November 19-20, 2024
Meeting Minutes

Welcome, Agenda Review and Meeting Minutes

Jennifer Light, RTF Chair, kicked off the two-day meeting at 9:00am. Mark Jerome, RTF Vice Chair, took attendance counting 20 voting members.

Rebecca Blanton, independent, moved to adopt minutes from the October 16th meeting. Kevin Watier, independent, seconded. The minutes were adopted unanimously. Eric Miller, independent, moved to adopt the day's agenda. Brian Owens, CLEAResult, seconded. The agenda was adopted unanimously.

Management Update

Laura Thomas, RTF Manager Presentation

Staff presented update topics including post QAQC information about combination ovens, specifically concerning convention idle rate impacts. Upcoming RTF meeting topics, and future subcommittee meetings were also reviewed. It was noted that there will be no subcommittee for heat pump water heaters updates, but members were urged to send in feedback, questions, and/or data. Staff then presented the list of incoming 2025-2027 RTF members. There was no discussion.

Update Planning UES: New Manufactured Homes and HVAC

Ryan Firestone, RTF Contract Analyst (CAT) Presentation

Staff reviewed the existing UES measure and discussed current and upcoming specifications for manufactured homes. The body discussed using REEDR for HVAC loads as well as the proposed updates, including moving the UES from Planning to a mix of Planning, Proven, and Small Saver for different parts. The RTF approved the updates.

David Baylon, independent, stated that [Slide 5] practically eliminates the UES for this program putting the review in the hands of a QC program that doesn't really exist. He asked if this is correct.

- Firestone: Yes. We are following the guidelines, but it's probably not the end of the story.
- Baylon: Will this be the pattern for other measures that are more about QC than widgets? It seems like we may need a guidelines update to handle those, so we don't have to keep punting as QC-oriented measures become increasingly common.
- Light: We're not talking about guideline updates today.

Watier asked about using existing manufactured homes if this is a new construction measure.

- Firestone: We are using REEDR to model new manufactured homes and we're checking those results against results in the existing homes measure.

Light stated that the next guidelines update is scheduled for next year, urging the RTF to send update suggestions.

Baylon asked if central air conditioning (CAC) is assumed in all cases [Slide 13].

- Firestone: Not for gas homes.
- Baylon: Do we have evidence that that's true?
- Firestone: No. It's about consistency with assumptions from the 2021 Power Plan.
- Baylon: Do we know much about the current percentage of gas homes in the market?
- Firestone: It's pretty small, a couple hundred a year.

Sarah Widder, Resource Innovations, asked if there is a source for our old baseline assumptions.

- Firestone: The 40/60 split was based on ASHP presence in RBSA 1 and 2, along with manufactured homes as a function of home vintage. We found that newer homes had about 40% ASHP.

Andrew Grant, Cadmus Group, asked if the RTF and Council align on weather normalization sources [Slide 17].

- Light: We align as best we can. The main concern is being on the same page on fundamental issues like what counts as conservation.

Baylon confirmed that NEEM 2.0 is essentially ENERGY STAR v3.2, leaving aside duct leakage and air sealing [Slide 21].

- Firestone: Correct.
- Baylon: So, is it fair to say that ENERGY STAR v2 is our baseline? If that's case, the envelope-only path is the same as NEEM 1.
- Firestone: Right. We're looking at ENERGY STAR v2 for our update.
- Baylon: How are we treating that mix, given that ENERGY STAR v2 has two paths that aren't envelope only?
- Firestone: All ENERGY STAR homes in the northwest are going through the NEEM program, so they're on the envelope-only path. We're not doing ENERGY STAR v3 because it's not in effect yet.

Brady Peeks, Northwestern Energy Works, stated that the envelope only path isn't really a thing in ENERGY STAR v3, adding that the standard pretty much requires the HPWH.

- Bob Davis, Ecotope: How and when is infiltration testing done?
- Brady Peeks, Northwest Energy Works: We do field tests on a sample of homes. There's a minimum sampling of two percent of homes, but we're currently running at eight percent. We routinely see homes around two or three for ACH 50. Occasionally we'll see a four but that's not common.

Baylon wondered why duct leakage is not on this list, asking how it is handled [Slide 24].

- Firestone: The supply duct leakage fraction is a REEDR input.
- Christian Douglass, NWPCC: REEDR uses the airflow network model, so it's not just a kluge or a simple, dumb fraction.

Davis appreciated the hysteresis explanation. He noted that we often see auxiliary heat coming on when it's not expected, even in cases where a house has a decent shell and decent ducts, and where those facts are verified via the NEEM program. Davis said NEEM homes provide a nice, controlled test case for understanding HP controls, urging the RTF to pay extra attention to this class of examples.

