From: Gary Shaff

RE: CEAP implementation / 2025 work program

A report entitled The 2024 state of the climate report: Perilous times on planet Earth concludes:

"Despite six IPCC reports, 28 COP meetings, hundreds of other reports, and tens of thousands of scientific papers, the world has made only very minor headway on climate change, in part because of stiff resistance from those benefiting financially from the current fossil-fuel based system. We are currently going in the wrong direction, and our increasing fossil fuel consumption and rising greenhouse gas emissions are driving us toward a climate catastrophe. We fear the danger of climate breakdown. The evidence we observe is both alarming and undeniable, but it is this very shock that drives us to action. We recognize the profound urgency of addressing this global challenge, especially the horrific outlook for the world's poor. We feel the courage and determination to seek transformative science-based solutions across all aspects of society (table S4). Our goal is to provide clear, evidence-based insights that inspire informed and bold responses from citizens to researchers and world leaders."

In that light, I would suggest that CEPAC propose to the Council that they implement the city's Climate and Energy Action Plan by:

1) converting city owned fossil fuel heated buildings to heat pump heated buildings,

2) buying only electric or battery powered vehicles and equipment (except where impractical),

3) building-out an "all ages and abilities" bicycle network and the city's pedestrian network by 2030,

4) modifying the zoning in downtown, including lands north to A Street, to allow taller buildings and high density housing,

5) subsidizing the construction of high density housing using grants and incentives (see items 8 and 10, below) in the area described in #4, above,

6) implementing the low-interest energy efficiency loan program,

7) advocating that Ashland residents transition to a plant based diet,

8) implementing parking fees in the area described in #4, above,

9) phasing-out, by no later than 2030, the use of small gas-powered lawn and garden equipment throughout the city, and

10) dedicating the city's Community Development Block Grant (app. $150,000/year) to the construction of low income and work force housing within the area described in #4, above.

The City Council has the authority to do all of the above. The recommendation should be forwarded to the Council in January and funding, for the above, reflected in the city's upcoming budget and capital improvement program.

We, the CEPAC, must work with the Council to accelerate the implementation of the CEAP.

Gary

Overview of who does what in Climate, Energy & Conservation:

Ashland Offerings: Natural Gas, Transportation, Electricity/Energy Efficiency, Programmatic, Waste, Other Heating Fuels, Refrigerant, Small Engines, Tertiary, City As Leader Mitigation

Current Offerings:

Dan - Residential:

1. Heat Pumps (can also benefit other heating fuels replacement)
    a. Forced Air
    b. Ductless (aka mini-split)
2. Home Energy Review
3. Duct Sealing
4. Weatherization
    a. Windows
    b. Insulation
5. Washer/Dryer
6. Heat Pump Water Heater

Larry – Commercial & Solar:

7. Lighting
8. Solar (residential & commercial)
    a. Incentive
    b. Net Metering (also virtual net metering)
9. Heating & Cooling (can also benefit other heating fuels replacement)
    a. Ductless
    b. Forced Aire
    c. Variable Refrigerant System
    d. Packaged Terminal Heat Pump (with refrigerant recapture requirement)
10. Heat Pump Water Heater
11. Refrigeration
12. Building Shell

Chad – Climate:

13. Electric Vehicle
14. EV Chargers
    a. Free Public
    b. Commercial Incentive
15. E bikes
    a. Regular
    b. Cargo
16. Induction Cooktop (residential & commercial)
17. EV Carshare
18. Home Energy Score program*
19. Energy Retrofit Ashland (on-bill financing)* (& RESP 2.0 and 3.0)
20. Committee Liaison
21. Climate Planning and Reporting

22. Clean Fuels Reporting
23. Website
24. Grant Research
25. General Outreach (presentations, press releases, newsletters)

Future Ideas

26. Incentives review:
    a. Increase business incentives?
    b. Increase Heat Pump Incentives?
27. CEAP
    a. Waste as part of inventory
    b. City – buildings and fleet plan/chargers
28. Solid Waste Reduction/composting options
29. V2H and V2G charging/storage
30. PAYs program(s)
    a. Heat Pump Water Heaters
    b. PTHP
31. Resiliency on bill financing
32. Community Solar
33. EV Charging Plan
34. Refrigerants = outreach and education
35. Outreach and Education
36. Air Travel
37. Home Chargers incentive
38. 2 EV's per account possible?
39. Apartment Chargers (120 v, nearby street, incentive, co-ownership/operation)
40. Small Engine – incentive..?
41. Vehicle Miles Travel local study that is easy to replicate and measure?
42. Bus ridership numbers

2024 Climate & Energy Action Plan (CEAP) Report

Introduction

Ashland's Climate and Energy Action Plan (CEAP) is the guiding document for our climate work and has two main goals: reducing greenhouse gases (GHGs) and creating resiliency to climate impacts. This report will focus on the former – how we should reduce our GHGs. This document is part CEAP analysis, part update on CEAP progress, part implementation plan, and part climate action budgeting tool.

The CEAP's GHG inventory is very comprehensive. Probably to comprehensive to use for setting actionable and attainable goals. This report will try to make the Community portion of the CEAP GHG inventory more accessible and create better alignment with how other communities are now focusing their efforts. Most importantly it will help us focus on what is attainable at the local level for Ashland. The good news is that our current ongoing work aligns very well with this reinvigoration of the CEAP.

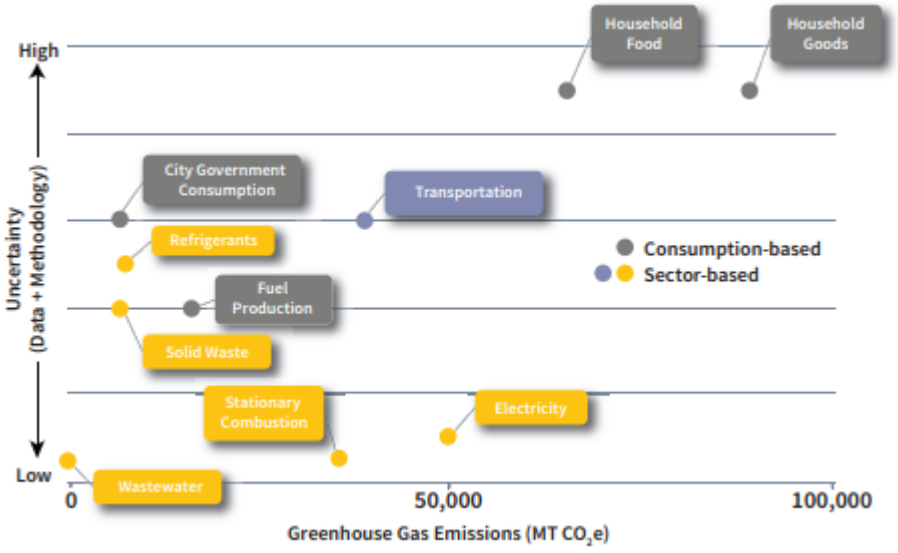
Executive Summary:

We have a good plan in the CEAP; however, it is not perfect, and it doesn't have to be. The plan needs to be reviewed and reimagined as we work towards the goal of reducing GHG emissions to as close to zero and possible. Previous CEAP reports align with what I lay out below, but this report can be thought of as more of an update to align it with the data and the current staff focus, which are already in alignment. The majority of the CEAP is still very relevant, however it does not allow for locally achievable and measurable goals and a few changes can help correct this,

These changes include:

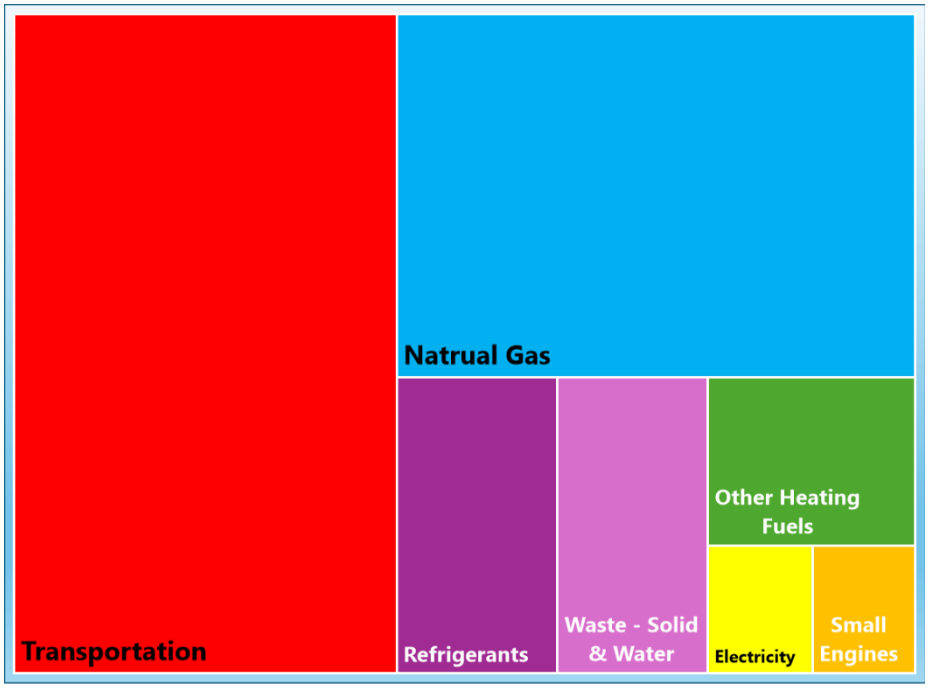
- Discarding the annual 8% average GHG reduction goal for the Ashland Community (but not the overarching goal of reducing GHG's citywide).
- Removing Consumption Emissions, based on extrapolated national data, from the local inventory.
- Changing the Electricity Emissions factor to represent local usage due to the unique nature of Ashland's electric supply.
- Move to a new metric for measuring Transportation Emissions reductions that is locally measurable.
- Add Small Engines Emission as a new metric.

