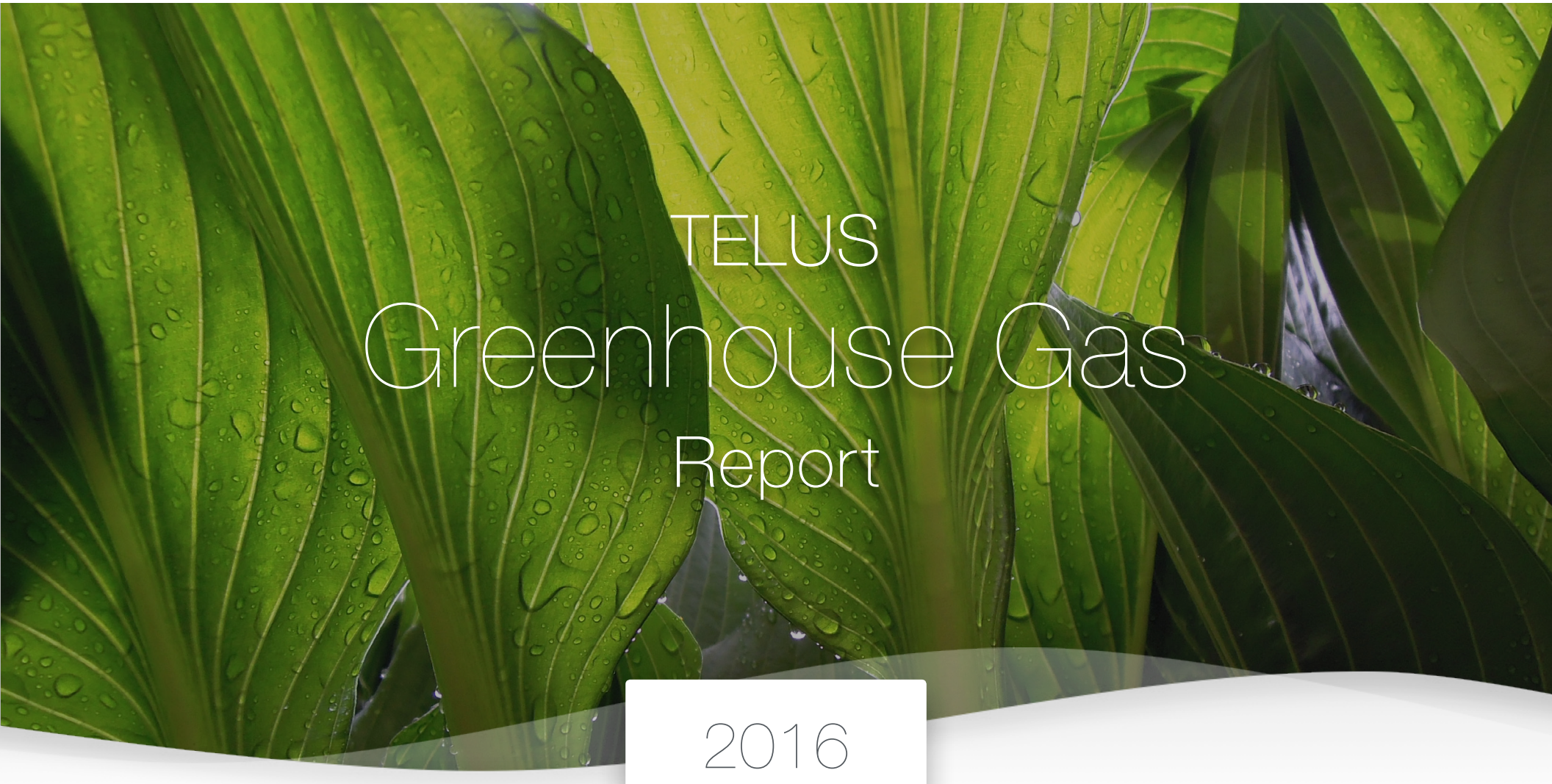


TELUS Greenhouse Gas Report

2016

Contents

Introduction

I. Who we are

a. Business operations

TELUS is Canada's fastest-growing national telecommunications company, with $12.8 billion of annual revenue and 12.7 million subscriber connections, including 8.6 million wireless subscribers, 1.7 million high-speed Internet subscribers, 1.4 million residential network access lines and more than 1.0 million TELUS TV® customers. TELUS provides a wide range of communications products and services, including wireless, data, Internet protocol (IP), voice, television, entertainment, video and business process outsourcing services, and is Canada's largest healthcare IT provider.

In support of our philosophy to give where we live, TELUS, our team members and retirees have contributed $482 million to charitable and not-for-profit organizations and volunteered more than 1 million days of service to local communities since 2000.

b. Climate change goals

Our goal is to achieve an absolute reduction in Energy use and Greenhouse Gas (GHG) emissions by 2020, using 2010 as our base year.

- 10 per cent absolute energy reduction by 2020 over 2010 levels
- 25 per cent reduction in GHG emissions by 2020 over 2010 levels

TELUS continues to maintain absolute reduction goals while understanding that increasing demand from our customers for data and connectivity requires additional power, estimated to increase by 3.35 per cent annually. To meet these goals, we continue to invest in initiatives that lead to energy efficiency in our network operations and buildings. As part of our balanced approach to addressing climate change and to address our energy use challenge, we continue to examine renewable energy solutions to either offset or replace a portion of our energy usage in regions where supply is reliant on energy-intensive production.

When setting climate change goals, organizations commonly use intensity metrics to measure their Energy and GHG performance. Intensity metrics are often expressed as ratios, with an impact, such as energy or emissions, in the numerator and an output, such as revenue or customer count, in the denominator. Expressing intensity metrics as ratios provide a way to relate environmental performance with economic performance. In this report, we include intensity metrics to complement our disclosure.