Watier asked if the model knows about construction differences between MH and SF, especially for different floor constructions.

- Firestone: Yes, our methodology examines those differences carefully.

Davis asked what the .45 thermostat means on [Slide 29].

- Firestone: It means that the total deadband between when the system turns off and when it turns on is 0.45°F.
- Davis: Add the "°F" to the slide please.
- Baylon: So, this is just a model knob that tries to reproduce what we see in the data. It's not a description of actual control logic.
- Firestone: Right.

Miller asked how zero-energy homes are identified [Slide 32].

- Firestone: It's a certification program under the DOE specifications.

Baylon asked if the ENERGY STAR baseline portion gets the QC-assured model specs [Slide 38].

- Firestone: Yes. The ENERGY STAR homes are actually certified by the NEEM program, so they do get that QC.
- Peeks: That's true for almost all homes built in the region. It doesn't apply to the few homes that migrate up from California.
- Baylon: Don't we have a border wall?

Baylon stated that he thought that ENERGY STAR gas homes also needed a HPWH [Slide 41].

- Firestone: That's only for zero-energy ready homes.
- Baylon: Doesn't it affect the cost and energy impacts?
- Firestone: Yes, and we'll get to that.

Jackie Goss, Energy Trust of Oregon, asked if the load profile on [Slide 46] will be used for eFAF to CDHP conversions in existing homes.

- Firestone: No.
- Goss: Then the name is confusing.

- Firestone: The “new” is trying to flag this. We may need to clarify further.

Nick O’Neil, Energy 350, asked why the shapes don’t line up better with the thermostat setpoints seen earlier.

- Firestone: It’s partly because of weather and partly because this is a savings shape relative to eFAF.

Goss asked if it’s assumed that the CAC is installed after delivery, same as CDHP [Slide 49].

- Firestone: Yes, that would be installed after the home is sited.
- Goss: So, they are not included in the purchase price.
- Firestone: They may be part of the package, but it would be installed after siting.

White did not understand the current practice factor in incremental costs. He thought it seemed like the incremental cost should just be the incremental cost.

- Firestone: Our baseline assumes 40% of homes are installing CDHP in the baseline, meaning that 60% do not. Our incremental cost is relative to that mixed baseline.
- Light: This is trying to be consistent with the savings calculations (and with our other measures).

O’Neil wrote a question to consider after the break in the question pane, did we not include the tax credit eligibility screen for the DHP measure similar to what was adopted at the October RTF meeting on the DHP for zonal UES [Slide 52]?

BREAK

Update Planning UES: New Manufactured Homes and HVAC (continued)
Ryan Firestone, RTF CAT Presentation

Looping back to O’Neil’s question, David Bopp, RTF CAT, wrote, our DHP eFAF and zonal measures both have options for the tax credit for the heat pump. A utility can choose to not verify the eligibility for the heat pup or verify it. If they verify it then they use the appropriate application and the costs follow with a tax credit for units that are verified. This should work since this measure pulls everything directly from the DHP measures.

Bopp then stated that there is an identifier for tax credit eligibility in all HP measures. He confirmed that he hasn’t checked whether that’s been brought forward to this workbook.

- Firestone: We can check to see if that needs to be added.
- Thomas: Do we have to worry about scenarios where the customer and the manufacturer both claim a credit for the same thing?
- Firestone: This is for the DHP. It’s added after the home is sited, and it’s incremental to the new home so there’s not a conflict there.
- Light: It sounds like we want to add that identifier to the DHP case. We can edit the decision language to reflect that when we get to it.

Baylon asked if there is evidence that the 3% HPWH saturation is real in the MH sector or if that figure just reflects the SF market [Slide 57].

- Peeks: Clayton homes use the zero-energy ready spec as a marketing tool. It ultimately requires a HPWH.
- Firestone: It sounds like there really are some HPWH going into this market.

Watier asked where HPWHs are being installed, wondering if it's a closet with exterior access.

- Peeks: Clayton is co-locating the HPWH in a utility room with louvered doors along with the HVAC.

Davis asked if it's assumed that the HPWH is always installed in the factory. He said if not, we have to face the various sources of cost inflation in the field and plumber resistance.

- Peeks: Yes, they're installed in the factory.
- Firestone: In that case, the proposed cost figures probably make sense.
- Davis: This cost has really gone up recently, at least in the field. Plumbers are really resistant to HPWH, so standardization is the way to go with these.

Watier asked if the cold air return to the furnace is using the same louvred door [Slide 59].

- Peeks: Yep, same door.
- Watier: So, when the HPWH is on a long reheat cycle the HVAC return is sucking that cold air in and having to reheat it. Is that right?
- Firestone: Yes, that's what the large interaction effect was getting at.