Making these changes helps filter our focus into 3 primary focus areas and 4 secondary focus areas, which closely resemble the sector-based emissions on page 21 of the CEAP.



Primary Focus Area:

- The three primary focus areas have the greatest local impact which we can make progress on and include Natural Gas, Transportation and Electricity. They also have or could have locally measurable metrics against which to benchmark progress.
- They are the only areas which will be measured in an inventory manner at this point and align with where most city programs are focused.
- Of the three primary areas of focus, Natural Gas and Transportation Emissions reflect our greatest areas to reduce GHG emissions, both of which have pathways forward.

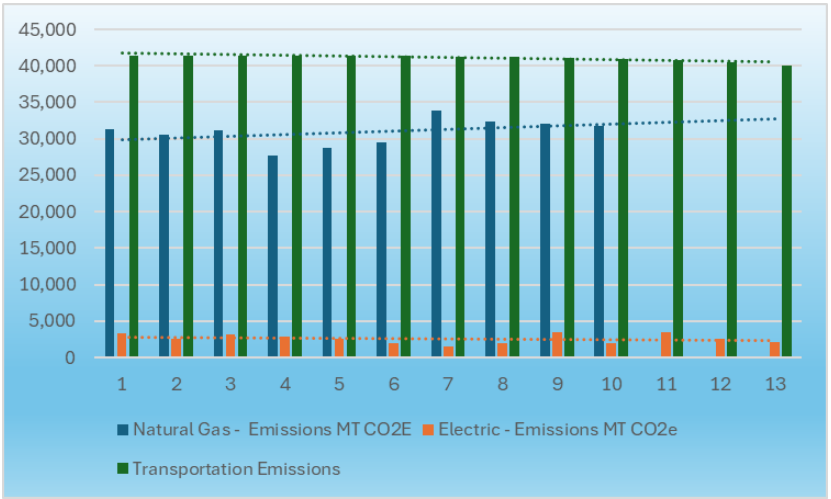


Other Focus Areas:

- The secondary focus areas include waste (both solid and liquid), refrigerants, other heating fuels (primarily heating oil and propane), and small engines. These areas all represent emissions that we can work on impacting locally, but most do not lend themselves to measurement useful in an inventory (waste being the area most likely to be included in the inventory next due to the likelihood of locally measurable data – more work must be done on this front).
- Tertiary focus areas are difficult to both measure and impact locally. They rely on extrapolated data, are difficult to impact with city actions because they are largely personal choices.
- Outreach and education are useful tools for all focus areas and are the only tool for some areas, making it integral to all activities.
- City as a leader:
    - As noted above, this report focuses on the community measures because they are a much bigger portion of the citywide emissions pie.
    - A deeper dive into city data and an update is planned.

How are we doing:

- Natural Gas Emissions are possibly going up, but our most recent information is from 2020. Obtaining this information is critical to understand our progress



in reducing GHG's. We have successful fuel switching incentives that align well with federal incentives. Additionally, we have a unique loan program that will launch in 2025 that should greatly help on this front as existing homes and businesses are the major source of natural gas emissions.

- There is progress being made on the transportation front, with Ashland being home to many early adopters of electric vehicles, and this trend should continue to accelerate.
- Electric emissions and consumption are trending downward, while local renewable energy production keeps making gains every year.

Conclusion

We know what we must do right now, reduce our fossil fuel emissions as quickly as possible and replace it with carbon free energy. The good news is these are the areas that we are focusing on. There is a path to decarbonize our homes and businesses and there is positive trend in decarbonizing our transportation.

This report contains some benchmarks and projections that seem attainable. We need to work on the programs that we have, expand when we can and ensure that our work continues. We must reassess our plan and progress to account for new ideas, information and technology. If we hope to reach our goals faster ore expand our works, it will require a combination of additional funding and work force.

We are making progress, yet we have a long way to go!

How is Ashland doing in reaching its climate goals?

A recurring experience in the world of climate work is the existence of seemingly opposite statements that are both true. Working in this paradoxical field requires objective analysis of the situation to assess, plan and implement projects.

Our first paradox pits what Ashland is doing versus what citizens think it should be doing. Ashland is viewed as a leader in climate and energy conservation work. It has one of the longest running solar energy and energy efficiency programs, active fuel switching incentives, a generous e-bike incentive program, and the highest paying electric vehicle incentive in the state. When accounting for the size of our city and number of staff it is truly remarkable what we are accomplishing!

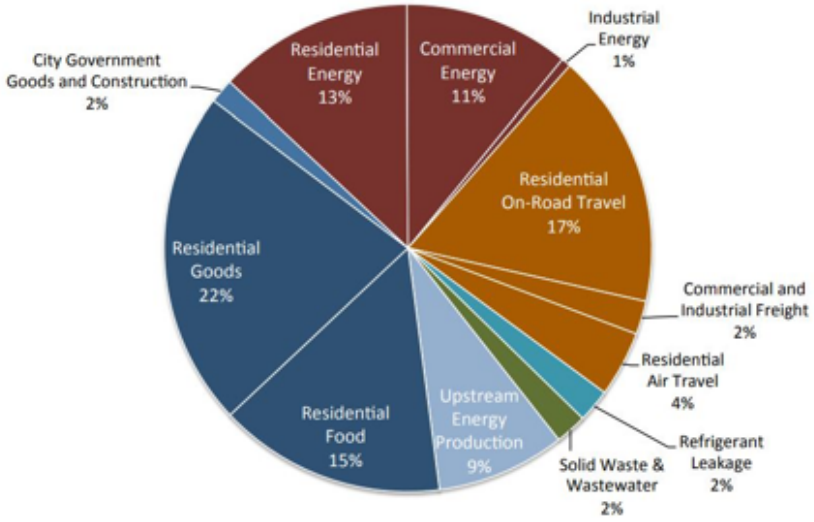
On the other hand, there are concerns that we are not doing enough and that we are falling behind in meeting our Climate and Energy Action Plan (CEAP) goals. These concerns are also likely valid, at least in some key areas. I see both foregoing statements as true, so how do we reconcile this? I think by better understanding our situation, and to do so requires a review of the CEAP.

The CEAP

Choices

I reviewed the CEAP to try and answer the question of how Ashland is doing. Can we measure our progress to determine if Ashland is genuinely on track to meet its goals? My first issue was in trying to utilize the numbers in the CEAP which, many of the graphs have combined information for simplicity's sake. However, when you consolidate information, you are making choices in what data to combine.

Figure 1 2015 GHG Inventory used in the CEAP



The 2015 greenhouse gas (GHG) inventory used in the CEAP on pages 8 and 20 is the starting point for measuring our climate progress (8% reductions per year). The pie chart in figure 1 is the grouping of 55 different inventory measurements.[1] Many of which are done using extrapolated national data.

This pie chart is described on page 23 and helps us understand the choices made. The energy slices of pie combine both electric usage and stationary combustion (natural gas, propane and fuel oil). In other words, combining fossil fuel energy and mostly low emission electricity (more on this later).

[1] https://ashlandor.opengov.com/data/#/27434/query=076C90BDE0EC16B9DB3C85C8644D41F1&embed=n

Fortunately, the original data is available to better understand how each piece of the pie is created. This allows for the reconstruction of a pie chart to help direct our work.[2] Additionally, the data contains other information such as what "scope" the emissions are. Scope matters in that it helps you understand what portions of your GHG inventory you impact can most.[3]

As noted, we can use the data to make changes and the CEAP strategies are sound and most of the document still makes perfect sense. We just need to adjust what numbers we are looking at to help us track and make progress. I dug into the underlying numbers of the CEAP, and to understand how we are doing we need to make a few changes to have locally useful information to answer this question.

