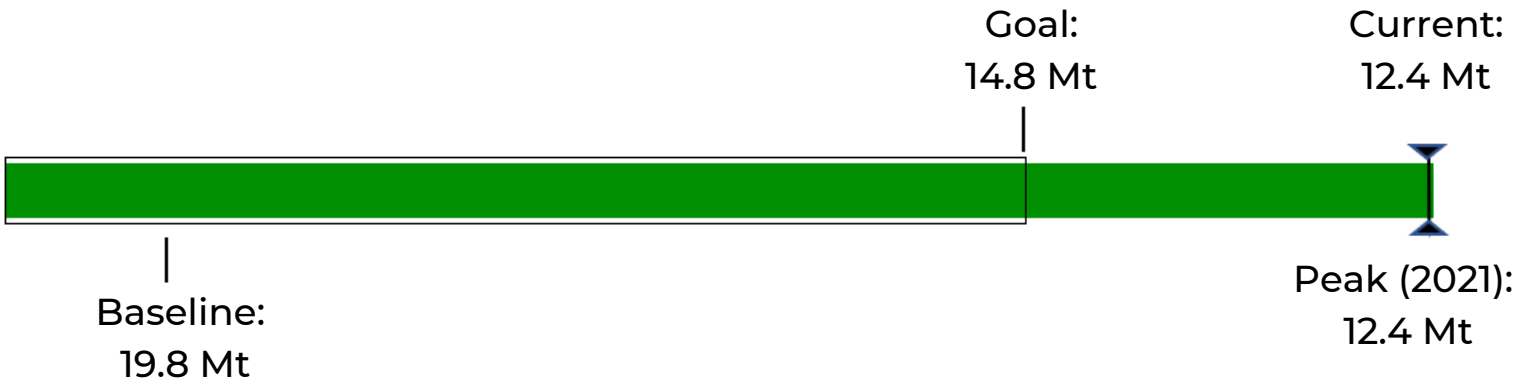
GREENHOUSE GAS EMISSIONS

STATUS: EXCEEDING

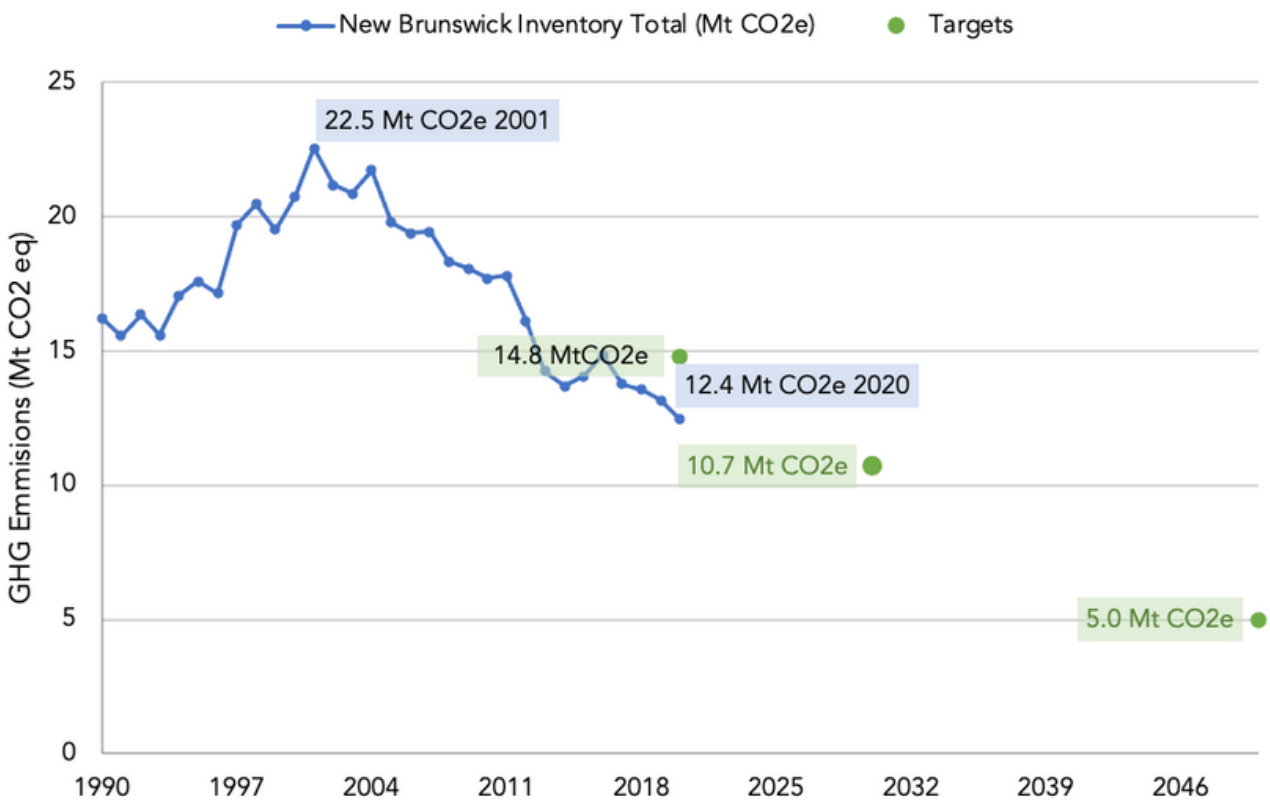


New Brunswick will aim to reduce greenhouse gas emissions 46% below 2005 levels by 2030 and 75% below 2005 levels by 2050.

BoostNB.com

Updated: June, 2022

Figure 1: Canada vs. New Brunswick Labour Force Participation Rate



(See full data in Appendix A)

HIGHLIGHTS

- New Brunswick will aim to reduce greenhouse gas emissions 46% below 2005 levels by 2030 and 75% below 2005 levels by 2050.
- New Brunswick has implemented over 100 action items to address and initiate a sustainable movement towards reducing emissions in their Transitioning to a Low-Carbon Economy plan
- In 2020, New Brunswick and Nova Scotia were the only provinces that had reduced their emissions enough to align with the Paris agreement targets, showing a 37% and 36% reduction since 2005.
- New Brunswick is a leader in lowering GHGs emitted nationally.

OVERVIEW

Importance

Emitting greenhouse gases (GHG) accelerates the rising global temperature. Once greenhouse gases are released into the atmosphere, they remain there for many years, trapping heat, and accelerating climate change. New Brunswick has implemented over 100 action items to address and initiate a sustainable movement towards reducing emissions in their Transitioning to a Low-Carbon Economy plan [1]. Climate change poses a risk to the natural resources in NB, and therefore to the economy as well.

Problem

New Brunswick is already experiencing the implications of climate change, largely due to the amount of greenhouse gasses being emitted worldwide. Although New Brunswick produces a very small portion of global emissions -with Canada only representing about 1-2%- the province can be seen as a national leader in emission reduction. Yet, despite major reductions, the province's annual temperature has risen by 1.1° Celsius