Davis thought that some of these lines look out of date, saying he was particularly surprised that rows two and three are so high.

- Firestone: This comes from our UES measure, which references the ENERGY STAR QPL.
- Baylon: It does sort of look like 2002 standards.
- Paul Sklar, RTF CAT: We should check the refrigerator volume.

Goss asked if we are going to see a graph that shows the net effect [Slide 65].

- Firestone: No but we'll see a benefit/cost graph.

Watier asked if the DHP efficient-case systems are Zonal+DHP or eFAF+DHP [Slide 68].

- Firestone: eFAF+DHP.
- Watier: But the cooling baseline is still a window unit instead of CAC?
- Firestone: Correct.

MOTION
Light instructed staff to add a bullet saying: Add DHP tax credit with appropriate measure identifiers.

Davis said he was still interested in HPWH cost in the aftermarket versus the factory.

- Firestone: It's happening in the factory.

- Davis: Does that always happen? The one-year window on HPWH ready makes that unclear.
- Peeks: In practice, it's always in the factory.
- Davis: Okay.

Watier pointing to the use of existing homes measure for CDHPs, stating that we know site-built homes don't show much heat pump savings. Because of this he wasn't sure how we hope to get at this.

- Firestone: Our research is built around eFAF to CDHP conversions, but it will be applied with a current practice baseline in our measure analysis.

I, David Baylon, move to Approve the updates to the New Manufacture Homes and HVAC UES measure and Research Strategy as Presented, Add in the DHP tax credit with appropriate measure identifiers, *Current practice baseline would include base case duct leakage and shell leakage consistent with non-NEEM homes*. Change the status to "Under Review" to "Active," Chang ethe category of NEEM v2.0 measure applications to "Small Saver," Change the category of NEEM v1.1 +ZERH v1 and HP Upgrade measure application to: "Proven" for CDHP in HZ1, "Planning" for CDHP in HZ 2 and 3, "Proven" for DHP in HZ 1 and 2, "Planning" for DHP in HZ3, "Small Saver for HE Gas Furnaces. Approve updates to CDHP and DHP for eFAF Research Strategies that point to their use in the New MH and HVAD measure, Set the sunset date to November 30, 2026.
Miller seconded.

Baylon stated that most national MH advancements have been driven by our region. He said the QC associated with these items remains a distinct benefit of the NEEM program.

- Goss: I agree with Baylon's intention to celebrate NEEM's accomplishments, but I think that's better done through market transformation channels instead of through the RTF UES baseline.
- Firestone: This is a policy question. The guidelines call for a current practice baseline, and the region's current practice is clearly not a non-NEEM home.

Jamie Anthony, BPA, asked how sensitive savings or costs would be to the suggested change.

- Baylon: Hard to say. You must change the baseline definition and see how it plays out.
- Light: We need to have the right hats on for this decision. That means not basing analysis decisions on what we think they'll do to cost-effectiveness or savings.
- Anthony: I don't think the current practice baseline is appropriate for this measure. I don't think the Plan correctly captures potential when it assumes NEEM in the baseline forecast.
- Light: Consistency with the Plan's baseline forecast is important. In principle, we could use less efficient baselines in the forecast and in the measures. The net effect would be higher conservation targets and larger UES values so the practical change would be very little. What we shouldn't do is pick and choose measure-by-measure. We need consistency across measures.

Peeks pointed to field testing on NEEM-spec homes that were shipped from, or sited in, other regions were not as tight as the NEEM homes. He said homes in the midwest or southeast were also nowhere near as tight as NEEM homes, adding that NEEM QA assurance brings something important.

- Light: agreed.

Watier thought that other avenues should be pursued for crediting QC-related savings, as doing it in the UES is not consistent with other measures and therefore not appropriate.

Vote on the motion. The motion does not carry. (5 yes, 10 no, 2 abstain)

I, Mark Jerome, move as originally written. (Same as above with italics removed.)
Davis seconded.

Vote on the motion. The motion carries (15 yes, 1 no, 2 abstain)

Peeks praised Firestone for capturing a lot of information quickly and accurately.

- Davis: Here, Here!

Light ended the first day of the meeting at 12:20pm.

Introduction and Welcome – Day 2
Jennifer Light, RTF Chair
Light welcomed the RTF to the second day of the meeting. Jerome took attendance counting 19 voting members.

Update Proven UES: Residential Refrigerators and Freezers
David Bopp, RTF CAT Presentation
Staff presented updates to the Proven UES. After discussing a ratio approach and lack of sales data for two categories, the RTF approved the updates.

Grant stated that ENERGY STAR is 10% more efficient than federal standard, while ESME is 15%, wondering why staff did not use a ratio to get to ESME [Slide 9].

