

**Fred Meyer, Bakerview in Bellingham**

grocery store size	164,655	sf
emergency generator size, <b>500 hr/yr</b>	2,021	kw
emergency generator fuel use	114.2	gal/hr
emergency generator CO2e	2,785	MT CO2e/yr
Electricity	3,598	MT CO2e/yr
NG	437	MT CO2e/yr
Total CO2e for store	<b>6,820</b>	MT CO2e/yr
fuel dispensing facility throughput, 2018	8,073,084	gal
Total CO2e for fuel dispensing facility	78,207	MT CO2e/yr
Total GHGs from facility	<b>85,027</b>	metric ton CO2e/yr

**EMISSION CALCS 22,000 sf store:**

Store size:	22000 sf
kW needed:	270 kw
Fuel use:	19.4 gal/hr
Diesel (#4)	0.01096 MT CO2/gal
	0.00044 MT CH4/gal
	0.00009 MT N2O/gal

Grocery Outlet store addition, from SEPA register  
 generator size est per : <https://www.kompareit.com/business/industrial-equipment-generators-backup-cost-grocery-stores.html>  
 fuel use, per Diesel service/support table below  
[https://www.epa.gov/sites/production/files/2015-07/documents/emission-factors\\_2014.pdf](https://www.epa.gov/sites/production/files/2015-07/documents/emission-factors_2014.pdf)

**GHG Emissions, 2 options depending on which hr/yr operation assumption we use:**

500 hr/yr ops	8760 hr/yr ops
473 MT CO2e/yr	1863 ton CO2e/yr

REFERENCES:

**How to Size a Grocery Store Generator**

Start with an inventory of every item you want the generator to run in the event of a power outage. Then, determine the kilowatts (kW) of each item. The total is the amount of power you need.

You find the kW information listed directly on the item. However, a missing tag doesn't mean you can't find that magic number; it may be in the owner's manual or available online.

Some items list amperes instead of kW. In that case, you need to convert amperes to kW. Calculate resistive load kilowatts by multiplying the amperes by the volts. Calculate reactive loads by taking that product (amps X volts) and multiplying it by the load factor.

A less accurate calculation, though easier, requires using your store's square footage, using the formula 50kW plus 10 watts for each square foot. So, a 10,000 square foot store looks like this: 50 kW + 100,000 watts. There are 1,000 watts in a kilowatt, so that becomes 50 kW + 100 kW. Therefore, you need a 150 kW generator.

**DIFFERENT INDUSTRIES AND HOW THEY BENEFIT FROM A STANDBY GENERATOR**

Explore the many different business types Generac is knowledgeable about and how a business standby generator can benefit and protect them. With a standby generator business owners know their business is safe, secure, and has power. No need to check or worry about the generator. Generac's business standby generators turn on automatically whenever a power outage is detected.

Our national dealer network offers reliable support, service, and maintenance to all customers and businesses.

- Auto Repair Shops
- Banks
- Call Centers
- Doctor's Office
- Gas Stations
- Grocery Stores
- Hotels
- Manufacturing
- Restaurants



**Approximate Fuel Consumption Chart**

This chart approximates the fuel consumption of a diesel generator based on the size of the generator and the load at which the generator is operating at. Please note that this table is intended to be used as an estimate of how much fuel a generator uses during operation and is not an exact representation due to various factors that can increase or decrease the amount of fuel consumed.

Generator Size (kW)	1/4 Load (gal/hr)	1/2 Load (gal/hr)	3/4 Load (gal/hr)	Full Load (gal/hr)
20	0.6	0.9	1.3	1.6
30	1.3	1.8	2.4	2.9
40	1.6	2.3	3.2	4
60	1.8	2.9	3.8	4.8
75	2.4	3.4	4.6	6.1
100	2.6	4.1	5.8	7.4
125	3.1	5	7.1	9.1
135	3.3	5.4	7.6	9.8
150	3.6	5.9	8.4	10.9
175	4.1	6.8	9.7	12.7
200	4.7	7.7	11	14.4
230	5.3	8.8	12.6	16.6
250	5.7	9.5	13.6	18
300	6.8	11.3	16.1	21.5
350	7.9	13.1	18.7	25.1
400	8.9	14.9	21.3	28.6
500	11	18.5	26.4	35.7
600	13.2	22	31.5	42.8
750	16.3	27.4	39.3	53.4
1000	21.6	36.4	52.1	71.1

**EMISSION CALCS 22,000 sf store:**

Store size:	22000	sf
Elec. Use:	50	kWh/yr/sf
Elec. Use:	1100000	kWh/yr
Unit convert:	1100	MWh/yr
GHG/yr:	480.7	metric tons CO2e/yr

Grocery Outlet store addition, from SEPA register  
Electrical use per Energy Star Website: [https://www.google.com/search?q=how+much+electricity+does+grocery+store+use&rlz=C1GCEA\\_enUS792US792&oeq=how+much+electricity+does+grocery+store+use&qs=chrome.6957j0j2230j20i3902.7993j0j4&sourceid=chrome&ie=UTF-8](https://www.google.com/search?q=how+much+electricity+does+grocery+store+use&rlz=C1GCEA_enUS792US792&oeq=how+much+electricity+does+grocery+store+use&qs=chrome.6957j0j2230j20i3902.7993j0j4&sourceid=chrome&ie=UTF-8)  
1000 kWh=1MWh  
calc based on equation from GAP rule

**REFERENCES:**

**Energy Use in Supermarkets**

On average, supermarkets in the United States use around 50 kilowatt-hours (kWh) of electricity and 50 cubic feet of natural gas per square foot per year — an average annual energy cost of more than \$4 per square foot. For an average-size (50,000 square foot) store, this equates to more than \$200,000 annually in energy costs and results in 1,900 tons of CO<sub>2</sub> being emitted into the atmosphere — equivalent to the emissions from 360 vehicles in one year!