over the past 30 years, showing the global scale of this issue. The Intergovernmental Panel on Climate Change expects a rise in temperature over 2° Celsius, which would have irreversible consequences. With rising temperatures comes rising sea levels, risks of flooding and erosion, and extreme weather events that do permanent damage.

Cause

New Brunswick relies on sectors that produce and emit greenhouse gases to stimulate economic growth. The provinces largest emitting sectors are oil and gas, transportation, and electricity, respectively which are large contributors to the New Brunswick economy. The refinery in New Brunswick is the largest in Canada and therefore plays a significant role in both the provinces emissions and economy. Transportation has been necessary to connect rural and urban parts of the province, so continues to be a large emitter, and, while electricity generation has also been a large contributor to New Brunswick's emissions until recently, with coal-fired plants being the main contributors, the closure of the Belledune plant in 2030 should reduce emissions coming from this sector [1].

[1] https://www2.gnb.ca/content/dam/gnb/Departments/env/pdf/ClimateClimatiques/TransitioningToALowCarbonEconomy.pdf

IN THE NUMBERS

New Brunswick's Emissions and Targets

As shown in Figure 1, New Brunswick’s emissions peaked in the early 2000s; and in 2005, the year of the Paris Agreement, New Brunswick was emitting 20 Megatonnes of CO2 equivalent (Mt CO2e). Following the Paris Agreement, emissions in New Brunswick decreased to 12.4 Mt CO2e in 2020, a 37% reduction. New Brunswick aimed to reduce emissions below 14.8Mt CO2e in 2020 and has succeeded. Yet, it still needs to further reduce emissions below 2020 levels by 14% by 2030 and 60% by 2050 to achieve emission targets. Currently, New Brunswick is progressing on track to reduce its emissions and do its part in limiting

