Yukon Energy Facts 2022

Highlights:

- In 2021, Yukon generated 571,511 mega-watt hours (MWh) of electricity, of which 506,076 MWh was from hydro (88.6%), 43,890 MWh was from diesel (7.7%), and 21,545 MWh was from natural gas (3.8%).
- Of the 461,871 MWh of electricity sold in Yukon in 2021, sales to non-residential customers accounted for 55.4%, while sales to residential customers accounted for 44.6%.
- The value of electricity sales to ultimate customers in 2021 totalled \$67.0 million; an increase of \$830,000, or 1.3%, compared to 2020.

2022

_			Installed
Type of			Capacity,
Generation	Location	Ownership	2022 (MW)
	Whitehorse	YEC	40.5
Uudro plante	Aishihik	YEC	37.0
Hydro plants	Mayo	YEC	15.1
	Fish Lake	ATCO	1.4
LNG facilities	Whitehorse	YEC	13.2
	Whitehorse	YEC	10.8
	Faro	YEC	7.5
	Dawson	YEC	6.2
	Watson Lake	ATCO	6.4
	Mayo	YEC	2.5
	Old Crow	ATCO	2.1
	Haines Junction	ATCO	1.8
Diesel facilities	Carmacks	ATCO	1.6
	Teslin	ATCO	1.5
	Destruction Bay	ATCO	1.3
	Pelly Crossing	ATCO	1.2
	Beaver Creek	ATCO	1.1
	Ross River	ATCO	1.0
	Swift River	ATCO	0.2
	Stewart Crossing	ATCO	0.2
Total			152.5

Installed Electricity Generating Capacity, Yukon, 2022

Sources: Yukon Energy Corporation and ATCO Electric Yukon. Note: Electricity generation by industry is not included.

Did you know?

- In 2022, the energy sector contributed \$71.1 million (chained (2012) dollars) towards Yukon's overall Gross Domestic Product (GDP) (\$3,029.9 million), a decrease of \$1.3 million, or 1.8%, compared to the revised 2021 figure (\$72.4 million).
- In 2022, Yukon's energy sector jobs (140) accounted for 0.5% of all jobs (26,220).

(Jobs in electric power generation, transmission and distribution made up the total number of jobs in the 2021 Energy sector.)

Sources: Statistics Canada, data tables 36-10-0402-01 and 36-10-0489-01.

- In 2022, Yukon had a total installed generating capacity of 152.5 megawatts (MW) — Yukon Energy Corporation had an installed capacity of 132.8 MW, or 87.1% of the total; and ATCO Electric Yukon had an installed generating capacity of 19.7 MW, or 12.9% of the total.
- Of the total installed generation capacity of 152.5 MW, hydro plants had an installed capacity of 94.0 MW, or 61.6%; LNG plants had an installed capacity of 13.2 MW, or 8.7%; and diesel plants had an installed capacity of 45.3 MW, or 29.7%.
- In 2022, installed electricity generating capacity has decreased by 0.7 MW, or 0.4%, compared to installed electricity generating capacity in 2021 (153.1 MW).
- The generation capacity of the hydro plants reduces substantially in the winter when the water flow is decreased. The winter generation capacity of the thermal plants (LNG and diesel) also reduces as temperature falls.

Did you know?

- In the last 10 years, annual changes in the energy aggregate price index ranged from a decrease of 14.4% in 2015 to an increase of 23.2% in 2022.
- Comparing 2022 to 2013, the energy aggregate price index increased by 36.7% in Whitehorse.

(Special aggregate of energy (CPI) includes: electricity;natural gas; fuel oil and other fuels; gasoline; and fuel, parts and accessories for recreational vehicles) Source: Statistics Canada, data table 18-10-0005-01.

Electric Utilities Generation by Type, Canada, Provinces and Territories, 2021



Source: Statistics Canada, data table 25-10-0020-01.





Source: Statistics Canada, data table 25-10-0020-01.

Note: Electricity generation by industry is not included.

