Oregon Energy Strategy Complementary Analyses Information Session

April 16, 2025 | 9 a.m. - noon

Meeting Summary

ODOE and the CETI-OES Team presented the complementary analyses results from air quality modeling and the Energy Wallet analysis of household energy costs, highlighting projected air quality benefits across as energy pathways modeled scenarios, high projected household savings associated with adopting electric vehicles, and various factors that may contribute to whether installing a heat pump for heating and cooling may be economical for households of different types. BW Research presented their planned approach to modeling jobs outcomes associated with the energy pathways modeling scenarios. ODOE and the CETI-OES Team also took questions from attendees via the WebEx chat. ODOE invited members of the public to continue providing input through the public comment portal at https://odoe.powerappsportals.us/en-US/energy-strategy/. Meeting materials and a recording of the meeting are available on ODOE's website: https://www.oregon.gov/energy/Data-and-Reports/Pages/Oregon-Energy-Strategy-Engagement.aspx

In-Person Meeting Notes

Introduction

- Edith Bayer (ODOE) introduced the call. Edith introduced herself and ODOE's consultants, including Jeremy Hargreaves of Evolved Energy Research, Ruby Moore-Bloom of the Clean Energy Transition Institute, Angela Long of Rockcress Consulting, and Mitch Schirch of BW Research. Edith introduced ODOE and the agency's mission. Edith provided an overview of ODOE's analysis and public engagement efforts included as elements of the development of Oregon's Energy Strategy. Edith explained WebEx functionality and requested that attendees provide questions and comments in chat during the presentation.
- Edith spoke to the meeting's purpose as focused on providing results from the complementary analyses, and, in particular, Energy Wallet analysis and air quality modeling results to inform the Oregon Energy Strategy. Edith explained that ODOE undertook economy-wide energy system modeling, the results of which both directly inform policy discussions and serve as inputs to complementary analyses, including the air quality modeling, Energy Wallet analysis, and jobs analysis. The jobs analysis results will only be available later in the summer. ODOE has also worked with CETI to develop a set of maps to support policy discussions, but these maps are not the focus of today's presentation.

Air Quality Modeling:

- Edith Bayer (ODOE) explained that the Air Quality modeling is based on EPA's COBRA model and public engagement on how results would be broken down on a regional level. Edith explained that the air quality results do not include wildfire impacts but do include particulate emissions from most energy-related combustion.

- Jeremy Hargreaves (Evolved Energy Research) presented on modeled reductions in emissions, especially of fine particulate matter in PM2.5 and secondary particulate matter such as nitrogen oxides (NOx) and sulfur oxides (SOx).
- Jeremy explains that the Air Quality analysis is based on the energy pathways modeling, which examined projected changes in energy demand and supply to produce emissions inputs to the EPA COBRA model.
- Jeremy highlighted key takeaways from the Air Quality modeling as showing substantial health benefits that can be monetized to as between $200 and 460 million in 2030, and $538 and 1211 million by 2050. These values are high because of reduced mortality. Jeremy added that most of these benefits are expected to accrue in southern Oregon.
- Jeremy presented a chart highlighting the projected air quality impacts under the various scenarios modeled; Jeremy explains that the results show fairly tight grouping in air quality results; however, the largest difference results from the "high" and "low" estimates, which reflect the uncertainties of air quality impacts to health included in the COBRA model. Jeremy presented modeled reductions in occurrences of specific health problems like asthma or heart disease and related lost work days and hospitalizations.
- Health benefits by region: Jeremy highlights the greatest net air quality benefits occurring in Portland because of the greater population there; higher per-capita benefits are shown in southern Oregon as based on regional airflow and where particulate matter is concentrated.

Energy Wallet Analysis:

- Edith Bayer (ODOE) stated that the Energy Wallet provides results from five sample households, based on how they use energy today in terms of vehicle fuel and miles traveled, where they live, the type of building they live in, the square footage of their homes, and the type of technology and fuels they use to heat and power their homes. The Energy Wallet analysis examines how changes in technology adoption and energy consumption is expected to impact the energy expenditures of representative customers.
- This Analysis was undertaken because the energy pathways modeling provided economy-wide efficiency findings, but does not address distributional impacts and needs; the Energy Wallet Analysis helps identify and inform ways to address distributional impacts of the energy transition, especially on a household level. The Analysis helps answer questions like: How might household bills change with changes in technology? How does this compare to keeping technologies consistent? Does the year of adoption matter? Is there a difference between different household characteristics? How does the cost of electricity and natural gas affect cost of technology change?
- However, the Energy Wallet does not tell us everything; the sample homes are not reflective of a single, actual home, a particular utility rate structure, or economic shifts that may occur as part of the energy transition.
- Jeremy Hargreaves (Evolved Energy Research) explains that the Wallet both includes fuel costs based on consumption and prices as well as capital costs of investing in new technologies. The Wallet reflects both transportation and household energy costs.
- Jeremy reviewed an Energy Wallet analysis for a fictious customer to highlight how the analysis works; it reflects transportation expenditures and how, for example, purchasing an EV and heat pump in 2035 would lead to reduced gasoline expenditures, increased household electricity use, and relatively capital costs for the technologies purchased – with EVs projected to be less expensive than internal combustion engines (ICE) vehicles by 2035, but with heat pumps more expensive than an alternative technology.