- Bopp: The RTF explicitly chose 15% more efficient than standard for ESME. It turned out to be less savings than the average ENERGY STAR equipment for these two categories.
- Grant: My point is why not just ratio the ENERGY STAR savings up, increase it by 5%, to get to ESME?
- Bopp: You could. It's just that we don't have sales data for these two categories. That would be a reasonable motion.

Widder addressed not having sales data, asking if it is because there are no units in those categories.

- Bopp: NEEA data didn't show any sales of these models in the time period we considered.

- Widder: Why not look at the consumption of those products specifically?
- Bopp: I'd have to go back to the spring presentation to see what was proposed. We looked more closely at specific values then, but that's not the approach we landed on.

Baylon voiced curiosity at how staff arrived at the existing current practice baseline with smaller savings. He said it sounds like it was all market based adding that this discussion helps.

- Bopp: If the RTF wants, I could look at these two categories again and see how actual models of ESME would result in savings, but we'd have to bring this back.

Goss thought that the current approach was fine, cautioning against the ratio approach. She thought some ENERGY STAR products would qualify for ESME if they had applied for it, so just looking at ENERGY STAR products might not give an accurate picture.

- Widder: That's why the 15% better than DOE baseline resulted in lower savings than the sales-weighted average. There are efficient ENERGY STAR units that are not ESME qualified.
- Bopp: That's correct.
- Light: We can either adopt something today or go back and do more work.

MOTION
I, Eric Miller, move that the RTF approve the updates to the Residential Refrigerator and Freezer UES as presented and: Keep the Category at Proven, Keep the status at Active, Keep the sunset date on March 31, 2027
Baylon seconded.

Vote on the motion. The motion carries. (17 yes, 0 no, 0 abstain)

Update Proven UES: Residential Gas Furnaces
David Bopp, RTF CAT Presentation
Staff presented updates, with special attention to a minimal change outside of the new adjustment factor, costs that will now include the tax credit, and a category change from Proven to Planning. Discussion touched on Washington ballot initiative 2066, lifetime assumptions, and current practice in a fast-growing market. The RTF approved the updates for the measure.

Baylon admitted that he did CPAs for the gas industry in his misspent youth [Slide 9]. He recalled the test procedure for AFUE, particularly that there is a piece of that test that uses more efficient fan energy as part of the furnace, which has the effect of adding some kWh to the calculation. Baylon said this is a national standard meaning it was based on source energy adjustment by the EIA, which triples the impact. He acknowledged that it's a small effect of around 100 kWh/year but noted that it allows AFUE to expand one to three points. Baylon said this, in effect, overstates the gas savings if we just use AFUE, admitting that this was in the dark ages, but insisted that this was the effect.

- Bopp: We're not currently accounting for the fan energy. The RTF previously decided that we didn't know enough about the electric consumption and that the impact was likely not that large. Hopefully, our adjustment factor captures this based on real word, evaluated savings.

- Baylon: VBDD error terms are much bigger than this issue. I just want to point out that there are electric impacts that are trivial but important to the AFUE calculation.
- Bopp: Thanks. I'll flag that for future updates. This might reduce the adjustment factor that we have to use.

Davis asked what was meant by "backsliding" on [Slide 11].

- Bopp: Previous WA data had a higher efficiency market. But if people aren't stocking high efficiency furnaces because of low demand, the market could become less efficient.
- Davis: I'm still trying to understand the recent ballot initiative. It's going to take some time to understand the impact of that.
- Baylon: Initiative 2066 was originally an initiative to remove some incentives to allow utilities to do fuel switching. The Building Industry Association of Washington got involved and changed the initiative. It wasn't a transparent or well throughout process, which leaves us with the state supreme court needing to decide what the voters meant. That will take a while. But you can't outlaw gas. That's not a big deal because the shift to HPs is not from restricting gas, it just addresses the overall efficiency of the house, and the HP has a much higher COP than the gas. With gas, you need to tradeoff other efficiencies, which raises the price of gas homes. So, unless the interpretation of 2066 is that it can't restrict anything about gas, there will be relatively little impact relative to the 2021 code, which does not outlaw gas.
- Light: For now, we're using the total market data to get to the baseline.

Bopp made one more point for SF homes saying there is potential for a new federal standard for 95 AFUE, which could make the point moot in the future.

Baylon stated that MT doesn't have permits associated with a large fraction of the state just in suburban areas around population centers [Slide 18]. He said that the numbers look small relative to what he saw 20 years ago. Baylon noted that the federal data is based on permits, but 50% of new construction there didn't have permits, wondering if that correction been made.