- In 2021, Yukon ranked the sixth-lowest in the country in thermal generation as a percentage of total electricity generated by electric utilities (11.4%).
- Nationally, 33.5% of electricity was produced using thermal generation in 2021.
- Between 2012 and 2021 (inclusive), the percentage of Yukon's thermal generation has fluctuated from a low of 5.2% in 2013 and 2014, to a high of 19.6% in 2019.
- Compared to 2012, electricity produced from thermal generation in 2021 increased by 41,070 MWh, or 168.6%.

Thermal Plant Generation of Electric Utilities



Source: Statistics Canada, data table 25-10-0019-01.

Electric Utilities Generation by Type, Yukon, 2012 to 2021

	2012	2013	2014	2015	2016 Megawa	2017 att hours	2018	2019	2020	2021
Total all types of electricity generation	455,004	448,558	433,686	447,879	446,998	484,818	477,850	467,636	532,078	571,511
Hydraulic turbine	430,194	424,990	410,668	421,696	419,461	448,151	418,510	375,783	440,580	506,076
Wind power turbine	445	277	334	650	509	33	0	0	0	0
Thermal combustion generation	24,365	23,291	22,684	25,533	27,028	36,634	59,340	91,853	91,498	65,435
Diesel	24,365	23,291	22,684	24,238	23,777	26,778	29,210	25,639	43,784	43,890
Natural gas			0	1,295	3,251	9,856	30,130	66,065	47,714	21,545

Sources: Statistics Canada, data tables 25-10-0019-01 and 25-10-0020-01.



Note: Wind power is not added to the chart as the MWh of electricity produced from wind power are either zero or too small to be visible.

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- Comparing 2021 to 2020, Yukon's total electricity production grew by 39,433 MWh, or 7.4%.
- Comparing 2021 to 2012, Yukon's total electricity production increased by 116,507 MWh, or 25.6%.
- In 2021, Yukon produced 506,076 MWh of electricity from hydro generation, which was the largest amount from hydro generation during the period from 2012 to 2021.
- Comparing 2021 to 2020, hydro generation increased by 65,496 MWh, or 14.9%; diesel generation increased by 106 MWh, or 0.2%; and LNG generation decreased by 26,169 MWh, or 54.8%.

Monthly Electricity by Type of Generation, Yukon, 2022



- During the generally colder months of January, February, November and December, the average monthly percentage of total electricity generation from combustible fuels was 18.8% in 2022.
- During the generally warmer months from May to August, the average monthly percentage of total electricity generated by hydraulic turbine was 95.4% in 2022.
- In 2022, the smallest percentage of total electricity from combustible fuels was generated in August at 4.0%

- More electricity was generated during the winter months from both hydraulic turbines and combustible fuels.
- Between 2018 and 2022, generation from hydraulic turbines varied from a low of 21,498 MWh in May 2019, to a high of 50,330 MWh in December 2022.
- Generation from combustible fuels varied from a low of 1,336 MWh in June 2021, to a high of 20,801 MWh in January 2020.
- Of the total generation in 2022, the percentage of electricity generated by hydro peaked in August at 96.0% of the total, while that from combustible fuels peaked in December at 26.5%.



Micro-generation Program, Yukon, 2013 to 2022



Note: Photovoltaic (PV) panel systems with a generating capacity of 0.4 kilowatts-peak (kWp) , when working at maximum capacity for one hour, can generate up to 0.4 kWh (kilowatt-hours) or 0.0004 MWh (megawatt-hours) of electricity.

- In 2022, there were 647 solar electric systems operating in Yukon under the Micro-generation Program with a peak generating capacity of 7,564.9 kWp, or the approximate equivalent of 7,564.9 MWh per year.
- Although actual total generation from these solar energy systems is unavailable, the systems added a total of 2,838.0 MWh of surplus energy to Yukon's electrical grid in 2022; 2,250.8 KWh was added in 2021.
- Exported solar energy added to Yukon's electrical grids, including diesel mini-grid communities, from the Microgeneration Program, represented about 0.4% of the total electricity generated in Yukon in 2022.

Did you know?