- Jeremy reviewed key takeaways from the Energy Wallet analysis.[1]
- Jeremy reviewed the overall approach of the Energy Wallet analysis as incorporating projected technology adoption from the modeling, technology costs, and energy costs to model household energy expenditures.
- Angela Long (Rockcress Consulting)
    - The process for designing the sample households was informed by engagement with Energy Strategy working groups and the Advisory Group through the summer and fall of 2025. This involved active listening, collecting feedback, and then developing representative customers.
    - Angela presented a word bubble that came from a single working group meeting and how interests in reflecting heat and other factors was used to inform representative customer groups.
    - The process entailed defining sample households through listening to Working Group feedback, defining household themes, generating ideas for sample households, identifying data sources and inputs for the household types, and then seeking feedback through the public comment portal, Working Group, and Advisory Group.
    - CETI relied largely on the Northwest Energy Efficiency Alliance's (NEEA) 2022 Residential Building Stock Assessment (2022 RBSA) as a data set that reflects numerous building characteristics in Oregon.
- Ruby Moore-Bloom (CETI) presented on the representative households and their key characteristics for assessing energy consumption. Ruby explains that these households created with area median income and other data in addition to NEEA data.
    - Question in chat: In January the PUC approved a rate increase of nearly 10% for Pacific Power and a 5.5% increase for PGE. This approved rate increase caps a 50% rate increase over the last 5 years. How does this 5 year trend, and future rate increases, get managed within the model?
- Energy Wallet uncertainties and results
    - Jeremy presented the inputs to the Energy Wallet analysis and their associated uncertainties.[2]
    - Transportation results:[3]
    - Jeremy highlighted assumptions associated with the transportation expenditures and findings that vehicle electrification provided a consistent, significant opportunity for savings for all household types, even for a household that relied on public chargers for 80 percent of their vehicle electricity. Energy and energy cost savings were still consistently realized, even if electricity costs raise significantly. IRA tax incentives also made vehicle electrification more financially beneficial, but those incentives are not necessary to realizing energy cost savings from adopting an electric vehicle. Vehicle electrification is projected to be better the earlier the vehicle is adopted except for 2024, where electric vehicle prices remain high.

[1] Key takeaways include:
- All five sample households save money with vehicle electrification in most circumstances
- All five sample households save energy from electrification of home heating, but not all sample households save money from heat pump installation, absent policy support
- Multiple factors impact how great the savings could be from electrification of home heating and transportation
    - Energy prices, cost and access to technology based on household income, technological development, production and supply chain challenges
- Policies are important to enable access to cost savings
    - Education, incentive programs, infrastructure development, access to useable technology, and workforce development
- Upfront costs must be addressed to ensure equal access to the savings from electrification
    - Intentional, explicit policies that ensure environmental justice and equitable solutions are required

[2] A full table on these inputs and uncertainties is available at the Evolved Energy Research presentation at page 24.

[3] A full description of transportation electrification Energy Wallet results is available at Evolved Energy Research presentation at from pages 25 through 34.

    - Heating and Cooling results:[4]
    - Jeremy highlighted assumptions associated with heating and cooling expenditures and findings that adopting a heat pump produces significant energy savings in all households but that heat pump adoption did not result in net energy cost savings in all cases, largely because of the capital and installation costs of heat pumps. Electricity rates, technology, and service demand all factor into whether adopting a heat pump is an economical choice for a given household.
- Conclusions, Challenges, and Takeaways
    - Jeremy highlighted findings from the analysis as indicating that upfront costs must be addressed to ensure equal access to the savings from electrification. Additionally, factors such as providing for charging infrastructure and addressing an incentive gap for landlord-rental situations for installing energy-efficient technologies should be addressed.

Jobs Study Methodology:

- Mitch Schirch (BW Research)
    - Background on BW Research; BWR works on USDOE's Energy and Employment Report (USEER), an annual study that tracks energy employment across the nation in different energy sectors and industries. BWR has also undertaken employment analyses for states.
- Model framework: Mitch explained that the model starts by determining unit inputs, based on energy pathways modeling outputs, then uses BWR job multipliers on an industry-by-industry basis to project jobs on a sector-by-sector basis in five-year increments.
- Mitch explains that BWR will rely on IMPLAN and JEDI models. Mitch says these are input output models that create 3 levels of output -direct, indirect, and induced outputs- based on a single economic event or input. that will show direct effects, such as construction workers installing solar panels; indirect effects to industry purchases and other factors, such as solar developers needing to purchase solar panels and the labor needed to sell and transport panels; and induced effects, which includes things like solar installers spending wages at restaurants, hospitals, etc.
- So, these jobs numbers will reflect changes to electricity, fuels, buildings, and transportation sectors, but not the whole economy; BWR uses static and linear models, not economy-wide general equilibrium models or dynamic models. So, economic impacts due to rate changes will not be captured.

