Massachusetts Institute of Technology

Comment on MA IRWG Near-Term Rates Report:

Why We Must Focus on Grid-Coordinated Heat Pump and EV Rates Now.

To: **Massachusetts Interagency Rates Working Group,**

by: **Harvey Michaels,** Faculty, Massachusetts Institute of Technology, Sloan School of Management
Principal Investigator, Clean Heat Transition Project
hgm@mit.edu 508-740-9233 September 6, 2024

I applaud the goals of this project and the background information in the Report. With the lens of almost 50 years as a Massachusetts-centric Energy Management and Policy practitioner, entrepreneur (Xenergy and Aclara), and now MIT Faculty, I see this project embarking on exactly the right problem at the right time. Of relevance, recently I led the *Clean Heat Transition study* for Sloan's System Dynamics Group. My new graduate course: *Energy Management and AI: Strategies for a Sustainable Future* explores climate solution pathways applying innovations to resolve the conflicts between grid and consumer economics. And as a grandfather, I am strongly motivated to help find a workable climate solution, which inevitably requires us to find ways that economics and our climate imperatives align – *which I'm sure they can, with much benefit from the steps we may take near-term on rates.*

Our situation: *The conflict between high rates and our climate imperative is substantial, but resolvable*. ISO-NE and our distribution utilities forecast a doubling of the New England grid infrastructure by 2050, *solely to accommodate the climate requirement to transition to heat pumps and EVs*. Otherwise, our peak demand has been dropping since 2006 and would continue to do so. Our study of the Massachusetts/New England situation indicated the following:

1. ***Our rates are too high for heat pumps and EVs to flourish, and our path could make things worse.*** The New England grid on average is 55% unutilized right now, and based on the 2050 forecast it will be almost 70% unutilized by then. This is at all levels: generation, transmission, distribution, and home wiring. That's a grid flying with a lot of slack ("empty seats" as analogy) that we need to pay for.

    - Our New England rates, which average $.33/kwh in the Boston area, are twice the national average, and at these prices, the economics of both heat pumps and EVs are not compelling. And the growing "empty seat" fraction will drive the price higher. Some have argued that our peak growth problem might be solved by consumer pushback – or voter pushback. As someone who cares about a climate solution, *I would consider this to be a terrible outcome.*

    - At about $.20/kwh, which is above the national average rate and about what the MA Municipal Electrics are charging, heat pumps and EVs look good enough financially to make consumers happy with the transition. For heat pumps and EV's, this is the price we need for our climate.

2. ***Adding heat pumps and EVs can raise rates, or lower them, depending on whether they are added in a grid-coordinated manner. Rate format, and program incentives, are critical to a successful result.***

    - The marginal cost of electricity is definable in several ways. Most narrowly defined as the cost of spot market electricity on an underutilized grid, in New England it is under $.05/kwh 90% of the time, and under $.10/kwh 98% of the time.

- The marginal cost of a kwh on the peak, spread over the 200 highest load hours (as we do for DR programs), is at least $1 per kwh. Our assignment of this cost to the summer peak hours largely reflects how ISO-NE charges for the expensive capacity assurance program we have here (ICAP), which pays heavily to encourage our ubiquitous natural gas power plants to have backup LNG stored on site for the every-year pipeline gas shutoff in very cold weather. It is not a reflection of true marginal costs to charge LSE's for ICAP based solely on the current highest demand hour, until 2033 a summer hour. This ISO-NE billing model from the 1990's needs updating; but meanwhile our programs and rates should not be built on this obsolete LSE billing methodology.

- *Without grid coordination, both heat pumps and EV's are "peakier" than the average load shape*. Heat pumps have exponential growth in power need, in relation to temperature drop; and with resistance backup, even worse. EV's plugged in the garage at the end of the workday have their max charging on "the head of the duck."

- However, *Grid-coordinated EVs, or heat pump systems designed to avoid the peaks, can be "less peaky" than average loads.* In fact, EVs can be net contributors to supply on peak with *V2G,* or more likely, *V2H islanding.* Hybrid heat, even at 90% heat pump for annual heat, is lower cost, more efficient, with lower emissions than all-electric with resistance backup. 80-90% heat pump systems require no grid-specific controls to avoid most of the peak. Reducing future backup site carbon emissions post-gas pipe can be accomplished with site-stored renewable fuels, thermal storage, community geothermal, and better heat pump technology.

Proposal: Our near-term focus should be on cost-justified rates that discount electricity to heat pumps and EVs, *provided that they are controlled or otherwise designed to avoid the peak*. Let's consider:

1. Let's put *Load Flexibility before Grid Expansion!* Controlled new loads, that disproportionately fill the grid's slack (or "empty seats") without adding much to peak, reduce the average price for everyone, provided that the rate charged to these marginal loads is above marginal cost (a low bar). So discounting EV and heat pump electricity to $.20/kwh or less is a program that passes the rate test, while it encourages the market in a manner that doesn't need a doubling of the grid.

2. *Heat pumps and EVs are truly marginal loads in Massachusetts.* Without an electric rate cut, we simply won't reach the scale we need (4-5% sustained adoption). Our approach now – to heavily subsidize heat pumps, only to have early adopters report financial *buyer's remorse* - won't work. With full rates to prospective heat pump and EV buyers: they simply won't buy them at $.33/kwh. But at $.20/kwh on most hours, they may. With marginal costs under $.10/kwh, 95% of the time or more, if controlled everyone is better off with lower heat pump and EV rates.

3. *The age of AI and smart homes has arrived:* Wifi connectivity to heat pump thermostats and controls are common out-of-the-box and can be promoted; all EVs have functionality to support rate programs, and most chargers do as well. AI-supported smart home ecosystems, including Alexa and the like, are making smart regulation of devices in response to price or DR signals much easier and inexpensive than before.

Specific suggestions for the near-term: We need to get past our conventional rate biases, since there is a climate solution at hand that should work, by reducing the price to grid-coordinated EV's and heat pumps, while also reducing the price of electricity *for everyone else* in the process. *And there appears to be no other climate solution that works in the Northeast to get to the adoption we need. For rates:*

1. **Consider special end use rates for heat pumps and EV's ($.20/kwh cap)**

Again; Heat Pumps and EVs are a special case: beneficial, marginal, and price sensitive. Load flexibility should be the priority, because with it new heat pumps and EVs can be a rate-lowering opportunity, rather than a problem. Uncoordinated with the grid, EVs and heat pumps are *peakier* than average loads, with marginal cost > average rates. (Raising rates). Coordinated with the grid, EVs and heat pumps are *flatter* than average loads, with marginal costs substantially below average rates.

The rate should therefore be tied to requirements to ensure coordination with the grid, a flat rate for all hours except extreme peak hours (not to exceed 5% of all hours), specifically setting the rate at a level that reflects the marginal cost of electricity during non-peak hours, not to exceed $.20/kWh. With such a rate, we can anticipate high market adoption, lower average rates, and lower needed incentive costs.

Let's also extend the same lower rates for heat pumps without backup or controls in all-electric deep retrofit homes, homes with thermal storage, or geothermal homes, to acknowledge their much lower contributions to winter peak.

2. **Consider ASAP moving to ubiquitous dynamic prices, *capped at the current rates*.**

To test the opportunity for load flexibility before we pay to expand the grid to double its current size, we should try dynamic pricing and/or DR focused on avoiding the annual peaks. Doing so ubiquitously would likely unleash an ecosystem of AI-enabling app-makers to create consumer value by juggling loads on behalf of the customer – there are armies of such folks looking for value-creating opportunities. And winter has our most expensive peak hours today –rates should reflect that.

With a cap at current flat rates each month, dynamic prices pose no customer risk; and should cause no pushback; and no reason to opt-in or out. And with such a cap, it is reasonable to anticipate lower average rates in time. Short term, a revenue loss is possible but small, and likely temporary. These costs could be seen as a modest investment trending quickly to dropping average rates due to higher grid utilization (filling the "empty seats"), a viable climate solution, and consumer equity benefits.

We should also encourage, with regulatory preferences and through promotion by the DOER Green Communities program, that Community Choice Aggregators and other Electric Retailers offer similar rate forms to residential consumers as an option. This aims to ensure broad access to cost-effective electrification opportunities, fostering equitable participation across the state's diverse communities.

3. **What not to do:** High fixed charge, lower marginal charge rates.

Without any signal to shape load, the idea of putting all consumers on a higher fixed charge to cover more of the grid's currently fixed infrastructure costs, allowing a lower marginal cost price, encourages non-beneficial load growth - essentially it is *a declining block rate, in an inclining-cost grid.* Smaller and more efficient households will see higher bills; investing in energy efficiency will be less cost-effective. Since peak demand will rise as a result, the so-called fixed costs will go up, as will average bills. *We're better off leaving general rates alone.* (I say this as a creator of this rate form in 1976).

For coordination, our Mass Save and Connected Solutions programs should also be adjusted.

- Incentives should allow the retention of existing fossil fuel heating systems in residences adopting heat pump technology, provided that these systems are utilized only when ambient temperatures are below 20°F and are capable of being remotely monitored by utility companies to ensure compliance. We have, and should continue to develop, pathways for such homes to ultimately disconnect from the gas pipelines at an appropriate time, applying next generation heat pumps, community geothermal networks, or a limited use of site-stored renewable fuel.

- The Connected Solutions Program should correct to reflect that our winter peak demand has substantial marginal cost today, as well as our dominant future peak. Our Avoided Cost study should be revisited regarding this question of current winter peak costs – to date there has been no focus on the severity of today's significant winter cost issue, growing markedly in the future.

- We should add a new Mass Save Smart Home program with incentives to encourage technologies capable of assisting consumers in responding to rates and the program ideas above.

I would be happy to discuss these ideas and suggestions with you. Thank you for moving the Commonwealth forward towards a model climate solution.

Respectfully submitted,

Harvey Michaels, Massachusetts Institute of Technology
Sloan Lecturer - Energy Management Innovation; Principal Investigator, Clean Heat Transition Project
cell: 508-740-9233 hgm@mit.edu

Harvey Michaels is MIT Sloan Lecturer - Energy and Climate Innovation, and Principal Investigator of the Clean Heat Transition study for Sloan's System Dynamics Group. He is currently teaching *Energy Management and AI: Strategies for a Sustainable Future.* He served previously on faculty teams for several cross-campus energy studies, including Community Energy Innovations, the *Future of the Electric Grid*, and campus energy planning. Harvey serves on several boards related to Energy Efficiency and Climate Solutions, and previously led two energy efficiency companies (sequentially): Xenergy and Aclara.

SEPTEMBER 6, 2024

Via e-mail: Rates.WG@mass.gov

Massachusetts Interagency Rates Working Group (IRWG)

Re: **Near-Term Rates Strategy Draft Report**
Subject: **Written Comment from the American Council for an Energy-Efficient Economy**

Dear IRWG Members,

The American Council for an Energy-Efficient Economy ("ACEEE") welcomes this opportunity to provide comments and recommendations on E3's Near-Term Rate Strategy Report Draft ("Draft Strategy").

ACEEE is a nonprofit research organization based in Washington, D.C. that conducts research and analysis on energy efficiency. ACEEE is one of the leading groups working on energy efficiency issues in the United States at the national, state, and local levels. We have been active on energy efficiency issues for more than four decades. For many years, ACEEE has provided technical assistance on energy efficiency topics to various stakeholders in Massachusetts.

ACEEE is highly supportive of the creation, purpose, and objectives of the IRWG and we hope to see other states replicate this stakeholder process as they grapple with strategies to reform rate design for their climate and equity goals. After reviewing the Draft Strategy, we have identified a few areas for improvement and/or where greater nuance is needed. We first summarize our recommendations and then provide additional details below for your consideration.

- Out of the four options presented in the Draft Strategy, ACEEE recommends a seasonal technology-specific electric rate for residential customers in Massachusetts.
- Affordability for low-to-moderate income households must be prioritized in their transition to electrification. Bill assistance and energy efficiency programs must be paired with alternative rate design options for these households.
- Any rate design option that is implemented should maintain a volumetric component to maintain price signals for energy-efficient behavior.

Recommendations

Out of the four rate levers that the Draft Strategy presents, ACEEE supports the concept of a seasonal technology-specific electric rate for residential customers in Massachusetts. Accelerating the deployment of efficient heat pumps is critical to achieving the state's energy, equity, and climate goals, and meeting Massachusetts's commitment to decarbonize buildings by 2030.[1] Reforming current electric rates is essential to address one of the key barriers to heat pump adoption: operational costs.

As noted in the Draft Strategy, on the current rates, customers heating with gas may see bill increases up to $100 per month when installing a heat pump. The Draft Strategy also shows that around 54% of homes in Massachusetts are heated by natural gas and would experience bill savings under a seasonal electric heating rate or a declining block electric heating rate.[2] Absent changes in rate design, homes in

[1] https://usclimatealliance.org/press-releases/decarbonizing-americas-buildings-sep-2023/

[2] Pg 43 of Draft Strategy: https://www.mass.gov/doc/near-term-rate-strategy-draft-report-for-public-comment/download

Massachusetts that heat with fuel oil or electric resistance (~ 39% of customers in the state) will see bill savings from switching to a heat pump.[3] Therefore, ACEEE concludes that implementing a technology-specific rate for heat pump customers will be the most beneficial option for households that face the highest barriers to electrify their heating source. ACEEE also recommends that a differentiated electric rate for efficient space heating be limited to heat pump customers and not apply to customers who use only electric resistance. Doing so will ensure that alternative rate designs are not promoting inefficient use of energy through electric resistance heating.

The Draft Strategy also shows that space heating is the most dominant energy end use for homes in the state and that electrified homes also have a larger winter heating load than their summer air conditioning load.[4] For this reason, ACEEE concludes that a seasonal electric rate for heat pump customers that lowers the volumetric charge in the winter compared to the summer will improve the affordability of heat pumps used for heating services. We recognize that most utilities are presently summer peaking, but as electrification across multiple sectors increases, peaks will likely shift to the winter. Maintaining some price signal for energy efficiency and demand management will help reduce costs for all customers. Long-term rate design strategies should reevaluate the appropriateness of a seasonal rate if or when winter peaks become more prominent for utilities in Massachusetts, which will likely happen after 2034, based on National Grid's forecast for aggregate peak demand.[5]

Any alternative rate design option, such as a seasonal-technology specific rate, should be paired with additional energy assistance for low-income households to mitigate unintended consequences such as exacerbated energy burdens. For example, tenants or renters or multifamily buildings that are master-metered, meaning that renters were not directly paying for heat previously, may experience bill increases from electrification even if they are enrolled in a season-technology specific rate.[6] Similarly, homes without air conditioning before electrification will face increases in bills despite changes in rate design.[7] Alternative rate structures on their own may not be enough to resolve energy affordability issues which is why additional complementary policies and programs are needed. Unitil's rate plan, which was recently approved by the Massachusetts Department of Public Utilities ("DPU"), establishes a seasonal heat-pump specific rate that allows low-income households to participate, while establishing an additional 40% rate discount for income-qualified households.[8] National Grid and Eversource should do the same.

Earlier this year, ACEEE provided written comments to the DPU on their Energy Burden Inquiry.[9] We continue to support those recommendations and will briefly synthesize them here. In our comments, we described the benefits of limiting energy bills for low-income households through a percentage of income payment program (PIPP), which caps utility bill payments at a guaranteed set percentage of a participant's income. PIPPs better address the energy affordability needs of individual households than tiered discount rates, providing certainty to households that their energy bills will be limited to what they can afford. By contrast, tiered discounts provide escalating cost reductions for lower income

[3] Pg 23 -24 of Draft Strategy

[4] Pg 12 – 13 of Draft Strategy

[5] Graph on pg 51 of Draft Strategy

[6] Pg 35 of Draft Strategy

[7] Pg 32 of Draft Strategy

[8] D.P.U. 23-80/23-81 Rate Case Order: https://fileservice.eea.comacloud.net/FileService.Api/file/FileRoom/19281184

[9] https://www.mass.gov/info-details/energy-burden-inquiry

customers, but still leave financially vulnerable households exposed to rate increases and price shocks from seasonal variations in temperature and extreme weather events. However, both approaches are impactful for making bills more affordable for those who need it the most.

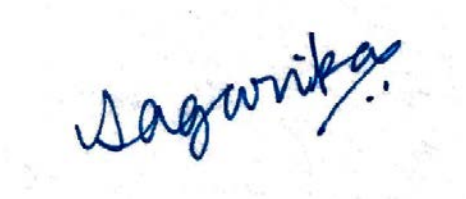
Weatherization and energy efficiency programs are still key to sustainably reducing energy burden in the long-term and makes electrification an attractive option for customers heating with non-electric sources. The Draft Strategy shows that including a shell upgrade with electrification of a single-family home with natural gas heating comes close to offsetting the bill increase.[10] Without energy efficiency improvements, electrification could significantly increase utility bills, particularly for households living in older buildings, who also tend to be lower income. For these reasons, we recommend that low-income households with heat pumps be automatically enrolled in energy assistance, weatherization programs, and any approved heat pump rate. According to the Draft Strategy, homes heated with gas but without air conditioning (often low-income households) will see bill increases with electrification.[11] PIPPs or a tiered discount will ensure that low-income households can still benefit from cooling services in the summer while managing their energy bills.

Finally, we also recommend that any seasonal technology-specific rate maintain a volumetric component to encourage energy efficiency and reduce the need for new infrastructure to serve winter peaks. We recognize that time-of-use ("TOU") rates will not be an option for the state in the near-term, at least until advanced metering infrastructure is rolled out to enough households. Under TOU rates, customers are usually charged higher prices during peak periods by utilities. However, well designed and implemented TOU rates can be effective at reducing energy consumption at key times and could be considered as another option to layer onto reformed rates. We acknowledge that there are real-world practical challenges with implementing any new rate structures for customers and that TOU rates may not be an equitable option for customers who do not have the ability to shift their loads easily. If TOU rates are considered in the future, we recommend that any changes are clearly communicated to customers to give them a better understanding of how their bills will be affected with each option.

In order to achieve Massachusetts's decarbonization and equity goals, current electric rates must be modified and aligned with efforts to electrify and enhance the energy efficiency of the building sector. Failing to align and complement these policies would mean undermining one goal in order to achieve the other, which is an unintended consequence that should be avoided.

ACEEE appreciates the opportunity to comment on E3's Near-Term Rate Strategy Report Draft and is looking forward to continued engagement with the IRWG on these issues. Please contact us with any questions or if you would like to discuss these comments in greater detail.

Sincerely,



Sagarika Subramanian

[10] Pg 30 of Draft Strategy

[11] Pg 32 of Draft Strategy

Manager, State & Utility Program
ACEEE
ssubramanian@aceee.org
Office: 202-672-1408

ADVANCED ENERGY UNITED

September 6, 2024

Massachusetts Interagency Rates Working Group

Re: Comments to the Interagency Rates Working Group on Near-Term Rates Draft Report

Dear Massachusetts Interagency Rates Working Group:

Advanced Energy United submits comments on the Near-Term Rates Draft Report as presented at the August 12, 2024 meeting.

Respectfully submitted,

/s/ Shawn Kelly
Shawn Kelly
Director, Advanced Energy United
skelly@advancedenergyunited.org

/s/ Sarah Steinberg
Sarah Steinberg
Director, Advanced Energy United
ssteinberg@advancedenergyunited.org

/s/ Kat Burnham
Kat Burnham
Senior Principal, Advanced Energy United
kburnham@advancedenergyunited.org

Advanced Energy United Initial Comments

Comments to the Massachusetts Interagency Rates Working Group on Near-Term Rates Draft Report

Introduction

Advanced Energy United ("United") attended the Interagency Rates Working Group's (IRWG) August 12, 2024 presentation of the Near-Term Rates Draft Report (Draft Report) developed by Energy & Environmental Economics (E3) and the workshop dedicated to distributed generation (DG) and distributed energy resource (DER) stakeholders held on August 23, 2024. United expressed a variety of views during the DG/DER stakeholder session and now provides our written comments below.

United is a national association of businesses that works to accelerate the move to 100% clean energy and electrified transportation in the U.S. The term advanced energy encompasses a broad range of products and services that constitute the best available technologies for meeting our energy needs today and tomorrow. These include electric vehicles, energy efficiency, demand response, heat pumps, energy storage, solar, wind, hydro, nuclear, and smart grid technologies. United represents more than 100 companies in the $374 billion U.S. advanced

The Draft Report provided a useful summary of the current residential rate design structure in Massachusetts and the impacts on energy bills from building and vehicle electrification. The current residential rate structure is essentially a monthly fixed charge and a volumetric rate, based on kilowatt hour (kWh) consumption that does not vary by time of use, season, or amount. The Draft Report then provided four rate options, all with the common theme of lowering volumetric rates, although by different means. Time-varying rates (TVR) were not included as a near-term option since advanced metering infrastructure (AMI) is not yet widely adopted in the Commonwealth. Overall, the Draft Report was informative on options for rate design that would make it less expensive to electrify than it would be under current electric rates, but it fell short in offering solutions that balance the complementary nature of DERs, energy efficiency, and electrification and could leave the reader with the impression that the only goal of the Commonwealth is to increase electricity consumption through electrification.

As stated in our Initial Comments submitted to the IRWG on May 31, 2024, United supports the following rate design priorities of the IRWG: 1) reduce energy burden and support

electrification using new rate structures that will promote energy affordability and incentivize transportation and building electrification; 2) increase DERs opportunities and penetration to advance decarbonization and electrification; 3) integrate distribution system planning (DSP) into the utility's business-as-usual operations and investments; and 4) promote operational efficiency to facilitate the transition to a distributed grid. However, the Draft Report in its current state shows a heavy bias towards the "Higher Fixed Charge" option as the optimal solution, without explicitly making that claim. As a general philosophy, United supports monthly fixed charges that capture only customer-related costs and all costs classified in an allocated cost-of-service study as energy or demand related, are excluded from the customer charge. We will discuss that issue in more detail, along with other concerns we have with the Draft Report throughout the sections below.

Concerns with Draft Report

Caution on near-term change, temporary change

United appreciates the IRWG's sense of urgency to change electricity rates to help enable electrification but recommends that major rate design changes occur after AMI is available to customers. Customer education is a vital aspect of any major rate design change. To make an informed decision when presented with multiple electricity rate options, customers need to understand how a change from their current rate would impact their bills, with and without behavioral changes. In addition, they should also be educated on actions they can take to lower their bills under a new rate, including electrification, load shifting, energy efficiency, distributed generation, etc. Customer education must be thoughtful so it can provide meaningful messages to customers without overloading them with information. With AMI, utilities will be able to use household-level data to know exactly how its customers will fare on various rate structures based on actual historical energy usage.

