may otherwise be disqualify due to the cost-effectiveness and high-ROI criteria built into the TOB electrification model.

Residences with such “pre-existing conditions” will need these issues addressed simultaneous to energy upgrades and electrification upgrades. For example, high performance HVAC filters will not solve the air quality issues associated with a rodent infestation, and consumers deserve the protection that quality standards addressing such issues must afford. The Building Performance Institute (BPI) that certifies energy analysts and contractors energy efficiency upgrades under nationally recognized standards has very clear requirements regarding such indoor air quality (IAQ) issues. It is unconscionable to air-seal an attic or “tighten” wall assemblies to avoid air-leakage losses without addressing indoor air quality problems. It is unethical to hide a rodent infestation under a layer of insulation. And it would be ethically difficult to discriminate against projects that have such existing conditions.

Recent peer-reviewed medical research indicates that 24% of the population carries the gene that produces a “Chronic Inflammatory Response Syndrome” (CIRS), which includes a range of biotoxin related illnesses and symptoms including chronic bronchitis, arthritis, flue like symptoms, heart and neurological illnesses among others*3. We owe consumers the protections afforded by maintaining

high worksite quality control standards. Program managers would be faced with difficult social justices choices if they accept one project but are forced to reject the otherwise workable project next door due to such “pre-existing conditions” that cannot be repaired with TOB Electrification funds (due to resulting low ROI). The CPUC should anticipate the need to fund such peripheral repairs with “wrap around” incentives that can address such issues. Alternatively, rules that require landlords to address health, safety and indoor air quality concerns should be built into the incentive framework.

IV. Consumer Protections and Renters’ Rights

Critical to the success of a TOB Electrification program are the need for thoroughly considered consumer protections that will assure proper program management, accurate representations to resident participants and landlords, and long-term consumer and property owner satisfaction with the value offered through the program. Consideration should be given to implementation rules that protect renters from future rent increases due to the quality of life and efficiency improvements made through TOB Electrification funding. In effect it will be the renter’s utility bill that pays back the TOB funding, and landlords have a legal obligation to provide heat and basic services. If TOB Electrification targets projects with older equipment that is near end of life as it should, then it is fair to presume that the landlord should provide a co-pay for the energy efficiency and electrification measures that are installed up to the replacement cost value of the existing gas equipment in order to qualify “marginal ROI” projects for TOB funding. They should not subsequently be allowed to increase rents for providing such basic services. In other words, landlords should be held to their obligation to provide a degree of comfort, health and safety for the residents, and the program should not have the unanticipated consequence of causing future evictions of low-income families which the landlord justifies on the basis of the improved value of the property.

Because there is anecdotal evidence of low-income families having suffered unintended impacts and some programmatic abuse under past funding programs, we strongly recommend that there be short videos produced in the recipient’s native language that explain any program’s benefits and limitations, as well as renters’ rights under the program, so that consumer expectations are managed, and consumer protections assured.

V. Incentive Layering Criteria

Mitsubishi Electric would agree that careful consideration should be given to how incentive layering will be allowed in order to meet decarbonization goals through the most cost-effective strategies possible. It is clear that incentive layering and co-payment by residents can solve many barriers to market transformation. We also agree that incentives should not be needlessly duplicative or wasteful. For example, if middle-income homeowners were in a position to assume the burden of equipment replacement costs, there is no reason why they could not partially or fully finance equipment replacement through a TOB electrification program, unless there are pre-existing site conditions that would require such co-investment. The criteria and rulemaking used to determine when and how incentive layering is allowed must be equitable, yet allow program providers the flexibility needed to respond to market conditions, site conditions, and technological advancements.

The following excerpt from the New York Department of Public Services 2016 document entitled “Multiple Incentive Recommendations Report”, offers cogent insights into the needed incentive layering evaluation criteria:

1) Where layered incentives exist or are proposed, ensure:

a. that each of the programs or initiatives offering the incentives address a different value stream, performance objective, or market barrier;

b. that there is a stated rationale or basis for why the layering will achieve greater or higher value results;

c. that coordination has occurred with regard to marketing and delivery channels to stimulate market uptake at least cost and avoid market confusion;

d. that programs maintain a clear objective and well-defined impact

2) Where incentives are offered to advance a utility capital deferral project, flexibility should be afforded to the PAs to ensure that required action is taken in order to defer or avoid the capital investment.