 The Old Crow Solar Project became fully operational in August 2021. The project is providing electricity for the community while reducing diesel use by about 190,000 litres per year.
 Source: https://www.canada.ca/en/northern-economic-development/news/2022/08/northern-fly-in-community-of-old-crowcontinues-to-strengthen-and-diversify.html

Electricity Generation and Sales to Ultimate Customers, Yukon, 2012 to 2021

	2012	2013	2014	2015	2016 (M	2017 Wh)	2018	2019	2020	2021
Total generation of electricity	455,004	448,558	433,686	447,879	446,998	484,818	477,850	467,636	532,078	571,511
Total sales of electricity to ultimate customers	396,435	393,278	385,400	393,483	398,724	429,806	421,373	423,121	450,041	461,871



Sales of Electricity, Yukon, 2012 to 2021



Source: Statistics Canada, data table 25-10-0021-01.



• Between 2012 to 2021 (inclusive), an average of 87.3% of all electricity generated in Yukon was sold to ultimate Yukon customers; nationally, an average of 76.8% of all electricity generated (includes generation by industry) was sold to customers during the same period.

- In 2021, 80.8% of all electricity generated in Yukon was sold to ultimate Yukon customers.
- The number of MWh sold over the past ten years, fluctuated from a low of 385,400 MWh in 2014, to a high of 461,871 MWh in 2021.
- Comparing 2021 to 2020, the total sales of electricity to ultimate customers, increased by 11,830 MWh, or 2.6%; compared to 2012, the 2021 total sales increased by 65,436 MWh, or 16.5%.
 - A total of 461,871 MWh of electricity was sold in Yukon in 2021 — sales to nonresidential customers accounted for 55.4% (255,978 MWh) and sales to residential customers accounted for 44.6% (205,893 MWh).
 - Compared to 2020, the 2021 sales to non-residential customers (255,978 MWh) increased by 8,503 MWh, or 3.4%, while sales to residential customers (205,893 MWh) increased by 3,327 MWh, or 1.6%.
 - Compared to 2012, the 2021 sales to non-residential customers (255,978 MWh) increased by 22,995 MWh, or 9.9%, while sales to residential customers (205,893 MWh) increased by 42,441 MWh, or 26.0%.
 - The value of electricity sales to ultimate customers in 2021 totalled \$67.0 million; an increase of \$830,000, or 1.3%, compared to 2020.
 - Comparing 2021 to 2020, sales to nonresidential customers (\$38.0 million) increased by \$308,000, or 0.8%, while sales to residential customers (\$29.0 million) increased by \$522,000, or 1.8%.

Source: Statistics Canada, data table 25-10-0021-01.

Energy Use, Supply and Demand by Type of Fuel (in natural units), Yukon, 2012 to 2021

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
				(megaliti	res unless	otherwise	e noted)			
Energy Supply										
Primary electricity production, hydro (GWh)	430.6	425.3	411.0	422.3	420.0	448.2	418.5	375.8	440.6	506.1
Secondary electricity production, thermal (GWh)	х	х	6.1	6.9	7.4	9.3	13.9	21.8	22.8	16.8
Natural gas transformed to electricity by utilities										
(gigalitres)			0.0	0.4	0.9	1.9	6.0	15.0	10.8	4.9
Diesel transformed to electricity by utilities	х	х	6.1	6.5	6.5	7.4	7.9	6.8	12.0	11.9
Final Use Energy Demand										
Gas plant natural gas liquids (NGLs)	14.4	13.2	11.2	10.8	9.9	12.4	15.2	19.6	18.1	16.8
Primary electricity, hydro (GWh)	396.5	393.3	378.7	394.0	399.3	430.5	421.8	423.6	458.6	466.1
Total refined petroleum products	213.3	193.2	159.3	171.2	174.7	175.6	211.1	215.7	178.3	201.5
Motor gasoline	х	х	х	х	х	х	х	98.8	85.0	76.1
Kerosene and stove oil	20.6	17.4	6.5	6.6	х	х	х	4.9	2.8	2.8
Diesel fuel oil	х	х	х	х	х	х	х	86.4	73.6	102.8
Light fuel oil	13.5	13.0	6.5	6.2	6.4	6.7	6.8	6.8	7.1	7.8
Heavy fuel oil	Os	0s	0s	0s	0s	0s	0s	0s	0s	0s
Aviation gasoline	0.9	1.1	0.6	0.5	1.0	х	х	1.1	0.5	1.4
Aviation turbo fuel	14.8	13.4	13.8	13.6	16.4	х	х	17.6	9.4	10.6
0s = value rounded to 0 (zero) where there is a meaningful disti	nction betwee	n true zero	and the vo	alue that w	as roundea	1				
Source: Statistics Canada, data table 25-10-0030-01										

