

MEMORANDUM

To: Oregon Global Warming Commission

From: Cathy Macdonald, OGWC Chair
Alan Zelenka, Assistant Director for P&I
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Date: September 22, 2022

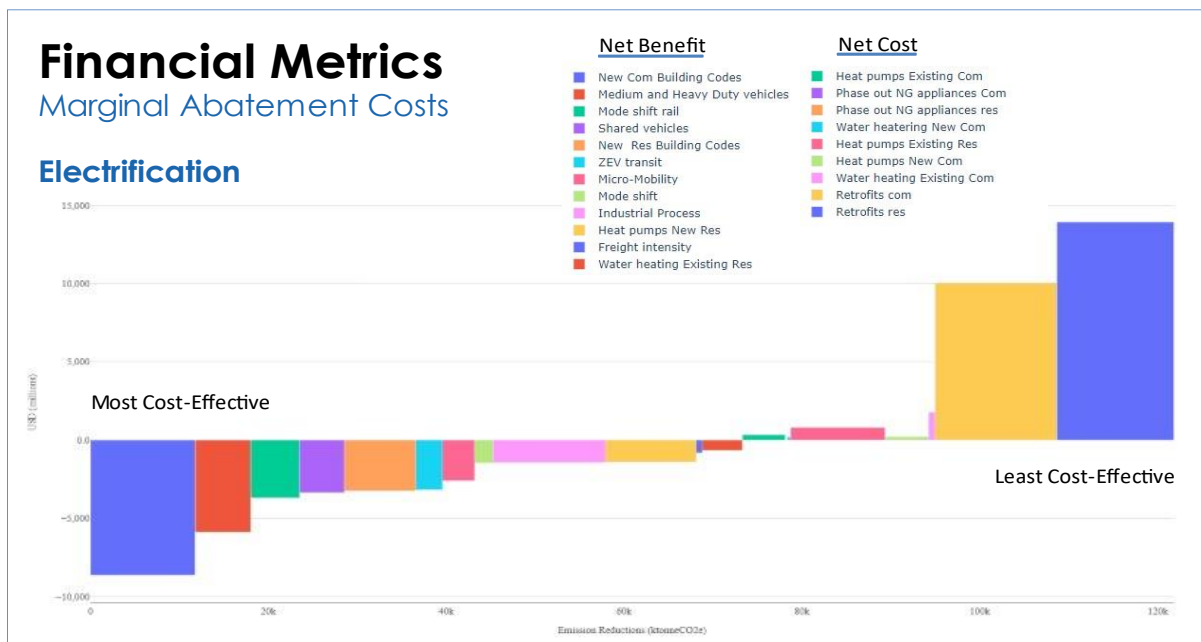
Re: TIGHGER Co-Benefits Analysis

With the two scenarios developed (Electrification and Hybrid) and the Marginal Abatement Cost Curves (MAC Curves) created for each scenario, the next phase of the process is to incorporate the co-benefits into the TIGHGER analysis. This memo describes the process we will use to accomplish this part of the development of the Roadmap to 2035.

To facilitate this process, we would like you to do a short homework assignment in advance of the meeting. The assignment is to select the co-benefits and other evaluation criteria you think the Commission should use to score and rank the proposed actions we have identified in the two scenarios. We have provided a straw proposal that you can comment on. Alternatively, you are welcome to provide your own proposal. A template will be emailed and posted on the website to use for your homework assignment. Please send your homework in by end of day Thursday, September 29th so we can compile it before our meeting on October 7th. ODOE staff will compile all the ideas from the Commission and present them at the October meeting for discussion and finalization.

Background

With many climate action plans the analysis stops at the creation of the MAC Curve; where the MAC Curve essentially lays out the pathway to achieve the GHG emission reduction goal. The MAC Curve orders the set of actions based on their cost-effectiveness (\$/MTCO₂) from left to right. The graph below shows the MAC Curve for some of the needed actions to accelerate the GHG emission reduction goal from 2035 to 2030 for the Electrification scenario. There is a similar graph for the Hybrid scenario that was presented in the August 18th OGWC meeting.



For the Roadmap to 2035, the Commission decided to incorporate co-benefits (e.g., health impacts, job impacts, equity impacts, etc.) into the development of our implementation plan. In doing so, the purely economic order of implementation can be rearranged to reflect the importance of the co-benefits of an action.

Next Steps

Over the next few weeks, the Commission will work through a process to develop and apply co-benefits to the scenario actions (listed in the Appendix) identified in the TIGHGER analysis. At our meeting on October 7th, the Commission will discuss the selection and weight to assign to the co-benefits and other evaluation criteria we will use to score the actions.

After the Commission identifies the co-benefits and other evaluation criteria, defines them, and identifies the weight each criterion should get, ODOE staff will score the actions based on the weighted evaluation criteria, and rank the actions based on their scores.

The co-benefits could include:

- Social Equity
- Access to programs
- Energy Burden
- Jobs
- Health Impacts
- Quality of Life
- Resilience
- Environmental Impacts
- Social Cost of Carbon
- Energy Use Reduction
- Building Energy Cost Reduction
- Transportation Cost Reduction

We recommend that Commissioners identify a subset of the co-benefits (3-4) to be among our evaluation criteria. Using evaluation criteria to score the actions is about trying to compare and distinguish actions from one another, and it is not about assessing all the climate change impacts from an action. The objective is to differentiate the individual actions within the set of actions, so they can be ranked. Therefore, the focus should be on selecting evaluation criteria that can help us do that, and not on ones that do not. For instance, an evaluation criterion where its direct or indirect impacts are non-existent or de minimis, or roughly equal to all the other actions, should not be used.