*3) Where programs differ in geography, customer types, or technology targeted, they should always maintain clarity and focus on ease of participation in markets by intended customers. *4*

This report goes on to detail how these incentive layering criteria may be applied through various site and project scenarios to reach equitable application of rules governing incentive layering. We are confident that the CPUC staff will produce similar equitable results that still allow sufficient flexibility to promote market transformation over the coming decade.

VI. The Equity Implications of Avoided Capital Investment

New York’s “Multiple Incentive Recommendations Report” in its entirety is so relevant to this discussion that we will be uploading it to the R.20-08-022 docket for public access and staff review. The issue of avoided capital investment that is raised in the document has particular relevance to the equity issues surrounding potential electrification programs, and should be fully considered in this proceeding. If for example, a utility such as PGE that owns both grid and gas assets, is able to avoid a \$300,000 repair to a gas extension, they should be willing and able to use the bulk of these funds for a “neighborhood electrification” project, thereby leveraging TOB funding opportunities and covering peripheral expenses that may not otherwise be covered. The circumstances for such rules are inherently different in jurisdictions wherein the gas utility is a separate entity from the electric utility such as in SCE and SoCal Gas territories. If gas companies are allowed to offer incentives to developers or reduce initial gas infrastructure costs to near zero by amortizing those costs over decades, it puts them at an unfair advantage and encourages ongoing expansion of the gas infrastructure. Although there are gas industry supported studies that assert otherwise, it is clear that the economics of RNG and hydrogen are not likely to compete with residential electrification*5. The potential in-state RNG resources are scarcely sufficient to meet 20% of projected 2050 demand, and hydrogen for the next decade may remain uneconomic, and is not suitable to use in the residential gas infrastructure except as an additive to methane. For these reasons, the commitment to electrification as the most practical and economically feasible solution should remain resolute.

Where gas and electric utilities are competing for market share, consideration should be given to the long term life-cycle impacts of climate change, and the need to factor these costs as an inevitable additional household burden. (See “Climate Change Costs to California Households”, also submitted to this docket for reference). These climate impacts are now so immediate and undeniable that the CPUC should proceed on the assumption that the Renewable Portfolio Standard (RPS) will transition to 100% renewable before the current 2045 deadline, and that future consideration to higher taxes on GHGs, both furnace stack emissions and methane leaks from well sites and infrastructure should be considered to fund electrification incentives.

State agencies should engage in direct negotiation with gas interests regarding methane leaks as they have with HVACR manufacturers on reducing the global warming potential (GWP) of refrigerants. Gas interests should now recognize the wisdom of diversifying their investments in alternative

technologies so that they have a viable and sustainable business plan that allows them to be fully collaborative with the needed market transformation rather than producing more studies to deny the impacts of climate change or promote inadequate solutions like RNG. For example, co-investment in offshore wind or realistically scaled hydrogen infrastructure for gas peaker plants would make gas interests strategic partners in the new green economy. Without this transformation, change will be hampered. Although these may appear to be issues that are peripheral to the discussion of incentive layering, agreement on the needed eventual electrification of the residential sector is paramount to determining fair rules for how these opportunity costs and sunk costs are anticipated and factored. Certainly, the real cost of climate impacts to California households should be factored, with an understanding that RNG will not magically decarbonize the gas infrastructure. California households deserve protection from such exaggerated claims, just as current gas pipeline workers deserve secure work repairing the leaks in the existing gas infrastructure.

VII. XeroHome Software as a Project Qualification Tool

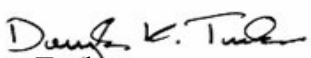
Over the past several years there have been innovations in energy modeling that allow supercomputing to model entire city quadrants at once without ever entering a home or asking residents to fill out a questionnaire. The XeroHome software has taken this technology to a new level. By using drone 3-D imaging of buildings that are identified by address with GPS, and then combining this data with building department records which include the vintage and probable efficiency characteristics of the structures, XeroHome can generate a preliminary energy model of an entire city and all of the homes in it, which facilitates the ability to predict where the energy savings may be greatest for the lowest dollar invested. Using this preliminary modeling, XeroHome can pinpoint the homes with the highest return on investment for various types of incentive programs including TOB electrification. Once an IOU or CCA's program administrator contacts the prospective participating household, a solicitation can come from the IOU informing the residents that they may qualify for a no-money-down energy plus electrification upgrade that will lower their utility bills and provide additional comfort and air quality benefits. The interested recipient of such an offer can then log onto a portal where they provide additional details about their home and where they can allow access to their historic energy bill data. These additional inputs then allow the XeroHome model for their home to be fine-tuned and calibrated so that the energy savings projected reflect the specific characteristics of the home and the occupants' energy usage behavior. The tool identifies whether a residence is a good candidate for full or partial electrification using TOB