- Bopp: The census data by state is not comprehensive. It's extrapolated from a sample of what the Census Bureau thinks is correct. You're right, in MT, you don't necessarily have to pull a permit or be inspected under codes.
- Baylon: My recollection didn't capture all of this.
- Bopp: I'd need to dig into the census data/methods to know more on this.

Widder asked if [Slide 21] represents existing or all homes.

- Bopp: Just existing.

Blanton asked why is heating zone 2 is lower than heating zone 1 for Single Family [Slide 24].

- Bopp: That's what we got out of the data. We've come across this before and I'm not sure why here. But this is what we get when we look at the calibrated SEEM models.

Davis addressed the two tiers on [Slide 28] asking where the bifurcation of 95, 97 come from.

- Bopp: That aligns with ENERGY STAR and CEE. We don't require that the measure buys ENERGY STAR or CEE, but we're being consistent with them.

Grant said some of the R2 values on [Slide 30] are good and some are close to 0.8. He suggested taking an average of all datapoints, instead of a trend.

- Bopp: We considered that. Prior to this update, we looked at the cost from 89 to 90 and moving up to 95 to 97. We're looking at incremental costs, so this change in method wouldn't have much impact. We can change that if the RTF wants.

Davis asked if HEMS measures gas usage [Slide 41].

- Bopp: I misspoke. It's REEDR model consumption based on gas HEMS homes. It's our best guess out of REEDR and not calibrated. That's part of why I'm not proposing to use REEDR here.
- Davis: We didn't measure gas usage in the 2011 submetering study.
- Baylon: That was my question, but the answer is "no, we didn't measure gas." So, no need to proceed with considering a HEMS calibration.
- Bopp: That's right. I think we'd go there if/when we move this to REEDR. And then we'd need to consider calibrating REEDR. We should look at the 2011 gas sub metered data for our next update of this measure.

Widder asked for a high-level look at gas savings shapes. She liked understanding the concept but asked if the gas savings shape is important.

- Firestone: We do have gas capacity values in ProCost.
- Widder: Got it. Also, this whole presentation is about gas savings, but Baylon alluded to the fact that furnaces use both gas and electric. Is there no electric impact?
- Bopp: The last time this went through the RTF decided not to consider the electric impact because it's small and fairly uncertain. It could play a bigger role next time if the federal standard only allows the higher AFUE furnaces.
- Widder: I agree with that. But for the research strategy, we should consider this if it might be a focus in the future.
- Jerome: In June 2019, the federal standard required an electronically commutated motor (ECM) in all residential gas furnaces. So, there's not much room for variation in fan performance.
- Widder: Got it. Maybe it's not worth researching.

Baylon stated that whatever electric savings appear in the testing are multiplied by about three before converting to therms. He said this means that maybe 10% of the AFUE might be buried in electric savings. Baylon recalled doing the calculation decades ago and finding that the kWh savings were about equivalent to converting an incandescent lamp to an LED. He said we're biasing our gas savings and the 20% correction we're applying to gas savings is larger than what the electric impact on AFUE could be.

Davis said the third tier, 97 AFUE or better, is a sales gimmick in his opinion. He disagreed with having it as an application because it's a material difference from the 95 AFUE furnace.

- Bopp: We're estimating seven therms greater savings from 97 AFUE than for 95 AFUE. This would be a big deal if the federal standard becomes 95 AFUE. We should look at this for the next update.

Widder pointed to another source of uncertainty—the lifetime assumption or the size of the existing market, which we use lifetime to estimate [Slide 45]. She said this is what we back the existing market AFUE out from so if the existing market is a different size than our estimate, it would impact our estimate.

- Josh Rushton, RTF CAT: That's on the next slide.
- Baylon: I'd be more comfortable if the research strategy included a review of the AFUE test method, especially in light of furnace fan efficiency standards. That might account for a lot of the 20% adjustment.
- Bopp: We'd do that internally as the CAT. It doesn't need to go in the research strategy. Unless more research is needed to understand this.
- Baylon: So, we just need to trust that CAT will do this. That sounds fine to me.
- Bopp: Yes, we'll flag this for the next update.

Kevin Geraghty, independent, said he didn't realize that the current practice is different between replacement and the new home market. He said replacements assume the number of gas homes from RBSA and divide by the lifetime of the furnace. He said that assumes a steady state, but in fast growing place like MT, you get more furnaces in new construction. Geraghty stressed that this rule of thumb will be wrong in fast growing market.

Goss said if/when we move this into REEDR, it will be important. She noted that EnergyPlus doesn't take AFUE, it takes thermal efficiency, so we'll have to know how to map AFUE to thermal efficient.

- C. Douglass: I don't know off the top of my head. We could look into this.

Goss asked what quantify of homes would be needed to reach the uncertainty levels specified on [Slide 47], wondering if it would be10,000 or 100.