In addition to the co-benefits we select, staff recommends the following three additional criteria be added to the overall evaluation criteria: 1) cost effectiveness (\$/MTCO₂), 2) the overall GHG emission reduction potential, and 3) the risk and uncertainty that a particular action will cost-effectively deliver the GHG emission reductions¹.

How we define each evaluation criterion is important. Evaluation criteria definitions can be straight forward or be multi-faceted. For example, cost-effectiveness is defined by only the metric \$/MTCO₂, while other criteria can combine several ideas. A “health” co-benefit can include not only the EPA-COBRA model dollar estimates of benefit but also increases to quality of life. An “equity” co-benefit could incorporate social equity, access to programs, and energy burden.

¹ Many factors can contribute to the risk and uncertainty of an action (e.g., economics, politics, logistics, availability and maturity of the resource or technology, ability to entice participants, experience with similar successful actions, etc.).

Once we have identified and define the evaluation criteria, we will assign weights to them. We will not assume all of the evaluation criteria carry the same weight. To differentiate the evaluation criteria, we will use a 100-point scale and allocate those points among the evaluate criteria. Applying these allocated weights to each action’s attributes will allow us to score each action with a score that reflects the value of an action’s particular attributes – including its co-benefits. Once scored we can then rank the actions creating a new order of priority for implementation.

Below is the straw proposal of co-benefits and other evaluation criteria with proposed definitions and weightings for your consideration. We tried to incorporate a number of the co-benefits and evaluation criteria previously mentioned in Commission discussions. For those that we did not include in the straw proposal, we thought they were already covered by the criteria proposed or we had concerns about the ability to score and differentiate using those criteria. We are of course happy to discuss all of the criteria in more detail and look forward to the upcoming conversation with the Commission.

For your homework assignment, please provide comments on the straw proposal and/or a new proposal for consideration. As described above please send us your homework no later than the end of day Thursday, September 29th.

Straw Proposal

Evaluation Criteria	Definition	Weight
Cost-Effectiveness	<ul style="list-style-type: none"> Relative net cost/benefit compared to the other actions, “bang for your buck” (\$/MTCO2 from the MAC Curve analysis) 	25
GHG Emission Reduction Amount	<ul style="list-style-type: none"> Relative amount of GHG emission reduced compared to the other actions (cumulative MTCO2 reduced) 	20
Risk & Uncertainty	<ul style="list-style-type: none"> How likely is the cost-effectiveness and GHG emission reductions from the action likely to actually materialize (confidence in the probability: low/medium/high) 	10
Health Co-Benefit	<ul style="list-style-type: none"> Health benefits that result from reduction in air pollutants; specific health savings accrue from reduced: mortality, heart attacks, hospital admissions, emergency room visits, and work loss (cumulative estimated dollar amount from the EPA-COBRA analysis) Quality of Life increases (physical activity, comfort, noise reduction) 	15
Jobs and Economic Prosperity Co-Benefit	<ul style="list-style-type: none"> Number of cumulative person job years estimated to be created over time as a result of implementing the action Decrease in household or business building energy cost (from the reduction in energy use) Decrease in household or business transportation costs 	15
Equity Co-Benefit	<ul style="list-style-type: none"> Relative level at which the action can serve historically and currently underserved populations and communities Relative level at which the action will help alleviate energy burden (reducing the number of Oregonians paying more than 6% of their income on energy) 	15
TOTAL =		100

Appendix: List of Actions to be Evaluated

As we discussed at the August 18th OGWC meeting, there are a number of actions that are common to both scenarios (Electrification and Hybrid) and are listed below.

- Residential and Commercial energy code reduction of 60% by 2030
- Efficient heat pumps and water heaters in 100% of new homes and businesses by 2025
- Retrofit 95% of existing buildings reducing energy use by 50% by 2040
- Existing buildings 100% heat pumps and water heaters by 2043
- 50% hot water heat pumps in commercial buildings by 2043
- Non-CPP Industrial load energy reduction of 50% by 2050
- 25% reduced residential floorspace per building by 2035
- 25% shift in urban areas to higher density residential dwelling types
- 100% of new sales EVs by 2035
- 100% of new buses are EVs by 2035
- Mode shift 10% from MD to LD in urban counties by 2035
- 50% of off-road vehicle sales are EVs by 2035
- 10% micro-mobility share by 2035
- 10% mode shift in urban areas to passenger rail
- Carshare increases by 2035
- Congestion pricing in urban areas resulting in 10% mode shift to transit by 2035
- Water system 20% increase in efficiency by 2035
- Recycling Modernization Act
- Food Waste Program 50% diversion by 2030
- Landfill Program

There are also actions that are unique to the two scenarios. They are listed below.

Electrification Only Actions

- 100% electric new non-heating equipment sales for all buildings by 2035
- Solar on new buildings (4 TWh) by 2035
- Rooftop solar (16.3 TWh) by 2035
- 25% of homes with energy storage by 2035
- 100% of diesel backup power replaced with electric battery storage by 2035
- 70% industrial electrification by 2050

Hybrid Only Actions

- 70% Green hydrogen in industry by 2050
- Use full potential of available RNG (47.5 TBtus) by 2050
- 15% hydrogen injection into pipeline by 2035
- 5% of homes with fuel cells by 2030
- 5% of fuel share from Pyrolysis of biomass by 2035