funding, and can prioritize the upgrade measures that are included in the scope of work in order of cost-effectiveness using NREL cost trade-off data. This software can precisely locate and prioritize the projects that would assure high project ROIs that would both protect residents from the risk of higher energy bills as well as protect program administrators and funding sources from the risk of defaults. Preliminary whole-neighborhood models have already been piloted in Sacramento and Santa Monica.

VIII. Conclusions

Mitsubishi Electric remains firmly committed to climate mitigation strategies that work. We agree that building decarbonization efforts will ultimately be unsuccessful unless the total cost to a resident for switching from a natural gas appliance to an electric heat pump appliance is nearly equal to the cost of replacing a natural gas appliance with similar equipment. However, the task of reaching the rental market that now constitutes 45% of all California households is particularly challenging and it requires new business and financial models that can bridge the split incentive gap and do so equitably. Tariff-On-Bill Electrification enabled by the XeroHome software, is the only model that can prioritize win-win projects that will reduce the most carbon emissions for the lowest price, largely without exhausting taxpayer and ratepayer funds, while creating a green job stimulus that is greatly needed in this economy. The objective of an incentive layering framework should be to give clear guidance on how incentives may be combined to remove market barriers, while mitigating unhealthy site conditions and protecting consumers from unanticipated impacts. We are committed to working in partnership with the CPUC to produce real solutions to climate change and the greatest long term societal benefits.

Respectfully submitted,

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(FOOTNOTES ON FOLLOWING PAGE)

FOOTNOTES:

*1 Job and Climate Impacts from Energy Efficiency Investments, American Council for an Energy Efficient Economy (ACEEE), August 4, 2020, Link: <https://www.aceee.org/fact-sheet/2020/08/job-and-climate-impacts-energy-efficiency-investments>

*2 Towards an Accessible Financing Solution: A Policy Roadmap with Program Implementation Considerations for Tariffed-On-Bill Programs in California, Building Decarbonization Coalition, Bruce Mast, Holmes Hummel and Jeanne Clinton, July 2020, Link: http://www.buildingdecarb.org/uploads/3/0/7/3/30734489/bdc_whitepaper_final_small.pdf

*3 Diagnostic Process for Chronic Inflammatory Response Syndrome (CIRS): A Consensus Statement Report of the Consensus Committee on Surviving Mold, Ritchie Shoemaker MD, Karen Johnson MD, Lysander Jim MD, Yvonne Berry MD, Ming Dooley, James Ryan PhD, Scott McMahon MD, Link: https://www.survivingmold.com/Publications/CIRS_diagnostic_protocol_final_5_1_2018.pdf

*4 Multiple Incentives Recommendations Report, The Clean Energy Implementation & Coordination Working Group of the Clean Energy Advisory Council, 9/12/2016, New York State, Department of Public Service, Matter 16-01005, Link: https://www.google.com/url?sa=t&rc=j&q=&esrc=s&source=web&cd=&ved=2ahUKewj04_GnLsAhVVs54KHTfhAzUQFjAAegQIBBAB&url=http%3A%2F%2Fdocuments.dps.ny.gov%2Fpublic%2FCommon%2FViewDoc.aspx%3FDocRefId%3D%257B184499F8-889A-4CF8-B515-E5F6028F5784%257D&usg=AOvVaw2hzFHHpXHVGB9zWD32a_AW

*5 Rhetoric Versus Reality, The Myths of Renewable Natural Gas for Building Decarbonization, Earth Justice and the Sierra Club, Susan Saadat (EJ), Matt Vespa (EJ), and Mark Kresowik (Sierra Club), July 2020, Link: https://earthjustice.org/sites/default/files/feature/2020/report-decarb/Report_Building-Decarbonization-2020.pdf