- Rushton: We looked at previous evaluations, with a sample size in the 1000's. The biggest source of uncertainty there is the lack of knowledge of AFUE-pre. We didn't put a number on it, but I think 1000 would certainly be sufficient.
- Goss: Sample sizes get small when we break them into smaller groups.
- Rushton: Good point. If it turns out that non-condensing is a small portion of these, then billing analysis won't tell us much. It would be a concern if programs are only going from condensing to condensing.
- Goss: An impact evaluation of a market baseline measure is unlikely to include billing analysis. It's not impossible, but…
- Bopp: The impact evaluations used for our analysis were pre/post billing analyses. That might not be what the savings assumptions are, though.

MOTION

I, Kevin Watier, move that the RTF approve the Residential Gas Furnaces measure as presented, and Change the Category to Planning, Keep the Status at Active, Set the sunset date to 11/30/2028.
Baylon seconded.

Vote on the motion. The motion carries. (16 yes, 0 no, 1 abstain)

BREAK

Update Part 2: Standard Information Workbook
Logan Douglass, RTF CAT Presentation
Staff presented a second round of updates to the Standard Information Workbook. Discussion centered on low labor rates and identified that the mark up rate was likely too low. The RTF recommended staff collect further data to inform the labor rates to inform the markup rate and bring back to a future meeting for RTF review. The updates to the GDP deflator tab were approved.

Baylon suggested using federal agency information instead of Global Insights [Slide 8], asking if anyone checked the Global Insight data.

- Thomas: Kevin Smit, NWPCC, provided this data and the Council uses this source. He's not here, but we can follow up with him.
- Baylon: All I'm saying is that someone should check if Global Insights lines up with federal estimates.
- C. Douglass: I checked and yes, they are very close. The only reason that we use Global Insights instead of the federal values is that we need a forecast, which the federal sources don't produce/provide.

Davis stated that he has been pointing out that the market rates are too low for quite a while [Slide 13]. He called these numbers better but insisted that the current market rates for electrician and plumber in OR/WA are significantly higher than this.

- Logan Douglass, RTF CAT: There's information on the next slide [Slide 14].
- Davis: You have about $130. It depends on the job. For large jobs, rates are lower, but for residential/light commercial jobs that last a day or two, hourly rates are well over $200/hour in Portland and Seattle. If we weight by where the work is happening, the rates are still too low. It's been like this for a long time. The median rate for a plumber in Portland is $225. An electrician is about the same. Seattle is worse: $230-$250. That's the *median*.
- Thomas: We're challenged by the level of granularity. We don't have data to get to that level of granularity. We have some metropolitan areas but not all. Additionally, the guidance we've gotten from the PAC is to look at this from the state level, but not deeper. If there's data out there, we can look at it and bring this discussion back to the PAC.
- L. Douglass: Concerning the OEWS data for raw hourly wages, these are available for select metro and non-metro areas. I looked up Seattle/Tacoma electrician versus all of

WA state. It's a bit higher in that area but no more than eight to ten percent. I wonder where the discrepancy is. Are we not marking up the rates enough?

- Davis: A lot of work is not done by licensed electricians or other trades. It brings prices down but brings up other questions. Even in rural areas, the trades can be picky about what jobs they accept, and less scrupulous people pick up the rest. I know that hourly rates they get paid are less, but what the customer gets charged all over WA/OR is about $250/hour.

Baylon pointed to a problem with our definition of "labor rates," saying it implies that we'll see this cost when we add some amount of labor to a measure. He said that is not what we see because you call the plumbing contractor to hire a plumber, not go down at the union hall and pick one from there. He said contractors have plumbers that work for them, and maybe they get paid this, but they have to charge more to be in business. Baylon called that typical with contractors, saying they probably use a value of about two. He explained further, saying if you multiply these rates by two, you'd get close to what Davis is seeing.

Baylon said if this is just to decide how much money goes back into the economy in wages, it's probably right. He said if represents what it costs someone in the market to get some work done, it's wrong by at least double. Baylon wanted to know what we're doing with this number.

- Rushton: My head went to where L. Douglass went, but now I see that it's the market rate that BLS doesn't address. We use a 2.0x adjustment, based on RTF judgement. If that's wrong, we should change it.
- Widder to L. Douglass: Is the wage data representative of the state? But I also see that the markup is probably a bigger issue.
- L. Douglass: My understanding is the wage data is the average of all areas in the state.
- Widder: Hopefully sampled appropriately.
- L. Douglass: Yes.
- Widder: OK. I do think you'd see something different in Seattle versus Pasco. We should keep that in mind. If there's a 10% different in wages, but that's marked up four times, that makes a big difference in market rate. I caution us to not just look at the I-5 corridor.