Questions, Comments, and Answers:

- Edith Bayer (ODOE) opened for questions and comments and began reviewing comments from the meeting chat.
- Comment from Dave Vant Hof to everyone: PGE offers charging at some utility pole stations for retail rate I understand. They are looking to expand that program as well I believe.
    - Jeremy; thinks there will be development in the area of public charging. Applied public charging rate was based on a current study; the big takeaway is that electricity rates had relatively little impact on whether customers would or would not realize savings based on adopting an EV, though the magnitude of those savings may vary based on electricity rates.
- Question from Bob Kaplan: have you done sensitivity analysis for financing heat pump installation costs for example, 10 year loans at 5 percent rather than seven years at 7 percent?
    - Jeremy; we did not look at different sensitivities there; however, the effect may be minimal because the model is comparing new versus old technology rates with similar financing; this would mute the effect of that loan rate. However, it would be interesting analysis, particularly if you're if you are a household and

[4] A full description of transportation electrification Energy Wallet results is available at Evolved Energy Research presentation at from pages 35 through 42

you're looking at the at the economic options, then financing is an important piece of that overall cost equation.

- Question regarding heat pumps usage of fuels such as propane for backup power at lower temperatures, and have lower efficiencies in lower temperatures.
    - Jeremy; current analysis bases efficiencies on NREL analysis, which is a little older. Jeremy says that heat pump efficiency has improved in the last two years, and if a household is considering installing a heat pump in 2030, the crossover point is very different, as modern heat pumps can still operate at high efficiency in sub-zero temperatures. So, the acceleration of technological development has already changed this picture, and large portions of Oregon may determine that a heat pump alone, or heat pump with a wood stove is sufficient; however, Jeremy recognizes that some Oregonians in cold climates may prefer hybrid systems. The energy pathways modeling provided for these hybrid systems, but the Energy Wallet used a simplified approach and only indicated whether a household adopted a heat pump or retained fossil or other electric home heating.
    - Edith; the Wallet did not test factors such as household heating with propane; recognizes this is a limitation of the Analysis.
        - Edith; clarifies that we considered houses with propane, but ultimately did not include a propane household based on comments that the analysis should reflect as many homes as possible and the relatively higher rates of household use of electricity and natural gas for heating.
- Brian Stewart: appreciates conservative approach to fuel and electricity pricing. Wouldn't it be prudent to include a scenario examining higher fossil fuel costs?
    - Jeremy; other scenarios with higher fossil fuel costs is technically doable; however, determining how to set those prices presents an issue. CETI and EER decided to use conservative fuel prices to highlight that new technology adoptions are likely to be cost-effective even under low fossil fuel rate scenarios. Thinks it comes down to household-specific considerations for heat pumps, and knowing that gas rates are likely to increase – though where and how gas costs are recovered is uncertain – consumers can insulate themselves against those increased rates by adopting a heat pump earlier rather than later.
- Question: How is ODOE thinking about the increases in electrification and burdens on the power grid as increasing cost pressures on energy-burdened households;
    - From ODOE;s perspective; this analysis is intended to provide better understanding of what the effects of technology change would be on some households based on some highlighted relevant factors. One element here is to review energy costs comprehensively, including both home energy costs and transportation costs. A finding is that transportation costs are pretty remarkable. An insight provided by this analysis is who would be missing out/what households might be left behind if they are not supported in the energy transition.
    - Jeremy: you can think about this analysis as dipping a toe in the water in the uncertainties facing energy rates going forward. There are two sets of factors – transition related costs, things motivated by electrification and clean energy; and those that are not transition related, such as industrial load growth, cost of materials such as transformers and conductors, hardening against wildfire risk. These latter are all impacts to rates outside of the energy transition that inform customer energy burden and the decisions they may make as part of the energy transition. So, exploring revenue requirements for energy providers and exploring how to recover gas infrastructure costs is another area of analysis that would take broad efforts and exploration. So, there are currently broad uncertainties, but there are also broad conclusions that can be drawn from likely projections.
    - Edith adds that there's an opportunity in the Strategy to flag areas for further investigation and research.

- Angela; this is the first time we've done this type of selection of customer groups and Energy Wallet analysis; appreciates the feedback we are receiving in today's meeting.

Meeting Conclusion:

- Edith reiterates that today's findings are intended to help move forward and inform conversations going forward. There are remarkable insights here, especially regarding electrification cost impacts to households and policy insights around public charging and needs to support some groups in the energy transition. Additionally, the factor of air conditioning and how that informs the cost-effectiveness of heat pump adoption is a valuable insight. Finally, air quality improvements indicated by the modeling also provides insight as to how the clean energy transition is likely to have health co-benefits.
- Edith asked that interested members of the public submit comments through Oregon Energy Strategy - Public Comment Portal · Customer Self-Service.
- **Final appreciation and adjournment at 12:00 p.m.**