What needs to change?

8%/year

After carefully reading through the CEAP and its appendices it became clear that the goal for the Ashland Community to reduce community greenhouse gas emissions by 8% on average every year to 2050 is impossible as presented. This is largely due to emissions and strategies discussed below that we have little control over. If we were to maintain the 8% then it should only be for those emissions that we can locally impact, regularly measure and track progress against. However, it would be better to simply remove the 8% progress language and instead focus on different benchmarks that will help us reach our goal of reducing our emissions to as close to zero as possible as soon as possible.

Additionally, we must acknowledge that we should not expect 8% on average every year until 2050 as it takes time for new technology to become widely implemented. Our task is like pushing an object. We begin to push and create momentum towards the goal, and, over time, we will move more quickly towards our goal. An example of what progress will look like is the transportation graphs below which demonstrates accelerated progress as we move forward.

Consumption Based Emissions

The blue sections of the pie above labeled 'Residential Foods' and 'Residential Goods' represent emissions associated with the manufacture and transport of items that come from outside Ashland. Similarly, the 'Upstream Energy Production' is related to the extraction and production of fuel products. Together these represent around 47% of the pie chart that we have limited ability to directly influence with local city actions and an inability to measure change at the local level. Again, the CEAP strategies on these areas are sound and can be pursued, however, to try and measure local GHG reductions on these would be difficult at best. ***Consumption emissions should be omitted when trying to measure progress locally though.***

Electricity Emissions Factor

The CEAP chose to use carbon intensity of the Northwest Power Pool (NWPP) because the GHG inventory protocols require our electricity be reported this way if we do not also purchase the separately sold environmental benefits of the energy. Therefore, in the CEAP our electric emissions are calculated at

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[2] https://ashlandor.opengov.com/data/#/27434/query=A503AC86D9FE446A366DDC001771C40E&embed=n

[3] https://www.epa.gov/climateleadership/scopes-1-2-and-3-emissions-inventorying-and-guidance Generally speaking, Scope 1 emissions occur locally and are most easily impacted by local decisions (burning natural gas or fueling your car), Scope 2 occur offsite but be impacted by decisions (utility electric purchases), while Scope 3 emissions are largely outside of local control and difficult to measure locally (the emissions it took to manufacture and deliver your refrigerator).

0.288 Metric Tons of co2e (Carbon Dioxide Equivalent)/MWh, compared to the emissions of the energy used by the electricity of 0.039 MT co2e/MWh (nearly 7.5 times cleaner if measured this way).[4]

Figure A3: Comparison of Utility-Specific and Regional Grid emissions factors.

Type of Emissions Factors (MT CO2e / MWh)	2011	2012	2013	2014	2015
Ashland Utility	0.080	0.039	0.044	0.039	0.039*
Regional Grid (NWPP)	0.373	0.304	0.304*	0.304*	0.304*
NWWP Grid (REC adjusted)	0.355	0.288	0.288*	0.288*	0.288*

*Indicates previous year's factor used as proxy. Most recent EPA eGRID factor for NWPP is 2012.
Likewise 2015 data from BPA for Ashland's inventory is not available.

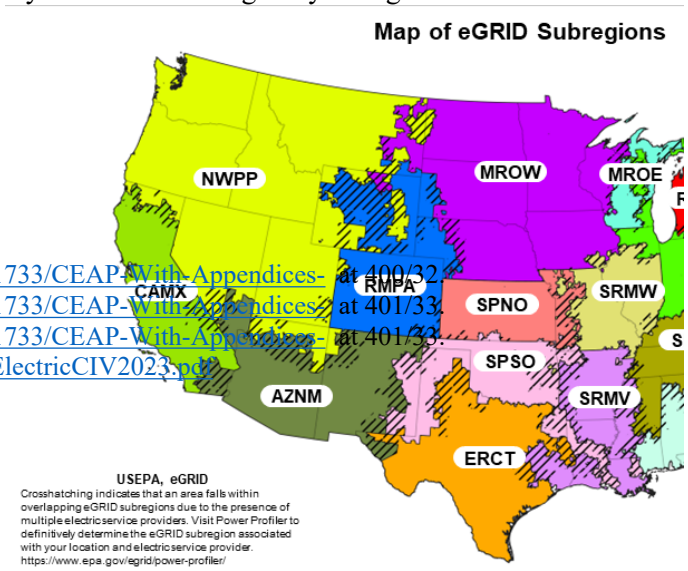
The authors of the GHG inventory (Appendix D of the CEAP) recognized this paradox of buying clean energy and not getting to claim the benefits and advised "…it is not recommended that Ashland continue to conduct this inventory in the future."[5]

This leads to another change from how the CEAP is written now to what should be included. The GHG inventory states this succinctly, while discussing electric supply, the report states that:

> *Focusing on supply is not as appropriate or useful for small, publicly owned utilities served by BPA. For these utilities, it could be argued that the* ***focus should be on energy efficiency and conservation, and cost effective, local renewable generation.*** *In other words - efforts to reduce peak and overall demand by Ashland for grid generated electricity. By reducing demand for grid power, low-carbon BPA electricity can be redirected back to the regional grid to reduce the need for generation from fossil fuels; thereby lowering emissions from the regional electricity grid.* [6] (emphasis added)

Not only does the GHG inventory not recommend tracking this data, but state agencies recognize the BPA power we purchase in calculating or local electric emissions. The Oregon Department of Environmental Quality's (DEQ) Clean Fuels Program calculates Ashland's electric carbon intensity with a much lower number than the NWPP number.[7]

If we use the NWPP carbon intensity, as done so in the CEAP, then we have an impossible task. To reduce our GHG's requires that the entire NWPP region is also reducing its emissions on the same timeline. If the rest of the NWPP region lags in reducing carbon intensity, then so does Ashland's progress. Changing how we measure our electricity GHG emissions greatly changes the emissions associated with electricity and the areas that we should focus our efforts on. Therefore, ***for the purposes of tracking electric consumption I suggest we use the low carbon value of the direct electricity purchased due to the unique nature of BPA***



[4] https://ashlandoregon.gov/DocumentCenter/View/1733/CEAP-With-Appendices- at 400/32
[5] https://ashlandoregon.gov/DocumentCenter/View/1733/CEAP-With-Appendices- at 401/33
[6] https://ashlandoregon.gov/DocumentCenter/View/1733/CEAP-With-Appendices- at 401/33.
[7] https://www.oregon.gov/deq/ghgp/Documents/cfpElectricCIV2023.pdf

energy purchase agreements. This is supported by the DEQ use of a lower carbon number.

While tracking electric energy usage may not show much change in emissions there is value in watching local usage and comparing it to local production. We will want to observe how much our electric consumption goes up as electrification of buildings and transportation increases. Also, it will be beneficial to know how much energy consumption we are offsetting with local production. Finally, we need to make it easy and affordable to electrify your home.

Separating Energy Types

Energy consumption in the CEAP pie chart combines both stationary combustion fuels (natural gas, propane and fuel oil) along with electricity. These are different sources of energy and should be disconnected out and tracked separately. Furthermore, natural gas represents the primary stationary combustion fuel (over 91 %) in our GHG inventory and is also a measurable (or should be measurable) emissions source.[8] The usage of propane and fuel oil is limited in scope and is on its way to obsolescence in most applications. Therefore, natural gas should be a primary focus of measuring emissions and tracking progress for stationary combustion fuels and electricity will be the tracked separately.

Transportation

Finally, the last major change identified is transportation emissions. My review identified the need to change how we track these emissions so that we can locally track our reductions and have benchmarks towards our goals.

In the CEAP Transportation GHG numbers are based on statewide vehicle miles traveled (VMTs) which are then apportioned based on a per capita basis to Ashland. This data is problematic in a couple of ways. First, it is generalized and doesn't account for local transportation choices. ***Everyone in Ashland could walk, bike or take the bus for a year and our VMT numbers would show minimal change because it is extrapolated statewide data.*** Second, the only way to meet our goals if measuring emissions by VMT is to reduce VMT's. This methodology ***does not account for emissions reductions by using a partial hybrid electric vehicle (PHEV) or battery electric vehicle (BEV)***, which is where we are much more likely to make emission reduction changes. Both my predecessor and the GHG inventory acknowledge that emissions reduction from PHEV and BEV could be included with better data.

Shifting to data based on local vehicle registrations is where we should focus. This would allow for local measurement of emissions reductions based on the use of PHEVs and BEVs. VMT data could still be useful to discern statewide trends when necessary and reducing VMT should still be a local goal, but it doesn't provide an annually measurable local result.