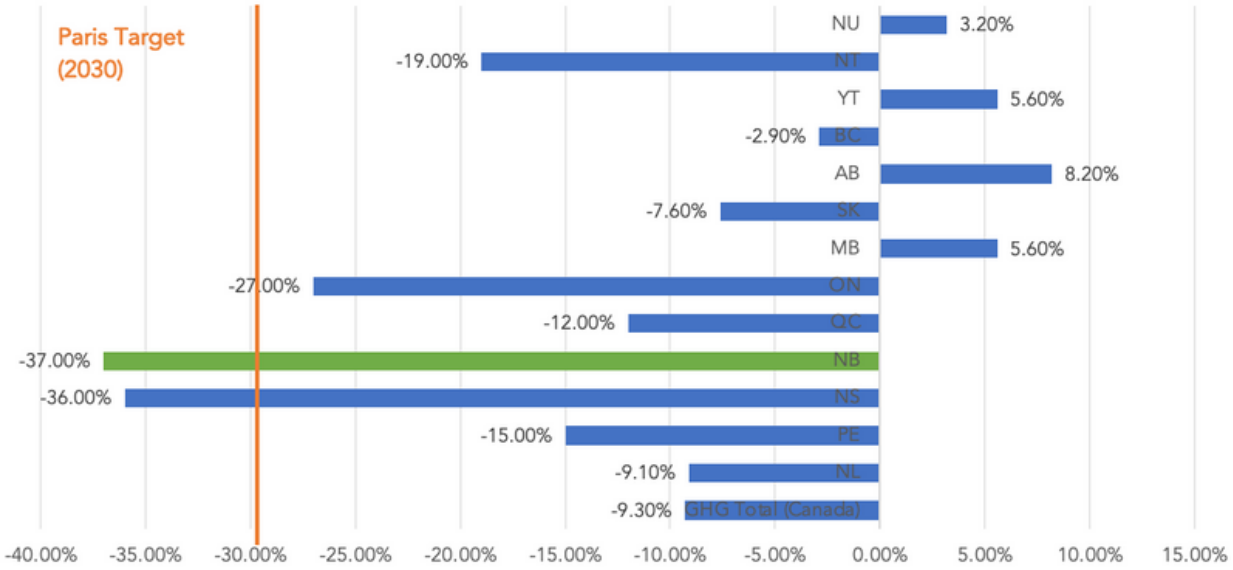
climate change. The reduction in emissions since the early 2000s has come from reduced coal and oil consumption for electricity generation. New Brunswick plans to implement carbon taxes and clean technologies to become more energy efficient while encouraging sustainable economic development and creating jobs to reach these future targets.

New Brunswick increased its carbon pricing from $30 per tonne to $40 per tonne in 2021 and again from $40 per tonne to $50 per tonne on April 1st, 2022, as per the federal backstop on carbon pricing. The most recent increase raised gas prices by 2.21 cents per litre, while diesel increased by 2.68 cents per litre [2]. The province is required to have the federal set carbon price at $170 per tonne by 2030, which will further increase gas prices. This carbon pricing could promote emissions reductions if revenue generated from carbon pricing is used in proactive ways.

Emissions Reductions by Province and Territory since 2005

Based on the 2022 National Inventory Report [3], Canada plans to reduce its emissions by 32-40% of 2005 levels by 2030. This comes in alignment with the Paris Agreement, where Canada pledged to reduce emissions 30% below 2005 levels. In 2020, New Brunswick and Nova Scotia were the only provinces that had reduced their emissions enough to align with these targets, showing a 37% and 36% reduction since 2005. These reductions have come from specific actions such as shutting down coal-fired plants, converting to more renewable energy, and implementing more energy-efficient infrastructure.

Figure 3: New Brunswick Labour Force Participation by Age Group



(See full data in Appendix B)