• Compared to 2020, the final demand for: natural gas liquids, (generally representing propane) decreased by 1.3 megalitres (7.2%); hydro electricity increased by 7.5 gigawatt hours (1.6%); and refined petroleum products increased by 23.2 megalitres (13.0%) in 2021.

megalitres



 In 2021, the final demand for natural gas liquids (16.8 ML) consisted of 7.1 ML (42.3%) used by commercial and other institutional sectors; 4.5 ML (26.8%) used by the industrial sector; 3.4 ML used by the residential sector (20.2%); and 1.7 ML used by the transportation sector (10.1%).

• The final demand for hydro energy in 2021 (466.1 GWh) consisted of 205.9 GWh (44.2%) used by the residential sector; 200.7 GWh (43.1%) used by commercial and other institutional sectors; 55.4 GWh (11.9%) used by the industrial sector; and 4.1 GWh (0.9%) by public administration.





Source: Statistics Canada, data table 25-10-0030-01.

Energy Use, Final Demand by Type of Fuel (in terajoule¹ units), Yukon, 2012 to 2021

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Primary Energy ²					(terrajo	ules)				
Gas plant natural gas liquids (NGLs)	366	334	283	273	252	315	385	495	458	426
Primary electricity, hydro	1,427	1,416	1,363	1,419	1,437	1,550	1,518	1,525	1,651	1,678
Secondary Energy ³										
Total refined petroleum products	7,921	7,173	5,874	6,318	6,421	6,462	7,774	7,916	6,412	7,340
Motor gasoline	x	х	х	х	х	х	х	3,458	2,845	2,544
Kerosene and stove oil	778	654	244	247	х	х	х	186	104	105
Diesel fuel oil	х	х	х	х	х	х	х	3,311	2,821	3,944
Light fuel oil	523	503	253	239	250	259	264	265	275	302
Heavy fuel oil	1	1	1	1	1	1	1	0	0	0
Aviation gasoline	31	38	20	17	34	х	х	37	16	48
Aviation turbo fuel	554	501	516	509	613	х	х	658	351	397
Total primary and secondary energy	9,732	8,941	7,521	8,010	8,110	8,326	9,677	9,938	8,523	9,444

1 Rather than using "natural" units (e.g., volume, weight), energy sources can be measured according to their energy content – this allows comparison between energy sources. Terajoule is unit of measurement of such energy.

2 Primary fuels are the fuels that are found in nature and can be extracted, cleaned or graded, without any sort of energy conversion or transformation process. 3 Secondary fuels are the fuels that are derived from primary fuels or fuels through chemical or physical process.

Source: Statistics Canada.data table 25-10-0029-01.







- Of the 2021 data available on primary and secondary energy consumption in terajoules (TJ): refined petroleum products (7,340 TJ) accounted for 77.7% of the final demand; hydro electricity (1,678 TJ), 17.8%; and NGLs (propane, 426 TJ) accounted for 4.5% of the final demand.
- In 2021, the distribution of final energy demand for all types of fuel by sector was as follows: transportation (4,473 TJ or 47.4%); industrial (2,864 TJ or 30.3%); commercial and other institutional (1,130 TJ or 12.0%); residential (831 TJ or 8.8%); and public administration (142 TJ or 1.5%).
- Within the industrial sector, mining accounted for 87.8% of total industrial energy use; manufacturing for 9.3%; and construction accounted for 2.9% of the total industrial energy use.
- Within the transportation sector, retail pump sales accounted for 51.9% of total transportation sector; road transport and urban transit accounted for 39.7%; and airlines accounted for 8.4% of final energy demand in the transportation sector.