How Do We Focus Our Climate Work

Making the above changes will help to create clearer data to use for stationary combustion, transportation and electricity. A major focus on our climate work is decarbonization as carbon-based pollution is the primary driver of climate change. As such, focusing on the combustion of fossil fuels in both stationery and transportation settings is the clear focus. These two areas of focus we can impact and measure locally. We should be putting a proportionate amount of time, money and effort into getting as close to zero as

[8] Until 2020 Avista, our local franchise provider of natural gas, was providing both total therms consumed in the city and the number of meters. This was further broken down by residential and commercial uses. Avista, has never been explicitly obligated to share this information, and has chosen to not share this information any longer, even with repeated requests for this data which is critical in measuring our climate progress.

possible on these two fronts. We should also consider and focus on other areas when we can have a quick and measurable impact, or an opportunity warrants our focus.

Primary Focus

This leaves us with three areas to primarily focus on –natural gas emissions, transportation emissions and electric emissions. ***Natural gas and transportation reflect our greatest areas to reduce GHG emissions through decarbonization.*** While conserving local electricity and increasing local production will be essential as demand increases. These areas demonstrate where progress can be made and measured in reducing emissions, increasing conservation, increasing local clean energy, reducing costs and decarbonizing our energy source.

	Rank	Focus	Type of GHG	Scope (1, 2, 3)	Sector or Consumption	GHG emissions in Metric Tons of CO2E	% of Primary	% of Primary & Secondary
Community	1	Primary	Natrual Gas	1	Sector	**29,330.10**	**41.49**	**31.71**
	2	Primary	Transportation*	1& 3	Sector	**39,277.40**	**55.57**	**42.47**
	3	Primary	Electricity**	2	Sector	**2,079.00**	**2.94**	**2.25**
	4	Secondary	Waste - Solid & Water***	3	Sector	6,923.50		**7.49**
	5	Secondary	Refrigerants	1	Sector	7,389.50		**7.99**
	6	Secondary	Other heating fuels	1	Sector	5,445.90		**5.89**
	7	Secondary	Small Engines****	1	Sector	2,035.17		**2.20**
	8	Tertiary	Air Travel	3	Consumption	14,350.00		
	9	Tertiary	Household Foods & Goods	3	Consumption	173,028.70		
City			City as Leader*****	All	Both			
			Primary			**70,686.50**		
			Primary & Secondary			92,480.57		
			Primary & Secondary & Tertiary			250,529.17		

If not noted elsewhere, numbers are taking from the GHG inventory from 2015

*Calculated using estmated number of drivers, estimated miles and reductions from PHEV and BEV vehicles

**Calculated using Oregon Dept. of Environmental Quality Direct Emission numbers

***Methane counting as 28x Global Warming Potential over 100 years - If multiplied by 80 for the shorter time span = 19,776 mt/ co2e.

****Data extrapolated from state estimates on a per capita basis

*****City numbers incorporated in other numbers - will be a separate analysis. Originally estiamated as 10,716 mt of CO2Ein the CEAP.

Non-focus categories: Off road vehicles, upstream power and transportation, NWPP energy difference (42,000 alone) = 72,856

No upstream numbers for stationary combustion (methane leakage for NG) included in the original GHG inventory

Secondary Focus

There are areas of secondary focus, that I do not include in the emission reductions calculations at this point. They are important to work on, however there are difficulties or limiting factors with each of these

that demote them to the secondary focus status. This focus area includes waste from both solid and wastewater sources, refrigerant leakage, other stationary heating fuels, and small engine emissions.[9] The leading candidate of this group for inclusion into the annually measured metrics would be the waste category. It has been included in other cities inventories on their relatively short GHG inventory lists and has data that can be measured.[10]

Tertiary Focus

Finally, there are important areas that are difficult to change because they largely depend on personal choices and upstream actions that are beyond our control. These tertiary focus elements include air travel by Ashland residents and consumption behaviors. These areas should be a focus of reductions because the numbers are so large. However, they should not be included in our GHG reduction numbers because of the lack of local impact and due to the use of extrapolated national data. We can focus on these areas with outreach and education mechanisms, hopefully leading to voluntary reductions, lifestyle changes, upstream changes and offsets. There is a recently released study by Oregon Department Environmental Quality recently created a report on Consumption Based GHG emissions and the need to work on this complex and difficult area. State leadership is welcome on this front.[11]

Special Focus

An area of special focus is the **City of Ashland leading by example**. While a small percentage of the original CEAP, it is an area where internal policy and choices are within our control and therefore many areas can be targeted including consumption behaviors. A supplemental report on City operations will be forthcoming but has been deemphasized at time with other more pressing programmatic matters at hand.

Not Included

The last area that I want to mention is that of upstream impacts. While hard for local changes to impact these items directly (such as electricity line loss), our downstream actions will resonate upstream as implicit benefits. The less electricity used, the less line loss there is. The less natural gas consumed, the reduction on the global scale of GHG emissions is more than doubled due to the upstream impacts of methane leakage (more on this below). ***Upstream impacts matter and are best addressed by focusing on the local impacts that create the upstream demand. This local focus can have both significant local and upstream impacts.***

Climate Progress

There is progress being made; however, it does not reflect the 8% change the CEAP calls for. As noted above, this may not be the best way to measure progress and instead we need to create a pathway forward and use projections to determine if more effort will be needed to meet our goals. How fast we can move forward will depend on funding, staffing, technological advancements and public input.

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[9] Small engine emissions were not included in the CEAP but have a sizeable impact and can be readily mitigated in some situations. Meanwhile the waste category is often in the form of methane which presents a different calculus in combating climate change.

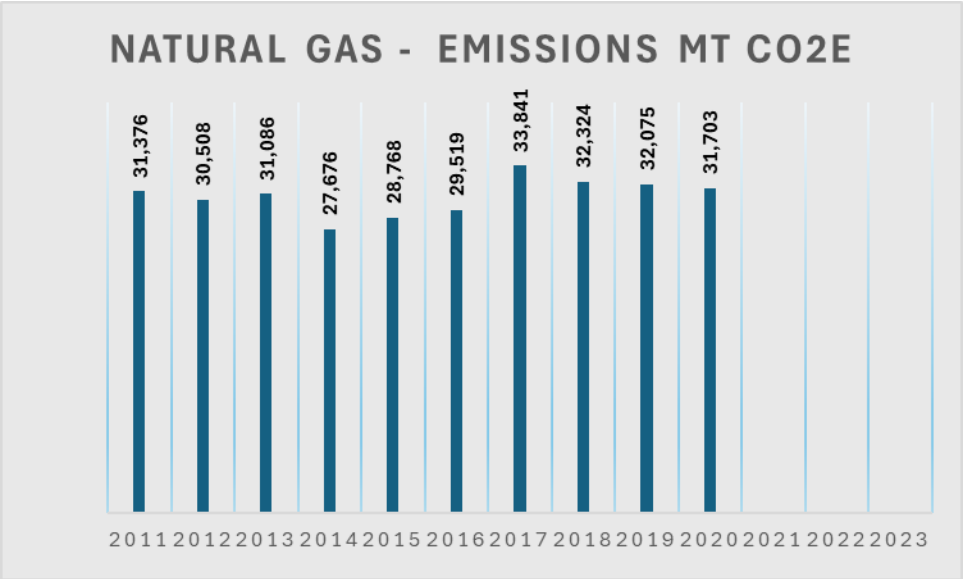
[10] See page 10 here: https://www.losaltoshills.ca.gov/DocumentCenter/View/1518/LAH-Green-House-Gas-Emission-Inventory?bidId=; see also https://ftcollinscap.clearpointstrategy.com/#:~:text=Welcome%20to%20the%20Fort%20Collins%20Climate%20Dashboard,%20a%20snapshot%20of

[11] https://www.oregon.gov/deq/mm/Documents/mm-Reporton2021CBEI.pdf#:~:text=%E2%80%A2%20In%201990,%20Oregon%E2%80%99s%20consumption-based%20emissions%20were%20only%20about%205

Regarding our primary focus areas, we are making inroads on transportation goals, and it seems likely we will be able to meet or get close to our 2050 goals. Natural gas consumption, the single largest source of stationary combustion fuel, is both an area of concern and difficult to measure. Our electric consumption and local production are both areas to be proud of as we have a low carbon source of energy and local production has shown incredible growth.

In other areas, there are possibilities to address small engine and waste emissions in the coming years. Both areas are less well studied and have smaller impacts but are part of the solution. Other heating fuels is an area that will slowly get replaced as equipment becomes obsolete, with goal being to help electrify these buildings rather than a conversion to natural gas to help reduce carbon emissions.

