

Portland Clean Energy Fund Committee – MEMO: 2017 Multnomah County Carbon Emissions and Trends

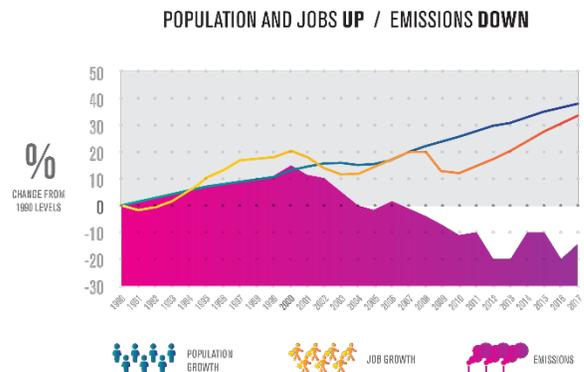
To: Portland Clean Energy Fund Committee
From: Jaimes Valdez and Cady Lister, PCEF Staff; Kyle Diesner, Climate Action Program Coordinator
Subject: Carbon Emissions Inventory, 11/15/2019 PCEF Committee Meeting #3, Agenda Item D
Date: November 8, 2019

Purpose:

This memo provides an overview of research and content from the 2017 Multnomah County Carbon Emissions and Trends Report (issued September 18, 2019) along with additional considerations and context related to racial and social equity, in order to inform and guide the Portland Clean Energy Fund (PCEF) Grant Committee.

Overview and Executive Summary:

Global carbon emissions are connected closely with climate change, driving increases in atmospheric temperatures, sea level rise, and increased frequency of natural disasters. Regionally, the Pacific Northwest has warmed nearly 2°F since 1900, and is experiencing warmer winters, decreasing snowpack, hotter summers, and heavier storms. Future local climate risks include greater likelihood of flooding, larger wildfires, and negative human impacts from poor air quality, heat and displacement.



Portland tracks and analyzes local carbon emissions in two different ways. The primary method calculates local emissions from energy use in our vehicles, homes and businesses, industrial facilities, wastewater treatment, fugitive emissions, and emissions from materials that are thrown in the garbage. This method is known as a **“sector-based” carbon emissions inventory** and Portland and Multnomah County have been using this approach to track local carbon emissions since 1990, which serves as the baseline year for measurement of our carbon reduction goals. The sector-based inventory, however, does not account for global carbon emissions that result from local consumption of goods that were produced in other places (e.g., clothes, furniture, food) and services (e.g., health care, banking). To understand the impact of these actions, a **“consumption-based” carbon emissions inventory** models carbon emissions from the full lifecycle of goods and services, including production, pre-purchase transportation, wholesale and retail, use and disposal.

Whereas the sector-based inventory includes emissions associated with the production of goods in Multnomah County (regardless of who buys them), the consumption-based inventory seeks to attribute emissions to the local consumption of goods and services (regardless of where those goods are produced). Taken together, the sector-based and consumption-based inventories offer a more complete picture of the global carbon emissions for which Portland and Multnomah County bear some responsibility — and therefore the opportunities to make local reductions.

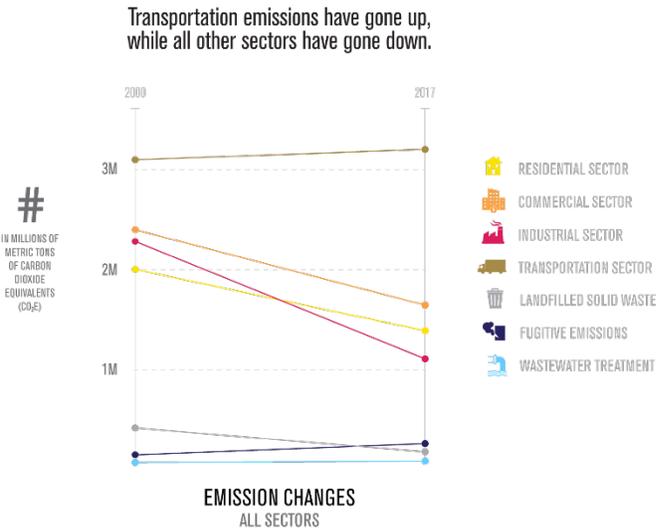
Overview of Sector-based Carbon Emissions

Overall, carbon emissions in the region have declined by approximately 15% from 1990 levels, even as population continued to grow. While the Portland metro area has grown in population by 38% and increased

employment by 34%, on a per-capita basis emissions have fallen by 38% per person since 1990. While the trajectory shows past progress in reducing carbon emissions, emissions reductions have plateaued since 2012, largely due to increases in transportation-related fuel use. There is also considerable variability annually based on changes in rainfall patterns and hydro generation. In 2017, emissions were usually high due to extremely low winter temperatures.

Sources of Sector-based Carbon Emissions:

The primary drivers of carbon emissions come from burning of carbon-intensive fossil fuels used for electricity, home heating and transportation fuels. These carbon-intensive fuels include coal, natural gas, gasoline, diesel, heating oil and propane. The two primary factors that influence local carbon emissions over time are the amount of energy used in different sectors of the economy, and the carbon intensity of different energy sources. Currently, the three largest sectors contributing to local emissions are transportation, commercial and residential energy use. Industrial energy use has declined, even as regional employment grows.