According to p. 3 of the workshop presentation, any near-term rate design would not go into effect until roughly 2026. If it is decided that the ideal solution is a form of TVR, another change would need to be offered to go into effect around 2028. One risk in attempting to offer rate offerings in the near-term and then offering different long-term solutions two to three years later, however, is the potential for customer education overload. After being exposed to information on near-term rate changes, some customers may not be receptive to additional rate design messaging. AMI will allow rates that are time-based and since utility system costs vary throughout the day, TVR may very well be the best option that balances multiple rate design priorities. Thus, careful consideration must be given to the timing and communication of these changes to ensure a smooth transition and maintain customer engagement.

A goal to electrify versus a goal to increase electricity consumption

As we know from the simple supply and demand curve, decreasing prices for a product or service typically increases the demand. If the goal is to increase electricity consumption, a logical solution would be to lower the price of electricity. One could even imagine a rate design that only includes a fixed charge and no volumetric charges and how that would eliminate all financial incentive to manage one's energy usage. Even worse, low-consumption households may consume more electricity than they actually need to feel like they are getting their money's worth for the high fixed charge they pay. This is similar to an all-you-can-eat buffet that many times results in people over-eating. It is United's understanding that one of the Commonwealth's climate goals is to reduce GHG emissions through electrification because utilizing electricity instead of the direct combustion of fossil fuels to run appliances and vehicles emits fewer GHG emissions. Although electrification will increase electricity consumption, the direct goal of the Commonwealth is not increased electricity consumption, particularly while the New England grid is capacity constrained and largely fossil fuel powered. This is an important distinction that needs to be clear when developing rates to enable electrification while also understanding that electrification is best done in tandem with energy efficiency and distributed energy.

The claim that higher fixed charges better align with cost of service is speculative

United disagrees with the claim made on p. 52 of the Draft Report that a higher fixed charge better aligns with cost of service. For such a claim to be accurate, it can only be made in the context of an allocated cost-of-service study that quantifies the various categories of the cost to serve. In the DER workshop, E3 explained that their chosen level of fixed charge was not based on the results of a cost-of-service study. Rather, it was based on the results of other proceedings throughout the country that increased fixed charges. Comparing other regulatory outcomes for reasonableness can be a guide, but a claim of better aligning with cost-of-service principles is conjecture and should be removed from the final report[1].

The bias in the Draft Report towards increasing fixed charges is captured on p. 52 by showing all but one of the pros/cons bubbles in a shade of red to represent a con. The only con listed is that it would be politically challenging to implement. This disregards arguments that have been made against high fixed charges in proceedings throughout the country like the disincentive it

[1] A similar claim is made on p. 3, where it is stated, "All options better align rates with utility costs of service, provide varying price signals to encourage building electrification, and have limited impacts on non-electrifying households, but face unique challenges."

creates for energy efficiency and various DERs. United believes this bias towards high fixed charges as the solution to electrification is misguided.

One of the IRWG's rate design priorities is to promote operational efficiency to facilitate the transition to a distributed grid. Utility costs vary across time of day and season so increasing fixed charges in order to decrease volumetric charges does nothing to address operational efficiency.

The only costs that do not depend on usage are customer-specific costs

On p. 38, for the declining block rate, the Draft Report states, "Costs that do not depend on usage are recovered in the first block". It is unclear what is meant by "do not depend on usage". There are few utility costs that do not depend on usage in the long-term and are classified and functionalized in a cost-of-service study as customer costs. For example, the service drop to a customer's meter and the meter itself would not exist if not for that one specific customer, regardless of the customer's electricity usage. However, other utility costs that are driven by electricity consumption are either classified as energy- or demand-related costs. Energy-related costs are things like fuel and purchased power. Demand-related costs are things like distribution equipment. Even though once constructed and in operation, the capital expenditures of demand-related infrastructure no longer vary based on consumption, that investment was in fact driven by energy consumption.

As stated earlier, United supports monthly fixed charges that capture only customer-related costs and all costs classified in an allocated cost-of-service study as energy or demand related, are excluded from the customer charge. An attempt to embed energy- or demand-related costs in a fixed, unavoidable charge sends improper price signals and will result in a system that is not operating efficiently. That alone should be reason enough to show "Unintended Consequences" as a con, under the Higher Fixed Charge option on p. 52.

Not considering DERs for near-term rates is a misstep

If DERs are considered to be part of the climate solution, not considering the impact of rates on DERs in the near-term, as suggested on p. 11 of the Draft Report, is misguided. The impact on DERs, including rooftop solar, should be considered before any rate design changes are implemented. Even if a near-term rate design is only in place for two to three years, that is two to three years when some customers will either install heat pumps without the complementary installation of energy efficiency measures and/or distributed, clean energy or those who have already made investments in DERs or energy efficiency, may forgo electrifying. This point

becomes moot if the final recommendation is to only make rate design changes when AMI is available.

Although p. 11 suggests DER impacts will only be considered in the long-term rate analysis, p. 41 of the Draft Report touches on the general impact on rooftop solar customers, specifically how lower volumetric rates negatively impact the benefits of net energy metering (NEM). However, p. 52 ignores these impacts as negative impacts as they are not listed.

Conclusion

United appreciates the opportunity to comment on the IRWG's Draft Report and we look forward to continued engagement throughout this process.

Sunnova Energy Corporation
20 Greenway Plaza, Suite 540
Houston, TX 77046
sunnova.com

September 6, 2024

Massachusetts Clean Energy Center
294 Washington Street, Suite 1150
Boston, MA 02108

To the Members of the Interagency Rates Working Group:

Sunnova Energy International submits these written comments on the Draft Near-term Rates Report[1] as requested by the consultant Energy + Environmental Economics ("E3"), who was hired by the Massachusetts Clean Energy Center ("MassCEC") to advance "near- and long-term rate designs that align with the Commonwealth's decarbonization goals.

Founded in 2012, Sunnova is a leading adaptive energy services company. Sunnova has more than 430,000 customers across 51 U.S. States and Territories, which include over 26.5 thousand customers in the Commonwealth of Massachusetts. Sunnova is grateful for the opportunity to participate in these proceedings to provide our insights gleaned from other states, as well as our collaboration with other industry partners who are following these proceedings. These comments will provide feedback on the underpinning assumptions of the draft decision, highlight concerns of the framework parameters for "near term" solutions for distributed energy resources ("DERs"), and the report's analysis of the benefits of a higher fixed charge for rate design for Massachusetts.

Sunnova disagrees with the report's fundamental assumption that the current trend and goal for rate design is to move from promoting "energy conservation" to decreasing rates to encourage electrification. We, along with other members of the industry, believe that this is a false dichotomy. As we see increased electrification among homes in Massachusetts, energy conservation and price signals to reduce peak usage will be even more important. In fact, while electrification is positive when it displaces less efficient energy use the deployment of on-site generation and energy efficiency result in reduced consumption of electricity from the distribution system.

[1] https://www.mass.gov/doc/near-term-rate-strategy-draft-report-for-public-comment/download

Sunnova has questions about the value of implementing near-term rate design changes in advance of the adaptation of advanced metering infrastructure ("AMI"). The draft decision's consideration of fixed charges and their impacts to distributed energy resources like residential solar as "minimal" (slide 52) is concerning. Massachusetts has already been met with challenges to increased solar adaptation[2] across the Commonwealth. Making changes to rate design for a short-term as proposed in this draft report will have adoption implications for residential solar, in a critical period while the Department of Public Utilities ("DPU) and the Department of Energy Resources ("DOER") is in the process of redesigning the Solar Massachusetts Renewable Target (SMART) program is challenging for both the solar industry, and ratepayers (including solar customers). The SMART redesign is happening in part due to a desire to increase enrollment in the tariff now that the incentive structure has reached the end of the declining block program. The DPU states that its goals for ratemaking are simplicity and continuity to promote important benefits and protect customers.[3]. These principles ensure that customers can understand their rates and are not frustrated or confused by sudden or frequent changes. We are concerned that an interim rate design, implemented rapidly and revisited following the roll-out of AMI will frustrate—not support—the Commonwealth's emission reduction goals; it risks confusing customers and it may result in inequitable cost burdens.

Higher Fixed Rate Charge Proposal Challenges

In the draft report, E3 highlights the fact that Massachusetts already has an issue with under enrollment of customers who are eligible for LMI electricity rate discounts.[4] While in stakeholder meetings, E3 stated that they used the term "fixed rate charge" to include the potential for an income based or flat graduated fixed charge, both options present challenges for impacts on ratepayers and difficulty of implementation. The changes outlined in this proposal, particularly the implementation of a higher fixed charge will disproportionately impact low-usage and low-income households, who are already struggling with utility rates despite the existence of public assistance rates. As the Solar Energy Industries Association (SEIA) and other members of the industry have stated, Sunnova believes the "electrification pricing" proposal would reduce distribution charges of customers with a higher-than-

[2] https://www.bostonglobe.com/2023/12/16/science/mass-falls-behind-on-solar/#:~:text=At%20the%20current%20rate%2C%20Massachusetts,well%20over%201%20million%20homes.
[3] ." *Eversource,* D.P.U. 22-22, at 404 (2022) D.P.U. 18-150, at 503; *Eversource*, D.P.U. 17-05-B at 5; *National Grid*, D.P.U. 15-155, at 383 (2016)
[4] Interagency Rates Working Group Near-Term Rates Report, pg. 21

average usage to the level of an average usage customer and shift the displaced revenue recovery burden onto all other energy customers, including low-income customers.

Income Graduated Fixed Charge Challenges

As seen with the challenges in California, using income-based graduated fixed charges ("IGFC") raises fairness and implementation concerns. As stated by the Clean Energy Coalition, while an income-based fixed charge might reduce volumetric rates for some customer classes, it will not reduce the pace at which rates are increasing, which is currently greater than inflation.[5] As seen in the California example, an income graduated fixed charge only provides relief from the burden of high rates for those in the lowest earning sector, while the edge case households (often small homes or multifamily dwellers) who spend a disproportionate amount of their income on utility bills are very real. If an IGFC were to be implemented, there are serious implementation issues regarding the collection and verification of income data and the hours required for updating data. How much more will utilities need to spend to set up a system to collect, track, and protect this information, and how would this flow through to rates. Would ratepayers be paying for the fee twice?

Fixed Rate Charge

On slide 52, Sunnova questions the assumption that a higher fixed rate charge is truly aligned with the cost of service without seeing detailed methodology. It is already the case that multifamily dwellers pay a larger share of transmission and distribution charges compared to their electricity consumption rates. It is imperative that there be clear and defined costs that can be associated with a fixed charge. The suggestion of a fixed charge at $30 represents a massive jump compared to other flat fixed charges implemented in other states. For example, If Massachusetts were to approve a $30 fixed charge, it would be second highest in the nation among investor-owned utilities, behind Mississippi Power which has a fixed rate fee of $38[6]. Without clear methodology on how a fixed charge would be formulated, Sunnova questions whether or not the assumed volumetric reduction is necessarily cost-reflective in a $30 fixed charge. We also question whether subsequent increases in the fixed charge would result in volumetric rate decreases or whether utilities would just continue to increase both over time.

[5] https://clean-coalition.org/wp-content/uploads/2023/06/R.-22-07-005-Clean-Coalition-Rebuttal-Testimony.pdf
[6] "Residential Fixed Charges – Comparison of Massachusetts Interagency Rates Working Group Proposal to National Investor-Owned Utility Charges", EQ Research LLC, August 23, 2024 (attached)

On slide 52, Sunnova disagrees with the report's assumption that "unintended consequences" of a fixed charge would be positive. Fundamentally, the implementation of a fixed charge would negatively impact the value proposition for energy efficiency measures and solar customers. Is the conclusion to be drawn that hampering the adoption of energy efficiency and residential solar is an intended goal? Sunnova believes that this impact is not thoroughly examined in this report, as the implementation of a fixed charge would require an extensive customer education campaign, and as seen in California, will be a difficult sell. Sunnova would like to raise concerns for how low-income renters using gas heating as referenced on slide 46. These multifamily renters would be hit hardest by a fixed charge that have no control over how and when or if their dwelling would be electrified. As stated earlier in the comments, Sunnova believes that a higher fixed charge's implementation would result in a reduction in value to conserve energy. In California, it was found that the adoption of a high fixed charge with reduced volumetric rates was likely to increase demand—one of the very issues we are already trying to address.

As for the other proposals listed in the Options Matrix, Sunnova believes that if a near-term rate design is the desired outcome for Massachusetts, an opt-in seasonal rate scenario represents the most workable of the solutions outlined in the report. For baseline affordability, the report highlights that homes shifting from no or limited air conditioning would have less savings during the summer months while on a seasonal rate. This statement does not reflect the quality-of-life benefits of having access to air conditioning in the summer, especially if customers are saving across the year on energy bills. We believe strongly that given that this is a near-term approach, the seasonal rate should reflect the fact that the region is still in a summer-peak load scenario. ISONE does not anticipate a switch to a winter peak until 2035.[7] The adaptation of heat pumps in the summer will encourage conservation during this peak season, while the lower winter rates will assist with heat pump affordability. Rather than an opaque fixed charge across the year, a seasonal rate allows customers to understand how their usage impacts their billing and allows for individual actions. We recognize why the report identifies "ease of implementation" as a dark red due to the complexity of using multiple technologies, compared to the ease of a tech specific rate which can be dialed in more closely through design. From our understanding of the utilities perspective from their participation in the IRWG and National Grid's most recent rate

[7] https://www.iso-ne.com/about/where-we-are-going/regional-electricity-outlook/pillar-one-clean-energy/

case, they would like to avoid implementing technology-specific rate design until AMI technology is deployed and integrated into the current utility metering system.

Thank you for the opportunity to provide comment. Please reach out to Alice Horgan at alice.horgan@sunnova.com if you have any questions regarding these comments.

Sincerely,

Meghan Nutting
Executive Vice President of Government and Regulatory Affairs
Sunnova Energy International

Residential Fixed Charges – Comparison of Massachusetts Interagency Rates Working Group Proposal to National Investor-Owned Utility Charges

EQ Research LLC | August 23, 2024

This brief compares the Higher Fixed Charge (Option 1) proposal set forth in Massachusetts Interagency Rates Working Group's (IRWG) Near-Term Rate Strategy Draft Report,[1] with residential fixed charges imposed by investor-owned utilities throughout the United States. The $30.00 per month under consideration by the IRWG, if implemented, would be the second highest in the country, exceeding the current highest residential fixed charge of $37.41 per month levied by Mississippi Power in Mississippi.

Figure 1 shows the IRWG proposal for a typical Massachusetts residential customer in relation to the national average residential fixed charge based on a survey of over 170 investor-owned utilities. The national average is likewise based on default residential rates offered by utilities and is current as of August 23, 2024. The utilities in the national survey comprise all large investor-owned utilities and most of the smaller investor-owned utilities throughout the country.

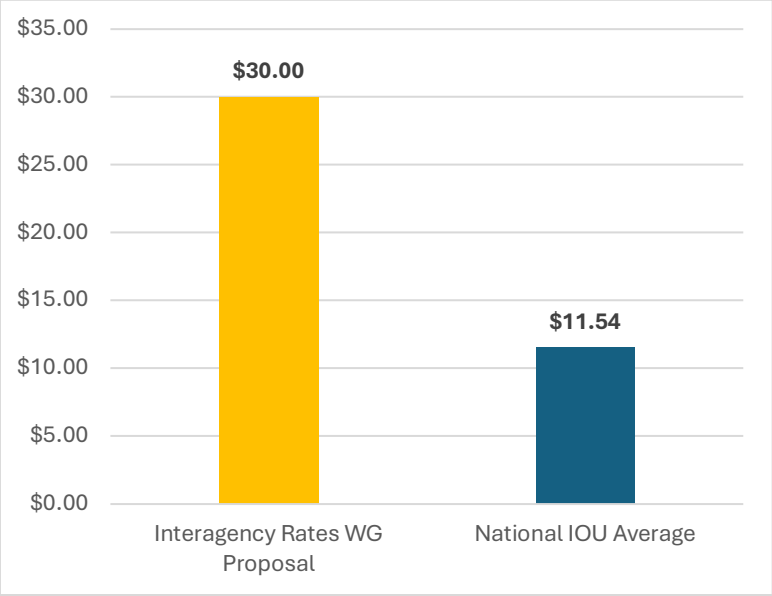


Fig. 1: IRWG Proposed Residential Fixed Charge vs. National IOU Average

Figure 2 shows a contrast between the utilities in the national survey with the lowest quartile of current residential fixed charges in blue and the IRWG's proposed high fixed charge rate highlighted on the right-hand side of chart in yellow.

[1] *Interagency Rates Working Group Study – Near-Term Rates Report*, Energy and Environmental Economics, Inc., PDF 40 (August 12, 2024). Available at: https://www.mass.gov/doc/near-term-rate-strategy-draft-report-for-public-comment/download.

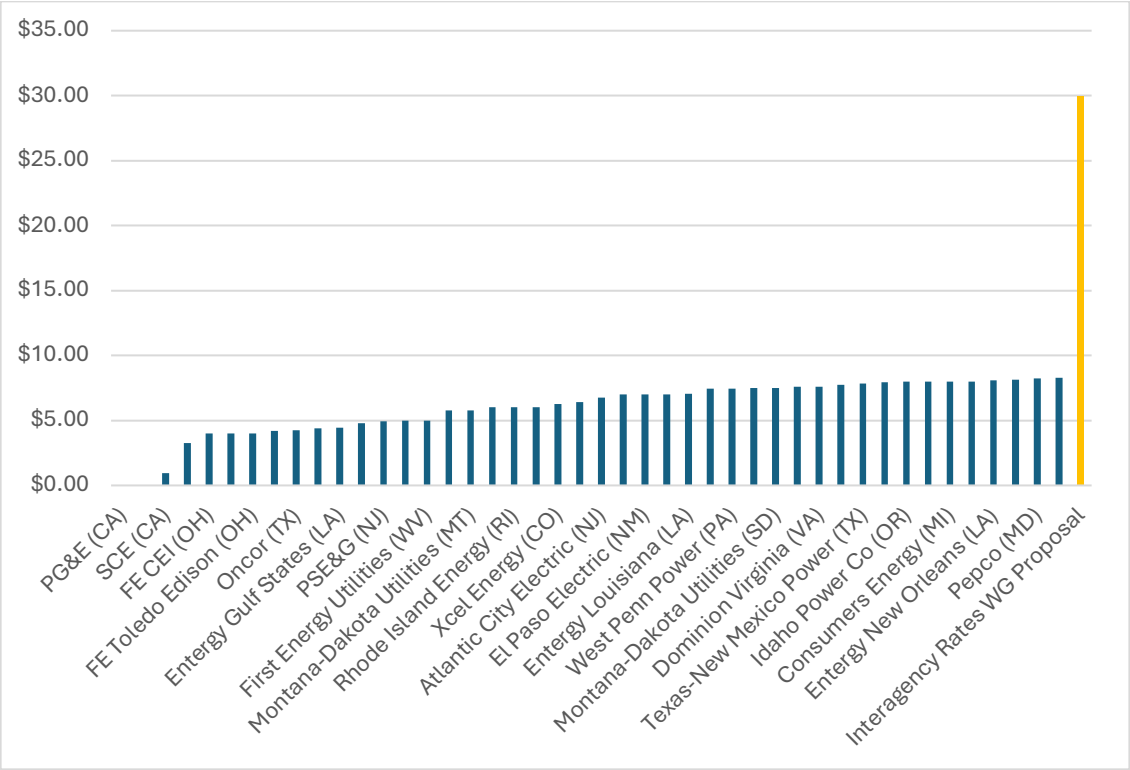


Fig. 2: IRWG Proposed Residential Fixed Charge vs. Lowest 44 Current Residential Fixed Charge

All In Energy
P.O. Box 69
Roslindale, MA 02131
www.allinenergy.org

September 6, 2024

Dear Members of the Interagency Rates Working Group:

Thank you for the opportunity to comment on the Near-Term Rate Strategy Draft Results. We appreciate the time and effort that was put into the development of these results, and we welcome the invitation to share our input.

All In Energy is a Massachusetts-based nonprofit organization, founded in 2018, with a mission to accelerate an inclusive clean energy economy. We were selected as the Mass Save Lead Vendor for the Community First Partnership ("CFP") in 2022. The feedback included here is informed by our experience serving the most underrepresented customer groups in Mass Save, namely renters and landlords, income eligible and moderate income households.

All In Energy strongly believes that the IRWG should prioritize implementing technology specific seasonal volumetric rates for low income households as the most targeted and effective way to enable electrification for vulnerable populations.

Low income residents cannot access Mass Save Programs without rate reform

The 55% of low income households enrolled in LIHEAP that heat their homes with gas[1] have to make the choice between paying higher energy bills and burning fossil fuels in their homes. The Mass Save low income program is installing new gas systems in low income households that will be online for years to come due to concerns about bill increases with electrification, even as Mass Save has stopped supporting gas installations for market rate and moderate income customers. Maintaining an aging and increasingly obsolete gas infrastructure will fall on these families.

Every effort should be made to reduce the increase of energy burdens by pairing electrification with weatherization, rooftop solar, and community solar, but until rates change, most of these already vulnerable households will continue to be left out from programmatic electrification offers. Only rate reform can unlock equitable access for these customer groups.

Identifying qualified ratepayers

Given that heat pumps are funded in full through the Mass Save Low-Income LEAN program and via rebates and subsidized financing for market rate customers, identifying ratepayers who qualify for heat pump specific rates should be a relatively simple process for the utilities that

[1] Low-Income Energy Affordability Network. (2024 June 17). Low Income Energy Affordability Network (LEAN) Presentation to DPU Energy Burden 24-15 Tech Session. DPU 24-15. 24-15DPUENERGYBURDENpsnt0624240617.pptx

also serve as Mass Save Program Administrators. An application and verification process could be created for the few homes occupied by income eligible that installed heat pumps without assistance. This process could be ovelaid and funded through the existing home energy assessment delivery models. Ratepayers that purchased unsubsidized heat pumps are unlikely to have participated in the Mass Save program and therefore would be eligible to receive a no-cost energy assessment.

Setting rates

Winter rates should be set so that heating costs post electrification are projected to be below existing gas heating costs, taking into account savings associated with discount programs including LIHEAP and discount rate to offer additional benefits. The models should reflect that all electrified homes are well weatherized as that is a requirement for LI homes to receive heat pumps.

Summer rates need not differ significantly from the non-technology specific low income discount rate as heat pumps will operate more efficiently than any air conditioning system they are replacing. Families can choose when and if to use their heat pumps in the summer, but will have built in resilience for heat emergencies.