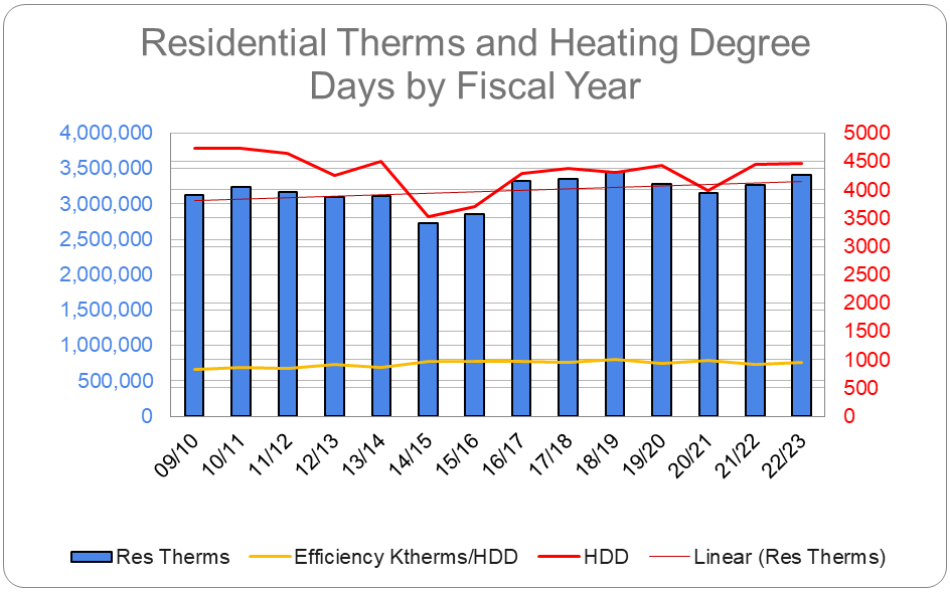
Natural Gas



We don't know exactly what our citywide consumption of natural gas is because these numbers have not been shared for the past three plus years. As noted earlier, Avista has decided not to voluntarily share this information even though it has been requested multiple times. Previously, Avista, our natural gas franchise provider, had shared the total therms of natural gas used and total meters installed. Each data point was further broken down by commercial and residential use. This data was helpful to determine trends regarding usage and carbon emissions related to our GHG inventory. The last data was provided in 2020; in the future this data should be required as part of any agreement so that we can better track natural gas (carbon) reductions.

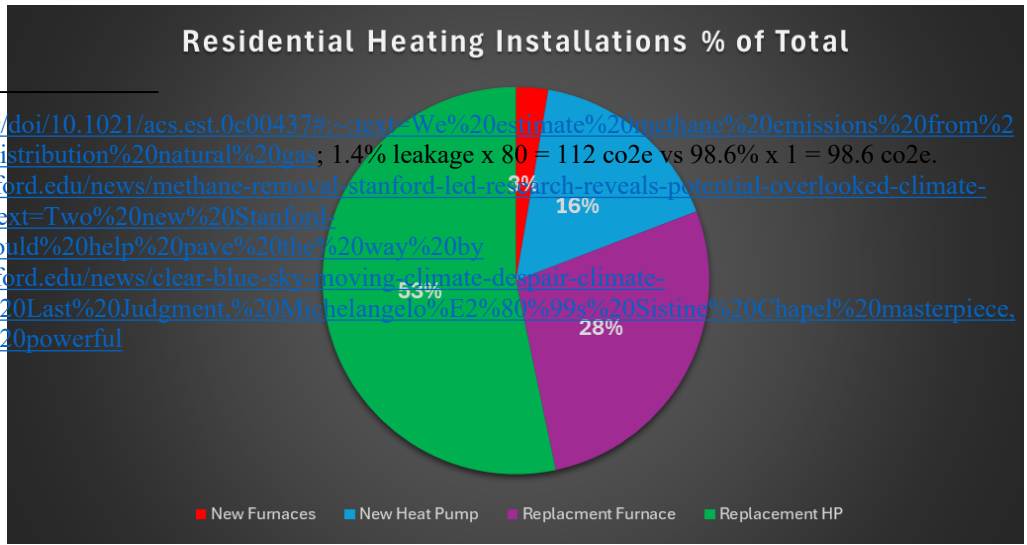
The closest information I have found is some data modeling based on heating degree days, Avista rates and franchise fee payments. This modeled data, shows a trendline with a slow increase in natural gas usage. This is exactly what we don't want to see as we are trying to reduce carbon emissions. ***We are very likely going the wrong direction on this key emission since the implementation of the CEAP.***

While discussing natural gas it is important to remember a couple points, it is primarily composed of methane. In our original GHG inventory, the upstream impacts natural gas were not calculated. Even at the EPA's more modest estimations of leakage of methane at wellheads and through distribution, the emissions of leakage (calculated as methane for unburned natural gas) over the short term are greater than emission of all the burned natural gas (emitted as carbon emissions) due to the much higher global warming potential of methane.[12] We are not targeting upstream energy emissions, however if calculated, this would have further changed the pie graph in our original GHG inventory to focus on natural gas.



Related to this, is the incidental upstream benefits of reducing our carbon emissions from natural gas. There is a strong argument that focus should be placed more heavily on methane related emissions because methane is a short lived GHG which, if reduced quickly could yield benefits in helping mitigate short term warming.[13] Stanford professor Rob Jackson, states that restoring "the atmosphere to preindustrial levels for gasses like methane. Doing so would save half a degree Celsius of warming and could happen in our lifetimes."[14] Both of these points emphasize that ***decarbonizing our buildings from stationary fossil fuel combustion is a primary focus and the number one target overall.*** This fact is only further emphasized when you change the timing of measuring GHGs. If looked at a 20-year period of emissions (rather than a 100-year period), methane emissions have an even higher carbon dioxide equivalent (co2e, aka global warming potential). This presents another paradox of weighing long lasting carbon emissions against short lived, more potent methane emissions related to the production and distribution of natural gas. When considering these methane emissions, it can help tilt the scales of where to focus. Fortunately, in our situation, working on both the carbon emissions of burning natural gas and the upstream methane emissions are in alignment and further help us prioritize natural gas emissions as the primary target.

While this information



[12] https://pubs.acs.org/doi/10.1021/acs.est.0c00437#:~:text=We%20estimate%20methane%20emissions%20from%20U.S.%20local%20distribution%20natural%20gas; 1.4% leakage x 80 = 112 co2e vs 98.6% x 1 = 98.6 co2e.

[13] https://woods.stanford.edu/news/methane-removal-stanford-led-research-reveals-potential-overlooked-climate-change-solution#:~:text=Two%20new%20Stanford-led%20studies%20could%20help%20pave%20the%20way%20by

[14] https://woods.stanford.edu/news/clear-blue-sky-moving-climate-despair-climate-repair#:~:text=The%20Last%20Judgment,%20Michelangelo%E2%80%99s%20Sistine%20Chapel%20masterpiece,%20provides%20a%20powerful

might seem dire, remember that we are discussing long term trends and a quickly changing world in terms of technology and policy. My belief is that we are just now seeing the shift away from natural gas for thermal purposes. New technology and awareness are helping move people to electrification. Additionally, state policy aims to green our grid energy.[15] It is an exciting time, and we are seeing substantial movement in Ashland on this front. Nearly 70% of heating installations in Ashland are heat pumps over the past five plus years. This is progress and I expect the percent of heat pump installs to increase as awareness increases and new programs become available.

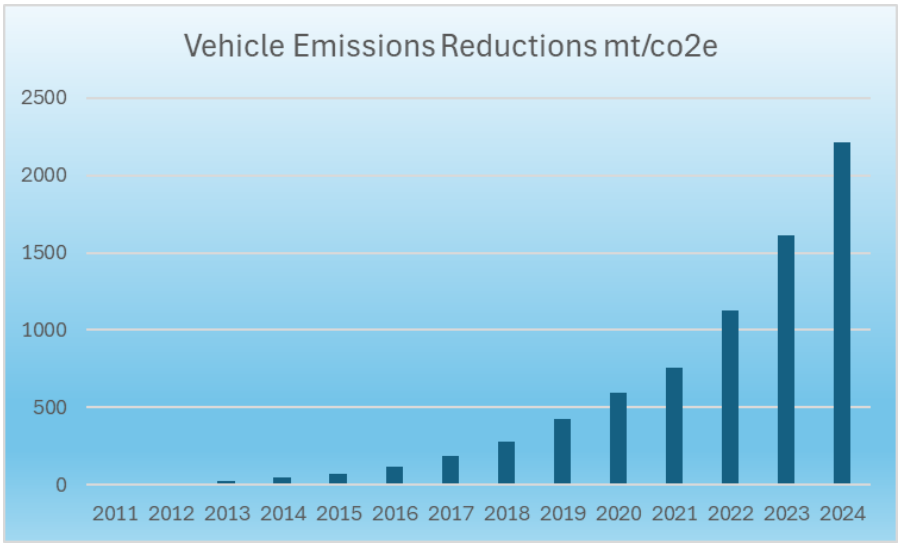
Ashland has been incentivizing residents to decarbonize their homes for years, however the federal government has recently began working on this trough the Inflation Reduction Act tax credits and state pass through incentives. Perhaps more exciting though is the cities soon to launch on-bill financing loans for energy efficiency measures. All this is to say that ***we have some great tools at our disposal to meet the goal of reducing an average of 1,200 mt co2e emission from natural gas combustion every year.***

We are not alone in this effort. There are state goals for reducing natural gas consumption across the state to help achieve statewide goals. Southern Oregon University also has ambitious goals that will help the entire city meets its goals.