Yukon Motor Vehicle Registrations, 2018 to 2022

	2018	2019	2020	2021	2022	¹ Registration counts exclude dealer, rental and special registrations, dump
Total ¹	43,581	44,955	45,411	46,777	45,906	trucks, platform trucks, etc.
Trucks ²	20,599	21,104	21,297	22,043	21,626	motorhomes,
Passenger cars	19,350	20,056	20,288	20,765	20,339	by-sides, dirt bikes, etc.
Off-road vehicles ³	1,330	1,426	1,504	1,558	1,483	nations, territorial and municipal
Motorcycle	1,226	1,276	1,279	1,322	1,334	Noto: Pogistration figures represent
Snowmobiles	773	779	802	837	812	data as of December 31 for each year.
Bus	303	314	241	252	312	Source: Yukon Bureau of Statistics.

Registered Motor Vehicles

- In 2022, a total of 45,906 motor vehicles were registered in Yukon — over one vehicle per person.
- Of the total vehicles registered in 2022 in Yukon, private owners registered 79.5% of vehicles (36,516); commercial, farm and society organizations registered 15.3% of vehicles (7,036); and government⁴ organizations registered 5.1% of vehicles (2.354).



- In 2022, the majority of registered vehicles in Yukon used fossil fuels.
 38,675 vehicles, or 84.2%, used
- 38,675 vehicles, or 84.2%, used only gasoline; 6,420, or 14.0%, used only diesel; 390, or 0.8%, were gasoline/electric hybrids; 111, or 0.2%, were electric, and 310, or 0.7%, used other or mixed fuel types.
- As of December 31, 2022, there were 12 level 3 (DC fast charging) stations in Yukon.

Yukon Fossil Fuel Consumption by Type of Use, 2012 to 2021

		_						
	Gasoline	Diesel				Diesel for	LNG for	
Year	for	for	Aviation	Fuel for	Heating	electricity	electricity	Total
	on-road use	on-road use	fuel ¹	off-road use ²	fuel ³	generation ⁴	generation ⁴	
			-	megalitres (litres	x 1,000,000) ·			
2012	64.3	59.5	17.3	38.9	58.0	7.1	0.0	245.1
2013	63.8	54.2	15.2	36.7	53.1	6.7	0.0	229.8
2014	63.5	53.7	16.6	31.4	51.3	6.5	0.0	223.0
2015	67.5	54.8	19.2	20.6	41.8	7.0	0.5	211.6
2016	71.5	54.3	17.4	23.0	45.7	6.8	1.3	220.0
2017	72.5	53.2	18.1	24.3	61.5	7.7	3.8	241.0
2018	72.5	62.4	19.6	28.3	59.4	8.3	11.7	262.1
2019	73.0	60.9	19.3	23.2	53.8	7.3	24.8	262.6
2020	62.0	62.2	6.8	35.5	59.8	12.1	17.9	256.4
2021	66.3	62.7	12.1	43.4	59.9	11.5	8.1	264.0

Megalitres

¹ Aviation fuel includes aviation gasoline and jet fuel

and jet fuel. ² Fuel for off-road use includes tax exempt gasoline and diesel (e.g. fuel used for mining, farming and outfitting).

 ³ Heating fuel includes heating oil and liquid petroleum gas (propane).
 ⁴ Diesel and LNG for electricity generation

^a Diesei and LNG for electricity generation is estimated from public data on electricity generation and exempt fuel permits for electricity generation.

Source: Yukon Bureau of Statistics.

- In the last 10 years, from 2012 to 2021, overall fossil fuel consumption increased by 18.9 megalitres, or 7.7%.
- In 2021, fuels for on-road use accounted for 129.0 megalitres, representing 48.9% of the Yukon's total fossil fuel consumption.
- Comparing 2021 to 2012, there was a 12.5 megalitres, or 175.2%, increase in the use of LNG and diesel for electricity generation.
- Yukon's consumption of aviation fuel increased by 5.3 megalitres, or 78.8%, from 6.8 megalitres in 2020 to 12.1 megalitres in 2021. However, this consumption remained below pre-pandemic levels.