Opt out with education

To prevent rates from being overly burdensome on consumers, technology-specific seasonal rates for low income customers should be opt out. LI customers benefit from turnkey installation of heat pumps, rate education could be introduced as a part of that service without requiring a significant increase in staff capacity. With proper inclusion of rate education in the turnkey installation service of heat pumps by Mass Save, customers should be educated on the potential drawbacks of a seasonal rate as well as the benefits.

Raise fixed charges cautiously

As heat pumps lead to higher electricity usage, lower volumetric rates favor heat pump usage, barring other factors.[5] To support electrification while preventing fixed charges from being overly regressive, income graduated fixed charges should be considered, as in California.[2] Graduated fixed charges should have flexibility for those on the margins of use potentially through a matrix system where both use and income determine the fixed charge to better protect customers at the margins from facing high intransigent fixed charges.[3]

Limit increased costs for low income non-participants

---

[2] Edward Yim and Sagarika Subramanian. (2023 September). Equity and Electrification-Driven Rate Policy Options. ACEEE. https://www.aceee.org/sites/default/files/pdfs/equity_and_electrification-driven_rate_policy_options_-_encrypt.pdf

[3] Severin Borenstein, Meredith Fowlie, and James Sallee. Designing Electricity Rates for An Equitable Energy Transition.

An additional benefit of seasonal technology specific rates, unlike other proposals like increased block rates, is that they should not result in increased burden for those who don't switch. As low income customers often have additional barriers to electrification by more often renting, any rates proposed must not punish LI customers who aren't able to rate switch. More specifically, attention should be paid to ensuring that transmission costs can be mitigated or reduced by participants, rather than shifted to non-participants.

Thank you for your consideration and please feel free to contact me with any questions about our comments.

Sincerely,

Gabriel Shapiro
Co-Executive Director, Partnerships
All In Energy, Inc.
gabe@allinenergy.org
(781) 656-5359

1380 Monroe Street NW, #721
Washington, DC 20010
720.334.8045
info@communitysolaraccess.org
www.communitysolaraccess.org

September 6, 2024

Re: Near-Term Rates Strategy Draft Report

Dear Members of the Interagency Rates Working Group:

Thank you for the opportunity to provide comment on the Interagency Rates Working Group (IRWG) Near-Term Rates Strategy Report. We are grateful to be able to provide input to the working group on these important issues, and commend your thoughtful and careful approach to rate design changes, including the ability to engage with stakeholders throughout the process.

The Coalition for Community Solar Access (CCSA) is a national coalition of businesses and nonprofits working to expand customer choice and access to solar for all American households and businesses through community solar. Our mission is to empower every American energy consumer with the option to choose local, clean, and affordable community solar. We work with customers, utilities, local stakeholders, and policymakers to develop and implement policies and best practices that ensure community solar programs provide a win, win, win for all, starting with the customer. Our comments on the Near-Term Rate Strategy Report are driven by our interest in ensuring that customers receive meaningful benefits from their participation in community solar, and changes in rate design have implications for the value of community solar. We also strongly support the intended goal to make home heating and vehicle electrification accessible and attractive, as it is an important element of achieving the Commonwealth's climate goals. As a customer-centric approach that advances energy equity, we also encourage rate design choices that improve energy affordability for low to moderate income customers and protect their ability to directly benefit from clean energy.

Rate design has important implications for community solar in Massachusetts, particularly if there are changes to supply rates (basic service charges).
The value of rates and the structure of how electricity costs are recovered have a direct impact on the value of a customer's investment in renewable energy, including in community solar. Currently, under the SMART program, community shared solar (CSS) bill credits - in the form of Alternative On-Bill Credits (AOBCs) - are tied to the basic service rate (supply charge) of the project. In order to assess the impact on the value of CSS credits, and thereby the value of subscribing to CSS, we need to have a better understanding of how rates would likely change across supply and delivery charges, as well as across different rate classes. Any reduction in basic service rates will reduce the value of AOBCs and therefore of community solar, and we discourage such changes in the near term.

It is critical to keep the investment signal in renewable energy strong while thinking about changing rate structures to encourage electrification. If we do not decarbonize the electric generation supply, there is no point to electrifying heating and transportation. Revised rate

CCSA
1380 Monroe Street NW, #721
Washington, DC 20010
720.334.8045
info@communitysolaraccess.org
www.communitysolaraccess.org

structures must therefore not reduce the savings a customer may receive from either installing rooftop or behind-the-meter solar, or subscribing to a community solar project.

Changes in rate design also impact community solar subscription management. It is already challenging to right-size a customer's CSS subscription because bill credits are not set equal to customers' per kWh rates, so a provider must have a good understanding of the customer's rate structure and usage in order to evaluate the community solar subscription size that maximizes the customer's savings. The more complexity there is to the rate structure, the more challenging it is to right-size the community solar subscription. A subscription that is too large can result in customers purchasing more community solar credits than they can actually use. A subscription that is too small leaves savings on the table for the customer; neither are good customer experiences.

A near-term strategy should be limited to electrification customers, opt-in, and treated as a pilot and opportunity to collect data about customer behavior, energy use, and affordability.

CCSA supports an opt-in, technology specific rate design for the near term (i.e., Option 2b, the seasonal electric heating option). This option is sufficiently targeted to customers directly impacted by the added costs of electrification, and thereby avoids unintended impacts to other customers. One specific benefit of that rate design option is that it does not discourage solar investment or penalize customers that have already gone solar, as rates will be lower when solar production is lower (i.e., winter), and higher when solar production is higher (i.e., summer).

We are concerned that the 2027-2028 time period is too soon in the future to roll out major rate design changes for all residential customers on an opt-out or default basis. Far more customer education is needed before substantial changes occur. While we strongly support beneficial electrification and are encouraged by increasing rates of home electric heat pumps and EV adoption, these technologies unfortunately are unlikely to be ubiquitous in homes within 2-3 years. The application of rates should mirror the rate of adoption of the technology and should not be the basis of default rates until the majority of customers meet the target profile.

CCSA fears that other near-term rate design options presented in the report could have negative unintended consequences. Higher fixed charges present affordability issues, and customers have less ability to control their costs by reducing or offsetting consumption - including through participation in community solar. Income graduated fixed charges that may address affordability issues are difficult to implement. Declining Block rates disincentivize conservation and do not distinguish between high energy uses for beneficial electrification versus lifestyle choices or inefficiency. Declining block structures also penalize low energy users relative to their higher energy users. This can lead to equity concerns if small apartment dwellers pay a higher rate on average than large single family home owners. Seasonal rates are

CCSA
1380 Monroe Street NW, #721
Washington, DC 20010
720.334.8045
info@communitysolaraccess.org
www.communitysolaraccess.org

less harmful to adoption of conservation measures or adoption of renewable energy, but we would caution that widely applied seasonal rates would cause cost increases for most non-electric heating customers (which in 2027-2028 would likely be most residential customers). This could have a disproportionate impact on lower income customers, particularly given the segment's higher reliance on window unit air conditioners.

Rate design is complex and no single driver, even electrification, should be considered in a vacuum.

While we recognize that a near-term strategy must by its nature take a simplified approach, we strongly urge the IRWG to consider the incentives and price signals that lead customers to adopt DERs, especially solar and storage, in crafting your recommendations on rate design. Avoiding per kWh charges has been a traditional signal for encouraging solar adoption; if new rate designs alter that value proposition, the Commonwealth must find other ways to incentivize individuals to adopt clean energy. The SMART program is under review and rate design and incentive structures must be coordinated to ensure intended outcomes. This is the case for both residential rooftop solar as well as for community solar, where significant changes are proposed under the program review. For example, there is a new proposed requirement to provide a 20% discount to subscribers under the new CSS rules, which aim to ensure that community solar provides meaningful savings. If the bill credit becomes much lower relative to the customer's total bill, that required discount becomes less meaningful. However, increasing the discount requirement is not likely feasible if the projects' revenues, in the form of a bill credit, are lower. Higher SMART incentives would be needed to offset the reduction in the value of the bill credit.

Further, actual system costs will shift with changing load patterns resulting from electrification. System peaks drive system costs and thereby delivery rates. Widespread electrification will naturally change those peaks, thus changing system costs. If rates are set to recover those costs (as they should be), the impacts of electrification should also cause a change in delivery rates. Those changes are difficult to predict when layering in rate design changes, as the level of responsiveness customers may have to price signals embedded in rates may either mitigate or exacerbate those changes.

We must provide equal or even greater emphasis on reducing the actual costs of electric service, rather than solely considering how to redistribute those costs through rate design. We urge the IRWG to consider what infrastructure upgrades will be needed, how they can be paid for, and what other benefits they provide when embarking upon the long term rate design study. The utilities' Electric Sector Modernization Plans are the appropriate forum for this evaluation, and the IRWG's work should be coordinated with efforts on the newly approved long-term grid planning process and the work of the Grid Modernization Advisory Council. Rate design issues should be carefully aligned with system plans and expected means of recovering the costs of those plans.

1380 Monroe Street NW, #721
Washington, DC 20010
720.334.8045
info@communitysolaraccess.org
www.communitysolaraccess.org

We again thank you for your thoughtful approach to balancing the many competing factors in developing an appropriate rate design that will help us meet our emission reduction targets. We recognize the constraints in developing an appropriate near-term rate design that can be implemented without universal AMI. We hope these comments and considerations are helpful as you craft your recommendations and proceed with your work to implement thoughtful rates in the Commonwealth.

Please do not hesitate to reach out with any questions or needed clarifications.

Sincerely,

Kate Daniel
Northeast Regional Director
Coalition for Community Solar Access

September 6, 2024

Via email to Rates.WG@mass.gov

Austin Dawson
Deputy Director - Policy, Planning, and Analysis Division
p. 617.875.6856
Massachusetts Department of Energy Resources
100 Cambridge Street, 9th Floor, Boston, MA 02114

Re: Electric Distribution Companies Comments on Near-Term Rate Strategy Draft Results

Dear Mr. Dawson,

Eversource, National Grid, and Unitil (Electric Distribution Companies, "EDCs") appreciate the opportunity to comment on the Near-Term Rates Report prepared by E3 ("E3 Report") for the Interagency Rates Working Group ("IRWG"). The EDCs thank the IRWG for undertaking this initiative, and E3 for their thorough analysis of rates and rate designs and their impacts on Massachusetts residential customers, low-income affordability, and the Commonwealth's electrification goals.

E3's presentation of current utility rates and rate designs aligns with the EDCs' overall understanding of customer energy burdens and the gaps between current rate designs and public policy objectives. Under today's residential delivery[1] rate designs, customers pay according to their level of volumetric consumption however distribution system costs and other charges are either fixed or driven by customer and system peak demands. As illustrated in the E3 Report, this can significantly increase the operating costs of heat and transportation electrification technologies and the energy burden to low-income customers who are more likely to rent their homes, live in older or less efficient homes, and rely on electric resistance space heating. Changes to existing delivery rate design can facilitate electrification and affordability policy goals.

General Principles and Framework for Considering Rate Design Options

The EDCs agree that alignment with policy objectives is a key consideration when comparing rate design alternatives. Rate design decisions inherently involve carefully considered trade-offs and must balance competing priorities. Changes to rate design should be assessed against their ability to meet established rate design objectives, which may be summarized as: (1) effectiveness at yielding the total revenue requirement and stability of cash flows; (2) stability of the rates themselves; (3) fairness in apportioning the cost of service among customers and

[1] Delivery rates include charges to recover transmission costs, distribution costs, and costs associated with funding programs such as bill assistance, energy efficiency, clean energy, and others.

avoidance of undue discrimination; and (4) promotion of efficient use by the customer (i.e., provision of efficient price signals). Cost-reflectiveness must be balanced with practical considerations including customer bill impacts, the simplicity and predictability of the rate design and the ability of customers to understand and respond to it, impacts on public policy goals, ease of implementation, and any other relevant factors and constraints.

Effective, stable, fair, and efficient rate design, balanced thoughtfully with customer, policy, and practical considerations, is necessary to provide a solid foundation for achieving the Commonwealth's electrification and affordability goals. However, as the E3 Report's bill impacts analysis shows, while rate design can improve the economics of electrification for individual customers, the level of savings it can provide is unlikely to drive significant incremental customer adoption of electrification technologies. It is important to recognize the critical but limited role of rate design in achieving policy goals. Programmatic mechanisms must be implemented alongside rate design to fully address system and policy needs and may have a more substantial near-term impact.

Rate Design Alternatives Analyzed by E3

The E3 Report provides a comparison of four near-term rate design options with respect to electrification affordability, baseline affordability, alignment with cost of service, unintended consequences, and ease of implementation. The four near-term options presented in the E3 Report include a higher fixed charge applied "universally", a seasonally differentiated volumetric charge applied "universally", a seasonally differentiated charge for electric heating customers only, and a volumetric declining block charge for electric heating customers only. The EDCs offer additional feedback on each of the four near-term options below.

- **Higher fixed charge (universal)** –E3 describes three variations on a higher fixed charge rate design: one recovering program costs through a fixed charge, one recovering program costs plus a portion of distribution and transmission costs though a fixed charge, and one recovering all program costs and all transmission and distribution costs through a fixed charge. These higher fixed charge solutions are overall more cost-reflective than volumetric charges for distribution, transmission, and policy-related program costs, may be implemented in the near-term, can reduce the operating costs of electrification technologies, including both heat pumps and electric vehicle charging, and may improve affordability for low-income customers and renters with electric resistance heating. With respect to program costs, the EDCs believe that fixed charges to recover certain policy-related program costs should be considered as they are currently recovered on a per kWh basis but have no relationship to a customer's usage.

- **Seasonal (universal)** -- The E3 Report describes a rate design that includes a fixed customer charge with no change from current rates, and a seasonally differentiated per kWh rate where 60 percent to 100 percent of utility costs are recovered in the summer. As the E3 Report points out, shifting costs collected through a volumetric charge to summer months would result in a significant increase in customer air conditioning costs, which may have disproportionate impacts on low-income customers with less efficient

air conditioning technology and building weatherization, and who may be at higher risk for health concerns if cooling costs increase. Moreover, the EDCs are expecting a winter peak demand to emerge as electrification moves forward. A seasonally differentiated rate with a discounted winter charge would thus result in an improper long-run price signal to customers. A gradual transition away from a winter discount would likely be required to prevent rate shocks, which the near-term timeline may not allow for.

- **Seasonal (electric heating)** – The EDCs recommend consideration of a seasonally differentiated programmatic approach for electric heating customers, with well-defined targets and parameters, such as the budget and term, and with program costs recovered as appropriate for a policy driven program. Such a programmatic approach would provide transparency for customers and enable flexibility as system conditions change over time. Targeted program parameters may also result in more efficient and effective achievement of specific policy outcomes. The EDCs note that any rate design or program offered exclusively to electric heating customers will require additional administration to verify eligibility.

- **Tiered/Declining Block (electric heating)** – The E3 Report describes an rate design for electric heating customers that is comprised of a fixed customer charge with no change from current rates, a volumetric charge to recover delivery system and program costs for usage less than or equal to 500 kWh/month, and a lower volumetric charge to recover energy supply costs for usage greater than 500 kWh/month. The first tier would recover "costs that do not depend on usage" in the first tier. Delivery system costs are not driven by volumetric usage, so the usage threshold between blocks would be based on desired savings outcomes rather than an efficient price signal.

Practical Considerations for a Near-Term Rate Design

Residential volumetric rates are a function of legacy rate designs and metering limitations. Prior to industry unbundling, rate designs generally utilized customer and demand charges to recover fixed administrative and system costs. Volumetric rates were designed to recover fuel and other variable costs. For residential customers, the use of demand charges was limited by the higher cost of demand meters. As noted in the E3 Report, volumetric delivery rate designs came to align with public policy goals centered on energy conservation. Even as these goals have increasingly shifted over the last decade to recognize the role of heat and transportation electrification in achieving decarbonization, lack of AMI metering capability has limited the options available to better align rate design with policy goals in the Commonwealth. However, such capability is very near with AMI deployments beginning in 2025 and estimated to be complete by the end of 2027/2028. The availability of EDC system-wide interval metering and interval meter data will enable advanced residential rate designs that are more aligned with both system costs and electrification policy goals.

As summarized above, the E3 Report presents four alternative rate designs that could be implemented in the "near-term". These four rate design options may not require interval metering or historic interval meter data to develop or implement, and therefore are proposed as

potential "near-term" solutions to address the barriers to the policy objectives of electrification and low-income energy burden relief. EDCs have already introduced or are exploring such rate designs. Unitil recently received approval for a seasonal electric heat pump rate in D.P.U. 23-80. National Grid has a pending proposal for an electrification rate with a higher fixed charge in D.P.U. 23-150. Eversource has a lower volumetric rate for its residential heating customers. The EDCs support the continued exploration of these rate designs.

However, the EDCs caution that any near-term consideration of rates should be informed by and consistent with longer-term objectives. As noted earlier, AMI is upon us as National Grid and Eversource plan to begin deployment of AMI meters on a rolling basis in 2025. A focus on statewide alignment of near-term rates risks being at the expense of timely progress toward AMI-enabled rates that can support the evolution of the electric system over the longer term. Further, once a near-term rate design is in place, transitioning away from that rate design to a long-term solution can pose significant challenges. Implementation of a near-term rate design followed by a transition to a long-term rate design within a few years could result in instability and confusion for customers, and may actually preclude or delay transition to an AMI-enabled long-term rate design. As the E3 Report points out, this could be especially problematic if the near-term solution becomes obsolete with changing system conditions. The E3 Report further notes that rate design is only a "step 1", and that implementation is crucial. These additional considerations put into question the viability of a true near-term rate design solution.

Given these timing considerations, programmatic mechanisms such as load management programs and electrification incentives may be more practical and effective than rate design in the near-term. Programs can more efficiently target and achieve priority objectives and can provide flexibility with respect to budget and timing. Most importantly, programmatic mechanisms implemented in the near-term can overlap with and operate in tandem with long-term rate design. Given that no single rate design can perfectly reflect system costs and mitigate bill impacts while meeting all policy goals and considerations, programmatic mechanisms can help optimize outcomes in an efficient and timely manner.

For these reasons the EDCs suggest the IRWG not recommend a single-near term rate design, and support EDC flexibility in identifying the right combination of rate and program offerings that support policy objectives as well as customer and system needs. If a near-term rate design is recommended, the EDCs emphasize the importance of choosing a simple rate design that can be implemented quickly on an opt-in basis, and with a low risk of interfering with the ability to progress to AMI-enabled rate design for the long term.

***

The EDCs appreciate the opportunity to submit comments on rate design and look forward to continued collaboration with IRWG.

Very truly yours,

Lauri Mancinelli
Principal Analyst, Regulatory Strategy
National Grid

Richard Chin
Manager, Rates (MA)
Eversource

Patrick Taylor
Chief Regulatory Counsel
Unitil

September 6, 2024

Re: Public Comment on Near-Term Rates Report and Proposed Rate Design Alternatives

Dear Members of the MA Interagency Rates Working Group:

Thank you for the opportunity to comment on the Near-Term Rate Strategy Report Draft. Emerald Cities Collaborative-Northeast (ECC-NE) is supportive of the objective and purpose of the Interagency Rates Working Group (IRWG) and the near-term rates strategy to address barriers to near-term electrification through rate design offerings and provide immediate benefits and incentives to consumers. We believe that the IRWG's process for public input and stakeholder engagement has been thoughtful and equitable. Our team has been monitoring the progress of the IRWG's work and we are appreciative of the opportunity to provide feedback and recommendations.

Emerald Cities Collaborative (ECC) is a national organization founded in 2009 with a mission to create just, sustainable and inclusive regional economies with opportunities for all — an approach we call "the high road." ECC follows a place-based approach, working out of several regional offices, ours being the Northeast office based in Boston, MA. Our experience working in frontline communities, with community-based organizations, institutions, and government, allows us a view of the unique barriers that underserved communities experience in their day-to-day lives as it relates to housing and energy burden.

Impact on Low-Income Households

The report highlights the significant energy burden faced by low-income households, particularly those living in older, inefficient homes and those relying on electric resistance heating. As an organization committed to reducing poverty and promoting equity, we are deeply concerned about the disproportionate energy costs borne by these households. It is crucial that any rate design changes prioritize the alleviation of these burdens.

We support the report's findings that utility bill discounts and state/federal assistance programs are essential but insufficient. More robust interventions are needed to ensure that low-income households are not left behind as we transition to cleaner and more efficient energy systems.

Support for Rate Design Reforms

We commend the consideration of higher fixed charges, seasonal rates, and declining block structures as alternatives to the current high volumetric rate structures. These approaches offer promising avenues to better align rates with utility costs while providing incentives for electrification—a key step toward a sustainable energy future. However, it is imperative that

these rate changes do not inadvertently exacerbate the financial challenges faced by low-income households.

Recommendations

We believe there remain opportunities to strengthen the strategy and offer the following comments and recommendations for your consideration.

I. **Income-Adjusted Fixed Charges**: We strongly advocate for the implementation of income-graduated fixed charges. By scaling fixed charges according to income, we can ensure that energy remains affordable for all, especially those who are most vulnerable.

II. **Seasonal Rates with Protections**: While seasonal rates may provide benefits by lowering winter heating costs for electrified homes, care must be taken to avoid penalizing households with high summer air conditioning loads, which are used more often in low-income households (pg. 17 of the report). We recommend that any seasonal rate structure includes protections for these households, such as additional discounts or exemptions during peak summer months.

III. **Technology-Specific Rates**: We support the introduction of technology-specific rates that could provide significant savings for low-income households that adopt heat pumps or other electrification measures. However, it is essential that these rates are accompanied by robust outreach and education efforts to ensure that low-income households are aware of and can access these opportunities.

IV. **Comprehensive Assistance Programs**: We urge the consideration of enhanced assistance programs, such as tiered low-income discount rates and Percent-of-Income Payment Plans (PIPP). These programs should be designed to reduce the energy burden for households earning below the state median income, particularly those who are already struggling with high utility bills.

V. **Pilot Programs and Gradual Implementation**: We support the introduction of a gradual roll out of new rate designs through pilot programs that test different combinations of fixed charges, seasonal rates, and technology-specific incentives. We suggest the collection of data to refine the approaches before full-scale implementation. Pilots allow for adjustment based on real-world data, ensuring that the final rate designs are both effective and equitable.

VI. **Reduce Barriers to Enrollment**: Many low-income households are eligible for assistance but face barriers to enrollment due to the complex nature of applying for the programs and a need for more targeted outreach efforts. We recommend the consideration of

enhanced and streamlined bill assistance programs like utility bill discounts and energy efficiency grants. Ensure these programs are easy to access and provide sufficient support to offset any increased costs due to electrification. Partnerships with local community-based organizations could allow more participation and increase trust-building in low-income communities.