We still need to continue making inroads to increase the percentage of residential heating installation to heat pumps. Additionally, adding and expanding opportunities for businesses to electrify will be essential.

Transportation

New Data

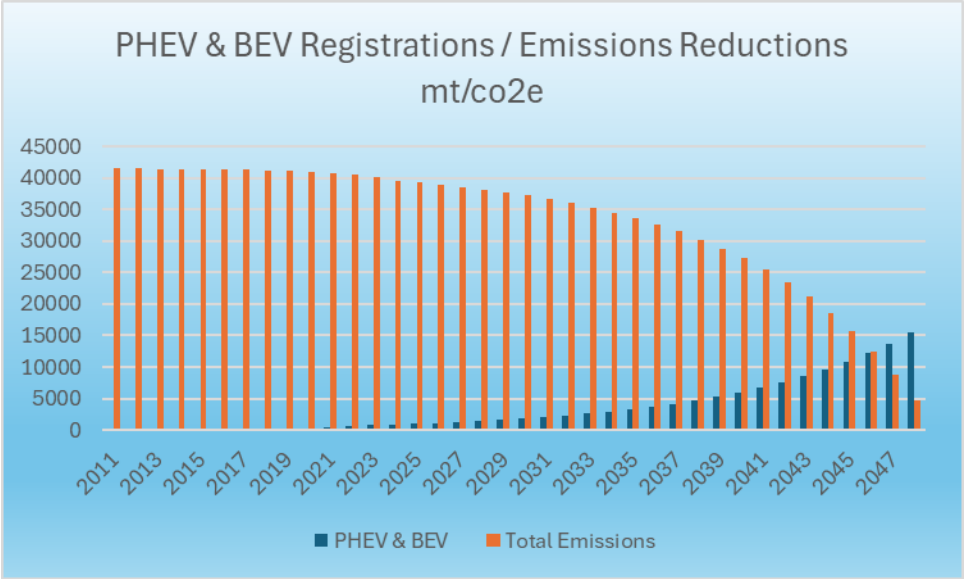


As introduced above, transportation GHG numbers are based on statewide vehicle miles traveled (VMTs) which are then apportioned based on per capita basis. Meaning VMTs do not account for local transportation choices and emissions reductions by using a partial hybrid electric vehicle (PHEV) or battery electric vehicle (BEV). ***Shifting to data based on local registration is where we can get better data to help us track progress and assess climate needs.***

The transportation numbers used below are uniquely created for this report. The data here was created with the best numbers available and could change in the future as better data becomes available. I have been in discussion with Oregon Department of Energy and the Oregon Department of Transportation about how to make localized numbers work better than VMT; there is shared interest in creating better local data.

[15] https://www.oregon.gov/deq/ghgp/Pages/Clean-Energy-Targets.aspx

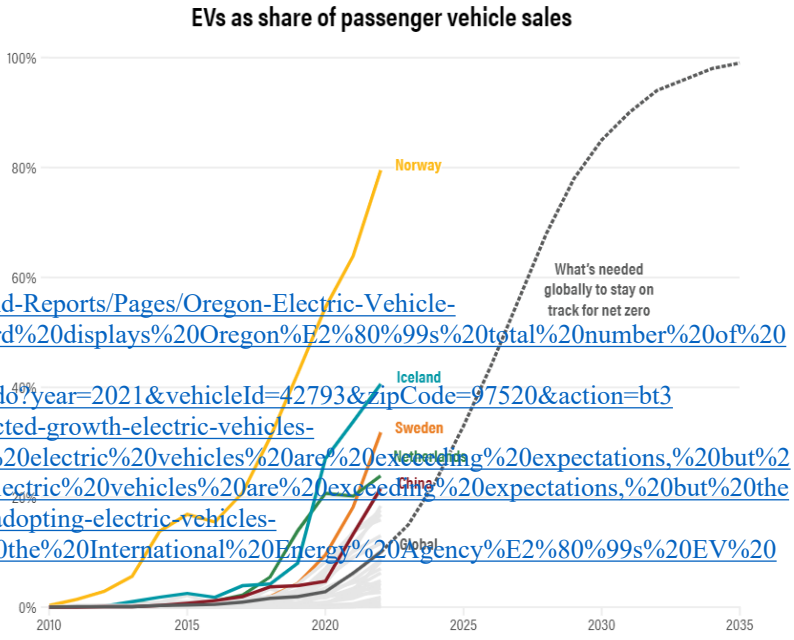
By using the available local data, we can demonstrate emission reductions from Ashland's residents adopting PHEV's and BEV's and project what we need to do to meet our goal and when we can meet it by.



The local data for electric vehicle adoption is taken from the Oregon EV Dashboard.[16] EV registration data is then compared to extrapolated local registration data and adjusted downward based on national data of registrations compared to licensed drivers. Using the relative registration numbers, you can account for tailpipe emission reductions using a common PHEV (a Rav4 Prime for this exercise) emissions numbers and zero for a BEV in comparison to an average internal combustion engine (ICE) vehicle tailpipe emission rate.[17] Then we reduce the emissions avoided from a scenario where all vehicles are internal combustion.

One thing to note about the registration and emissions chart is the shape of the curve. It takes a while to move downward and then it begins to turn sharply downward, and the shift happens dramatically. This isn't unique and aligns well with what is known as the s-curve that appears for "value-creating" technologies, including EVs.[18] The charts below show that EVs are on the precipice of an automotive revolution.[19] If you need further proof of how quickly things can change, look no further than Norway who went from 1% of new car sales being EV's to 80% in just 12 years.

This vehicle sales study correlates with the emission reductions portion of the chart and demonstrates how quickly change could happen in Ashland.



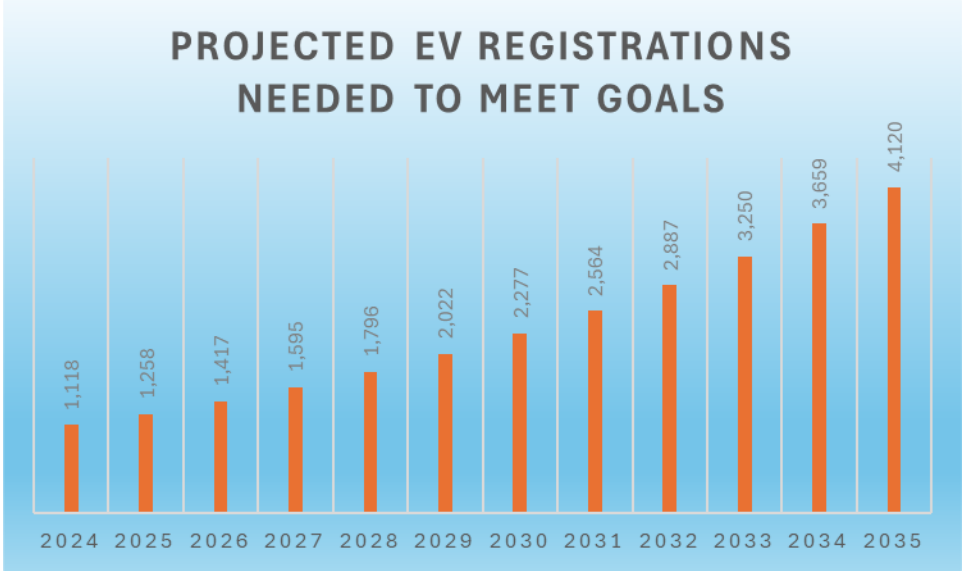
[16] https://www.oregon.gov/energy/Data-and-Reports/Pages/Oregon-Electric-Vehicle-Dashboard.aspx#:~:text=The%20dashboard%20displays%20Oregon%E2%80%99s%20total%20number%20of%20electric%20vehicles%20by

[17] https://www.fueleconomy.gov/feg/Find.do?year=2021&vehicleId=42793&zipCode=97520&action=bt3

[18] https://www.wri.org/insights/what-projected-growth-electric-vehicles-adoption#:~:text=Global%20sales%20of%20electric%20vehicles%20are%20exceeding%20expectations,%20but%20the#:~:text=Global%20sales%20of%20electric%20vehicles%20are%20exceeding%20expectations,%20but%20the

[19] https://www.wri.org/insights/countries-adopting-electric-vehicles-fastest#:~:text=Our%20analysis%20of%20the%20International%20Energy%20Agency%E2%80%99s%20EV%20Data%20Explorer

Norway made policy decisions that helped accelerate EV adoption. California has similarly implemented a policy called the Advanced Clean Cars II rule, which establishes that ***by 2035 100% of new cars and light trucks sold in California will be zero emission.[20] Oregon, along with California and ten other states have now adopted this standard,*** which will have a large impact on this s-curve timing above for the U.S.[21] Currently the U.S. sits just below the global mark, so this type of policy can jumpstart the trajectory on the s-curve and get us where we need to be in 2035.