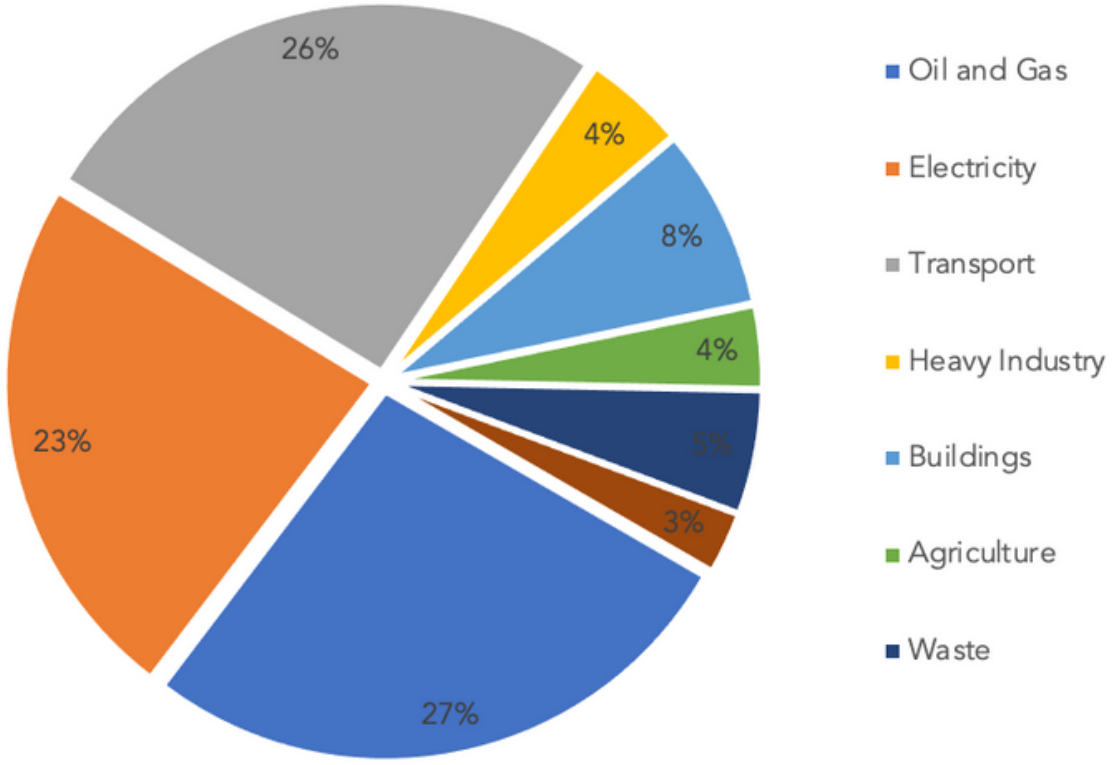
A CLOSER LOOK

Figure 3 illustrates the main contributors to New Brunswick's GHG emissions in 2020. The province sees 26% of its emissions coming from transportation, with emissions from this sector totalling 3.2 Megatonnes CO2 equivalent (Mt CO2e). New Brunswick is in the process of improving its public transit accessibility and its green transportation policies, which would reduce emissions coming from transportation. With a high proportion of the population coming from outside the cities, emissions reductions within this sector may come from urban reform, reduction of rural populations, and high-density cities. New Brunswick also aims to increase the number of electric vehicles on the road while providing incentives to convert to electric cars and minimize the emissions coming from freight trucks.

New Brunswick's highest source of emissions of GHG is oil and gas, at 27%. New Brunswick is in the progress of reducing emissions in this

sector by limiting the amount of oil and gas fuels used for public building heating. Electricity is the third-highest emitting sector, at 23%. The emissions coming from electricity have been significantly reduced since 2001, when they reached their highest point at 10.5Mt CO2e. Currently, 80% of NBPower's generation is coming from non-emitting sources, like the nuclear plant in Lepreau. Emissions from electricity come from coal-fired plants that are only used as peak demand and backup generation facilities. They do, however, employ a large amount of the population in the surrounding rural communities, so elimination of these plants would be felt.

Figure 3: GHG Emissions for New Brunswick by Canadian Economic Sector (2020)