Examples from Other Jurisdictions

1. Maine's Versant Power program offers a **seasonal, technology-specific rate** for customers who use heat pumps. The rate offers lower winter rates to encourage the use of heat pumps for heating but **higher summer rates**. This pilot program is aimed at balancing the costs of heating and cooling while promoting energy-efficient technologies. The program also includes **income-adjusted fixed charges**, allowing low-income customers to qualify for **lower fixed charges** to help manage their energy costs year-round, even if their summer cooling costs increase due to the higher summer rate.
2. Illinois offers a **PIPP** where low-income customers can pay a **fixed percentage of their income** toward their energy bills and the state covers the remaining balance. PIPP enrollment is often done in conjunction with other low-income programs, like the Low-Income Home Energy Assistance Program (LIHEAP), to **simplify the process** for applicants. Outreach for this program includes partnerships with community action agencies, public service announcements, and engagement with social service agencies.
3. Energy Outreach Colorado program offers energy bill payment assistance and energy efficiency services to low-income residents by **partnering with hundreds of local agencies and nonprofits**. They identify, assist, and handle the initial contact and enrollment processes, making the program more **accessible**.

We recommend that the IRWG meet with these jurisdictions to learn more about their policies and understand best practices for implementation.

Promote a Holistic Approach to Reduced Energy Burden

While rate design changes and enhanced energy assistance programs are important, they are not sufficient on their own to fully address the energy burdens faced by low-income households. ECC believes that beyond just adjusting how electricity rates are structured (e.g., through higher fixed charges or seasonal rates) and offering utility bill assistance programs (like discounts or PIPP), it is also crucial to improve the physical conditions of low-income homes. This can be achieved by:

- Weatherization: Improving the insulation and sealing of homes to reduce energy loss, which in turn lowers heating and cooling costs.

- Energy Efficiency: Implementing more energy-efficient appliances and systems (like heat pumps or efficient lighting) to reduce overall energy consumption.
- Housing Opportunities: Ensuring that low-income households have access to better-quality housing that is inherently more energy-efficient and affordable to maintain.

These additional measures can significantly lower the overall energy demand of a household, thereby reducing their energy bills and the associated burden, even as rate designs and assistance programs are reformed. The report suggests that a comprehensive approach, combining rate reform with improvements in housing conditions, is necessary to effectively reduce energy burdens for low-income households.

Conclusion
As Massachusetts continues its journey toward a more electrified and sustainable energy system, it is vital that the needs of low-income communities are not only considered but prioritized. The proposed rate design changes offer a unique opportunity to realign our energy policies with equity and justice at the forefront. We urge you to adopt measures that protect and uplift low-income households, ensuring that the transition to cleaner energy benefits all residents of the Commonwealth.

Thank you for considering our comments. We look forward to working collaboratively to advance policies that support the well-being of low-income communities across Massachusetts.

Sincerely,

Alexis Washburn

Alexis Washburn
Northeast Regional Director
Emerald Cities Collaborative
awashburn@emeraldcities.org

Esmeralda Bisono

Esmeralda Bisono
Northeast Community Engagement and Policy Manager
Emerald Cities Collaborative
ebisono@emeraldcities.org

September 6, 2024

VIA ELECTRONIC MAIL ONLY
Interagency Rates Working Group
c/o Massachusetts Department of Energy Resources
100 Cambridge Street, Suite 1020
Boston, MA 02114
rates.wg@mass.gov

Subject: Comments on the Interagency Rates Working Group Near-Term Rates Strategy Draft Report

Dear Interagency Rates Working Group Members,

In accordance with the Interagency Rates Working Group's ("IRWG") invitation to submit public comment on the Near-Term Rates Strategy Draft Report ("Draft Report"), the undersigned advocacy organizations respectfully submit the enclosed comments for your consideration. We thank you for commissioning this timely and necessary study of near-term rate options and for the opportunity to provide feedback on the analysis conducted to date. We also extend our thanks to the E3 consultant team ("Consultants") for their efforts in preparing the Draft Report. We recognize the magnitude of the task and the significant technical challenges involved in such an effort.

In the stakeholder workshops to date, we have been concerned by statements framing the IRWG's work as an effort designed to solve mainly for electrification and leaving many affordability questions for the Massachusetts Department of Public Utilities ("DPU") to address separately. We urge the IRWG to reconsider this position—promoting efficient electrification and reducing energy burdens for our most vulnerable residents can and should be prioritized together. Indeed, the IRWG states on its website that "[e]lectric ratemaking and rate design must prioritize the reduction of energy burden and incentivize transportation and building electrification to facilitate the transition to a distributed grid." The IRWG process represents a singular opportunity to reform energy rates in an equitable manner, and we cannot afford to miss the mark.

Statutory ratemaking principles have shifted from a focus on cost-causation to prioritization of, among other things, "affordability, equity and reductions in greenhouse gas emissions to meet statewide greenhouse gas emission limits and sublimits established pursuant to chapter 21N."[1] To achieve our mandate of net-zero greenhouse gas emissions by 2050[2] in an equitable manner, Massachusetts is thus required to prioritize affordable, equitable electrification for our most vulnerable communities, including environmental justice ("EJ") populations, low- and moderate-income ("LMI") households, affordable and subsidized housing residents, persons living with disabilities, and elderly persons. These customers already struggle to meet their

[1] M.G.L. ch. 25, § 1A.
[2] M.G.L. ch. 21N, § 3.

essential needs and spend a higher proportion of their income on energy than high-earning households. While the average residential energy burden in Massachusetts is about three percent, it rises to about 10 percent for low-income populations and can reach as high as 31 percent for some.[3] As we align our electric rate structures with our policy goals of decarbonizing in an equitable manner, near- and long-term rate reform is needed to solve for barriers to affordable electrification and achieve energy burden[4] reductions for LMI customers.

The Draft Report does not adequately address near-term solutions for reducing energy burdens for LMI customers; this can be improved by incorporating the feedback below. First, we suggest improvements for the study of energy bills and burdens under the current rate structure. Second, we identify areas where additional modeling or clarification of the Draft Report's analysis of four alternative rate options is needed. Third, we offer our initial assessment of the alternative rate options presented and recommend additional approaches that the IRWG and its Consultants should prioritize to achieve affordability and energy burden reductions for LMI customers. We welcome dialogue on these recommendations and look forward to engaging with the IRWG and its Consultants.

I. The Near-Term Rates Strategy Draft Report's Analysis of Current Energy Bills and Burdens Should Include Additional Detail Regarding the Impacts of Race and Income on Energy Affordability.

While we appreciate the Draft Report's focus on analyzing how energy burden varies across different household types, how weatherization combined with electrification impacts bills, and which types of households are most energy burdened under the existing rate structure, we identify a few areas for improvement and clarification.

First, the Draft Report does not consider the relationship between racial inequities and rates. Layering race into an analysis of rate design is critical for effectively addressing equity and affordability concerns. In general, Black, Indigenous, and people of color households are disproportionately impacted by high energy burdens as compared to white households, regardless of income level. In fact, data show that low-income Black, Hispanic, and other non-White households are disconnected three times more often than low-income White households.[5] Further, Black households are more than twice as likely to report late payments to a utility.[6] This evidence underscores the urgency to consider race when designing rates. The Consultants should include race in their analysis of current rate design to better understand racial disparities and inform selection and evaluation of alternative rate options.

---

[3] Kimberly Clark, *Reducing Energy Burden: Resources for Low-Income Residents*, Metropolitan Area Planning Council (Jan. 28, 2022), https://www.mapc.org/planning101/reducing-energy-burden-resources-for-low-income-residents/.

[4] The Federal Department of Energy (DOE) defines energy burden as "percentage of gross household income spent on energy costs." This term reflects the proportion of income a household spends on energy costs, with anything over six percent being considered a high energy burden.

[5] Congressional Research Service, *Electric Utility Disconnections* (Jan. 31, 2023) at 11 (Figure 5), available at https://crsreports.congress.gov/product/pdf/R/R47417.

[6] *Id*.

Second, the Draft Report illustrates the seasonal volatility of energy bills for low-income households but does not mention the utilities' level or budget billing programs.[7] The Consultants should clarify if they considered utilities' level billing programs in their analysis and, if not, account for the impacts of those programs in their presentation of seasonal volatility. Further, the Draft Report should consider the growing need for increased energy use in the summer.

Third, the Draft Report presents data on the energy burdens for low-income households after receiving bill discounts but does not identify the specific bill discounts used in the analysis.[8] The Consultants should make explicit whether the "bill discounts" refer to the R-2 rate.

II. The Near-Term Rates Strategy Draft Report's Presentation and Evaluation of Alternative Rates Should Include Additional Analysis and Clarification.

The Draft Report's presentation and analysis of four alternative rate options is a commendable first step in providing the IRWG with the information it needs to recommend effective solutions for achieving affordable electrification. Nevertheless, there are areas for improvement and additional modeling, which we outline below.

Customers left behind: Our initial impression is that a technology-specific seasonal rate, designated "Option 2b" in the Draft Report, may help some LMI households transition from gas to efficient electric heating while keeping their energy bills affordable. The DPU recently approved Unitil's proposal of a similar seasonal rate.[9] In its order approving Unitil's proposal, which applies to RD-1 and RD-2 rate classes (i.e., non-low-income and low-income residential customers), the DPU stated, "[T]he availability of a heat-pump rate for residential low-income customer classes is consistent with the important consideration that there should be policies and programs to support low-income electrification to ensure low-income customers are not left behind in the transition to clean energy and, in fact, benefit in the near-term from electrification opportunities."[10] It further stated that the proposed rate is "a reasonable, cost-efficient solution to mitigate the potential high bills associated with heat-pump implementation faced by residential and low-income customers within the context of current rate structures, while maintaining a rate structure that accurately reflects the cost to serve customers during this stage of electrification."[11] While we are optimistic about the potential for a technology-specific seasonal rate to help many LMI customers, we would like to see more information in the Final Report about how such a rate would impact the rates of customers who remain unserved by Massachusetts' various electrification programs due to budget or technical limitations or lack of eligibility. We also seek more information about whether eligibility criteria should be revised to mitigate any discrepancies identified in the course of this review. In any case, there are equity, affordability, and health concerns about limiting low-income rate relief to a particular season.

[7] Interagency Rates Working Group, Near-Term Rates Strategy Draft Report, at 19 ("Draft Report").
[8] Draft Report at 19-20.
[9] D.P.U. Order 23-80 & 23-81.
[10] D.P.U. Order 23-80 & 23-81, at 407 (citing D.P.U. 20-80-B at 120).
[11] D.P.U. Order 23-80 & 23-81, at 407.

Gas cost assumptions: The Consultants should explain their gas bill modeling. Assessing the results of the study is challenging without understanding what the cost assumptions were and whether the modeling accounted for factors such as weatherization, variation in gas rates across the Commonwealth, and the Gas System Enhancement Program ("GSEP"). A 2020 analysis conducted by Conservation Law Foundation indicated that the cost impact of GSEP would eliminate the cost difference between gas and electric heating on a near-term basis.[12] Relatedly, the Consultants should account for the likelihood of increased electricity rates due to anticipated transmission and distribution investments, including implementation of grid modernization plans which are expected to result in at least $2.6 billion of additional spending over the next five years.[13] The uncertainty of future gas and electricity prices–and thus the uncertain bill impacts of electrification–needs to be accounted for; sensitivity analysis may be appropriate.

Implementation challenges: While the Draft Report discusses some important advantages of a technology-specific seasonal rate, it should include more detail about how such a rate would be implemented to benefit the majority of eligible LMI customers. We encourage the IRWG to consider ways that Mass Save data could be utilized to automatically add customers who electrify their homes, or whether customers receiving Mass Save rebates could be shepherded through the process of opting into the seasonal rate. Such measures may be crucial in light of what some assert is low enrollment in the R-2 rate: National Grid estimated that only about 154,596 out of 390,000 potentially eligible customers were enrolled in the R-2 rate in 2023.[14] Further exploration and analysis of the actual size of the eligible R-2 population is needed.

Seasonal rate applicability: The Report should assess the impact of extending a seasonal rate to customers who electrify any portion of their home in comparison to the impact of restricting eligibility for seasonal rates to customers who electrify their whole home. In assessing these options, the Consultants and IRWG should consider the importance of requiring whole-home electrification, which will result in rates that better align with our electrification and decarbonization policy goals.

"Near-term" vs. Winter-peaking timeline: The Consultants should clarify how the "near-term" timeline tracks with the transition to a winter-peaking system. While it is true that a technology-specific seasonal rate would need to be phased out once a winter peak arises, the modeling presented does not show that transition occurring for another ten years.[15] Therefore, any challenges associated with phasing out a seasonal rate may not materialize in the near term, and the Report should reflect as much. Whether "near-term" or not, the impact on customers of the likelihood of a seasonal rate increasing heating bills due to the shift in the system peak from summer to the winter heating season should also be analyzed.

---

[12] Conservation Law Foundation, *Getting Off Gas: Transforming Home Heating in Massachusetts* 12 (2020), https://www.clf.org/wp-content/uploads/2020/12/CLF_GasWhitepaper_GettingOffGas.pdf.
[13] Jon Lamson, *Mass. DPU Approves 1st Round of Utility Grid Modernization Plans*, RTO Insider (Sept. 2, 2024), https://www.rtoinsider.com/86472-mass-dpu-first-round-utility-grid-modernization-plans/?utm_medium=email#/.
[14] D.P.U. 23-150 Exh. NG-CP-1, at 25–26.
[15] Draft Report at 51.

Impacts on solar incentives: In its discussion of the impacts of lower volumetric rates on households participating in Net Energy Metering ("NEM"),[16] the Report should provide more data on the different types of NEM solar customers and factor in the impacts of time-of-use ("TOU") rates. For example, it would be useful to know how many solar customers are sending energy back to the grid, especially during peak months, how many customers are covering all or a portion of their monthly bills with their own solar, and how customers' use of their own solar impacts system peaking. The policy considerations around net metering used to assess the different rate options should prioritize the impact on LMI customers who engage with net metering primarily via community solar programs; this information should be supplemented with an analysis of customers participating in the SMART program to ensure a complete picture of impacts on LMI customers. Additionally, with TOU rates on the horizon, the IRWG should consider the likelihood that TOU rates will have an impact on incentives for solar-owning customers who are able to respond to price signals—for example, by using batteries to load shift—changing the effectiveness of net metering as a solar deployment incentive for upper income customers. In discussions about incentives to adopt solar, the IRWG should account for customers' income level and prioritize incentive signals that will be meaningful for low-income customers. Analysis is needed of the relationship of electrification rates to future adoption of solar.

Community solar: Community solar can significantly reduce low-income customer bills and should be factored into the Final Report's analyses. Considering the role of community solar has become especially relevant as work has begun to overcome interconnection obstacles and Eversource has effectively addressed the high costs of customer recruitment, credit and income verification, and back-office mechanics such as distribution of solar credits, including ways net metering credits could vary in future implementation.

Energy efficiency: The Final Report should include analysis of the relationship between electrification rates and the future economics of energy efficiency measures.

"No EV" scenarios: While the presentation of bill impacts for households with and without an EV is useful,[17] the Final Report should include more granular data. It is not clear if the "No EV" scenarios illustrated in the Draft Report assume a household with a gas-powered vehicle. If they do, the Consultants should break out the gas vehicle scenario to avoid obscuring savings from home electrification. We also note that a high volume of EVs in low-income households does not appear likely in the near term without substantial purchase rebates and significantly greater access to charging. As such, we caution against relying on EV contributions to low-income bill reductions in any affordability analyses.

Weatherization: We appreciate the modeling showing bill impacts for gas customers who weatherize and electrify their homes.[18] However, the Final Report should include data on more types of customers (e.g., gas customers who already have a weatherized home). Averaging the two obscures the differential impacts.

---

[16] Draft Report at 41.
[17] Draft Report at 43-45 (showing that households that electrify and have an EV see deeper savings (or reduced bill increases) compared to households that electrify but do not have an EV).
[18] Draft Report at 30.

Bill impacts for renters: The Draft Report does not provide adequate analysis of bill impacts for different types of renters. While the Report depicts bill impacts of alternative rate designs on electrifying and non-electrifying customers, it does not analyze impacts for renters who did not pay for space heating prior to their landlord electrifying the building. The Consultants recognize elsewhere in the Report that bill protections may be needed for this type of customer,[19] but modeling of impacts is needed as a first step.

Varied low-income discounts: The utility of the Draft Report's analyses of bill impacts for low-income customers[20] is somewhat limited by the Consultants' use of only Eversource's low-income discounts. For the Final Report, we are interested in modeling that also includes review of discount rates proposed by National Grid and Unitil. Analysis of the impact of low-income discounts at the relatively high Eversource level, and higher, would be very helpful.

Unclear evaluation criteria: The Draft Report's summary of the "pros" and "cons" for each alternative rate option leaves out key information. The Final Report should define "alignment with cost of service"[21] and include in its definition whether the category impacts the revenue requirement. Note should be made of the contention surrounding certain theories of cost of service.

TOU rates: The Final Report should provide more clarity about how the Consultants are considering opt-in TOU rate structures as part of the solution set, including simple TOU rate options that would not require AMI to deploy. Gradual introduction of TOU rate options is especially important for vulnerable customers including LMI households, EJ community members, elderly and disabled populations, and people with limited English proficiency or other limitations communicating. Consideration of TOU rates should also account for impacts on electricity-dependent households (e.g., people who use medical devices, including air conditioning, that require electricity to operate[22]) and households that cannot take advantage of TOU rates (e.g., people who work night jobs or at non-traditional hours).

III. Near-Term Rate Design Should Prioritize Affordability and Energy Burden Reductions for Low- and Moderate-Income Customers.

While we appreciate the in-depth analysis of current energy burdens and near-term rate options presented in the Draft Report, we ask that additional attention be paid to affordability and energy burden reduction for LMI customers in the modeling and desired outcomes. As discussed above, LMI households spend a higher percentage of their income on energy compared to high-earning households. This is inequitable and perpetuates historic injustices in energy and infrastructure planning. Elements of rate design cannot be considered in silos, and near-term rate design aimed at making electrification financially feasible for more people should include solutions that address energy burden for LMI residents in a targeted manner. Effectively

[19] Draft Report at 54.
[20] Draft Report at 45.
[21] Draft Report at 52.
[22] *See* Lee V. White & Nicole D. Sintov, *Health and Financial Impacts of Demand-Side Response Measures Differ Across Sociodemographic Groups*, 5 NATURE ENERGY 50-60 (January 2020), available at https://tinyurl.com/yc5nm4nk.

reducing energy burden requires thinking holistically about energy efficiency, weatherization, electrification, distributed generation, and income-tiered discounts, all of which have tangible impacts on customers' energy bills.

We offer our initial assessment of the four alternative rate options presented and recommend that the IRWG and its Consultants take steps to prioritize achieving affordability and energy burden reductions for LMI customers.

Technology-Specific Seasonal Rate:

We agree with the Draft Report's conclusion that the technology-specific seasonal rate offers a promising solution for electrification affordability.[23] However, as previously discussed, more analysis and discussion of paths forward under this rate structure is necessary. It is important that the IRWG consider how a technology-specific seasonal rate would layer with specific income-eligible rate structures and TOU rates, even before AMI is available. The Final Report and IRWG Recommendations should explore income-eligible structures, such as an income-tiered structure or Percent-of-Income Payment Plan ("PIPP"), to protect low-income customers from having to pay energy bills above what they can afford. Such structures would need to be implemented consistently across the utilities and service territories. They should also account for the range of low-income customer needs and experiences related to air conditioning and electricity use–while many low-income customers are on the lower end of energy consumption, others cannot shift or reduce their energy use for medical or health reasons. Importantly, income-eligible mechanisms would also protect moderate-income customers, including those who fall just above the "low-income" threshold and have been burdened by high energy bills without the assistance of existing low-income discount rates.

Part of exploring income-eligible rate structures is addressing the barriers that income verification pose. For moderate-income customers, income verification concerns have been raised for consideration to improve affordability. Studying income-eligible rate structures also involves extensive modeling to fully understand the energy burden that residents face in different geographic areas of the state, under different utility rates, with different family size and needs, and with varying home size and construction. The need for additional modeling is especially critical for the greater Boston area, where cost of living is high, and for other areas that currently have even higher rates.

Additionally, although not directly tied to rate design, it is critical that the IRWG consider how a technology-specific seasonal rate links with other energy and housing policies, including the Mass Save program. For a reduced winter electric rate to advance affordability goals and benefit LMI residents, those residents must be made aware of how a seasonal rate can benefit them and must be able to install heat pumps. While Mass Save offers no-cost heat pump installation for LMI residents, implementation may continue to be uneven and the budget for income-eligible measures may limit the number of customers who will benefit.

Higher Fixed Charge:

[23] Draft Report at 52.

While a rate design using a higher fixed charge reduces incentives for efficiency and net metering and generally promotes revenue stability for the utilities with little to no benefit for customers (especially low-income customers, many of which consume relatively little energy), LMI rate structures using fixed charges and reduced volumetric rates could make sense to promote electrification and protect LMI customers, if done correctly. When considering income graduated fixed charges, we urge the IRWG to think creatively. An income-graduated fixed charge could be designed so that the lowest-income tier would have a fixed charge of zero dollars. While the Draft Report looks at California's rate structure as an example to learn from, the Consultants and IRWG should carefully evaluate what is and is not working there. California's system uses only three income tiers at present; more tiers are necessary to adequately protect moderate-income customers. The IRWG should track the results of the upcoming phase of the California Public Utilities Commission proceeding, which will address moderate-income customers. The Final Report should also detail a strategy for capping bill increases for LMI residents.

Technology-Specific Declining Block:

The Draft Report did not show favorable outcomes for the declining block rate option. Declining block rates provide diminished conservation signal during the summer peak, are less than optimal for low usage customers, and lower the value of solar. The Consultants and IRWG should consider leaving this option out of future analysis.

Special Rates for Renters & Affordable Housing:

Although the Draft Report did not address the possibility of special rates for specific categories of customers, we recommend exploring such options for renters and affordable housing administrators in the Final Report. As previously discussed and as noted in the introduction to the Draft Report, rate design should protect LMI renters who did not pay for space heating but would cover heating costs when their landlord transitions their building from fossil fuels to efficient electric heating. The Consultants should analyze bill protections for this subset of renters. Discount rates for affordable housing electrification where operating costs are paid by the landlord (including for central heating) should be included. Relatedly, the Consultants should explore how special rates for affordable housing administrators could reduce high energy burdens for affordable housing residents. Public, subsidized, and naturally occurring affordable housing programs provide affordable housing through rent subsidies and or low rents in which heat is usually master metered. Allowing the administrators of these programs to participate in discount rate programs on behalf of program participants would reduce the number of individual households needing to seek relief from high energy burdens. It would also help reduce gentrification risks for affordable housing residents.