When looking at both our local emissions reductions and registrations alongside the larger policy picture, it means that when we hit the year 2035, our registration numbers will likely turn the corner helping accelerate total registrations of BEV and reducing emissions. In short, ***we have a good chance to meet our long term 2050 goals with our current trajectory due to local efforts, state policy and overall market transition.***

VMTs, Ebikes and Bike Lanes

As noted, it would be impossible to meet our transportation goals by tracking statewide VMTs and meeting our numerical goals are better served with other data. However, ***reducing our actual vehicle miles traveled is still an important transportation goal*** and one than can be worked on. We have a robust ebike incentive program, there are goals to ***increase protected bike lanes and regional efforts at making mass transit more appealing.*** All of these can result in reducing the energy needed to get us around to our jobs, schools and appointments, whether that energy be fossil fuel or zero emissions electricity. It will be important to reduce energy needs so that energy can be used in other sectors. This work should be maintained, and perhaps a useful metric to locally and easily measure the impact can be developed in the future.

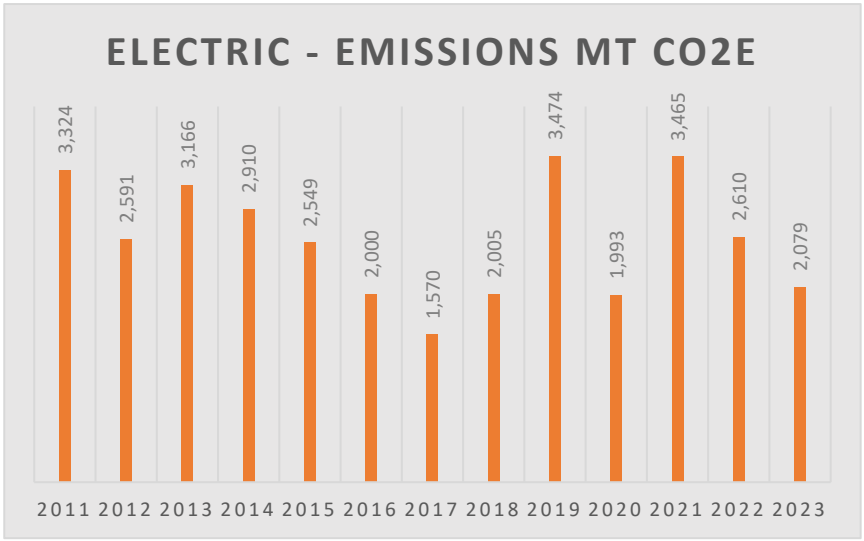
Electricity

The biggest news with electricity isn't new at all. As mentioned above, there is no practical reason to measure our electric consumption using the NWPP emissions factor. Doing so simply misdirects where our efforts should be focused. It is useful to understand the underlying premise of GHG protocols that

[20] https://ww2.arb.ca.gov/news/california-moves-accelerate-100-new-zero-emission-vehicle-sales-2035#:~:text=The%20new%20regulation%20accelerates%20requirements%20that%20automakers%20deliver%20an%20increasing

[21] https://www.oregon.gov/deq/aq/programs/Pages/ORLEV.aspx#:~:text=DEQ%20recently%20adopted%20the%20Advanced%20Clean%20Cars%20II%20regulation.%20This

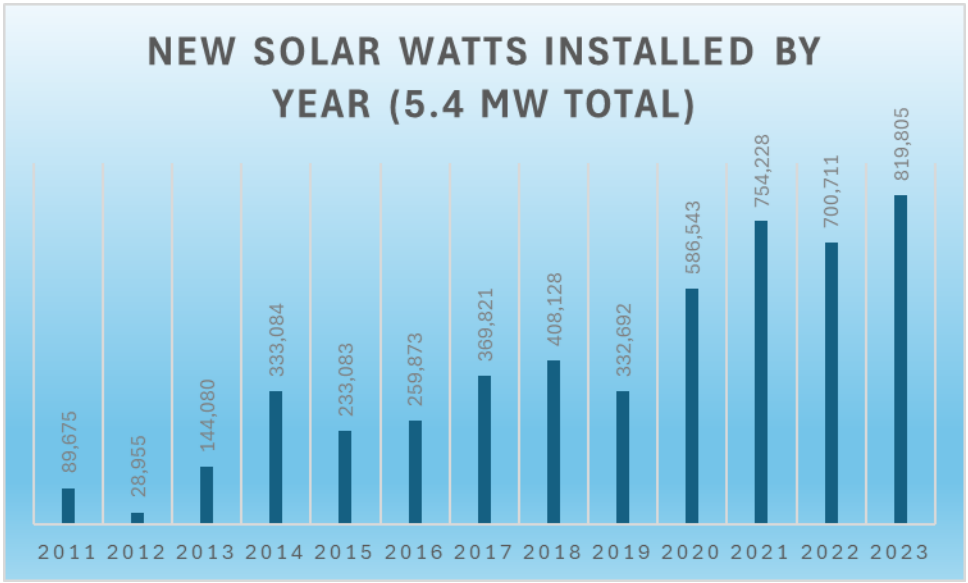
suggest the NWPP emissions should be used and allow that to inform decisions on local production though.



By shifting from the NWPP emissions to the DEQ emissions factor changes our electricity related emissions enormously. ***With the NWPP our emissions in 2015 were 48,584 mt co2e. Using the DEQ numbers reduces this to 2,549 mt co2e.*** As noted above, in order reduce emissions in the NWPP scenario requires the entire NWPP area to reduce at the same rate. There is no way a small city like Ashland can pull the entire NWPP area to greener pastures. The unique nature of Bonneville Power Authority (BPA) electricity informs us to focus on other areas, however the more local production and energy conservation we create locally, can lessen the amount of clean BPA energy we need that can be used elsewhere. Furthermore, as the use of EV's rises, it is helpful to know that the energy powering them is coming from a clean source when charged locally.

We have numerous energy efficiency programs in place, that should only be bolstered by our on-bill financing program noted above. These programs should continue, as it often, and accurately is stated that conservation is the most cost-effective way to reduce energy use!

While our electric emission numbers are quite low when using the DEQ numbers, there are other reasons to focus on electricity and efficiency. One key reason is that of reducing cost in heating and cooling our homes and water. ***Some of the lowest income homes have least efficient appliances – we still have homes using electric resistance heat that could be done 200% more efficiently by installing a heat pump*** and thereby reducing energy costs and energy needs. We need our homes to be ready to move to low carbon electricity to solve this climate crisis, so we must focus on having homes ready for electrification without it being an undue burden. Related to both is the 10-year remaining duration of the Inflation Reduction Act, which allows the city and residents to reduce the costs of transition to a low carbon electric future.



In addition to conservation, Ashlanders have embraced solar energy and continue to install solar power. ***A realistic goal for our community, especially when including Southern***

Oregon University's efforts, is to install an average of 1 MW of new solar per year for the next ten years.[22] Additionally, the on-bill financing program can be available for solar installations and necessary panel upgrades. Not to mention the Inflation Reduction Act tax benefits that help reduce overall cost.

Implementation & Budgeting

Our implementation has naturally followed the primary and to a lesser extent the secondary focus pathways. These seem more obvious when you dig in a bit and look for ways to decarbonize or reduce co2e. What can we impact locally? What can we measure locally? What has the greatest impact? What other factors should be considered (equity, return on investment)? Is it realistic? These questions need to be asked when implementing and budgeting for any of climate work. We do work within the constraints of a city budget and ingenuity. It is noteworthy how much of our current work is already working on the primary focus areas (see chart below).