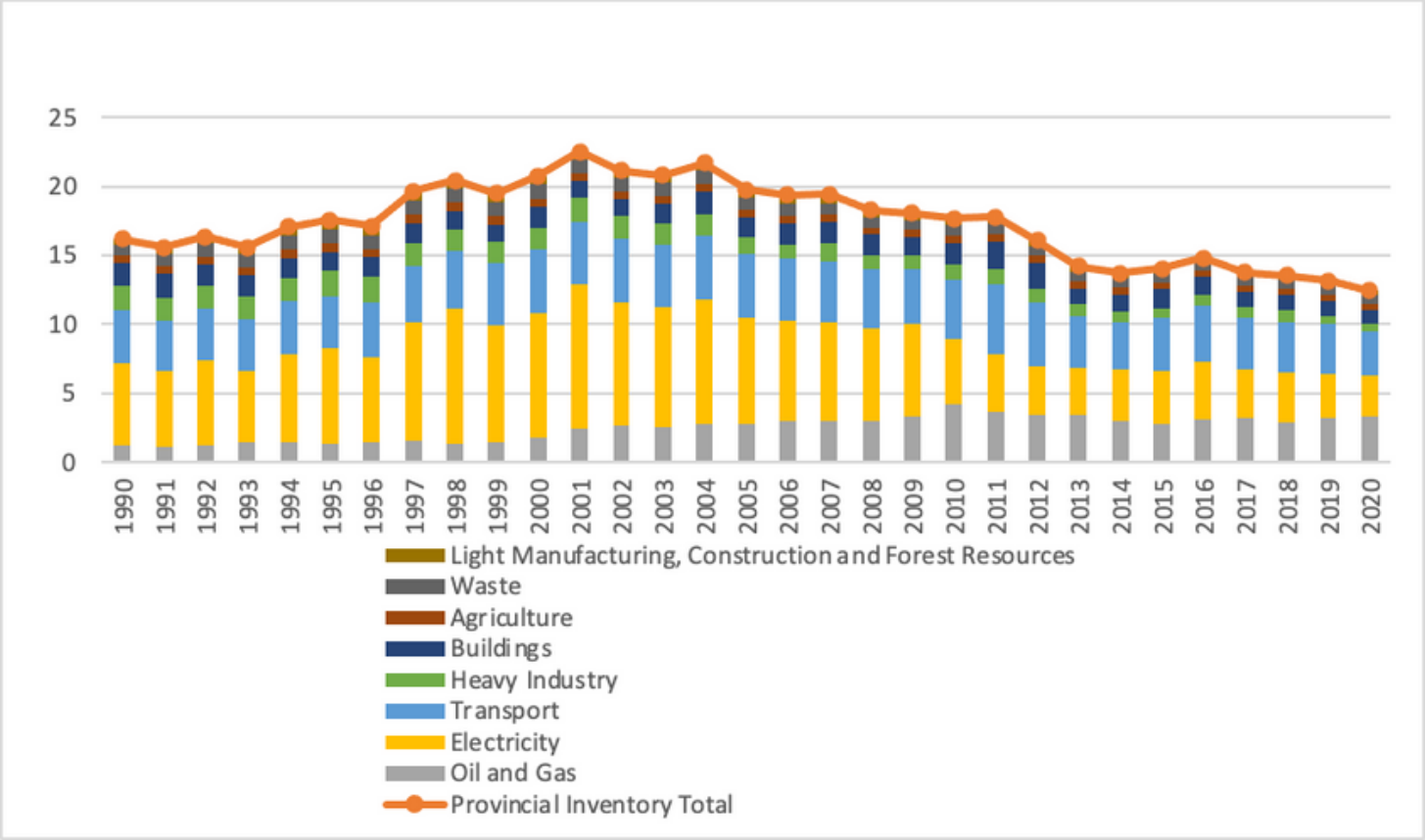
(See full data in Appendix C)

As seen in the breakdown of New Brunswick's emissions since 1990 (Figure 4), the sectors emitting GHGs have shifted over time. Electricity used to be the largest contributor, producing 46% of emissions in 2001. New Brunswick has since seen a decreasing trend in emissions from

the oil and gas sector have been increasing. Since 2001, New Brunswick's oil and gas emissions have grown from 2.4Mt CO2e to 3.4Mt CO2e. New Brunswick's 2019 report, Holding Large Emitters Accountable, outlines how NB is acting on reducing emissions coming from large emitters in the industrial and electricity generation sectors, through carbon pricing [3].

Emissions from transportation have stayed consistent since the early 1990s. Emissions from this sector are challenging to reduce, as transportation is necessary to connect urban and rural New Brunswick. As well, the province is reliant on road/truck transportation due to the lack of rail infrastructure in the rest of the country. The main sectors - Transport, Oil and Gas, and Electricity - have room to continue reducing emissions to reach future targets.