We remind the IRWG that the scope of its study of near-term rate options impacts customers' decisions right now: with no IRWG consideration or analysis of special rates, affordable housing residents and administrators cannot feel confident that participating in income-eligible electrification incentives will not result in unmanageable energy burdens.

Protections for Low- and Moderate-Income Customers Who Do Not Electrify:

The IRWG and its Consultants should provide more analysis and solutions for addressing energy burden for all residents, not just those who electrify. It is crucial to recognize that many customers face energy burdens regardless of the fuel they use, and their need for relief is no less important than those who are interested in and able to transition to efficient electric systems. Also, it should be recognized that electrification of LMI customers cannot be done all at once, so some will electrify later than others. Many renters, LMI households, and residents enrolled in affordable and subsidized housing programs are susceptible to being left on the gas system as more and more people electrify. As the pool of gas customers shrinks, the rate that each remaining gas customer pays increases. This is a problem that a rate redesign effort should try to solve, and we call on the IRWG to study solutions.

IV. Conclusion

We thank the IRWG and its Consultants for their work and dedication to the Near-Term Rates Strategy Draft Report, an important first step in determining how energy rates should be re-designed to protect Massachusetts' most vulnerable residents while also advancing our decarbonization mandate. As discussed above, we hope to see helpful clarifications and additional analysis in the Final Report, and we urge the IRWG to work with the Consultants to lay out and model more targeted approaches to solving for the high energy burdens that LMI customers face. It is essential that the IRWG provides the DPU with a deeper level of analysis and recommendations that prioritize improving affordability and reducing energy burdens, especially for LMI customers. We look forward to continuing this dialogue and working together in this process. Thank you for your time and consideration.

Very truly yours,

Caitlin Peale Sloan, Conservation Law Foundation
Priya Gandbhir, Conservation Law Foundation
Jocelyn Lee, Conservation Law Foundation
Amy Boyd Rabin, Environmental League of Massachusetts
Kyle Murray, Acadia Center
Paula Garcia, Union of Concerned Scientists
Mary Wambui, Planning Office for Urban Affairs
Jolette Westbrook, Environmental Defense Fund
Lindsay Griffin, Vote Solar
Zach Pierce, Rewiring America
John Walkey, GreenRoots
Jerrold Oppenheim, Esq., Low Income Energy Affordability Network (LEAN) and the Low-Income Weatherization and Fuel Assistance Program Network
Jess Nahigian, Sierra Club

From:	Rafidah Rahman
To:	Rates WG (ENE)
Cc:	Patrick Roche; Laura Olton
Subject:	Written Comment on the Near-Term Rate Strategy Draft Report
Date:	Friday, September 6, 2024 12:51:55 PM

Dear IRWG team,

Good afternoon. My name is Rafidah, and I serve as the Sustainability and Engagement Strategist at Good Energy. Patrick Roche, our Director of Innovation, and our legal counsel, Laura Olton, are both copied here. Our team collaborates with municipalities across New England on their Community Aggregation programs, with around 50 active programs. We wanted to suggest that while the focus is currently on Distribution rates, the group may also want to explore how near-term solutions on the Distribution side could be applied to the Supply side, nder the current billing system conditions.

Hope this helps.
Sincerely,
Rafidah

Rafidah Rahman
Sustainability and Engagement Strategist
Good Energy, L.P.
M: 617-949-9813 | rafidah.rahman@goodenergy.com | www.goodenergy.com
Connect with me on LinkedIn

GREEN ENERGY CONSUMERS ALLIANCE

To: Interagency Rates Working Group
From: Larry Chretien, Green Energy Consumers Alliance
Date: September 6, 2024
Re: Comment on the Near-Term Rate Strategy Draft Report

Overall, we find the Near-Term Rate Strategy Draft Report to be based on sound analysis and very useful. We hope it will lead to recommendations and changes in the rate structure that would better support electrification while reducing the energy burden on low-income consumers. The following are our comments for your further consideration:

- One of the most important contributions is the report's quantification of how consumers fare when they shift from electric resistance heat and delivered fuels to heat pumps versus from gas to heat pumps. This basic point – that consumers currently heating with electric resistance heat and delivered fuels stand to benefit financially from switching to heat pumps - has been made elsewhere, but it's critical to the main question of *how* we should shift consumers to heat pumps over time.
- The Massachusetts Clean Energy and Climate Plan calls for the widespread adoption of electric vehicles (EVs) and heat pumps in the very near term. If the rate structure is not modified to reduce rates by owners of EVs and heat pumps, there will be added pressure to support consumer incentives through programs. Finding the money for such programs is exceedingly difficult.
- Programmatically, as a complement to rate reform, we need to focus Mass Save's heat pump program for delivered fuel customers without paying for consumer incentives by raising electricity rates. My most recent National Grid electricity bill showed that I am paying 3.3 cents per kWh for Mass Save. While I can afford that, any additional per-kWh cost discourages consumers from adopting electric vehicles (EVs) and heat pumps. The 3.3 cents per kWh is probably the highest in the country for an efficiency program and is largely the result of increased spending on heat pump incentives for delivered fuel customers. A better way to finance those incentives is through a Clean Heat Standard that places the obligation on oil and propane companies rather than on electricity consumers.
- Our current rates could be reduced without significant impact on conservation. Today and looking into the out years, the higher order imperative is to make electrification sensible for consumers.
- While it would be outside the scope of E3's work, now is also the time to consider whether the benefits of certain elements of the Renewable Portfolio Standard outweigh the costs. The standard for Class I produces positive and necessary results, but other standards affecting the supply rate should be carefully re-evaluated, namely – Class II, Class II WTE, the Alternative Portfolio Standard, and the Clean Peak Standard. Shaving a penny off the supply rate to help induce customers to adopt EVs and heat pumps might be worthwhile.
- Slide 22 of the Near-Term Rate Strategy Report Draft Presentation suggests that universal rate designs to encourage electrification can be made such that energy costs increases for natural gas customers who do not electrify would be $4 to $8/month; an increase which, in my opinion

as a gas customer, is relatively modest. This may be one of the necessary prices to pay for the transition, one that could be ameliorated for low-income families.

- I would like to see more analysis of options involving income graduated fixed charges. I am aware of the controversy in California, but it's an idea worth studying further using Massachusetts-specific numbers and coupled with a deepening of the low-income discount rate.
- Of the alternative rate structures shown on slide 20, Green Energy Consumers Alliance is inclined to support Option 2b: a seasonal, technology-specific rate designed to promote heat pumps. This could be coupled with a higher fixed monthly charge to further reduce the winter and summer volumetric rates and, again, a deepening of the low-income discount rate.
- Finally, regarding shifting EV load in the near-term, we know that we cannot enable time-varying rates (TVR) until AMI is in place. However, in the near-term, we have various tools at our disposal to shift EV load to off-peak times that don't require AMI. In our view, the big questions that the IRWG should tackle on this front are (a) which of these tools to recommend and (b) how to appropriately size any incentives.
    - The tools at our disposal are off-peak charging rebates (which offer consumers a $/kWh rebate on any charging done off-peak on a daily basis), passive managed charging programs (where consumers get paid an incentive if they do not charge during system peaks), and active managed charging programs (where consumers get paid an incentive to allow the utility to actively ramp down their charging during system peaks). Each of these can be implemented via vehicle telematics or smart charging stations. And each has pros and cons, related to ease of understanding by consumers, administrative costs, creation of timer peaks, flexibility in addressing congested grid areas. Currently, what is available to drivers in Massachusetts is an off-peak charging rebate offered by National Grid. Eversource does not currently offer a program. In both cases, now and historically, we have been limited by what the utilities propose; the Commonwealth, to our knowledge, has not clearly defined what managed charging programs it deems to be necessary to both meet our emissions reductions requirements and protect the grid. This IRWG offers the state the opportunity to set the vision for the role managed charging should play in the near-term and specifically outline which of these three tools it feels the utilities should be pursuing.
    - Similarly, past and existing program incentives have been proposed by the utilities and approved by the DPU without a thorough analysis of all of the benefits of shifting load off-peak. Back in 2021, the Applied Economics Clinic did an analysis of what National Grid's off-peak charging rebate would look like if it accounted for all of the benefits of shifting load off-peak. Though the analysis would need to be rerun with new inputs in 2024, the overarching point stands: the current incentive does not capture all of the benefits of shifting EV load. More recently, in this year's EV time-of-use dockets, National Grid included distribution but not transmission in its calculations; Eversource included transmission but not distribution. The IRWG has an opportunity to lay out a vision of how incentives, whether per-kWh or per-peak-event, should be calculated. We strongly encourage those calculations to include all relevant benefits.

- It's worth highlighting that managed charging is a key strategy for reducing the costs EVs impose on the grid, which we discuss in greater detail here.

Thank you for this chance to comment.

Sincerely,

Larry Chretien, Executive Director

Acadia Center
Advancing the Clean Energy Future
15 Court Square • Suite 1000
Boston, MA 02108
617.742.0054 • acadiacenter.org

September 6, 2024

Massachusetts Interagency Rates Working Group
Re: Near Term Rates Draft Report

Dear Interagency Rates Working Group Members:

Thank you for the opportunity to submit comments in response to the Interagency Rates Working Group Near Term Rates Draft Report. Below, we offer several reactions and recommendations for consideration by the Working Group and E3.

- **There is inconsistency across the results in terms of home square footage size, making it difficult to compare across results.** (For example, see slides 23-27, 45, and 46). Assumptions about square footage size are especially important as we consider the impact of different fixed charges, which could have a significantly different impact on households of different SF size compared to their overall energy bills.
- **The bundling of benefits from home and vehicle electrification may be misleading.** Many customers do not have access to electric vehicle charging, and people generally evaluate costs on a project-by-project basis. The bundling of cost savings across building and vehicle electrification—although meaningful in terms the Commonwealth's larger climate goals—may warrant careful consideration for how to best communicate these impacts in the final recommendations to the Department.
- **The analysis should include more specifics on the impact of weatherization across the results.** As slides 29-30 note, weatherization and energy efficiency are the most impactful steps one can take to reduce energy burden. Shell upgrades offset a significant amount of bill increases from electrification, and we would like to see the impact of EE/weatherization brought up more front and center in the analysis.
- **Page 11 notes that DER status (e.g. none, solar, storage) will be part of long-term rate analysis. Customers already make use of those technologies today, so it may be helpful to incorporate some specific near-term rate solutions relevant to customers with DER.** For either the near-term report or the long-term analysis, we would like to see specific analysis for NEM customers. Slide 41 alludes to the effects of different rate options on NEM customers, but we would appreciate more specific analysis of impact of these alternatives for NEM customers, as well as for customers with both rooftop solar and electric heating and cooling.
- **On slide 25, we recommend clarifying how the information is presented.** Where the slide notes "Under existing rates: bill increase from home electrification, bill savings from EV adoption," it is important to clarify that the bill savings are *relative to full home electrification, not the baseline.*
- **On slide 32, it seems somewhat misleading to tie bill increases to heat pumps, when, according to the chart titled "Annual Cooling Expenditure," all cooling solutions would lead to bill increases for a customer that does not currently have AC**. According to the chart on the right side of the slide, heat pumps

increase bills the lowest amount compared to room AC and central AC. It would also be helpful to add an additional column showing the $200 increase for low-income discount-eligible customers, which is noted in text but could be included on the graph itself.

- **We recommend that basic time-of-use rates should be included in the report.** The report notes that, without Advanced Metering Infrastructure, sophisticated time-varying rates that dynamically respond to price changes throughout the day are not feasible. But basic TOU rates can and should be rolled out more broadly in the Commonwealth, even if just a near-term solution. We recommend that E3 acknowledge the opportunities for Massachusetts to do more on TOU.
- **In general, it would be helpful to see different combinations of the rate design options, rather than just separately.** For instance, what would the combined impact of a higher fixed charge and a seasonal rate be on customer bills and electrification?
- **On slide 52, we recommend including additional pros/cons to those already mentioned:**
    - We would like to see emissions impact included as a primary category on the left-hand column, particularly in the long-term rate analysis.
    - We worry that marking Unintended Consequences for higher fixed charges as green may be misleading, when there could in fact be negative consequences for maintaining signals for energy efficiency.
    - In general, it would be helpful to provide written text for every box on slide 52, in addition to the colors, if possible.
- **We recommend that E3 include a discussion of the issue of separate metering for technology-specific rates.** For example, Acadia Center is concerned with the potential requirement for EV owners to install a separate meter in order to subscribe to EV-specific rates. This may add unnecessary costs for consumers and create a barrier to increased adoption. Submetering (also known as embedded metering) is an alternative method for accurately measuring the electricity usage of an EV without the need to install a separate utility-owned meter. While some utility companies may claim that submetering is not adequate for "revenue grade" metering and billing, the California PUC recently issued a decision explicitly allowing submetering using EV equipment.[1] In explaining its decision, the California PUC stated that submetering technology meets sufficient standards of accuracy and would "provide accurate billing and transparency."[2] By allowing submetering, the Commonwealth can help ratepayers avoid the expense of installing a separate meter.
- **As part of the IRWG process, we recommend an assessment of the impact of managed EV charging for customer bills.** While slide 51 notes the "relatively flat nature of EV load over the year," managed EV charging

[1] California PUC Rulemaking 18-12-006. Decision Adopting Plug-In Electric Vehicle Submetering Protocol and Electric Vehicle Supply Equipment Communication Protocols, June 30, 2022. See more: https://www.cpuc.ca.gov/news-and-updates/all-news/cpuc-decision-makes-california-first-state-in-the-nation-toallow-submetering-of-electric-vehicles

[2] California PUC Rulemaking 18-12-006, page 38.

can significantly alter an EV load profile over the course of a day, which would have direct consequences for customer bills.

Thank you for your consideration.

Sincerely,

Kyle Murray
Director, State Program Implementation and Massachusetts Program Director
kmurray@acadiacenter.org
617-742-0054 x106

Oliver Tully
Director, Utility Innovation Initiative
otully@acadiacenter.org
860-246-7121 x202

Ben Butterworth
Director, Climate, Energy & Equity Analysis
bbutterworth@acadiacenter.org
617-742-0054 x111

VIA ELECTRONIC MAIL ONLY

September 6, 2024

Subject: MAPC Comments on the Interagency Rates Working Group (IRWG) Study Interim Results

Dear IRWG Members,

Thank you for the opportunity to comment on interim results of the IRWG study. The Metropolitan Area Planning Council (MAPC) is the Regional Planning Agency serving the people who live and work in the 101 cities and towns of Greater Boston. We are committed to smart growth, sustainability, regional collaboration, and advancing equity.

We appreciate the detailed focus that this current study provides to help understand energy burdens among household types in the Commonwealth. The analysis underscores what our work often focuses on, that far too many households in Massachusetts are burdened by high energy costs and left out of the clean energy transition. These high energy costs are coupled with our state having one of the highest costs of housing in the nation. High energy costs and high costs of housing are helping to fuel an affordability crisis, which risks exacerbating existing inequalities and compromising our ability to meet our 2030 climate goals. MAPC advocates for equitable building decarbonization – we need to weatherize and electrify our buildings, *and* we need to relieve the disproportionate energy burden so many households encounter, especially in the face of a rapidly changing climate. These two priorities must work together.

In the next phase of analysis for the IRWG, we hope to see: (1) a stronger prioritization of equity in the analysis and better alignment with the DPU's 24-15 Affordability Docket; (2) more focus on ensuring resilience to extreme heat is factored into rate design; and (3) clearer transparency on the numbers used in the study and greater clarity on the efficiencies assumed for heat pump performance.

A Stronger Prioritization of Equity and Alignment with DPU Docket 24-15: Switching to rates that encourage building electrification, whether voluntary or applicable across customers, should not increase energy burdens for low- and moderate-income (LMI) customers. Several of the rate designs modeled in the study could increase electricity

costs for LMI households, and we ask that the final study more strongly prioritize equity and lowering energy burdens for LMI households, regardless of their electrification status. Moving to a clean energy future should never place extra burden on households already struggling to pay energy bills; a foundational goal of any new rates—universal or opt-in—should be to avoid or minimize any increases in energy burden for LMI households whether they move to a new rate or not.

In the final study, we ask to see proposed rate options that lean much more strongly into equity and consider greater cross-subsidization to achieve electrification and equity priorities simultaneously. Within the four scenarios on Slide 52, modeling a graduated fixed charge within Option 1 is one example of the equity-centered analysis that is needed in the final study. Baseline affordability, particularly for LMI households, is also still applicable to the opt-in rates proposed in Options 2b and 3 on Slide 52 and should not be considered "not applicable," especially if these tech-specific rates opt-in rates are not cost-neutral and risk relying on cross-subsidization from customers that remain on the existing volumetric rate to yield electrification discounts.

We also have concerns about Option 3 proposing full cost recovery within its first tier, as that approach will likely benefit wealthier households that use more electricity to heat larger homes and result in lower-income households on this rate paying proportionally more (i.e. a regressive cross-subsidization within the rate class). The final study should include a table and analysis that clearly demonstrates the equity impacts of each proposed rate, including pros and cons and offer some scalability in the degree of equity offered within each option. The illustrative examples of the degree to which the change in status quo is modeled for each rate option on Slide 58 are insightful and should further be expanded on across each rate option to assess the differing impacts of each degree of change on equity.

Finally, while DPU's 24-15 Affordability Docket is progressing at a different pace than this study, the IRWG's work should still consider the impacts of the main scenarios DPU is investigating on electrification rates, including Percentage of Income Payment Plans (PIPPs) and tiered discount rates. We also recognize that modeling rate impacts can only go so far in predicting actual outcomes and encourage that any electrification rate implementation includes a mechanism for ensuring that LMI households do not see a net increase in their bill, and ideally a decrease. The foundational approach to the rates explored in this interim study maintains the current approach to income-eligible discounted rates where the rate structure between discounted and standard rates are the same with a percentage discount then applied. This study demonstrates the challenges of balancing the priorities of incentivizing electrification and not exacerbating inequities

within single universal or opt-in rate class. As noted on Slide 39, other jurisdictions like California are exploring more significant changes to income-eligible rates (i.e. income-graduated fixed charges). We hope that the consultants and working group explore additional options for more fundamental changes between market-rate and LMI rate structures that more effectively balance these priorities. Any rate design should include frequent and transparent reporting requirements to help understand the equity impacts of implementation on households' different rate classes.

(2) More focus on ensuring resilience to extreme heat factored into rates: MAPC supports communities taking action on climate mitigation and resilience, and increasingly our resilience work has focused on helping frontline communities to prepare for and stay safe during extreme heat events. We are particularly concerned about the seasonal rate proposed in the study, especially Option 2a, which proposes a universal seasonal rate. Without an analogous program to LIHEAP or another subsidy offered to low-income households, these higher seasonal rates would likely lead to dangerous indoor air temperatures for low-income households. We already know that many low-income households cannot afford to turn on their air conditioners due to current high energy costs, even when at higher risk of heat-related illnesses, and increasing summer electricity rates will only exacerbate this public health challenge.[1] The Metro Boston region is expected to experience up to 37 days over 90 degrees by 2030, and any switch to electrification rates must consider this extreme heat and the health and safety of residents most vulnerable to it.[2]

(3) Clearer transparency on the numbers used in the study: We appreciate that the draft study's appendix (Slides 58 and 60) and ask that these numbers and assumptions be made clearer earlier in the report alongside modeled results, so it is easier to understand the full picture of the rates, costs, equity impacts, and assumptions being used.

We note that Slide 60 summarizes the electrification measures and efficiencies used in the HEEM modeling. The rate impacts modeled throughout the study are highly sensitive to the amount and seasonality of electricity usage; overstating the efficiencies of electrification measures could significantly affect our understanding of potential rate impacts. It is unclear to what extent the modeling derates the nameplate efficiencies of the equipment used for real-world performance: for example, the slide indicates a high-efficiency cold climate air source heat pump with a COP of 3.2 (HSPF 11-equivalent) is modeled for full-

[1] https://www.nclc.org/resources/risks-of-utility-shutoffs-are-rising-in-massachusetts/ and https://www.bostonglobe.com/2020/07/09/metro/will-staying-cool-this-summer-be-luxury-only-some-can-afford/

[2] https://www.mapc.org/wp-content/uploads/2021/06/MMC_Keeping-Metro-Boston-Cool_Plan_2022.pdf

displacement applications and a COP of 2.7 for partial-displacement applications. However, recent studies have consistently shown actual-in field cold climate heat pump performance has been lower than rated, with the most recent Massachusetts and Connecticut Heat Pump Metering Study (MA22R51-B-HPMS) estimating actual performance at a seasonal COP of approximately 2.7 with limited difference between full and partial displacement.[3]

Additionally, the study used heat pump clothes dryers, which have had limited uptake in the Massachusetts market (such that the Residential Building Use and Equipment Characterization Study does not differentiate between heat pump and other electric dryers), and Mass Save has only recently begun offering an additional incentive for heat pump dryers within its ENERGY STAR dryer rebate. Within the nearer-term orientation of the study, it may not be realistic to assume electrifying customers are choosing heat pump dryers over other efficient electric dryers. Additional clarity on actual appliance efficiencies modeled would be valuable.

Rate design for electrification is absolutely needed to encourage our clean energy transformation and we appreciate the opportunity to review the interim study results and offer these comments. We strongly believe that this work can happen in a way that prioritizes equity within an optional electrification rate or a universal rate design and look forward to final study results that lean more strongly into equity and prioritizing those most burdened by energy bills.

Sincerely,

Julie Curti

Director of Clean Energy

Metropolitan Area Planning Council

617-933-0716 | jcurti@mapc.org

[3] See Table 3-1 of https://ma-eeac.org/wp-content/uploads/MA-HPMS-CT-R2246-Heat-Pump-Metering-Study-Updated-Final-Report_2024-05-30-1.pdf

From: David Beavers
To: Rates WG (ENE)
Subject: Near-Term Rate Strategy Draft Results
Date: Friday, September 6, 2024 11:57:13 AM

Thanks for allowing me to participate in the IRWG workshops. Based on presentation and discussion I have a suggestion for phased rate.

1. Use a seasonal approach with a higher fixed charge, that has 2 phases.The first phase will be in the near term (without smart meters). and transition to an amended rate when a customer has a smart meter installed.

2. Fixed charge -- I agree with some of the participants that this should follow the cost of service study findings and reflect the true fixed portion of the cost. My guess is this will be $20 to $30 /month.