Private Dwellings Occupied by Usual Residents, Yukon, 1961 to 2021 Censuses





Source: Statistics Canada, data table 98-10-0039-01

- In the 2021 Census, there were 17,180 private dwellings in Yukon, a 12.9% increase compared to the previous census in 2016.
- The intercensal growth between the 2016 and 2021 censuses (12.9%) was preceded by an 7.8% increase between 2016 and 2011; and an 11.9% increase between 2011 and 2006.

Heating Sources in Residential Dwellings, Yukon, 2022

Property Type	Total	Elec	tric	o	il	Prop	pane	Multi-s	ources	Oth	ner ¹	Incom Inform	plete ation ²
rioperty rype	number of	# of	%	# of	%								
	dwellings	dwelling	of total	dwelling	of total								
Single detached house	8,552	1,652	19.3%	4,702	55.0%	558	6.5%	77	0.9%	296	3.5%	1,267	14.8%
Semi-detached house	1,017	270	26.5%	685	67.4%	53	5.2%	1	0.1%	5	0.5%	3	0.3%
Townhouse/row house	897	784	87.4%	113	12.6%	0		0		0		0	
Mobile home	838	78	9.3%	598	71.4%	138	16.5%	0		16	1.9%	8	1.0%
Condo Apartment	744	664	89.2%	59	7.9%	0		0		0		21	2.8%
Single dwelling in mixed-use property	35	6	17.1%	6	17.1%	5	14.3%	1	2.9%	1	2.9%	16	45.7%
Single dwelling - unknown type	1,600	342	21.4%	1,132	70.8%	39	2.4%	6	0.4%	3	0.2%	78	4.9%
Multiplex (duplex, triplex, fourplex, etc.)	498	62	12.4%	379	76.1%	28	5.6%	5	1.0%	2	0.4%	22	4.4%
Apartment building	371	236	63.6%	112	30.2%	19	5.1%	0		0		4	1.1%
Multiple detatched/attached in a single property	3,033	196	6.5%	747	24.6%	42	1.4%	1,633	53.8%	94	3.1%	321	10.6%
Multiple dwellings - unknown type	1,775	411	23.2%	995	56.1%	26	1.5%	34	1.9%	0		309	17.4%
All dwellings	19,360	4,701	24.3%	9,528	49.2%	908	4.7%	1,757	9.1%	417	2.2%	2,049	10.6%

x data suppressed

not applicable

Other includes wood, hot water or steam from undefined sources, and other unspecific sources.

² Incomplete information includes dwellings without specific and/or updated information on heating system.

• In 2022, of the 19,360 dwellings in Yukon, 9,528 dwellings (49.2%) used oil-based heating, 4,701 (24.3%) used electricity-based heating and 908 (4.7%) used propane-based heating; 1,757 (9.1%) used multiple heating sources.

• At least 53.9% of residential dwellings used fossil fuels as a heating source in 2022.

Average Expenditure per Household, Selected Energy Components, Territorial Capitals, Survey of Household Spending, 2015 to 2019

	Whitehorse YT			۱ ۱	ellowkni/ NWT	fe	lqaluit NU		
	2015	2017	2019	2015	2017	2019	2015	2017	2019
					\$				
Fuel and Electricity for									
Principal Residence									
Electricity	1,645	1,518	1,553	2,430	2,391	2,534	1,692	1,240	994
Other Fuels ¹	1,557	1,412	1,619	2,198	2,153	2,589	1,412	958	761
Transportation Expenditures									
Gas & other fuels (all vehicles and tools)	2,603	1,853	2,837	1,748	1,850	2,569	2,395	2,073	1,743



¹ For heating and cooking (example: oil, propane, wood, other fuels)

Source: Statistics Canada, data table 11-10-0233-01.



² Includes electricity and fuel used for heating and cooking.

Combined Average Shelter Expenditures² for Principal Residence, Territories, 2015 to 2019

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Yuko

\$5,123

2015

2017

2019

Source: Yukon Bureau of Statistics.