Figure 4: GHG Emissions in New Brunswick by Sector Breakdown



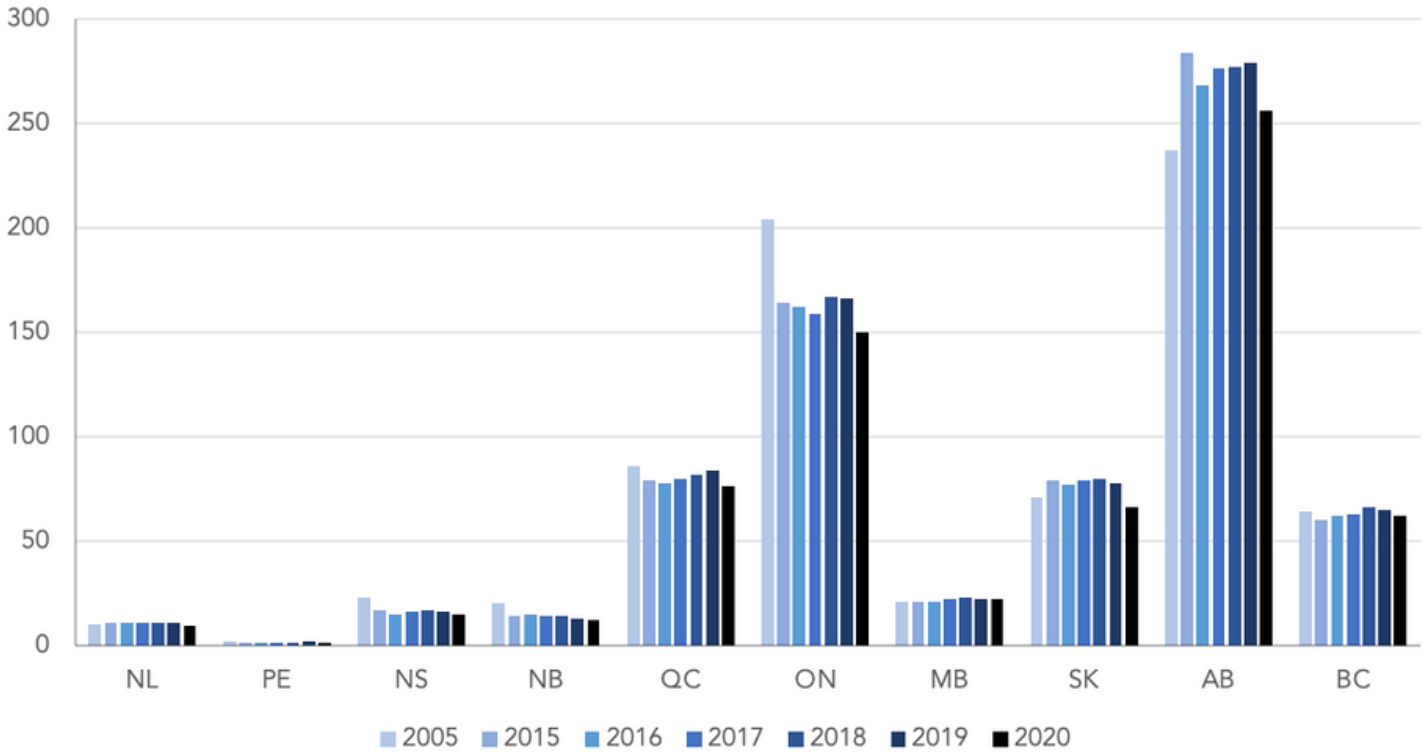
(See full data in Appendix D)

[4].https://www2.gnb.ca/content/dam/gnb/Departments/env/pdf/ClimateClimatiques/HoldingLargeEmittersAccountable.pdf

GHG Emissions: Canadian Provinces (2020)

When looking at New Brunswick in comparison to the rest of Canada, New Brunswick is a leader in lowering GHGs emitted nationally. Alberta emits the most GHGs and has seen a significant increase in emissions since 2005. The Atlantic region has seen a downward trend in emissions since 2005 and collectively produces only about 6% of Canada's emissions. Unfortunately, this is a global battle, and to limit the implications of climate change, all parties need to buy in to reducing emissions.

Figure 5: Canadian Provinces' GHG Emissions (Mt CO2 eq)



(See full data in Appendix E)

SUMMARY

Greenhouse gas emissions in the province have been decreasing since the early 2000s. Through several province-wide actions, NB has been able to move away from and reduce emissions from various sectors. New Brunswick has succeeded in reducing and limiting its greenhouse gas emissions in alignment with Canada's reduction targets, as well as with the 2005 Paris Agreement.