C. Douglass assured the room that the method Baylon is describing, working out what the customer is paying, is how we do it. He said staff historically used a markup of two but agreed that maybe a markup of three or four is more appropriate now. C. Douglass said he lives outside of Portland but could hire a licensed/bonded electrician for $125 an hour, admitting he couldn't do that in Portland.

- Blanton: I share the concerns that this underestimates things.
- Goss: I also share the concerns. We use a similar method, but we get different numbers. For example, our electrician rate from BLS data is $80, not $42. I'm looking at Oregon data from an Oregon dataset. Maybe you should look at NW government agencies, not federal data sources. I also agree that the markup rates are too low. The rates for government contracts assume large projects, not residential work. For small residential projects, the starting rate and markup will be different.

O'Neil said the OEWS is an actual data and probably the best source we have. He thought that the big issue is the RTF judgement around markup rate, saying if we think it's higher than two now, we should update it. O'Neil noted that we've been using this underlying data for a long time, adding that the data underpinning mean hourly wage and scale to fully-burdened is sufficient.

- Geraghty: Prices are determined by demand and relative scarcity. If the credentialled trades are in increasingly short supply, then markups should go up. We should keep an eye on how this varies over time. Davis and Jerome see this information all of the time and they think our numbers are wrong. But we should track how these numbers vary over time. We need a way to figure out how to track this.

Baylon agreed with O'Neil's point confirming that we use to use a one-x multiplier, but count the cost twice, which is an effectively a two-x multiplier. He said the markup is meant to be the markup by the business which includes paying for a huge truck, and transporting a plumber, etc. Baylon said you should expect a big markup because of the costs associated plus profit margin. He suggested using a two-x multiplier but use it to add this to the base, to be closer to the truth.

- Light: It seems like we're focusing in on the judgment of the markup rate and using judgement to choose a different rate.
- Jerome: That's my take. There could be some different sources to get a fully burdened rate, but the market rate and the markup seems to be the discrepancy between this and what we see in the market.

C. Douglass said these labor rates are rarely used as 90-95% of the time, labor is embedded in our total costs. He was hard pressed to remember using these at all and didn't think it was worth overthinking too much as we're just going to ask Davis and Jerome what the rates should be. C. Douglass said we can resolve this by just picking a markup rate.

- Jerome: And when we do use it, it's typically the Unskilled Labor rate, like for homeowner install.

Grant suggested using RSMeans as a benchmark, acknowledging that it costs money. He also agreed with C. Douglass that this doesn't show up in RTF measures much. Grant added that the RTF looks at incremental costs, so labor costs often net out of a measure. Lastly, he was fascinated that this is not discussed on the equipment side, saying we just take the TSD value and go with it, not what the customer ultimately pays.

Blanton suggested using rural and urban mark-ups.

- L. Douglass: There is enough data granularity that we could bust out hourly wages for metro versus non-metro. I'm not sure on the rest of this.

Goss stated that we use these numbers to calculate non-energy impacts for early replacement. She said that means even if they don't show up in incremental cost, they can show up elsewhere in the calculation.

Light said the RTF could bring this back, or we could pick a markup rate for today's approval. She reminded the room that it is only used in some analyses and encouraged the RTF to scrutinize total costs for every measure that comes up.

- Baylon: You start the mean hourly wage and keep multiplying. The numbers you're starting with seem awfully low. For example, hiring an architect for $40/hour isn't realistic. It's more like $120. Start by scrutinizing the underlying data.

MOTION
I, Bob Davis, move that the RTF approve the updates to the Standard Information Workbook as presented for the following tabs: GDP Deflator, Direct CAT to work with RTF members and stakeholder for updated proposal on Labor Rates.
Miller seconded.

Vote on the motion. The motion carries. (16 yes, 0 no, 0 abstain).

Light ended the meeting at 11:45am.

Voting Record: November 19-20, 2024

Motion Language	Yea	Nea	Abs	Motion Passes?	Percent of Yea Votes		Number of Voting Members Present
					RTF Voting Members (40% min)	Members Voting (60% min)	
Motion: Approve the agenda for the November 19-20 meeting (Blanton/Watier)	20	0	0	Yes	67%	100%	20
Motion: Approve the minutes from the October 16 meeting as posted (Miller/Owens)	20	0	0	Yes	67%	100%	20
Motion: Approve the updates to the New Manufactured Homes and HVAC UES measure and Research Strategy as presented • Add in the DHP tax credit with appropriate measure identifiers • Current practice baseline would include base case duct leakage and shell leakage consistent with non-NEEM homes • Change the status from to "Under Review" to "Active"	5	10	2	No	17%	33%	17