Waste (solid and water) Refrigerants, Other Heating Fuels, Small Engines

Of these, waste is the most easily calculated but has not been for years. We have the data we could work from. There is nothing to report on this front as of now, but hopefully in the future. This source of emissions is especially important when looking at the short-term impacts of methane emission (80x co2e versus 20x (+) co2e). I hope to incorporate annual measurements of this in the near term with locally available and calculated data.

Refrigerants are important because the enormous global warming potential they have compared to co2; it is multiple orders of magnitude higher.[23] Refrigerants are another data point that comes from extrapolated data and is hard to pin down locally. To date, the city has required refrigerant recapture as part of incentives that deal with refrigerants. This in turn does provide some education to installers and help create awareness. This category could use further development.

Small engines do have extrapolated data available, that we can apportion on per capita basis. The emissions from these devices are surprisingly high, especially when you compare it to our electricity source emissions. One study has state level information that can be apportioned in Ashland on a per capita basis.[24] It is a unique opportunity to reduce emissions and one that shouldn't be difficult to meet as each year there are better electric alternatives and presumably the cost will come down as the power goes up in the next two and a half decades.

Other heating fuels will likely go away; however, the concern is that it may be easier for homes and businesses to transition to carbon emitting natural gas and lock in that emission source for 15 or more years. The work on natural gas electrification will cross over into this realm as will the solutions outlined above.

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[22] https://news.sou.edu/2024/09/sou-receives-third-1-million-state-grant-for-solar-arrays/#:~:text=%E2%80%94%20The%20solar%20energy%20aspirations%20at%20Southern%20Oregon%20University%20have

[23] https://ghgprotocol.org/sites/default/files/2024-08/Global-Warming-Potential-Values%20%28August%202024%29.pdf#:~:text=This%20document%20provides%20100-year%20time%20horizon%20global%20warming%20potential%20(GWP)

[24] https://publicinterestnetwork.org/wp-content/uploads/2023/10/Lawn_Care_Goes_Electric_Oct23.pdf

City As Leader

There is a large amount of data to use for city analysis and presents a unique opportunity. We have data for, electricity, natural gas, fuels, vehicle inventory (including other equipment), building equipment inventory and solar installations.

We can track this data (it was for the GHG inventory) and can be again in the future, however, there is good reason to deprioritize this now. The community at large is a much larger source of emissions and providing a clear path and alignment in this area is a critical first step, which this report attempts to begin doing.

Once there is time to commit to this, we can combine numbers and provide an update on how the city is doing in reducing emissions. This doesn't mean that city cannot work on its emissions now. The same logic for the primary focus areas above applies equally to the city and decarbonization should be front and center.

Conclusion

This report is intended to orient our climate work moving forward by explicitly stating how we can better focus our efforts by slightly tweaking how we look at the CEAP. We know what we must do right now - reduce our fossil fuel emissions as quickly as possible and replace the energy with carbon free energy. The good news is these are the areas that we are focusing on. There is a path to decarbonize our homes and businesses and there is positive trend in decarbonizing our transportation.

This report contains some basic benchmarks and projections that seem attainable. We need to work on the programs that we have, expand when we can and ensure that our work continues. Reaching our goals faster and expanding our scope will require a combination of additional funding and work force to amplify city efforts.

In short, we are making progress, yet we have a long way to go. I think we will get there.

Strategic Framework Aligning Current Work Plans (and possible future work) With 2024 CEAP Report Primary Focus Areas									
Category	**Focus Area**	**Goal**	**Objective**	**Key Performance Indicators**	**Strategy**	**Tactics/Actions**	**Metrics**	**Timeline**	**Planned Result**
Community	# 1 Primary Focus	Zero Natural Gas Emissions	Reduce emissions by an average of 1,200 metric tons/year = 29,330 MT over 25 years	Annual Therms Used (then calculated for emissions)	Electrification	Fuel Switching Incentives - Federal, State, Local (Local = heat pumps - 4 types, induction cooking, heat pump water heaters)	Assist 280 homes per year transition to electric power from NG for 25 years	25 years	17,500 MT CO2E from NG removed
							Assist 35 businesses per year transition to electric power from NG for 25 years	25 years	11,237 MT CO2 from NG removed
						Fuel Switching Loans (USDA RESP - on bill financing)	Assist up to 1,000 homes (10%) fuel switch in the next 10 years	10+ years	2.5 MT co2e/house
Community	# 2 Primary Focus	Zero Tailpipe Emissions for Daily Use Transportation	Continue trajectory of increased zero tailpipe emissions for daily use vehicle ownership	BEV and PHEV Registration Data	Support and promote the adoption of zero tailpipe emission vehicles	*State Actions*	*No new internal combustion engine car sales in 2035*	*10 years*	*100% of newly purchased daily use vehicles have zero tailpipe emissions by 2035*
						EV Incentives - Federal, State, Local ($1000 local incentive)	Increase low emission registrations to 22% by 2035 and 100% zero tailpipe emissions by 2050	10 years	100% of daily use vehicles have zero tailpipe emissions by 2050
						EV Chargers (free EV charger, commercial incentive)	Maintain Free EV Chargers	25 years	Incentivizes EV purchases
							Strategically deploy new chargers	10 years	Easy and affordable charging creates a desire to adopt EV's
							Workplace Chargers	10 years	Encourage employees and patrons to drive EV's
							Create a City EV Charger plan	2026	Strategic plan for infrastructure changes to accommodate citywide needs
		Increase usage of low emission mobility options	Improve access to non-personal automobile transportation options	Reduction in VMT (a better local indicator is needed)	Expand mileage of low emissions infrastructure, increase percent of walkable areas, and enable access to these options	Bike Path & Pedestrian Infrastructure Development	Increase mileage of bike paths & sidewalks/pedestrian infrastructure	25+ years	Lower emissions and more affordable transit
						Climate Friendly Communities (Community Development Dept.)	Walkable Communities Development	25+ years	Reduced need for transportation
						E- bike Incentive	Number of Incentives	25+ years	Affordable, useful micromobility!
						EV Carshare	Miles Used	2 years (pilot)	Allow for trial of EV's and reduce need for personal auto use and cost
Community	# 3 Primary Focus	100% Carbon Free Electricity	1) Continue to increase efficiency, 2) Increase local production of electricity, 3) Provide 100% carbon free electricity	Annual Kilowatt Hours Used (then calculated for emissions) & Watts installed	Increased Energy Efficiency	Energy Efficiency Loans (USDA RESP - on bill financing)	Reduction in electricity used	10 + years	Reduction in kilowatt hours used
						Home Energy Review (City Staff, and pending Home Energy Score Incentive)	Total number of Reviews	10+ years	Allow for easy access to energy efficiency and cost savings programs
						BPA Incentives (weatherization, windows, doors, duct sealing, lighting, refrigeration, heating and cooling)	Reduction in electricity used	25 years	Reduction in kilowatt hours used
					Local Renewable Energy Production	Solar Expansion (via city and federal incentives & possible state grants)	Increase generation by 1 MW/year for 10 years	10 years	10 new megawatts of local production - increases total to over 16 MW of local solar
					Low Carbon Electricity Requirements	*State/Federal Actions*	*Lower carbon grid electricity*	*25+ years*	*Carbon free electric grid*

Methodology & Data Sources

Electric

Methodology:

- Used calculated emissions from the data source below for a given year.

Data:

- https://www.oregon.gov/deq/ghgp/Documents/ghgElectricityEms.xlsx

Natural Gas

Methodology:

- Natural Gas (total therms used in the city) x Emissions factor of .005 (metric tons of CO2/therm) = Total MT CO2 for the city

Data:

- Formerly provided by Avista Utilities are part of the quarterly franchise fee payment.

Transportation

Methodology:

- Per capita allocation of statewide vehicle registration (adjusted by per capita drivers' licenses) is determined and then local registrations for PHEVs and BEVs is then used to reduce the total number of standard internal combustion engine registrations. Emissions are calculated at different rates for each quantity of vehicle type based on average miles driven (PHEV (72 grams CO2 /mile) and BEV (0 grams of CO2 / mile) and internal combustion vehicle (319 grams of CO2 / mile)).
- Previous years data was used in a spreadsheet to predict a similar growth rate moving forward (227% growth rate for 2024-2033 compared to a 272% growth rate from 2019-2023)

Data:

- https://www.oregon.gov/energy/Data-and-Reports/Pages/Oregon-Electric-Vehicle-Dashboard.aspx#:~:text=The%20dashboard%20displays%20Oregon%E2%80%99s%20total%20number%20of%20electric%20vehicles%20by
- https://www.fueleconomy.gov/feg/Find.do?year=2021&vehicleId=42793&zipCode=97520&action=bt3