SEATTLE CITY COUNCIL
CENTRAL STAFF

September 12, 2019

M E M O R A N D U M

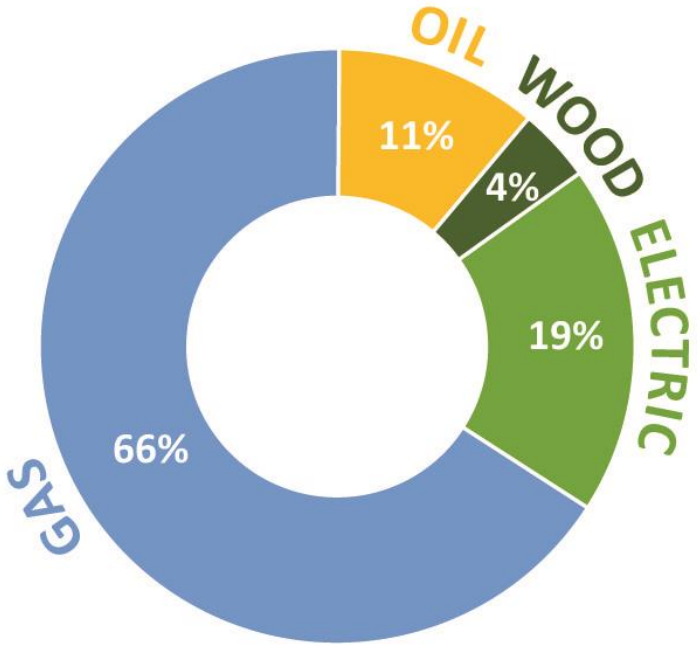
To: Sustainability and Transportation Committee
From: Yolanda Ho, Analyst
Subject: Natural gas piping systems prohibition (CB 119640)

On September 17, 2019, the Sustainability and Transportation Committee (Committee) will continue discussing Council Bill (CB) 119640, that would amend Seattle's Building and Construction Codes (Seattle Municipal Code Title 22) to prohibit natural gas piping systems in all new buildings. This memorandum (1) provides additional background information and (2) further analysis of impacts of CB 119640.[1]

Background

Currently, almost two-thirds of Seattle's single-family houses are heated by natural gas and about 19 percent are heated by electricity, based on Seattle City Light's most recent Residential Building Stock Assessment, 2016-2017 (Exhibit 1).