3. Near term (pre smart meter) rate will be seasonal with the higher fixed charge (should help the economics of heat pumps)

4. After a smart meter is installed at a customer's location, the rate will still have the seasonal and higher fixed charge components, but the day will be broken up into peak and off peak rates for each season (i.e. TOU). Peak being say 4 - 8 pm including weekends. This should help reduce winter and summer peaks and allow for lower energy bills (i.e. by staying off the peak)

5. This will be an "opt-in" rate and customers should know that the rate will change when they get a smart meter installed. They should be informed well in advance and given guidance on how to reduce energy use during the peak periods. The fact that the rate will exist after the near-term, non smart meter period, should give customers confidence in energy savings estimates when considering heat pumps.

Good luck with any proposals,
Dave Beavers

IRWG Near Term Rates Strategy Draft Report
Via Electronic Mail

September 6, 2024
Interagency Rates Working Group Representatives
RatesWG@mass.gov

RE: Near-Term Rates Strategy Draft Report

Dear Interagency Rates Working Group Representatives,

The Northeast Clean Energy Council ("NECEC" or "Council") appreciates the opportunity to submit comments to the Interagency Rates Working Group ("IRWG") in regard to the Near-Term Rates Strategy Draft Report ("Draft Report") prepared by Energy & Environmental Economics ("E3").

NECEC leads the just, equitable, and rapid transition to a clean energy future and a diverse climate economy. NECEC is the only organization in the Northeast that covers all of the clean energy market segments, representing the business perspectives of investors and clean energy companies across every stage of development. NECEC members span the broad spectrum of the clean energy industry, including clean transportation, energy efficiency, wind, solar, energy storage, microgrids, fuel cells, and advanced and "smart" technologies.

The Council is dedicated to growing the clean energy economy in Massachusetts and across the region, in pursuit of our mission to create a world-class and equitable clean energy hub in the Northeast. The Council's 250+ members include companies based in Massachusetts and doing business or hoping to make future investments in the Commonwealth.

NECEC commends the IRWG for undertaking this thoughtful process of examining existing electric rate structures and the potential barriers they present for decarbonization and the reduction of energy burden. We have appreciated the opportunity to participate in this process along with other stakeholders and submit the following comments on E3's Near-Term Draft Report.

Proposed Near-Term Rate Design Options

E3 states that the proposed Rate Design options in the Draft Report reflect what it declares as the relatively recent change in overarching policy goals from the 1970s' focus on incentivizing Conservation to the more recent focus on incentivizing Electrification. **Draft Report** at p. 37. Unfortunately this broad declaration is unsupported by actual examples of policy shifts deemphasizing the importance of energy efficiency by specific regulatory agencies. NECEC submits that it would be helpful to review the proposed alternatives within the context of actual regulatory experience and impact.

E3 further points out that, given the fact that Advanced Metering Infrastructure ("AMI") is not widely available to Massachusetts customers, time-varying rates are not an option for the near term. Instead, E3 proposes that near-term rate design options rely on reducing the volumetric component of rates. **Id**.

at p. 38. The proposed reduction in volumetric rates will result in a decrease in Electric Distribution Company ("EDC") revenue, which E3 acknowledges will need to be recovered through an additional rate adjustment mechanism or mechanisms. **Id**. E3 modeled four alternative rate design options, or "levers" to address the revenue shortfall resulting from reduced volumetric rates. E3 states these levers are not mutually exclusive and could be combined to achieve even greater volumetric rate reductions. These options include an income based Higher Fixed Charge, which E3 contends would mitigate affordability concerns; a Seasonal Rate, which would differentiate Summer versus Winter charges; a Seasonal Electric Heating rate; and a Declining Block rate structure in which, as usage increases beyond a certain level, charges decrease. **Id**. at p. 40. These proposed alternative options were compared to the existing Eversource rate, which comprises a $10 monthly fixed charge and a 34¢/kWh volumetric charge (17¢ delivery and 17¢ supply). For reasons stated below we have limited our review to E3's proposal to implement a higher income graduated monthly fixed charge.

Higher Fixed Charge

E3 proposes implementation of a $30 income-graduated monthly fixed charge and a volumetric rate of 30¢/kWh. **Id**. This reflects a $20 increase in the current Eversource fixed charge and a 4¢/kWh reduction in the volumetric charge. As support for its proposal E3 states that the "California Public Utilities Commission approved a $24.15 fixed charge for non income-eligible bill discount ratepayers in 2024." **Id**. Income eligible customers will be charged a monthly rate of $6 or $12 depending on their financial circumstances. CPUC Docket R-22-07-05. The new billing structure, approved by the California Public Utilities Commission ("CPUC") on May 9, 2024, is projected to be implemented in late 2025 or early 2026 following a mandated customer education and outreach initiative Id.

E3 cites the CPUC decision as support for its own increased fixed customer charge proposal. **Draft Report** at p. 40. NECEC submits that the comparison is inappropriate. The CPUC decision to implement income-graduated fixed charges was mandated by the California Legislature. **AB205, Stats. 2022, ch. 61 amending § 739.9 of the Public Utilities Code**. No such Legislative mandate exists in Massachusetts. Also, the $24.15 fixed charge approved by the CPUC is considerably lower than the $30 charge proposed by E3 in this proceeding. In March, 2024 EQ Research released a survey comparing fixed charges implemented by 170 Investor Owned Utilities ("IOUs"). That comparison shows that the national fixed charge average for the 170 IOUs is $11.66, which is considerably less than the $30 charge proposed by E3 in its Draft Report. **EQ Comparison Brief** at p. 1.

Moreover, California's newly approved fixed charge rate structure will not be implemented until late 2025 or 2026. Thus we currently have no results from California for comparison and will not have any for some time. Nor has E3 provided customer impact results from any other jurisdiction which has implemented fixed charges or, for that matter, for any of the other potential levers cited by E3. Curiously, an E3 spokesperson revealed in the September 4, 2024 Synthesis Workshop that E3 had "isolated" customer impact results from its analysis of the several rate designs and that customer impacts were not considered.

In the California docket – a docket in which E3 participated – numerous parties rigorously analyzed and debated potential customer impacts from the implementation of income-graduated fixed charges and concomitant reductions in volumetric charges. Analyses presented in that proceeding demonstrate that low volumetric charges may result in an overall increase in electric usage, particularly during periods of high demand, thus increasing stress and future costs on the grid. This is a particular risk for Massachusetts, where the implementation of time varying rates has been delayed because of the lack of Advanced Metering Infrastructure. While reduction in volumetric charges coupled with increased,

income-graduated fixed charges may appear on the surface to be a boon for low-income customers, there are many other rate design options to reduce utility bills for those most burdened by high electric rate that do not carry the same risks.

Higher fixed charges paired with lower volumetric prices also reduce the value of installed customer DER equipment via lower net metering credits while increasing the customer's bill via the fixed charge. Additionally the lower volumetric rate/income graduated fixed charge combination may result in grid defection by higher income customers who can become self-sufficient with solar and storage. NECEC submits that an analysis and understanding of potential customer response to specific rate designs is fundamental and critical to determining their potential impact. Unfortunately E3 has failed to provide such a fulsome analysis.

For the reasons outlined above, NECEC does not support a higher fixed charge.

The Council remains appreciative of the several stakeholder sessions and numerous opportunities for discussion and exchange of ideas that the IRWG structure has provided. IRWG Representatives have developed a thoughtful process designed to result in the creation of a rate design or combination of alternatives reflecting an appropriate balance of a number of critical priorities. Stakeholder comments have helped to flesh out what those priorities are. NECEC recommends that a distillation of stakeholder and EDC priorities into a set of principles would assist in guiding us in the development of a rate design reflecting an appropriate balance of competing priorities. NECEC looks forward to engaging with the IRWG representatives and other stakeholders in crafting a design which accelerates the Commonwealth's climate and clean energy transition goals while incorporating principles of equity and affordability. We appreciate the opportunity to submit these comments.

Best regards,

/s/ *Alycia Lyons Goody*
Alycia Lyons Goody
Senior Policy Counsel
Northeast Clean Energy Council
agoody@necec.org

NRG Energy, Inc.
804 Carnegie Center
Princeton, NJ 08540

NRG Energy Comments to Interagency Rates Working Group on Near-Term Rate Strategy Draft Report
September 6, 2024

I. Introduction

NRG Energy Inc. ("NRG") thanks the Interagency Rates Working Group ("IRWG") for soliciting comments from stakeholders on the "Near-Term Rate Strategy Draft Report."

The NRG Retail Companies provide competitive electric generation supply as well as other energy-related products and services to residential and non-residential customers in the Massachusetts competitive retail market.[1] The NRG Retail Companies also currently provide competitive electric generation supply to more than 30 cities and towns in Massachusetts. Across North America, NRG serves 8 million energy and energy services customers, including through its smart-home company, Vivint, which has a technology-development office in Boston.

Below, NRG offers several comments on E3's near-term report. While E3's report was thorough in responding to the assigned task, we recommend pursuing alternative strategies to those highlighted in the report, including:

- The IRWG should conduct a cost causation study on the impact of customer usage patterns on total system costs (electric and gas) in specific hours before recommending any rate changes
- In the near-term, avoid technology-specific rate changes and high fixed charges. Focus the IRWG's and the DPU's attention on implementing opt-out TVR as soon as possible that sends strong price signals and reduces system costs, thereby reducing the cost of electrification
- Following a cost causation study, consider programs that incent customers and their authorized suppliers to reduce their consumption during high-cost periods, including device-level measures to incent electrification

II. The IRWG Should Conduct a Cost Causation Study on the Impact of Customer Usage Patterns on Total System Costs (Electric and Gas) in Specific Hours Before Recommending Any Rate Changes

As noted in our May 31 comments, to determine rates that align with cost causation, we must understand the hours when customer usage has the greatest impact on electric and gas system costs, and the magnitude of that impact relative to usage during off-peak hours. Our

[1]The NRG Retail Companies in MA include Direct Energy Business, LLC, Direct Energy Services, LLC, Energy Plus Holdings LLC, Green Mountain Energy Company, Inc., NRG Home f/k/a Reliant Energy Northeast LLC, and XOOM Energy Massachusetts, LLC. They are all licensed competitive electricity suppliers.

understanding is that this was not part of the E3 analysis. Without grasping cost causation, the IRWG risks incenting customer behavior that increases total system costs and runs contrary to the goal of making electrification more affordable.

For example, ISO-NE allocates transmission costs based on coincident monthly peak usage for the local transmission network.[2] With transmission costs topping $13,500/MW-month,[3] if the IRWG were to exclusively pursue technology-specific rate reform that increased winter-peaking electricity consumption, it would increase the allocation of these transmission costs to all Massachusetts customers. While the intent of the rate reforms is not to create winners and losers, without understanding cost causation, the example above demonstrates that the rate reforms could create winners and losers.

NRG appreciates and applauds the urgency of the IRWG to act. However, this cost causation analysis is foundational to any near-term or long-term strategy focused on affordability. We recognize that ISO-NE is currently a summer-peaking electric system but increased electric usage during the winter months bears scrutiny. In conducting this analysis, we recommend that the IRWG and its consultants discuss this topic with ISO-NE and key stakeholders in the gas sector and publicize the findings with IRWG stakeholders.

The analysis can then serve as a roadmap for future action and rate reform.

III. In the Near-Term, Avoid Technology-Specific Rate Changes and High Fixed Charges and Focus the IRWG's and the DPU's attention on Expeditiously Implementing Opt-Out TVR that Sends Strong Price Signals and Reduces System Costs, Thereby Reducing the Cost of Electrification

Comprehensive, time-varying, smart rate design, aligned with cost causation, will ultimately encourage electrification. Focusing on implementing technology-specific rates at this juncture, which are not time-differentiated, and creating customer sub-classes risks creating customer confusion and is a poor use of limited resources.

The Commonwealth's ambition is commendable, but there are a significant number of ongoing regulatory proceedings and only so much bandwidth at the DPU. Factoring in the necessary regulatory steps and, even more importantly, the timing of utility back-end implementation, any technology-specific rate would not be rolled out to customers until 2027, at best. There would be a significant opportunity cost to the time of regulatory and utility staff to implement the time-

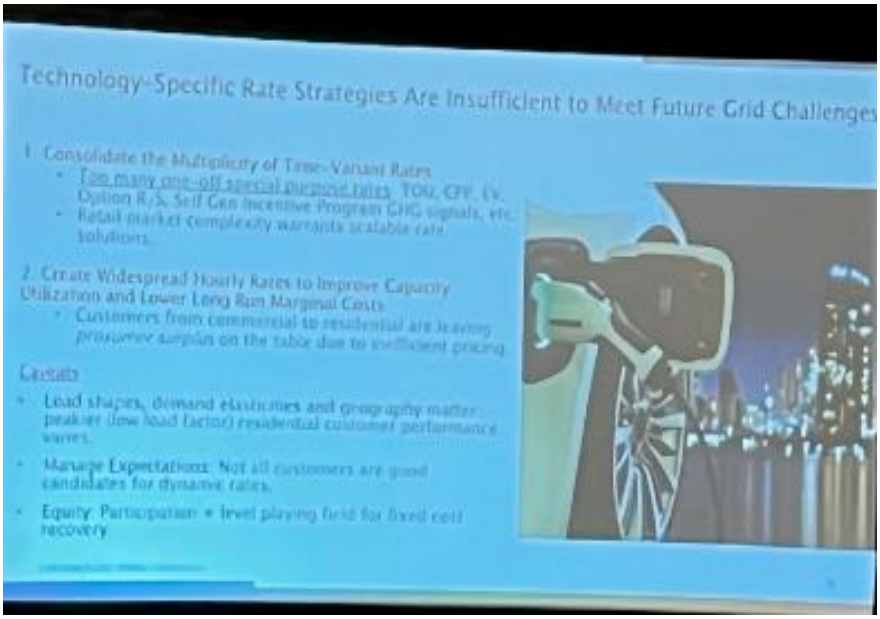
[2] From ISO-NE June 2024 Regional Network Load Report: "The smaller portion of "total wholesale load costs," reported here, are associated with providing regional network service (RNS) and other services to transmission customers that collectively provide for the use of transmission facilities, reliability, and certain administrative services. The Open Access Transmission Tariff (OATT) (Section II of the ISO tariff) governs the allocation of these costs, which are billed according to a transmission customer's regional network load (RNL). The RNL is the customer's hourly load at the time of the peak load of its local transmission network. The aggregate of these costs generally is referred to as "OATT costs" or "RNL costs," which are charged and reported by $/MW-Month." 2024_06_nlcr_final.pdf (iso-ne.com)

[3] *Ibid*

static, technology-specific rate that would likely become irrelevant and outdated once AMI deployment and TVR are complete.

With proper focus, the Commonwealth could adopt default, opt-out TVR in 2028, and immediately begin realizing the benefits of lower system costs that translates to lower electrification costs. In our May 31 comments, we presented evidence to support TVR with strong peak to off-peak price signals. Lowering costs for all consumers will also avoid creating political backlash from non-adopters to electrification and from customers that would face higher fixed charges.

We also encourage the IRWG to speak with their regulatory colleagues from California and potentially invite them to speak at a public forum. Below, we have pasted a slide that CPUC staff presented at the 2023 NARUC Annual Meeting that supports NRG's recommendation to avoid technology-specific, one-off rates and instead pursue more comprehensive reform.[4] Specifically, California, a leader in adopting technology-specific and other special-purpose rates, has concluded that there are "too many one-off special purpose rates" that are "insufficient to meet future grid challenges." Instead, "consolidat[ing] the multiplicity of time-variant rates" is seen as the crucial step to using rate design to facilitate the transition to electrification.



Once a technology-specific rate is developed, it will be exceedingly difficult to sunset or transition customers on to a different rate even if a new rate (which is time-varying) is a superior option. Customers will understandably be invested in and dependent upon that technology-specific rate to support their having purchased long-lived assets like heat pumps. In taking a wrong "short-term" step, the IRWG risks foreclosing longer-term optionality that portends a

[4] California PUC on X: "CPUC supervisor on retail rates, Paul Phillips, presented on demand flexibility and management of distributed energy resources at the 2023 @NARUC Annual Meeting. #NARUCAnnual23 Learn more about the CPUC's work on demand flexibility: https://t.co/dcUlpfT6bs https://t.co/wDDjlOQgQZ" / X

more efficient outcome. Finally, even if customers are transitioned to a new rate, over their likely objection, there would be significant confusion.

IV. Following a Cost Causation Study, Consider Programs that Incent Customers And Their Authorized Suppliers to Reduce Their Consumption During High-Cost Periods, Including Device-Level Measures to Incent Electrification

The Commonwealth has a foundation for programs that incent customers to reduce their overall and their peak consumption, e.g., ConnectedSolutions. By studying how granular usage during winter months impacts total gas and electric system costs, the Commonwealth can create or enhance existing programs for all customers to lower these costs. In Section II, we referenced transmission cost allocation. New programs could incent lower consumption during winter peaks (and other monthly peaks) and reduce transmission cost allocation (and other costs captured in the study) to MA customers. This benefit would flow to all customers and lower electrification costs. Electrification customers and non-electrification customers could participate in the program using sub-metering in their devices. While this is a short-term measure to implement before AMI and TVR, it does not require the same regulatory and utility bandwidth as rate changes and lays the foundation for reducing consumption during peak hours.

Additionally, one major flaw in programs like ConnectedSolutions to date is that they do not provide for co-optimization by those entities (municipal aggregators and direct-access retailers for example) that are responsible for energy costs. This has resulted in the more than 60,000 smart thermostats enrolled in ConnectedSolutions becoming, in essence, half-stranded assets because they are not dispatchable on the basis of wholesale energy pricing. To be clear, it would be unreasonable for electric distribution companies to engage in this dispatch, but ConnectedSolutions and any other programs should allow for co-optimized dispatch, with customer consent, by the entities that are responsible for supplying energy to customers.

Conclusion

NRG thanks the IRWG for the opportunity to comment and looks forward to collaborating with the IRWG toward pursuing and implementing reforms that both reduce energy bills and achieves the Commonwealth's goals on electrification and decarbonization.

nrg

Travis Kavulla
Vice President, Regulatory Affairs
1825 K. St., NW, Suite 1203
Washington, D.C. 20006
c: 406-788-3419

Greg Geller
Founder and CEO, Stack Energy Consulting
P: (781) 808-6616
E: greg@stackenergyconsulting.com
W: Stack Energy Consulting

STACK ENERGY
CONSULTING

MASSACHUSETTS
SIERRA CLUB

September 6, 2024

VIA ELECTRONIC FILING

Interagency Rates Working Group
c/o Massachusetts Department of Energy Resources
100 Cambridge Street, Suite 1020
Boston, MA 02114
rates.wg@mass.gov

RE: Near-Term Rates Strategy Draft Report

Dear Interagency Rates Working Group Members,

On behalf of its nearly 80,000 members and supporters in Massachusetts, the Sierra Club Massachusetts Chapter respectfully submits the following comments in response to the Interagency Rates Working Group's (IRWG) invitation to submit public comments on the Near-Term Rates Strategy Draft Report. We thank you for commissioning this critical report, and for the opportunity to provide feedback. We also extend our thanks to the E3 consultant team for preparing the analysis. This is an issue that our organization cares deeply about and we are eager to continue working with you to advance progressive and equitable rate reform.

Upon review of the draft report, and participation in the consumer and advocacy group stakeholder session, we are concerned by the lack of focus on alleviating energy burden in the rate design proposals. In the stakeholder sessions, it has been stated that the purpose of the IRWG is to "advance near- and long-term electric rate designs that align with the Commonwealth's decarbonization goals **by prioritizing the reduction of energy burden** while incentivizing transportation and building electrification." We applaud the working group for bringing on additional consultants to provide analysis on differentials in energy burden and energy poverty based on demographics. However, we remain concerned that if options are not reconsidered based on this analysis and further feedback, equity will not truly be incorporated into the near-term rate design strategy. The IRWG must prioritize energy affordability and reducing energy burden, along with incentivizing electrification.

The Commonwealth is experiencing an energy affordability crisis. The issues of energy burden and energy insecurity are impacting a growing number of residents across the Commonwealth. At the beginning of this year, our organization began working on an energy burden story-telling project in which we conducted interviews with residents across the Commonwealth who are experiencing energy burden. These stories come from low-and moderate-income (LMI) households with a diversity of identities in regard to age, race and ethnicity, geographic location, and fuel source. The common thread is that they're all experiencing difficulty paying their energy bills.

MASSACHUSETTS SIERRA CLUB

Please read our first seven stories (links here and full text in appendix):

- "Chasing Warmth: The Burden of Energy Costs"
- "The Discount Rate is Not Enough on Social Security"
- "The State Needs to Push Back on the Utility Rate Increases"
- "The Challenge of Warming a Home with Fuel Oil"
- "Los programas de ahorro energético no llegan a las comunidades aisladas en inglés como la nuestra"
- "Surviving the Summer Heat in Boston"
- "It Takes a Village to Heat a Home with Wood"

Below is a summary of the high-level takeaways from these conversations:

- Massachusetts ratepayers think about energy burden on a daily basis and they are struggling to pay their utility bills.
- They are having conversations about their energy bills with friends, family and neighbors.
- Receiving energy bills in the mail has become a stress-inducing experience.
- They are trying every strategy they can think of to lower their bills (keeping lights off, keeping the heat as low as possible, gathering in one room with a space heater, only using lower energy kitchen appliances, changing all their lightbulbs to LEDs, looking into Mass Save offerings, etc.)
- Utilities profits are too high. Utilities should be carefully scrutinized and held accountable.
- Immigrant and non-English speaking communities particularly struggle to access utility and state programs for energy efficiency, fuel assistance, and discount rates.
- They want more transparency around electricity rates.
- Mass Save is not responding to people efficiently and people are struggling to get the rebates they were promised.
- Middle-income people are suffering too.
- In order for Massachusetts to fully electrify as a solution to climate change, we must address the cost of electricity.

The implementation of our current rate structure has resulted in an unfair distribution of electric system costs on our most vulnerable residents including LMI customers, environmental justice populations, affordable and subsidized housing residents, people living with disability, and elderly people. These customers shoulder disproportionate electric costs in comparison to high-income ratepayers. In Massachusetts, the average energy burden is about three percent. However, the average energy burden for low-income populations is about 10 percent, and, in

certain neighborhoods, energy burden is as high as 31 percent.[1] In addition, it has been estimated by National Grid that only about 154,596 out of 390,000 potentially eligible customers were enrolled in the low-income discount (R-2) rate in 2023.[2] Therefore, further exploration and analysis of the actual size of the eligible R-2 population is needed. We are concerned that if the IRWG does not propose a rate design structure or programs that ensure a more equitable distribution of electricity costs across customers, the most vulnerable ratepayers will suffer even more.