Equation from GAP rule

**Equation 4**

$$\text{unspecified} = \text{UE} \times \text{UCO}_2\text{e}$$

- Where:
- Unspecified = Total of all GHG emissions calculated using the unspecified electricity method/step, metric ton CO<sub>2</sub>e/year
  - UE = Total electricity subject to this method, MWh/calendar year
  - UCO<sub>2</sub>e = 0.437 metric tons CO<sub>2</sub>e/MWh of electricity.

**EMISSION CALCS 22,000 sf store:**

Store size:	22000 sf
Gas per sf:	50 cf gas/sf
Gas/yr:	1100 thousand cf/yr
GHGs in Gas:	117 lb CO <sub>2</sub> e/thousand cf
GHGs/yr:	64 tons CO <sub>2</sub> e/yr
GHGs/yr:	58 metric tons CO <sub>2</sub> e/yr

grocery Outlet store addition, from SEPA register

usage based on Energy Star Website:

[https://www.google.com/search?q=how+much+electricity+does+grocery+store+use&rlz=1C1GCEA\\_enUS792US792&aq=how+much+electricity+does+grocery+store+use&ag=chrome..69157j0i2j3012j0i39012.7993j0j4&sourceid=chrome&ie=UTF-8](https://www.google.com/search?q=how+much+electricity+does+grocery+store+use&rlz=1C1GCEA_enUS792US792&aq=how+much+electricity+does+grocery+store+use&ag=chrome..69157j0i2j3012j0i39012.7993j0j4&sourceid=chrome&ie=UTF-8)

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**EMISSION CALCS AVERAGE GAS STATION IN NWCAA'S AREA:**

GDF Throughput	1,000,000	gal/yr	minimum per GO 003R1, 201 gas stations in NWCAA district
Input - Refining	245	MT CO <sub>2</sub> e	Not included - see note below
Input - Transfer	529	MT CO <sub>2</sub> e	
Output - combustion of product	8,813	MT CO <sub>2</sub> e	
GHG/ yr	9,687	MT CO <sub>2</sub> e/yr	

**REFERENCES:**

**Throughput assumption**

NWCAA Technical Support Document for GO 003R1, Gasoline Dispensing Facilities, March 22, 2021  
 The annual throughput of gasoline at GDF varies considerably. According to 2018 data in the NWCAA jurisdiction, the average annual throughput was a little less than 1 million gallons, and the maximum was 17 million gallons.

**Inputs: Emissions from Refining of Gasoline - NOT INCLUDED in emissions as reported on 40 CFR 98 Subpart MM by refineries**

published studies not found for GHG emissions from refining, as GHG vary considerably depending on the process units at the refinery  
 Direct emissions downloaded from Ecology at <https://data.wa.gov/Natural-Resources-Environment/GHG-Reporting-Program-Publication/dthm-59de>  
 Average throughput and proportion of gasoline from public websites

Refinery	Direct MT CO <sub>2</sub> e	Crude bbls	% Gasoline	Gasoline CO <sub>2</sub> e
BP Cherry Point	2,345,530	83,125,000	37%	0.0106
Phillips 66 Ferndale	834,697	38,325,000	62%	0.0135
Marathon Anacortes	1,421,127	43,435,000	50%	0.0164
Shell Puget Sound Refinery	1,859,261	52,925,000	50%	0.0176
Average				0.0145 MT CO <sub>2</sub> e/bbl

[https://www.bp.com/content/dam/bp/country-sites/en\\_us/united-states/home/documents/eir-2019/cherry-point-refinery-factsheet.pdf](https://www.bp.com/content/dam/bp/country-sites/en_us/united-states/home/documents/eir-2019/cherry-point-refinery-factsheet.pdf)  
<https://www.phillips66.com/refining/ferndale-refinery>  
<https://www.marathonpetroleum.com/Operations/Refining/Anacortes-Refinery/>  
<https://ecology.wa.gov/Regulations-Permits/Permits-certifications/Industrial-facilities-permits/Shell-Puget-Sound-Refinery>

<http://barrefill.wisdot.com/cherry-point-refinery>  
<https://ecology.wa.gov/Regulations-Permits/Permits-certifications/Industrial-facilities-permits/Phillips-66-Refinery>  
[https://en.wikipedia.org/wiki/Shell\\_Anacortes\\_Refinery](https://en.wikipedia.org/wiki/Shell_Anacortes_Refinery)

**Emissions from Transport of Product**

<https://www.siemensdirect.com/energy/articles/fuel-efficiency-1632331017305794>

assume heavy duty vehicles fueled by diesel, certified to MY 2010 emissions standards

diesel truck, regional route	1,755	g CO <sub>2</sub> e/mi
average miles per load	900	miles
gals per load	3000	gals
Total CO <sub>2</sub> e per load	1,17	lbs CO <sub>2</sub> e/gal

**Outputs: Emissions from Combustion of Gasoline**

[https://www.epa.gov/sites/production/files/2015-07/documents/emission-factors\\_2014.pdf](https://www.epa.gov/sites/production/files/2015-07/documents/emission-factors_2014.pdf)

Gasoline	lb/gal	MT/gal
CO <sub>2</sub>	8.78	0.00878
CH <sub>4</sub>	0.00038	0.00000038
N <sub>2</sub> O	0.00038	0.00000038

**Global Warming Potential for 100-yr**

<https://epa.epa.gov/WAC/default.aspx?cde=173-441-040>

CO <sub>2</sub>	1
CH <sub>4</sub>	25
NO <sub>2</sub>	298