Other Food and Beverages – Process Heat and Greenhouse Gas Emissions

FACT SHEET

Process Heat in New Zealand

What is process heat?

In the Other Food and Beverages sector, process heat is the energy used as heat to produce steam, hot water or hot gases for processing and manufacturing.

The Other Food and Beverages sector typically uses onsite boilers and ovens to generate heat to make beverages and food products. Examples of the sector's process heat use include boiling grain when brewing, cooking food and commercial baking.

The sector accounted for over $1.5 billion dollars in sales in the September quarter 2018.[1]

What does the Other Food and Beverages sector cover?

The Other Food and Beverages sector covers[2] the processing of fruit and vegetables, and includes the manufacturing of:

- grains and cereals
- baked goods
- confectionery
- potato chips
- animal and bird feed
- sugar
- soft drinks
- beer, wine and spirits

It excludes the dairy and meat processing sectors which are covered in other fact sheets in this series.[3]

372
thousand tonnes
of carbon dioxide equivalent (CO_2-e)

The approximate volume of the Other Food and Beverage sector's GHG emissions in 2016.

New Zealand Government

MINISTRY OF BUSINESS, INNOVATION & EMPLOYMENT
HĪKINA WHAKATUTUKI

EECA Energy Efficiency and Conservation Authority
Te Tari Tiaki Pūngao

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What is the fuel demand and greenhouse gas (GHG) emission volume from process heat in this sector?

This sector is a comparatively small user of process heat and in 2016 it used 6.1 Petajoules (PJ) of fuel for process heat (or **3.1%** of New Zealand's total process heat fuel use).[4] This is equivalent to the total amount of energy consumed by 180,000 of New Zealand's households annually.[5]

The sector's GHG emissions (372 kilo tonnes of CO_2-e) also accounts for a relatively small share of New Zealand's total process heat-related GHG emissions (**4.5%** in 2016).[6]

The vast majority (**92.5%**) of the sector's energy use comes from non-renewable sources, dominated by natural gas, diesel and coal. Similarly, non-renewable fuels produced most (**95.8%**) of the sector's process heat GHG emissions (see Figure 1).[7]

Renewable sources of energy supplied **7.5%** of the sector's energy in 2016, accounting for **4.2%** of its GHG emissions. This mostly came from electricity.[8]

Figure 1. Fuel demand and GHG emissions for the Other Food and Beverage sector by energy source, 2016[9]

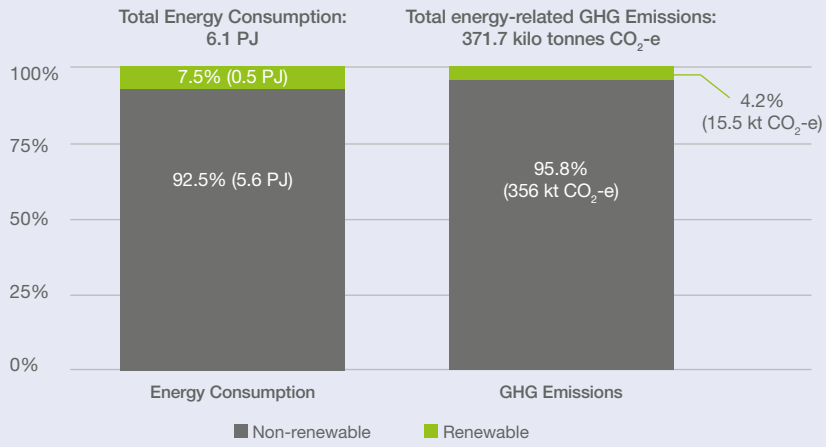


Figure 2 shows the sector's percentages of fuel use and GHG emissions by fuel type. Almost half (**47.4%**) of energy consumption was met using natural gas, ahead of diesel (**30.3**%), coal (**10.7%**) and electricity (**10.1%**). The GHG emissions from natural gas (**42.4**%) and diesel (**35%**) combined, accounted for over three-quarters of the sector's total emissions (see Figure 2).[10]

Figure 2. Fuel demand and GHG emissions in the Other Food and Beverage sector – percentages by fuel type, 2016[11]