We would like to see the working group continue to explore the option of an income-graduated fixed charge (paired with reduced volumetric rates) which could be implemented in combination with a percentage of income payment plan (PIPP) or low-income discount. An income-graduated fixed charge would lower the volumetric rate charged for energy consumption and add a monthly fixed charge to bills, thereby lessening price increases due to electrification. Income graduation adds nuance to this fixed charge by differentiating the amount based on income. A percentage of income payment plan (PIPP) could work in tandem with such a rate structure to cap monthly utility bills at a certain percentage of a household's income. We recommend a multi-tiered income-graduated fixed charge in which low-income customers would have a fixed charge of zero, and higher-income customers would see a higher fixed charge. Analysis of California's income-graduated fixed charge indicates that low-income customers will experience lower electric bills, moderate-and high-income customers will experience higher bills depending on energy usage, and electrification customers will experience lower bills across the board.

However, there are lessons to be learned from California that can assist Massachusetts in passing a more equitable rate structure. For example, California's system uses only three income tiers at present. We recommend a system of 5+ tiers to adequately protect moderate-income customers.

We urge the IRWG to analyze an income-graduated fixed charge with more tiers than the two-tiered design currently examined as Option 1 to better reflect ability to pay and to promote more equitable electric rates. With more tiers, the income-graduated fixed charge could serve the dual purpose of promoting affordable electrification and alleviating energy burden for LMI customers. As currently designed, Option 1 would not meaningfully protect LMI customers or promote a truly equitable rate structure.

In conclusion, we urge the IRWG to recommend solutions that will increase affordability and reduce energy burden for our most vulnerable residents by more equitably distributing the costs of electricity while also incentivizing electrification. We welcome any questions or further dialogue and appreciate your work on this important issue.

---

[1] Kimberly Clark, *Reducing Energy Burden: Resources for Low-Income Residents*, Metropolitan Area Planning Council (Jan. 28, 2022),
[2] D.P.U. 23-150 Exh. NG-CP-1, at 25–26.

MASSACHUSETTS
SIERRA CLUB

Respectfully submitted,

Jess Nahigian
State Political Director
Sierra Club Massachusetts
jess.nahigian@sierraclub.org
617-460-6351

The Solar Energy Industries Association Comments on
Interagency Rates Working Group Study – Near Term Rates Report

The Solar Energy Industries Association ("SEIA") submits the following comments in response to the August 12, 2024, Interagency Rate Working Group ("IRWG") Study Near-Term Rates Report published by Energy and Environmental Economics (E3) ("IRWG Rates Report").

I. IDENTITY OF THE SOLAR ENERGY INDUSTRIES ASSOCIATION

SEIA is leading the transformation to a clean energy economy through advocacy and education. Founded in 1974, SEIA is the national trade association for the solar and storage industries, building a comprehensive vision for the advancement of these technologies. SEIA works with its 1,200 member companies and other strategic partners to create jobs and diversity, champion the use of cost-competitive solar in America, remove market barriers, and educate the public on the benefits of solar energy.

SEIA appreciates the opportunity to participate in the IRWG and to comment on the proposals contained in the IRWG Rate Report. SEIA has reservations about the implications of the proposal and strongly urges the IRWG and Commonwealth to consider alternative approaches to encouraging electrification while addressing the energy burden of customers in Massachusetts. We outline our reasoning below.

II. OVERVIEW OF SEIA POSITION

The stated goal of the IRWG is to advance near-and long-term rate designs that align with the Commonwealth's decarbonization goals. However, the near-term rates proposals advanced through the report appear to narrow this overarching goal to one which is more limited - i.e., to "reduce energy burden while incentivizing transportation and building electrification."[1] While SEIA supports the goals of reducing energy burden and incentivizing electrification, the concurrent objective of decarbonization is absent from the report. As a result, the subsequent

[1] Energy + Environmental Economic, "*Interagency Rates Working Group Study - Near-Term Rates Report"* (August 12, 2024) ("IRWG Rates Report"), p. 7.

recommendations risk derailing the Commonwealth's progress towards meeting its climate mandate while also failing to equitably reduce energy burden for low-income residents.

Moreover, SEIA shares the concerns of many working group participants that an interim rate design, implemented rapidly and revisited following the roll-out of Advanced Metering Infrastructure ("AMI") will frustrate—not support—the Commonwealth's emission reduction goals; it risks confusing customers; and it may result in inequitable cost burdens.

With a narrowed objective of lowering volumetric rates to support greater electrification, the IRWG Rates Report appears to place heavy reliance on a fixed charge approach. But, as discussed below, such an approach is out of line with other important decarbonization efforts, including energy efficiency, energy conservation, and customer adoption of behind-the-meter ("BTM") clean energy generation and should not be adopted at this time. Rather, SEIA submits that the best approach at this time is to develop an opt-in seasonal or seasonal tech-specific rate option in order to give customers more flexibility in energy usage and to collect valuable data on the potential impacts and/or unintended consequences resulting from changes in rate design.

III. OPTION 1: HIGHER / INCOME GRADUATED FIXED CHARGE

The IRWG Rates Report offers as a "near term option" a higher fixed charge, perhaps income based. The level of fixed charge advanced in the report - $30.00 is not cost justified. SEIA emphasizes that a fixed customer charge should be designed to *only* recover costs that are actually fixed, i.e., won't change based on the volume of electricity consumed. The only utility costs that fit this definition are customer access costs (e.g., metering, service drop). SEIA does not oppose increasing the current fixed charges of $7.00 to $10.00 to recover all customer-access costs (although there is no indication that this is what the proposed $30.00 is intending to do) but would caution against rapid changes or increases. Substantial increases to the fixed charge that are divorced from actual customer-related costs in order to achieve specific reductions in a volumetric rate for certain customers would be a significant departure from cost-causation principles and would impede the customer acceptance. Gradualism is a long-accepted rate design principle and there is no compelling reason to abandon that principle now.

As a threshold matter, the IRWG Rates Report appears to make assumptions about the objectives of rate design that are not supported in law, precedent, or good public policy. The Report states that high volumetric rates to encourage energy efficiency are a concept of the past and that low volumetric rates with higher fixed charges to incentivize electrification is the ratemaking policy of the future.[2] That is a short-sighted paradigm shift. As load and electrification increase, energy efficiency will become more important, not less. Electrification is most beneficial when it is not exacerbating high demand, and therefore high cost, for periods of time. Therefore, energy efficiency and conservation, targeted for periods of high demand, will continue to be critical and impactful. As the California Public Utilities Commission ("CPUC") noted in its proceedings addressing rate design principles, strategies for reducing GHG emissions have shifted the focus from one of conserving electricity at all times to reducing usage during certain hours.[3]

The level of fixed charges advanced in the IRWG Rates Report, with reduced volumetric rates at all times, have the potential to increase peak demand. This will have several detrimental results. First, increased usage during peak periods will negatively impact grid reliability. Second, increased usage during peak periods will necessitate increased reliance on high-polluting fossil fuel peaker plants, impacting GHG reduction goals. Finally, as fixed charges fail to incent efficiency and conservation during peak, fixed charges would at best fail to maximize efficient use of existing grid infrastructure and thereby increase utility costs.

Moreover, the decision to delay considering the impact of rate redesign on distributed energy resources until the long-term rate design report suggests that the IRWG does not consider the potential impact of near term changes in rate design to the deployment of solar to be important in the near-term. Additionally, as the long-term report evaluates DER dispatching and price signal response, a reduced DER asset base will stunt potential benefits. SEIA disagrees with this approach especially in the context of the SMART program redesign currently underway to advance the deployment of solar, particularly solar located behind-the-meter and in the built

---

2 IRWG Rates Report, p. 37

3 California Public Utilities Decision 23-04-040, p. 14.

environment. Caution is justified in making any change to the default rate structure that applies to residential customers.

Inexplicably, the report relies heavily on California as an example, a state that very few jurisdictions have historically wanted to emulate.[4] California went into its fixed charge proceeding with all of its investor owned utilities ("IOUs") having default Time of Use rates in place–that themselves took years to implement– and California's three major IOUs began replacing their conventional meters with smart meters over a decade ago. If Massachusetts were to jump into a high fixed charge or income graduated fixed charges now, with a concomitant reduction in volumetric rates, we would be skipping two foundational steps necessary to make such a rate structure even have a chance at advancing beneficial electrification.

Importantly, California ratepayers will not see the impacts of the state's income graduated fixed charges for more than another year, so how customers accept those charges or otherwise respond with regard to their electricity usage patterns or adoption of electrification on technologies will not be known for several years. The California IOUs own customer preference research shows that fixed charges are not popular with their customers.[5] It remains to be seen whether the California income-graduated fixed charge experiment ends with customer acceptance or revolt. Moreover, by the time the income-graduate fixed charges begin to hit customers' bills, the California IOUs will have additional rate increases take effect which will minimize or completely overtake any volumetric rate reductions that were theorized by the initial fixed charge levels adopted proposed by the CPUC. In many ways, increasing the fixed charge is a temporary gimmick to lower the volumetric rate that does little to nothing to lower the customer's overall bill (and in the case of low-usage customers, increases their bill) by addressing the root causes of those increases. A time-of-use rate, on the other hand, can aim squarely at reducing electricity costs for all ratepayers in peak hours by shifting usage to non-

[4] IRWG Rates Report, p. 39.

[5] *See* California Public Utilities Commission Rulemaking 22-07-005, Exhibit Joint IOUs-01, pp. 111-113.

peak hours. This type of rate design addresses affordability at the root cause: mitigating ballooning utility revenue requirements.

The "high fixed charge" option proposed by E3 is even higher than the initial fixed charge level approved by the CPUC. This proposed $30/month fixed charge bears no relationship to any established cost of service unit cost and is excessive relative to the status quo charge and national norms. The average residential fixed charge for investor-owned utilities across the country is around $11/month. Only one IOU in the country (Mississippi Power) features a default residential fixed charge that is more than $30/month. Customer acceptance and response to such a drastic change, particularly for households who would see increased electricity bills, has not been factored into E3's recommendations.

The IRWG Rates Report contemplates two distinct rate designs with increased fixed charges: one with a fixed charge applied equally and one that is based on income thresholds.[6] Of the two, an income-based fixed charge ("IGFC") is particularly problematic from both a practical implementation perspective and from a cost of service approach. After extensive investigation, California opted to implement it's an IGFC based on the existing classifications of its low-income discount rates (akin to the R-2 rate) rather than pursuing an approach that used different income brackets, income verification procedures, and extremely high fixed charges for some households. SEIA believes that an IGFC is both impractical and a significant departure from cost of service rate regulation.

Implementation of an IGFC - particularly if it uses tiers that are separate from the existing R-2 rate class - raises several intractable challenges without a clear benefit over an approach of adjusting the discount associated with the R-2 rate class. First, verifying the income for all ratepayers on a continuous basis in order to apply the correct fixed charge amount would be impossible and inevitably lead to misclassification with disastrous results. The range of living situations found throughout the Commonwealth would make it impossible to comprehensively determine rules on how to the apply the application of the fixed charge to the ever varying types of households. From renter-occupied households that may have multiple tenants associated with a single utility meter to households with inconsistent income to households that experience

[6] IRWG Rates Report, p. 38.

drastic changes in their income due to life circumstances, there are too many practical challenges to ensuring each ratepayer is accurately classified.

Second, while an aggressive IGFC *may* reduce overall utility bills for certain low-income households, it will necessarily increase rates on many low-usage or moderate-income households who do not have access to other assistance programs like the R-2 rate, LIHEAP, or additional incentives for electrification or energy efficiency services. Once again, it is not clear how this would be a preferred outcome over a further refined R-2 discount that can address a household's energy burden.

Third, the customer trust and acceptance needed to allow utilities to collect and manage potentially sensitive information such as income information for *all* ratepayers is highly suspect. Income verification remains a persistent challenge in enrolling households for programs and services that *help* their energy burden. An income verification that could *increase* a household's utility bill will be even more challenging. The overall costs and administrative burden of collecting, managing, auditing, and enforcing an IGFC is significant and must be accounted for.

Overall, SEIA believes that the IRWG Rates Report understates the challenges and problems regarding electrification affordability, alignment with cost of service, unintended consequences, and ease of implementation all of which are exacerbated by an IGFC approach.[7] Review of the Report would lead one to come away with the false belief that the *only* potential issue with a higher fixed charge or IGFC is that it is "politically challenging" despite the myriad of other concerns addressed in these comments.

IV. OPTION 2: SEASONAL OR SEASONAL TECH-SPECIFIC RATES

SEIA supports the development of an opt-in seasonal or seasonal tech-specific rate as an interim option in order to give customers more flexibility and to collect valuable data on the potential impacts and/or unintended consequences. These types of rates can provide helpful data that could be used to inform the long-term rate designs. There is emerging thought that tech-specific rates may become an important part of how we evolve the traditional approach to rate

[7] IRWG Rates Report, p. 52.

design to meet the unique circumstances of home electrification.[8] Additionally, implementing these opt in rates are highly unlikely to produce the same backlash as a high mandatory fixed charge or IGFC and are fairly straight forward to implement.

Unlike a declining block design that has a significant risk of attracting and benefiting high electricity users regardless of whether they have electrified anything, a tech-specific seasonal rate can be targeted to support the deployment of heat pumps for households that are switching from both natural gas and heating oil.

It is clear from IRWG Rates Report that the affordability and attractiveness of adopting heat pumps is a primary near-term objective – an objective that SEIA supports. A tech-specific seasonal rate that is available for heat pump adopters can best support that goal in the near-term given the limitations of current metering and billing capabilities. The Report identifies the largest negative of such a rate design is the "over-crediting" of NEM customers due to the increased summer rates but decreased winter rates.[9] While this may be an unintended consequence, we disagree that it is as problematic as portrayed in the report.

First, if a customer who opts into a tech-specific seasonal rate has adopted both a heat pump and rooftop solar, they are helping achieve state objectives in multiple ways and that should not be discouraged. Second, customers who electrify their home and transportation often cannot fully offset their electricity usage, meaning there will be far fewer credits that would roll forward from season to season. Third, even if there is a small incremental value for a heat pump and solar customer, it is not clear that it outweighs the value of reduced household energy costs that can help drive increased heat pump adoption. Finally, if the changes to the basic service periods are effective at reducing the difference in supply rates between summer and winter months, the risk of "over-crediting" will be reduced.

Seasonal rates, whether tech-specific or not, are a step towards what we believe is likely to be reflected in long-term rate designs in that it is beginning to send price signals to customers

---

[8] *See, e.g.* https://pv-magazine-usa.com/2024/08/30/accelerating-electrification-through-rate-design/

[9] IRWG Rates Report, p. 52

that electricity has a different cost based on when it is used. While it will not be as effective as a time-varying rate, it is a step in the right direction compared to flat distribution and transmission rates that are currently in place. As we think about customer education, acceptance, and behavioral change, a seasonal tech-specific rate seems best positioned to bridge current and future rate designs.

We appreciate your time in consideration of SEIA's comments and are available for further discussion. We look forward to continuing to participate in the IRWG.

SUNRUN'S COMMENTS ON THE E3 DRAFT REPORT

September 6, 2024
Thad Culley
Director of Regulatory Policy, Sunrun
thad.culley@sunrun.com

Introduction

Sunrun[1] appreciates the opportunity to comment on the Interagency Rates Working Group (IRWG) draft report (E3 Draft Report) on rate design options to address the operational costs of electrification decisions in the near term. Structural change to default rate design is a major undertaking. Under the most optimistic circumstances, it can take two to four years to go through regulatory approvals, engage in the required marketing, education, and outreach, and make the necessary back office updates to a utility's billing system. Additionally, default rate design changes affect a range of energy service providers who all must modify their offerings and marketing to make sure that consumers are given accurate information upon which to make decision when investing in solar, energy efficient appliances, electric vehicles, or other distributed energy resources ("DER"). Changes to the structure of retail rates will have major and far-reaching consequences, so the process used and ultimate goals of this exercise should be thoughtfully and cautiously considered.

Unfortunately, rate design theory does not always translate into consumer action or the desired response. Like any theory, extensive empirical testing is required to build confidence in likely outcomes before a particular rate design path should be imposed on all consumers. Accordingly, Sunrun's primary recommendation on the near-term report is to focus solely on recommendations for optional, interim rates that could feasibly be implemented before 2027 to test consumer responses and acceptance of specific approaches, in this case seasonal and tech-specific seasonal rates.

Through working group conversations, there seems to be an emerging consensus that time-variant rates ("TVR" or "TOU") are the future of rate design. The current lack of advanced metering infrastructure (AMI) appears to be the only reason that TOU rates are not being considered as the preferred recommendation for the E3 Draft Report. However, there does not appear to be a consensus that implementing interim rate designs is feasible or advisable, particularly if the intent is to institute a change to default residential rates.

Instead of using the near-term report to take a "build the plane while we are flying it" approach, Sunrun believes it makes sense to treat any near-term recommendations as iterative and to

[1] Sunrun is the nation's leading provider of residential solar and battery storage services, with over one million customers across twenty-two states, Puerto Rico, and the District of Columbia.

keep them open to modification as the IRWG envisions where we are actually going to land the plane (e.g., the long-term report and DPU-guided rate design principles). Accordingly, any recommendations flowing from this report should be made explicitly limited to optional (opt-in) rate pilots.

From Sunrun's perspective, the primary objective in facing the challenges of electrification is embracing technologies and load management techniques to keep system costs lower than they would be under the status quo approach. Investing in the future grid and transitioning energy to cleaner sources will come at a cost, but that cost can be kept much lower if we manage how new, incremental electrification load is added to the grid. To do this, the IRWG recommendations should strive to support beneficial use of electrification technologies (i.e., encouraging the incremental new load to occur in non-peak times) and protect the long tradition of conservation price signals in residential rates to support energy efficiency and to encourage the use of consumer-sited distributed energy resources to meet new demand where it occurs.

Sunrun believes that consumers–through their private investments in energy efficiency measures and DERs–can be a large part of the answer of how we meet the challenges of electrification while mitigating local and system impacts on the grid. A rate design intended to encourage customers to adopt electrification technologies should not simultaneously discourage those same customers from investing in measures that reduce and manage the timing and amount of consumption of electricity from the grid. The right rate design, or suite of rate design options, will enable both outcomes.

Importantly, the final report from the Massachusetts Commission on Clean Heat embraces this primary objective of electrification rate design, recommending that "[t]hese structures should not seek to use rates to add subsidies, but rather pursue electric cost reductions, particularly during peak usage times, that reduce rates overall."[2] As that report envisioned, the rate inquiry we are on should look at "cost-reflective rate structures that can **encourage conservation** and reduce consumers' costs of operating electric heating systems."[3]

A "high fixed charges" option, as featured prominently in the E3 Draft Report, is inconsistent with any coherent and holistic vision of where Massachusetts is going. As discussed below, high fixed charges are **not** cost-reflective and they are inflexible and erode the volumetric price signal that will eventually encourage customers to shift usage away from peak periods. Rate signals that support conservation, load shifting, or adoption of DERs–as an alternative to or mitigation of adding new load on the system–are essential for a soft landing (i.e., reducing system costs) at our future state.

Shifting to high fixed charges is not like "building the plane" as we fly. It is more like throwing out the landing gear mid-flight. While reducing the conservation price signal would make electrification operational costs cheaper in the short-term, it could drive even higher long-term

[2] Massachusetts Commission on Clean Heat Final Report (11/30/22), at p. 24, fn 21, *available at* https://www.mass.gov/orgs/commission-on-clean-heat.
[3] *Id.*

peak-driven costs and frustrate the Commonwealth's climate, clean energy, and affordability objectives. For those reasons, Sunrun urges the IRWG to exclude the "high fixed charge" option from the interim report, or in the alternative, give an honest assessment of the significant downsides and unintended consequences that following such a path could deliver.

I. Near-term recommendations for rate design should be incremental and optional, as it is inappropriate and infeasible to make structural rate design changes before 2028.

Any interim rate design modifications should avoid creating customer confusion and repetitious spending on education, marketing, and software updates needed to implement a rate charge. The time and money required to modify and implement rate design changes is not immaterial and represents an additional ratepayer cost. By the time that interim rates could be approved and implemented, the EDCs will be close to complete rollout of advanced metering infrastructure (AMI) and then capable of implementing long-term time-variant rate designs. Accordingly, Sunrun recommends that the IRWG should not recommend rate structure changes to default rate schedules and should focus on recommendations for optional, pilot rates that could provide empirical support for expanding electrification-friendly concepts in the time-variant-based future of rate design.

Beyond the cost of implementing interim default rate design changes, the prospect that another paradigm shift is on the horizon (with TOU rates) could create significant customer confusion and dissatisfaction. Nationally, the basic rate structure for residential customers has been static for decades, with very few jurisdictions adopting novel rate design approaches for all customers. Sunrun believes that TOU rates are necessarily a featured part of the future of the electric utility industry, particularly as managing peak demand becomes critically important to mitigating the impacts and costs of increased electrification and the further growth of data centers. The negative consequences of frequent rate design changes are likely to significantly outweigh the potential benefits of near-term reductions in the operational costs of adopting electrification technologies.

Of the options presented in the near-term report, Sunrun only supports creating an optional, pilot rate for seasonal and technology-specific seasonal rates. For the reasons discussed below, Sunrun urges that the high-fixed charge option be discarded from the list of recommendations in either the near-term or long-term report. Cost recovery and allocation methods for distribution infrastructure can be discussed in the long-term context, but under no circumstances should a monthly fixed customer charge be based on costs that are not "customer-related costs" (i.e., costs that do not vary with the number of customers served).

II. Changes to rate design should be guided by principles, developed by interested stakeholders through a DPU-guided process.

The exercise of reimagining rate design risks futility without well-articulated objectives and principles. Ideally, the IRWG process would have begun with a solicitation of ideas from

stakeholders and a subsequent workshopping of what objectives and principles should be followed. It is understandable that the compressed time schedule made such a step impracticable, but establishing a north star of shared values and objectives could pay dividends. The closest thing to an articulable "objective" is the statement on page 37 of the E3 Draft Report gives a presumptive impression that the time for prioritizing conservation has passed and that a new era of incentivizing home electrification has begun. And that era is typified by creating rates that will lower the volumetric rate and, thus, lower the operating costs of electrification to make it more attractive than the existing fossil fuel alternatives for heating or cooling or transportation. This presumption oversteps and undermines a more holistic view of the future state of both rate design and the electric system.

Sunrun is not aware of any Massachusetts statute, regulation, or legal precedent that has articulated such a clear shift in policy **away from** conservation price signals and **toward** suppressed volumetric rates to support electrification. To the contrary of what is suggested in the E3 Draft Report, conservation remains a cornerstone of rate design. A primary objective is to ensure that rate design does not lead to waste, as energy is often derived from limited resources (or at least cost constrained resources) and inefficient use by a few can help increase the cost of service and commodity costs for all.