• Change the category of NEEM v2.0 measure applications to "Small Saver" • Change the category of NEEM v1.1 + ZERH v1 and HP Upgrade measure applications to: – "Proven" for CDHP in HZ1 – "Planning" for CDHP in HZ 2 and 3 – "Proven" for DHP in HZ 1 and 2 – "Planning" for DHP in HZ 3 – "Small Saver" for HE Gas Furnace • Approve updates to CDHP and DHP for eFAF Research Strategies that point to their use in the New MH and HVAC measure • Set the sunset date to November 30, 2026							
Motion: Approve the updates to the New Manufactured Homes and HVAC UES measure and Research Strategy as presented • Add in the DHP tax credit with appropriate measure identifiers • Change the status from to "Under Review" to "Active" • Change the category of NEEM v2.0 measure applications to "Small Saver" • Change the category of NEEM v1.1 + ZERH v1 and HP Upgrade measure applications to: – "Proven" for CDHP in HZ1 – "Planning" for CDHP in HZ 2 and 3 – "Proven" for DHP in HZ 1 and 2 – "Planning" for DHP in HZ 3 – "Small Saver" for HE Gas Furnace • Approve updates to CDHP and DHP for eFAF Research Strategies that point to their use in the New MH and HVAC measure • Set the sunset date to November 30, 2026 (Jerome/Davis)	15	1	3	Yes	50%	94%	18

Motion: Approve the updates to the Residential Refrigerator and Freezer UES as presented, and: • Keep the Category at Proven • Keep the Status at Active • Keep the sunset date on March 31, 2027 (Miller/Baylon)	17	0	0	Yes	57%	100%	17
Motion: Approve the Residential Gas Furnaces measure as presented, and: • Change the Category to Planning • Keep the Status at Active • Set the sunset date to November 30, 2028 (Watier/Baylon)	16	0	1	Yes	53%	100%	17
Motion: Approve the updates to the Standard Information Workbook, as presented for the following tabs: • GDP Deflator Direct CAT to work with RTF Members and stakholders for updated proposal in Labor rates (Davis/Miller)	16	0	0	Yes	53%	100%	16

November 19-20, 2024, Meeting Attendance

* Designates Voting Member

Name	Affiliation
Jamie Anthony*	BPA
David Baylon*	Independent
Jonathon Belmont	BPA
Rebecca Blanton*	Independent
David Bopp	RTF Contract Analyst
John Davey	Puget Sound Energy
Bob Davis*	Ecotope
Christian Douglass	NWPCC
Logan Douglass	RTF Contract Analyst
Jesse Durst	PSE
Zach Erdmann	Premium Efficiency
Joseph Fernandi*	Seattle City Light
Ryan Firestone	RTF Contract Analyst
Wesley Franks	WA UTC
Kevin Geraghty*	independent

Jackie Goss*	Energy Trust of Oregon
Andrew Grant	Cadmus Group
Adam Hadley	RTF Contract Analyst
Michael Hoch	Energy Trust of Oregon
Aaron Ingle	NEEA
Mark Jerome*	CLEAResult
Peter Jensen	NWPCC
Anna Kelly	SBW Consulting
Phillip Kelsven*	BPA
Rick Knori*	Lower Valley Electric
Megan Lacy	Puget Sound Energy
Mark Lenssen*	PSE
Scott Leonard	Energy Trust of Oregon
Jennifer Light*	RTF Chair
Denis Livchack	RTF Contract Analyst
Ben Mabee	BPA
Eric Miller*	Independent
Eric Mullendore*	BPA
Andi Nix	Energy Trust of Oregon
Alex Novie*	Energy Trust of Oregon
Sorochi Okam	RTF Contract Analyst
Nick O'Neil*	Energy 350
Brian Owens*	CLEAResult
ShaToya Parker	BPA
Andrew Paul	Avista Corp
Brady Peeks	Northwestern Energy Works
Joe Prijyanonda	Applied Energy Group
Laney Ralph*	NW Natural
Akanksha Rawal	Energy Trust of Oregon
Mark Rehley*	NEEA
Sam Rosenberg*	PNNL
Josh Rushton	RTF Contract Analyst
Brian Sipe	PGN
Blake Shelide	ODOE
Kenji Spielman	Energy Trust of Oregon
John Stalnaker	BPA
Jeremy Stapp	BSW Consulting
Paul Sklar	RTF Contract Analyst
Jason Talford	Idaho PUC
Samantha Taylor	CLEAResult

Laura Thomas	RTF Manager
David Tripamer	BPA
Michelle Wildie	Puget Sound Energy
Kevin Watier*	independent
Jim White*	Chelan County PUD
Sarah Widder*	Resource Innovations
Kathy Yi*	BPA