Exhibit 1: Share of single-family houses by heat source in Seattle, 2017

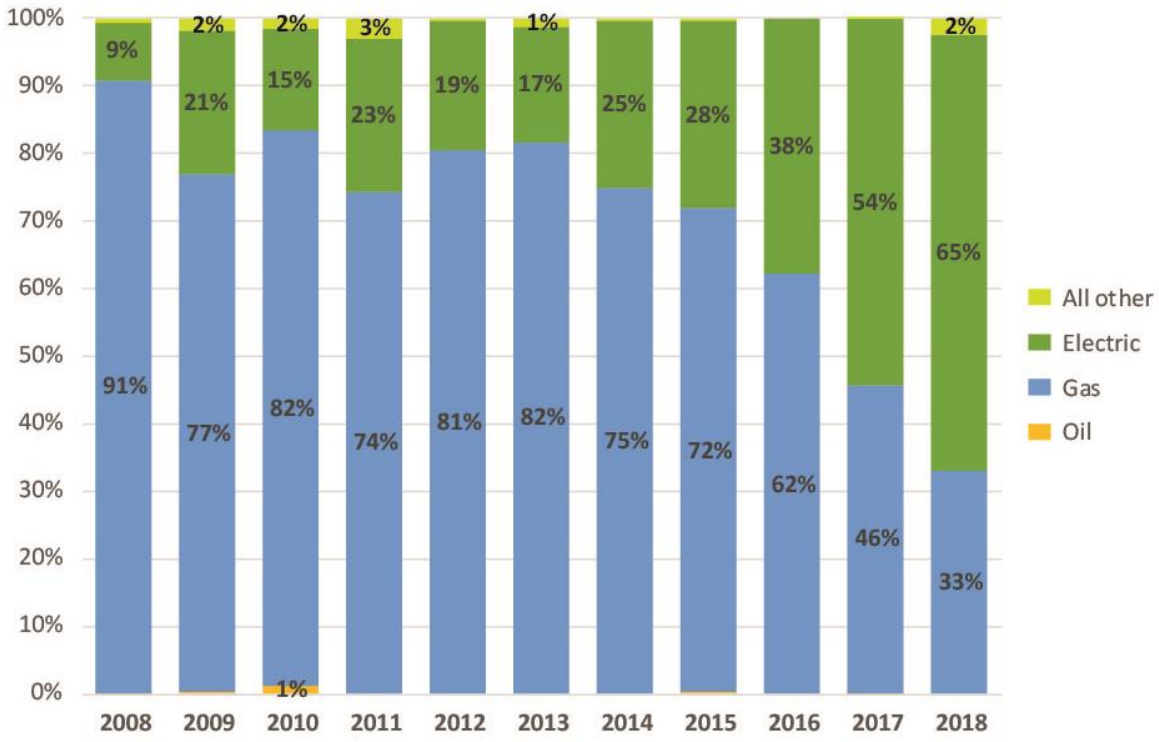


Source: Seattle Residential Building Stock Assessment II, 2016-2017

[1] See Central Staff memorandum from the September 10, 2019, meeting of the Sustainability and Transportation Committee for background information and discussion of the potential impacts of CB 119640.

A growing share of single-family homes have been constructed with electric heating systems in recent years. In 2008, only 9 percent of new single-family homes used electricity for heat, whereas 91 percent of used natural gas; in 2018, 65 percent of new single-family homes used electricity for heat and 33 percent used natural gas (Exhibit 2).

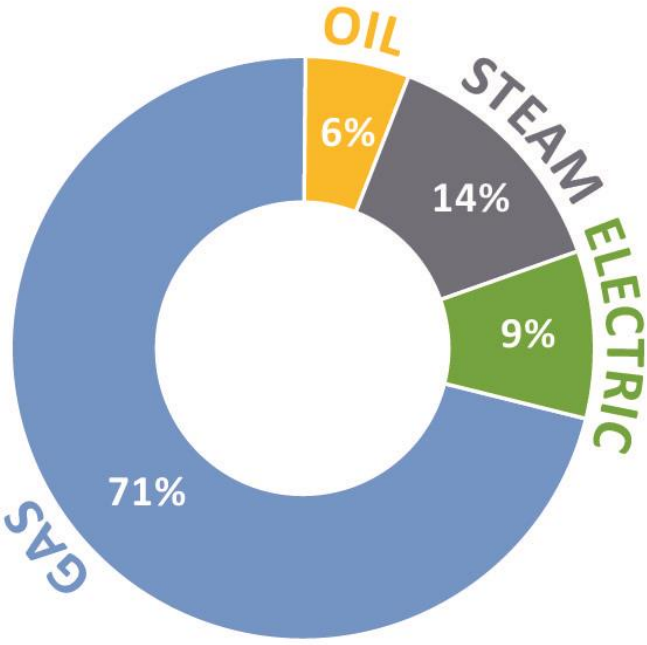
Exhibit 2: Share of single-family houses in Seattle by heat source and year of construction



Source: King County Assessor, 2019

Of Seattle's greenhouse gas (GHG) emissions from buildings, the direct combustion of natural gas accounted for 71 percent of the total (Exhibit 3). The second greatest source of emissions is from the use of natural gas to create steam, which heats buildings connected to a district energy system. District energy systems are comprised of a central plant connected to a network of underground pipes that pump steam, hot water, and/or chilled water to multiple buildings in an area such as a downtown district, college or hospital campus. While these systems are more energy efficient than each building having its own boiler, they are still a large source of building emissions.

Exhibit 3. Share of Seattle's building greenhouse gas emissions by source, 2016



Note: Does not include Seattle City Light's carbon offsets
Source: 2016 Seattle Community Greenhouse Gas inventory

Impacts of CB 119640

Greenhouse Gas Emissions

The Office of Sustainability and Environment conducted an analysis of the impacts of this legislation on Seattle's GHG emissions. Assuming that all new residential and commercial buildings are heated using electricity beginning in 2021, the reductions in GHG emissions using the 2008 baseline are estimated to be:

- 2.7 percent by 2025
- 4.6 percent by 2030
- 12.0 percent by 2050

The analytical model used to generate these findings does not account for all-electric buildings, however, so these projections underestimate the reductions in GHG emissions. The use of natural gas to heat buildings currently accounts for 50 percent of natural gas consumption in the residential sector and 33 percent in the commercial sector.[2] Additionally, the analysis assumes indirect emissions related to district energy systems will continue.

[2] These findings use post-offset (i.e. carbon neutral) emissions for electricity and do not account for the phase out of heating oil, anticipated in 2029.

Electricity Generation and Transmission Capacity

Seattle City Light (SCL) has determined that it has adequate generation resources to meet the projected load, assuming all new buildings are fully electric after July 1, 2020. There may be constraints to the transmission and distribution system, but SCL notes that these can be resolved.

Next Steps

The Committee will continue to discuss CB 119640, consider amendments, and possibly vote in December.

cc: Kirstan Arestad, Exec Director
Aly Pennucci, Supervising Analyst