Our province could face irreversible damages from climate change if the temperature continues to rise. Moving towards green technologies and lifestyles provides the opportunity for economic growth through job creation while encouraging both private and public investments.

APPENDIX A

New Brunswick's GHG Emissions and Targets

Year	New Brunswick Inventory Total (Mt CO2 eq)	Targets
1990	16.21803936	
1991	15.56280391	
1992	16.34375426	
1993	15.58914536	
1994	17.05510586	
1995	17.59465015	
1996	17.14062122	
1997	19.67795822	
1998	20.45915183	
1999	19.49259628	
2000	20.74725645	
2001	22.54265827	
2002	21.15922059	
2003	20.84415985	
2004	21.71134851	
2005	19.7811128	
2006	19.37640429	
2007	19.43714163	
2008	18.30983643	
2009	18.06232177	
2010	17.69217662	
2011	17.78641845	
2012	16.10435482	
2013	14.23537096	
2014	13.69122658	
2015	14.04022956	
2016	14.83634595	
2017	13.76213725	
2018	13.55964181	
2019	13.14848945	
2020	12.44090741	14.8
2030		10.7
2050		5

Source: Canada. 2022 National Inventory Report (NIR)

APPENDIX B

GHG Emission Reductions Since 2005

Province and territory	2005	2015	2016	2017	2018	2019	2020	Province and territory	Change (%)2005 to 2020
GHG Total (Canada)	741	733	715	725	740	738	672	GHG Total (Canada)	-9.30%
NL	10	11	11	11	11	11	9.5	NL	-9.10%
PE	1.9	1.6	1.6	1.6	1.6	1.7	1.6	PE	-15.00%
NS	23	17	15	16	17	16	15	NS	-36.00%
NB	20	14	15	14	14	13	12	NB	-37.00%
QC	86	79	78	80	82	84	76	QC	-12.00%
ON	204	164	162	159	167	166	150	ON	-27.00%
MB	21	21	21	22	23	22	22	MB	5.60%
SK	71	79	77	79	80	78	66	SK	-7.60%
AB	237	284	268	276	277	279	256	AB	8.20%
BC	64	60	62	63	66	65	62	BC	-2.90%
YT	0.57	0.53	0.53	0.56	0.65	0.69	0.6	YT	5.60%
NT	1.7	1.6	1.5	1.6	1.6	1.6	1.4	NT	-19.00%
NU	0.58	0.65	0.74	0.75	0.74	0.73	0.6	NU	3.20%
								Paris Target	-30.00%

Source: Canada Green House Gases Sources and Sinks (Executive Summary 2022)

APPENDIX C

GHG Emissions for New Brunswick by Canadian Economic Sector

Year	2020
Provincial Inventory Total	12.44090741
Oil and Gas	3.358985897
Electricity	2.905424946
Transport	3.202840138
Heavy Industry	0.54896473
Buildings	0.98293588
Agriculture	0.445694988
Waste	0.667599547
Light Manufacturing, Construction and Forest Resources	0.328461279