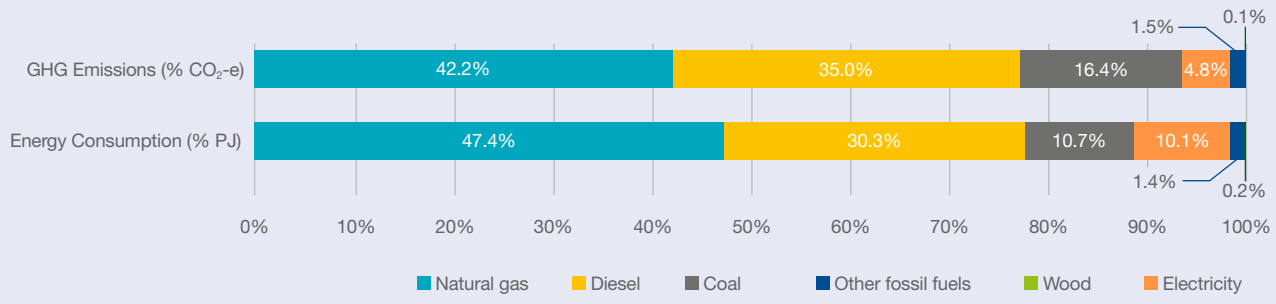
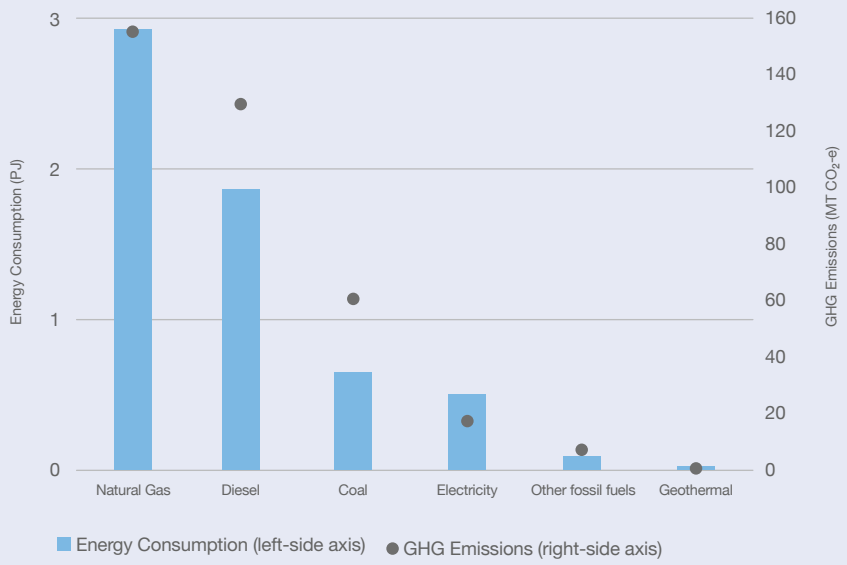


Figure 3 displays absolute levels of fuel demand and GHG emissions by fuel type. It highlights that diesel and coal are more emissions-intensive than natural gas or electricity, but that most of the emissions in this sector come from using natural gas.

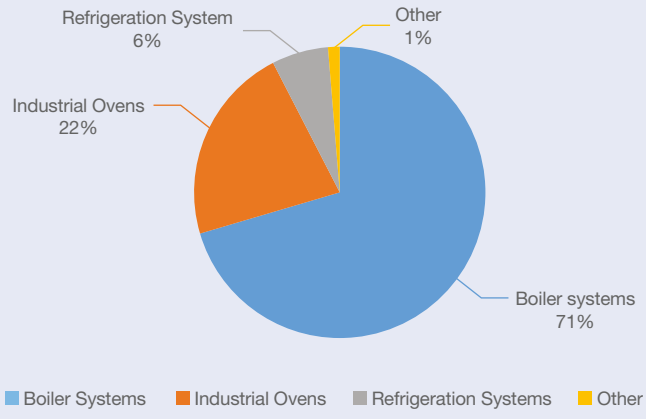
Figure 3. Fuel demand and GHG emissions for the Other Food and Beverage sector by fuel type, 2016 [12]



What technologies are used in this sector to generate process heat?

In 2016, boiler systems were the dominant technology type used by the sector and accounted for **71%** of the delivered energy used in relation to process heat, and well ahead of industrial ovens (**22%**) as shown in Figure 4.[13]

Figure 4. Delivered energy use by technology type in the Other Food and Beverage sector, 2016[14]



Sources

1. Statistics New Zealand Economic Survey of Manufacturing: September 2018 quarter: www.stats.govt.nz/information-releases/economic-survey-of-manufacturing-september-2018-quarter
2. Refers to Australian and New Zealand Standard Industrial Classification (ANZSIC) 2006 Subdivisions C114 Fruit and Vegetable Processing; C115 Oil and Fat Manufacturing; C116 Grain Mill and Cereal Product Manufacturing; C117 Bakery Product Manufacturing; C118 Sugar and Confectionery Manufacturing; C119 Other Food Product Manufacturing; and C12 Beverage and Tobacco Product Manufacturing.
3. Meat and Meat Product Manufacturing fact sheet
   Dairy Manufacturing fact sheet
4. EECA 2016 Energy End Use Database (EEUD) (2018). www.eeca.govt.nz/resources-and-tools/tools/energy-end-use-database/
5. Based on Statistics New Zealand 2018 household estimates data and MBIE 2017 Energy Balances - residential energy demand data (2018).
6. EECA 2016 EEUD (2018).
7. EECA 2016 EEUD (2018).
8. EECA 2016 EEUD (2018).
9. EECA 2016 EEUD (2018).
10. EECA 2016 EEUD (2018).
11. EECA 2016 EEUD (2018). Note: The “other fossil fuels” group includes LPG and fuel oil.
12. EECA 2016 EEUD (2018).
13. EECA 2016 EEUD (2018).
14. EECA 2016 EEUD (2018).

Process Heat in New Zealand

You can find out more about Process Heat in New Zealand (PHiNZ) on the Ministry of Business, Innovation & Employment (MBIE) website - www.mbie.govt.nz/PHiNZ

For more information on PHiNZ please contact us at energymarkets@mbie.govt.nz

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