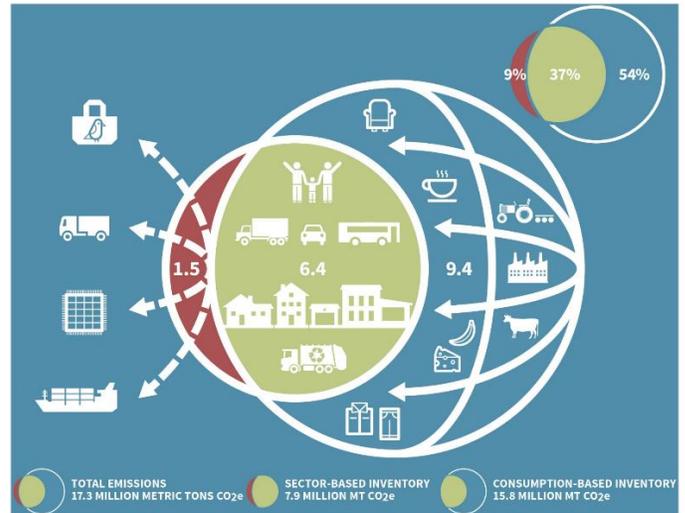


Since 2012, transportation sector fuel use has increased, largely due to population growth and increase in total vehicle use, while emissions from other major sectors have declined. Across sectors, electricity generation is currently our single largest source of carbon emissions, representing 28 percent of all emissions. Electricity has become less carbon intensive on a kWh unit basis over the past years, reflecting utility investments, policy changes and increased wind and solar generation. Combined with voluntary customer purchases of green power and energy efficiency improvements, total electricity use and emissions have declined since the year 2000, though 63% of electricity is still currently generated from fossil fuels. Oregon’s Renewable Portfolio Standards and the City and County goals for 100% Renewable Energy will further decarbonize the electric sector in the coming years. However, natural gas use has increased significantly in heating homes and businesses, currently accounting for 20% of emissions. Much of this natural gas use had displaced heating oil, which has declined by 80% since 1990. Decarbonization of heating needs in Portland will require extensive private investment and public policies to switch to lower carbon energy sources. To find out more about Portland’s sector-base emissions, visit:

<https://www.portlandoregon.gov/bps/article/742164>

Overview of Consumption-based Carbon Emissions

Consumption-based emissions are the lifecycle emissions produced globally from the result of Portlander's demand for goods, services, food, and building materials. The emissions from these activities are modeled in Portland Consumption-based emissions inventory, which is a new and emergent practice for cities. Consumption based emissions are double the emissions we produce locally. These emissions are the result of consumer choices and production practices by manufacturers globally. These emissions can be reduced through changes in consumer demand and shifts in how goods are produced. This requires acknowledging that high-income households need to consume less and shift consumption patterns towards less carbon intensive products and services. Low-income households already live less carbon-intensive lifestyles. Many low-income communities need to consume more to achieve higher levels of wellbeing and prosperity. The Portland Bureau of Planning and Sustainability is working to develop a Sustainable Consumption and Production Strategy that addresses this balance and the need to reduce these global emissions in ways that enable all Portlanders to thrive in low carbon future. To find out more about consumption-based emissions, see Portland's 2015 Climate Action Plan, starting on page 36: <https://www.portlandoregon.gov/bps/article/531984>



Social and Racial Equity Considerations:

While the Carbon Emission Inventories provides a high-level overview of which sectors of the economy are most carbon-intensive, it does not directly address the social impacts of climate hazards, who has opportunities to reduce carbon emissions, or who bears most responsibility. The consumption-based emissions inventory acknowledges that individual carbon emissions are closely tied to patterns of consumer consumption and travel choices. People with lower incomes generally contribute less to consumption-based emissions than the wealthy. Many of the solutions that people can use to reduce their sector-based carbon emissions, such as buying a more fuel-efficient or electric car, improving energy efficiency in their home, or installing solar power requires access to capital or credit, which is a barrier to participation by lower income Portlanders. Likewise, people's ability to use transit or bicycles is often limited by their proximity to accessible transit, work schedules, and public infrastructure in their neighborhood. In Portland, people of color face disparities in access to housing and transportation options, linked closely to housing affordability and household income. There are also differences in what energy sources are used in the home based on homeownership. Renters are more likely to have electric heating, which is often more expensive, but offers significant opportunity to increase efficiency, reduce carbon emissions and reduce household energy bills.

Source: U.S. Census Bureau, 2013-2017 American Community Survey 5-Year Estimates

House Heating Fuel	Number of Occupied Units	Percent Total Occupied Units	Percent of Owner-Occupied units	Percent of Renter- Occupied Units
Natural Gas	134,280	51%	71%	29%
Propane Gas	3,001	1%	1%	1%
Electricity	107,116	41%	20%	65%
Fuel Oil	10,462	4%	6%	2%
All other	4,277	2%	2%	1%
No fuel	1,813	1%	0%	1%
	260,949			

Considerations for PCEF Funding and Prioritization

As the Portland Clean Energy Fund (PCEF) provides funding and resources for non-profit organizations to address climate change and social equity together, these data can inform the opportunities to address some of the largest sources of carbon emissions in the city, including residential and commercial energy use and transportation. However, a sector-based approach alone is not adequate to identify the greatest need and societal benefit. In future briefings, there will be an opportunity to learn more about the needs and challenges of different communities in Portland, and how that intersects with potential climate impacts.