While electrification and efficiency could be viewed as an either/or choice in respect to the volumetric price signal, that is a bit of a false dichotomy. Rather than fixating solely on how much a person is paying for each unit of electricity, there needs be a recognition that system costs impose different price impacts depending on when the electricity is consumed. Without TOU rates, demand-side practices like demand response can utilize non-metering technology to achieve a time-specific reduction that avoids unnecessary and wasteful usage during periods of system strain, typically the highest cost hours. A holistic approach to mitigating the impact of new load on the system should reach beyond rate design and embrace the overlapping demand-side programs, including but not limited to ConnectedSolutions, to achieve the goals of balancing the tension between increasing load and a desire to maintain an efficient electric system.

Rate design and ratemaking must embrace the myriad of competing priorities and find the solution that produces the highest number of desired results. However, the E3 Draft Report does not enunciate a set of guiding principles or recommend a threshold process to determine the process that should guide the evaluation of rate design recommendations. In California, for example, the California Public Utilities Commission approved an official list of rate design principles–which reflect the governing statute and prior Commission precedent–and established a process for commenting and refining those principles.[4] This past legislative session in Massachusetts, a house bill included a set of principles that enunciated a list very similar to the CPUC's list of rate design principles.[5]

---

[4] CPUC, Decision No. 23-04-040 Decision Adopting Electric Rate Design Principles and Demand Flexibility Design Principles, *available at* https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M507/K837/507837776.PDF.

[5] *See,* H.4503, Section 34, *available at* https://malegislature.gov/Bills/193/H4503.

Sunrun respectfully suggests that it is premature to rush to rate design recommendations to fill a short-term technological constraint (i.e., lack of AMI infrastructure) without guiding principles and an ultimate vision of where we want to land the plane.

III. The IRWG Should Recommend that the DPU Undertake a Process to Develop Rate Design Principles to Guide the Future State Electric System.

One of the most significant outcomes of the IRWG could be the development of long-lived principles by the DPU to guide future rate design to match the climate, electrification, and clean energy ambitions of the Commonwealth. Currently, the DPU measures the rate proposals before it against its various statutory duties and directives, taking a case-by-case approach to specific rate proposals. In developing a set of principles for rate design that are consistent with the Commonwealth's set of goals, the DPU could help project to the EDCs where rate design needs to go to satisfy the requirements that the DPU must balance. Such principles should be informed by a rigorous stakeholder process. As the expert agency, it is appropriate for the DPU to lead and decide the course of such principles, with input from the various agencies and stakeholders engaged in the IRWG.

IV. The High Fixed Charge Option Should Be Removed from the List of Options in the E3 Draft Report.

As a current feature in rates, the size and justification for fixed charges is not a new consideration for the DPU. In fact, there is a pending case where the DPU is deciding whether to accept National Grid's proposal to adopt a higher fixed charge for an electrification-specific opt-in rate.[6] IRWG stakeholders have raised significant concerns about the impacts of "high" fixed charges on other customers and policy objectives. Sunrun does not believe that a "higher fixed charge" option should be included in the near-term report and that any call to increase the fixed charge is in effect a recommendation to modify cost allocation methods and not purely a rate design recommendation. Additionally, the high fixed charge proposal would be one of the highest in the country, would produce unintended consequences not contemplated in the E3 draft report, introduces a controversial and difficult to implement income-differentiated aspect.

A. The Illustrative fixed charge proposed by E3 is almost three times the national average residential fixed charge for investor-owned utilities.

As an initial matter, the level of fixed charge increase proposed in E3's draft report is extreme. The illustrative example of $30 represents a 300% increase from the status quo. Despite the claim that this is consistent with peer jurisdictions, it significantly exceeds the level approved in California, which has not yet begun to appear on customers' bills. According to a survey of

[6] *See*, Docket No. D.P.U. 23-150.

every investor-owned utilities' default residential rate, a $30 monthly fixed charge would be the second highest in the nation, only behind Mississippi Power's charge of $37.41 per month.[7]

B. There are significant unintended consequences of a high fixed charge that are completely ignored or overlooked in the draft report

Page 52 of the E3 Draft Report is very misleading and appears to favor high fixed charge options as carrying the least amount of cons and no apparent unintended consequences. There are many well-documented impacts of high fixed charges on other valid rate design considerations, including the support for energy efficiency, demand-side programs, and customer adoption and utilization of distributed energy resources. While Sunrun certainly agrees with the E3 Draft Report that high fixed charges are "politically challenging,"[8] there are many more direct rate and electric system related impacts that should give caution to adopting or recommending a high fixed charge approach.

1. Fixed charges dilute the conservation price signal

Volumetric rates send an intuitive price signal to consumers that is easy to understand. As with most goods or services, the amount you pay is directly proportional to the amount you consume. The conservation price signal in residential rates tends to be flat across time as most residential customers do not take service on time-variant rates. Thus, the price signal is extremely simple and easy to understand and utilize to manage the amount of electric bills.

If a greater proportion of the utility revenue requirement is collected through mechanisms other than the volumetric rate, then the volumetric rate will be reduced and the price signal to consumers to avoid consuming the next unit of electricity is diluted compared to what it was before. Historically, residential ratepayers have grown accustomed to the "use less, pay less" mode of being charged for electric service. While there is likely no magic number in the volumetric rate that is the base price signal for conservation response, the question becomes about continuity with the status quo and how much the rate is being diluted with any change.

---

[7] *See* "Residential Fixed Charges-Comparison of Massachusetts Interagency Rates Working Group Proposal to National Investor-Owned Utility Charges", EQ Research (August 2024) (Attached as Attachment "EQ").

[8] *See, e.g.,* Letter of 15 Rate Design Exports to the CPUC opposing the income-graduated fixed charge proposal (submitted as an ex parte notice on 5/30/2023) (Attached as Attachment "A"); Letter of from California Assembly Members to the CPUC President opposing the income-graduated fixed charge (Attached as Attachment "B"); "Why California's plan to let PG&E charge you a fixed monthly fee is as flawed as it sounds", San Francisco Chronicle Editorial Board (May 8, 2024), *available at* https://www.google.com/url?sa=t&source=web&rct=j&opi=89978449&url=https://www.sfchronicle.com/opinion/editorials/article/pge-fixed-bill-california-19436421.php&ved=2ahUKEwiM7fXRla-IAxXrFlkFHdkbKA0QFnoECA4QAQ&usg=AOvVaw15_iFkvTGcIEGnlZZD7_Hg; "California lawmakers want to halt new income-based electricity rates", KCRA (January 30, 2024), *available at https://www.kcra.com/article/california-backpedal-new-electricity-rates-income-based/46586910*. There were hundreds of public comments submitted to the CPUC opposing the income-graduated fixed charge, *available as* https://apps.cpuc.ca.gov/apex/f?p=401:65::::::.

While fixed charges have increased over time, they do not tend to outpace (or even keep pace) with overall revenue requirement increases. Thus, volumetric rates have grown at a faster pace than customer charges in that time. To avoid reduction in the conservation price signal (as compared to status quo rates), Sunrun suggests that the fixed charge should not be increased at any one time in an amount greater than the overall revenue requirement increase.

Of course, there are outer bounds to how much a fixed charge should be used to collect revenues in any event. In most jurisdictions, fixed charges are only utilized to collect customer costs, which are typically metering, customer service, and the cost of the service drop. Sunrun does not oppose rate designs that fully capture these customer costs through a fixed charge, but believes that adhering to the rule of thumb that increases should follow gradualism and never exceed the percentage of revenue requirement increase that is approved at any given time.

In the E3 Draft Report, independent of any revenue requirement increase, the proposal is to adopt a nearly 300% increase to the fixed charge, affecting a 12% reduction in the volumetric rate. This clearly and materially dilutes the conservation price signal in current rates. The draft report does not consider what impact this dilution would have on overall usage or in continued consumer investment in energy efficiency. That is a major oversight and omission from the page 52 assessment of a high fixed charge pathway.

In Sunrun's own survey of national IOU's default residential rates, fixed charges represent between 8-10% of the average residential customer's bill in most instances. There has been a pronounced trend in IOU rate cases seeking to dramatically increase fixed charges over the past decade, but utility regulators have, for the most part, significantly mitigated or rejected these requests.[9] Increasing fixed charges has long been the strategy expressed by the Edison Electric Institute as a means of mitigating the impacts of revenue erosion from programs like energy efficiency and net metering.[10] A "high" fixed charge is thus not a novel concept, but represents a long-standing effort by the utility industry to mitigate against load and revenue erosion. In the current context, high fixed charges are being pitched as a solution to enable electrification, but the historical context of "high fixed charge" advocacy to counteract the success of energy efficiency and rooftop solar should not be forgotten.[11]

---

[9] *See* Whitted, M., Woolf, T., and Joseph, D., "Caught in a Fix", Synapse Energy Economics (prepared for Consumers Union), pp.3-4 (2016), *available at* https://www.synapse-energy.com/sites/default/files/Caught-in-a-Fix.pdf. Sunrun's analysis of IOU rate cases from 2014 to present shows that Commission's rarely grant the full requested fixed charge and that the magnitude of changes sought has generally declined in the past 3 years.

[10] Kind, Peter, "Disruptive Challenges: Financial Implications and Strategic Responses to a Changing Retail Electric Business," (Prepared for the Edison Electric Institute) (Jan. 2013), *available at https://apps.psc.wi.gov/pages/viewdoc.htm?docid=477055*.

[11] Pentland, William, "Disruption Derailed: The Utility Death Spiral Myth", Forbes (Nov. 25, 2015), *available at* https://www.forbes.com/sites/williampentland/2015/11/25/disruption-derailed-the-utility-death-spiral-myth/ ("After all, investor-owned electric utilities have fielded a full-court press to ward off the much-hyped threat posed by distributed generation, especially rooftop solar. Utilities have filed special rate cases targeting distributed energy, funded public relations campaigns challenging net metering policies as unfair and lobbied political decision makers at all levels of government.")

2. Interactions with SMART Program

Massachusetts SMART program stands out as one of the more ambitious programs to ensure that significant numbers of DERs are being deployed to help meet the Commonwealth's clean energy goals. The volumetric price signal in rates has increased over the years, which reduces the level of the behind-the-meter incentive. Accordingly, any material decrease to volumetric rates through a high fixed charge option will have a related impact on what level of SMART incentive is required to drive customer investment in solar. The consequences of high fixed charges must be considered on this program.

3. Impact on the adoption of customer-sited solar

The dilution of the conservation price signal also dilutes the value of customer-sited solar and other distributed energy resources. Setting aside export compensation in the net metering context, consumers that utilize a DER (including rooftop solar) to avoid purchases from the utility will realize a net savings if the cost of the measure that helps avoid purchases from the grid is less than grid delivered power. If a customer pays a much higher fixed charge, then the volumetric rate that they are "avoiding" is less for any measure they undertake behind the meter to avoid that purchase. This reduces the cost savings of self-generation from rooftop solar and generally discourages other demand-side and efficiency measures that have the same result of reducing electric needs from the grid.

In the context of electrification, if consumers can realize savings by self-generating and avoiding grid-delivered electricity for their status quo electric requirements, the same will hold true for incremental new electrification load. Thus, under the status quo fixed charge, there is a value proposition to meeting as much load as possible from onsite resources, including solar and solar paired with batteries. As time-variant rates become widely available, this type of preference for BTM self-service could be increased with technology assistance from the battery to automate and manage how much BTM energy is consumed at any given time given time-differentiated price signals from the grid.

The E3 Draft Report does not take into account this potential lost opportunity to utilize onsite clean energy to meet new, incremental electrification load. It makes sense to encourage greater adoption of BTM DERs to help manage customer's experience of electrification and to build in the flexibility in customers' homes to help mitigate the impacts of new incremental electrification load on the local distribution system and the bulk power system. High fixed charges dilute the price signal that helps consumers justify investment in clean energy homes that will help achieve the future state grid largely using private customer investment in these cost saving technologies. Meeting some of the challenge of electrification with distributed energy resources and onsite clean energy checks a lot of boxes in advancing the Commonwealth's goals. A "high fixed charge" future represents a missed opportunity to build solutions that can satisfy multiple of these objectives simultaneously.

4. Increased energy burden for "edge cases" and qualifying low-income customers that do not opt-in to a low-income rate discount program.

One of the challenges that comes with setting low-income rates is that there is a threshold by which customers must be divided and through which eligibility for a benefit is binary. A household either qualifies for the benefit or relief or they just miss it. For customers that do not qualify or do not avail themselves of the existing low-income discount in rates, the increase in the fixed charge can have negative effects. Low-income households tend to use less energy than the average household. Utilities do not ordinarily track the income of their customers (nor should they), so it tends to be difficult to match demographic data or assumptions with specific customer accounts. There will always be customers who fall through the cracks of methods of classification and eligibility criteria. For those customers, a high fixed charge is likely to **increase** their energy burden.

On pages 21 and 33 of the E3 Draft Report, there is an acknowledgement that this could be the case. On page 21, the report notes that customers just on the edge of discount eligibility have high energy burdens. On slide 44, the report notes that "non-electrifying homes may see modest monthly bill increases with universal rate designs shown." While the increase in energy burden may be slight in this example, the lower the usage of a customer that falls out of eligibility for a discount (as an edge case), the more regressive the impact of the fixed charge. During the California fixed charge case, analysis from Flagstaff Research was put into the record showing that the high fixed charge proposals in California would shift significant costs to low-usage, median income households while high-usage, larger households would see the most benefit.[12]

Under the principle of first do no harm, a high fixed charge proposal should be carefully considered for the impact it could have on the edge cases of households that do not qualify or that have failed to avail themselves of the current low-income discount eligibility.

5. Elasticity of demand suggests higher fixed charges could increase peak demand, put further strain on the NE-ISO grid, and increase costs.

Lastly, one of the potential negative impacts of lowering the volumetric rate in all hours of the day is that the conservation price signal is dampened for electricity that is consumed during high cost, peak demand hours. Thus, a high fixed charge that reduces the volumetric rate can have the unintended consequence of further exacerbating peak demand.

In the California fixed charge case, several parties raised the issue of price elascticity of demand. The testimony of Tom Beach on behalf of SEIA pointed out that "if the Joint IOU proposal is adopted, demand in the net load peak could be expected to increase by 575 MW immediately and by 2,200 to 4,000 MW over time,"[13] carrying significant potential cost impacts

[12] "Assessment of Fixed Charge Proposals" Flagstaff Research (June 1, 2023) (Attached as Attachment "C").

[13] *Prepared Rebuttal Testimony of R. Thomas Beach on behalf of the Solar Energy Industries Association*, CPUC Docket No. R.22-07-005 (6/2/23), at p. 9, lines 4-6, *available at*

as more infrastructure will be needed to accommodate that additional load. Massachusetts should carefully consider the potential for lower volumetric rates to exacerbate system peak in contemplating any significant increase to fixed charges.

C. There are significant cons to adopting a fixed charge and relying on an income-graduated fixed charge to provide additional rate relief to low-income customers

The proposal to include an income-based fixed charge exports an idea from California that has not been implemented and that has not yet settled some of the more challenging logistical and legal barriers to implementation. As originally proposed, the IOU proponents of the income-based fixed charge would classify all customers by matching their customer accounts with state tax information. The proponents acknowledged the need to seek changes in the law to allow that type of data sharing between state agencies–information of the high personal sensitivity. The CPUC settled on applying rate tiers to customers that qualified (and avail themselves) of FERA or the state low-income rate discount program (CARE). Everyone else will be presumed to land in the catch-all category, until such time the CPUC approves an alternate means of differentiating between middle and upper-income households.

Additionally, the California IOUs will be spending tens of millions over the next few years making billing changes and performing marketing, education, and outreach to customers to get them ready for this significant change in billing.

A more straightforward and less legally dubious way to increase rate relief for low-income customers would appear to be to increase the percentage bill discount.

D. High fixed charges are not "more cost-reflective"

Sunrun disagrees with the characterization that a "high fixed charge" would be more cost reflective.[14] As discussed, customer charges typically are limited to those customer-related costs that do not vary with usage. There is nothing to indicate that a $30 charge (or a $94/month charge in the outer case on p. 58 of the E3 Draft Report) would reflect the customer-related costs of any utility in Massachusetts. Rather, this suggests a methodology that conflates distribution costs as "fixed costs", even though customers and customer classes each contribute to the size and capacity of that equipment based on their usage. As the DPU undertakes a consideration of rate design, at some time in the future, it will be important to reconsider methodological approaches to classifying and allocating costs, particularly in light of the need to mitigate the risk of overallocation of costs to the residential class as peaks shift to winter at some time in the future.

---

https://www.cpuc.ca.gov/-/media/cpuc-website/divisions/energy-division/documents/demand-response/demand-response-workshops/advanced-der---demand-flexibility-management/track-a-reply-testimony/rebuttal-testimony-of-r-thomas-beach-on-behalf-of-seia.pdf.

[14] E3 Draft Report at p. 56 ("Higher fixed charges, seasonal variation, and declining block structures better align rates with utility costs of service compared to existing flat volumetric retail rates.").

V. There is no empirical evidence that lowering volumetric rates will impact the rate of customer adoption of electrification measures.

While it is intuitive that consumers would prefer lower volumetric rates if they are contemplating an investment that will represent more kWh consumption, there is no empirical evidence that any amount of volumetric rate reduction will spur customers to invest in an electrification measure. In the context of the "limited" high fixed charge proposal of $30/month, a volumetric rate reduction of $0.04/kWh would produce marginal savings for an electrification decision (compared to the status quo). Market and consumer research is needed to better understand the role that rates play in consumer decisions of whether or not to invest in an electrification measure. Rate design alone is likely insufficient to tip a consumer's decision, particularly when many of the electrification measures carry high upfront capital costs.

VI. Conclusion

Sunrun appreciates the work of the IRWG, E3, and all of the stakeholders who have given considerable time to participate in this process. Rate design is clearly an important topic that merits this dedication of time and attention. For the reasons stated above, we ask that the E3 Draft Report be modified to exclude the "high fixed charge" option and make clear that any rate recommendations made in this report should be considered optional, pilot rates that could be executed in the near-term while the stakeholder continue their work (through the IRWG or a DPU docket) to identify the best path forward. We look forward to continued participation and appreciate the opportunity to submit these comments.

/s/_____
Thadeus B. Culley
Director of Regulatory Policy
Sunrun
Thad.culley@sunrun.com

Dear Interagency Rates Working Group,

I am writing to offer comments on the Near-Term Rate Strategy Draft Report.

Overall, the report presents a compelling case that rate design is needed to improve the economics of building electrification so that the Commonwealth can achieve its legally binding decarbonization goals.

The report does not attempt to compute how electrification might apply downward rate pressure by increasing the volume of electricity consumed at a higher rate than increases to the rate base. This analysis may be part of the long-term study, but there is also an important short term impact, which can help temper the negative impacts for non-electrifying customers (e.g., shown in the right-hand graph on slide 44). Without incorporating these effects, I am concerned that the analysis overestimates the change in monthly average energy expenditure. To remedy this gap, I suggest that the E3 team consider population-wide cost impacts at predetermined electrification levels (e.g., 5, 10, and 15% of homes), rather than for just a single representative household in each group.

The goal of rate design should not be to achieve a specific policy end (e.g., deployment of cold climate heat pumps). Rather, the goal should be to reflect the true underlying costs incurred by utilities. That the economics of electrification improve when rates accurately reflect costs is a positive (but unintended) consequence. I am concerned that the modeled rates start with the goal of heat pump deployment and work backwards to identify options that move us closer to that goal. These rates are not cost-based, and this will leave them vulnerable to opposition from consumer advocates concerned about cost shifts. Assigning 100% of delivery costs to the summer volumetric rate (option 2b) or the first tier (option 3) will be difficult to justify based on cost-causation principles. New England has a summer-peaking grid, but a kilowatt-hour used at 4:00am on a mild summer night does not contribute equally to delivery costs as one used at 6:00pm on the hottest, most humid day. Without intraday price differentiation, a summer/winter rate structure may be just as crude as the flat volumetric rates prevalent today. And the California Income-Graduated Fixed Charge debacle has illustrated the difficulty of implementing an income-based rate (like option 1); utilities also do not seem eager to collect income information.

I know the features of the modeled rate options can partly be attributed to the near-term (i.e., pre-AMI) scope. But we likely will only have one chance to get default rates right. It will take time to educate consumers, and once any new rate is in place, making changes will require overcoming institutional inertia. The four proposed near-term rates are essentially band aids to fix the problem of unfavorable economics of heat pump adoption. But they don't (and can't, as long as AMI is not deployed) fix more fundamental issues in how costs are allocated.

For these reasons, I believe an opt-in technology-specific rate for heating electrification is warranted in the near term until AMI is fully deployed and a more comprehensive whole-home default opt-out rate can be implemented.

I believe the report should address how to verify that customers enrolling on the technology-specific rates have actually installed a heat pump. Without rigorous verification, a declining block rate (option 3) would be enticing for any high-income customer who uses a significant amount of electricity. As one example of a verification pathway, customers could enroll in the new electrification rate at the same time they qualify for the Mass Save upfront heat pump rebate. This will ensure that customers see a reasonable return on their investment and does not require implementing a brand new default rate for all customers that will be outdated within 3 years.

Finally, a note on electric vehicles. While electricity cost is a factor in EV purchases, consumers rank upfront purchase price and public charging availability as much more significant adoption barriers.[1] It is vital to encourage EV owners to shift the timing of charging to off-peak hours. But offering steep discounts for off-peak EV charging is not necessary *either* for widespread adoption of EVs or shifting demand away from peaks (often achieved by scheduling charging in a mobile app). We have ample empirical evidence that EV drivers charge almost exclusively off-peak even when the price-differential between on- and off-peak rates is modest.[2]

Thank you for the opportunity to offer feedback. I look forward to continuing to engage.

Sincerely,
Graham Turk
Eversource Customer

[1] Pamidimukkala, Apurva, Sharareh Kermanshachi, Jay Michael Rosenberger, and Greg Hladik. 2023. "Evaluation of Barriers to Electric Vehicle Adoption: A Study of Technological, Environmental, Financial, and Infrastructure Factors." *Transportation Research Interdisciplinary Perspectives* 22:100962.
[2] In Green Mountain Power's 2021 Integrated Resource Plan, the utility reported that customers enrolled on an EV time-of-use rate charged 90% off-peak with a peak-to-off-peak price ratio of 1.31 (p. 1-14). https://greenmountainpower.com/wp-content/uploads/2021/12/2021-Integrated-Resource-Plan.pdf.