Source: GHG Emissions for New Brunswick by Canadian Economic Sector, 1990-2020

APPENDIX D

GHG Emissions in New Brunswick with Sector Breakdown

Year	Provincial Inventory Total	Oil and Gas	Electricity	Transport	Heavy Industry	Buildings	Agriculture	Waste	Light Manufacturing, Construction and Forest Resources
1990	16.21803936	1.218964001	6.01709502	3.754745795	1.778626583	1.653300696	0.544530308	0.833529983	0.407079574
1991	15.56280391	1.157263535	5.442461836	3.629210819	1.723979666	1.74024288	0.556667225	0.8619602	0.440473347
1992	16.34375426	1.253826246	6.178979557	3.670343527	1.652444587	1.606420581	0.592543146	0.90255164	0.478040328
1993	15.58914536	1.454435948	5.178265531	3.716066876	1.715735846	1.515730915	0.595135101	0.927859798	0.469664945
1994	17.05510586	1.485778966	6.335738425	3.870046832	1.674404796	1.461314907	0.607497504	0.966677125	0.613952302
1995	17.59465015	1.300564251	6.973547121	3.79794072	1.782312525	1.401728822	0.668507159	0.994685948	0.66772041
1996	17.14062122	1.499262488	6.177222188	3.961308934	1.864666342	1.344318278	0.638876008	1.010540601	0.636256004
1997	19.67795822	1.541581606	8.616363561	4.035439421	1.675199159	1.483545345	0.649932645	1.017068861	0.65368935
1998	20.45915183	1.332098121	9.854482773	4.197538185	1.524216995	1.263784193	0.66141864	1.020997447	0.598438167
1999	19.49259628	1.441922005	8.53343069	4.449315263	1.559300271	1.223777613	0.664751009	1.022756662	0.590455019
2000	20.74725645	1.816297675	8.974877892	4.607542893	1.615154881	1.478427419	0.626524298	1.022835758	0.600368802
2001	22.54265827	2.407591956	10.48000311	4.549597679	1.709072852	1.226481026	0.555739762	1.016236213	0.59557072
2002	21.15922059	2.694290697	8.939061191	4.609073373	1.602402284	1.191534242	0.579329433	1.0095982	0.529939116
2003	20.84415985	2.504571788	8.726873	4.535285003	1.548475941	1.414638549	0.587416572	0.972460256	0.551051201
2004	21.71134851	2.732430993	9.114047101	4.580078125	1.529888745	1.650557003	0.586967063	0.944881298	0.56924553
2005	19.7811128	2.72328702	7.791907043	4.580615143	1.213937937	1.447538472	0.570426449	0.923462949	0.527418822
2006	19.37640429	2.969801977	7.30343286	4.523232379	1.039217342	1.457189918	0.558350031	0.887982688	0.635644508
2007	19.43714163	2.962684727	7.169796582	4.432162999	1.343015509	1.560775044	0.530099264	0.804706728	0.632157747
2008	18.30983643	3.02339926	6.68989652	4.292778465	0.969279985	1.561170468	0.495573886	0.755957315	0.521062169
2009	18.06232177	3.360648622	6.645203399	3.979105138	0.99322186	1.328980943	0.530092429	0.735659526	0.487531807
2010	17.69217662	4.189198509	4.708450455	4.393811372	1.051313787	1.522857063	0.592054034	0.705832324	0.528659075
2011	17.78641845	3.639833381	4.250411951	5.037042952	1.14163532	1.94466495	0.579944257	0.705108925	0.487776713
2012	16.10435482	3.432111355	3.574315018	4.558386603	1.021607634	1.898653162	0.570039709	0.659363232	0.389878111
2013	14.23537096	3.390029137	3.467224985	3.788776122	0.854184871	1.130317618	0.526351024	0.657688052	0.420799155
2014	13.69122658	2.973133637	3.752716441	3.466424264	0.709711539	1.253519036	0.531689779	0.665632225	0.338399664
2015	14.04022956	2.815115796	3.845345376	3.782083636	0.738403184	1.418751357	0.443623493	0.648000437	0.34890628
2016	14.83634595	3.069808357	4.173792692	4.141315708	0.792282692	1.252120517	0.486555694	0.605936433	0.314533857
2017	13.76213725	3.254241645	3.486996889	3.741414927	0.767117967	1.088073235	0.452081826	0.626437747	0.345773018
2018	13.55964181	2.836800666	3.66236505	3.690600936	0.802550286	1.120022144	0.460679551	0.634494856	0.352128319
2019	13.14848945	3.167061925	3.237591582	3.598807574	0.620801785	1.066550329	0.453027938	0.659857433	0.34479088
2020	12.44090741	3.358985897	2.905424946	3.202840138	0.54896473	0.98293588	0.445694988	0.667599547	0.328461279

Source: GHG Emissions for New Brunswick by Canadian Economic Sector, 1990-2020

APPENDIX E

GHG Emissions in New Brunswick with Sector Breakdown

Year	NL	PE	NS	NB	QC	ON	MB	SK	AB	BC	YT	NT	NU	GHG Total (Canada)
2005	10	1.9	23	20	86	204	21	71	237	64	0.57	1.7	0.58	741
2015	11	1.6	17	14	79	164	21	79	284	60	0.53	1.6	0.65	733
2016	11	1.6	15	15	78	162	21	77	268	62	0.53	1.5	0.74	715
2017	11	1.6	16	14	80	159	22	79	276	63	0.56	1.6	0.75	725
2018	11	1.6	17	14	82	167	23	80	277	66	0.65	1.6	0.74	740
2019	11	1.7	16	13	84	166	22	78	279	65	0.69	1.6	0.73	738
2020	9.5	1.6	15	12	76	150	22	66	256	62	0.6	1.4	0.6	672

Source: Green House Gases Sources and Sinks (Executive Summary 2022)