Methodology

I. Accounting and reporting procedures

When reporting energy and GHG usage, we follow the Greenhouse Gas Protocol methodology. Emission factors are collected from the Canadian National Inventory Report.

a. Organizational boundary

When reporting GHG emissions, the organizational boundary must be defined in order to determine which part of the business is included in the report. TELUS uses Operational Control to define the organizational boundaries in which GHG emissions are collected. Operational Control is where the organization has authority to introduce and implement its own operating policies.

b. Operational boundary

We categorize our energy and GHG consumption according to the GHG Protocol guidelines:

- Scope 1: direct energy sources such as fuels that include natural gas, gasoline, diesel, propane and heating oil
- Scope 2: indirect energy sources such as electricity
- Scope 3: other energy sources. TELUS defines "other" as air travel and employee commuting

The energy footprint, as defined for our climate change goals, consists of direct energy and indirect energy for our domestic owned and leased real estate properties, cellular sites, vehicle fleet, releases and remote generator fuel.

c. Base year

The base year for TELUS' GHG reporting is 2010.

Our climate change objectives were introduced in 2010. In 2013, we changed our base year from 2009 to 2010 to incorporate data associated with our leased properties into our disclosure. This was after our analysis determined there was material, reliable leased property data dating back to 2010.

d. Inventory quality

The type of inventory included and omitted is assessed through ongoing discussions with each energy manager. Decisions are based on reliability, accuracy and relevancy of data. Regular reviews with energy managers may uncover new inventory sources.

e. Inventory exclusions

Energy use and GHG emission data for our office buildings in the United States and Europe are currently not included in our Scope 1, 2 or 3 reporting as we assess our ability to collect and analyze data for these locations. Energy use and GHG emission data associated with our office buildings in the Philippines and Central America are reported separately. These locations are not included in our baseline or targets for our climate change goals as data reliability was an issue when targets were initially set.

f. Emissions adjustments

i. Policy for recalculation: Where energy data is missing and errors are uncovered, TELUS will correct the errors and apply the missing data as applicable from current year to base year. Data will be restated with explanation back to 2010 as required in our GHG report.

ii. When energy data is unavailable: We will apply historical data and use assumptions, and provide rationale for those assumptions, to improve the quality of our disclosure.

iii. Acquisition and divestures recalculation:

- TELUS will not recalculate its base year data when acquisitions and divestitures occur unless it can be determined the newly available data is material, currently defined as accounting for more than 10 per cent of total energy and/or GHG emission inventory.
- If an acquisition is made and the associated energy use and GHG emission data is deemed material we will determine, based on our organizational boundaries, if it should be included in our Scope 1 or 2 disclosure. If it is included and historical data isn't available, we will utilize available energy data and use assumptions (with accompanying rationale) to restate our disclosure as applicable from current year to base year.
- For a divestiture, we will remove any associated data from current to base year.

d. Data storage

i. Inventory from each energy manager is submitted and entered into a master inventory document.

ii. The master document is stored on a secure SharePoint site.

iii. The master document includes the most up-to-date emission factors.

iv. Emission factors used are from Canada's National Inventory Report (NIR) and footnotes reference the location of the emission factor on the NIR.

e. Quality control and verification

i. Internal controls:

1. Energy data from across the organization is produced by 12 energy managers and consolidated by one GHG inventory quantifier (GHG IQ).
2. Utility bill management and payment is decentralized. This function is performed by energy managers within TELUS and by external partners.
3. The consolidation of utility data and application of emission factors is centralized and performed by one GHG IQ.
4. The energy data is reviewed and verified by TELUS' GHG IQ who performs the following tasks:
    - Applies emission factors to the energy data
    - Applies equivalent kilowatt hours to relevant energy inputs
    - Performs quality control and verification measures including:
        - Discussing input with energy managers
        - Reviewing inputs and questioning variances
        - Checking CO2e and kWh conversions
        - Reviewing inputs against previous year's inventory for irregularities

i. External controls

- GHG and Energy inputs related to specific GRI disclosure requirements are reviewed and assured by an independent third-party professional services firm.

GHG Inventory

I. GHG emissions inventory for 2016

a. Domestic emissions by Scope

Scope 1	77,564
Scope 2	263,541
Total	341,106

Scope 1 emissions include: Fuel sources such as biodiesel, diesel, gasoline, natural gas, propane and light oil

Scope 2 emissions include: Electricity, heating/cooling loop and steam

b. Domestic emissions by commodity

Source	%
Vehicle Fuel	7.98
Electricity	78.27
Natural Gas	11.51
Stationary Diesel	1.09
Other Stationary Fuel	0.05
Halocarbons	0.89
Heating Cooling Loop	0.03
Steam	0.19

Electricity use accounts for the majority of emissions in our operations with natural gas being the second largest source of emissions. Electricity and natural gas are used to power our office spaces, retail locations, network operations and cellular sites. Our vehicle fleet, which is used to support delivery of our wireless and wireline products and services, accounts for 7.98 per cent of our greenhouse gas emissions.

c. Energy use and emissions by province

	eMWh %	CO_2e %
Alberta	42.79	87.20
British Columbia	28.46	6.47
Manitoba	0.26	0.01
New Brunswick	0.02	0.02
Newfoundland	0.00	0.00
Nova Scotia	0.17	0.26
Ontario	14.79	4.22
Quebec	13.30	1.45
Saskatchewan	0.20	0.37

Greenhouse Gas emissions result primarily from our operations in Alberta, accounting for 87.2 per cent of overall emissions. This is partially due to the higher electricity emission factor in the province. The electricity emission factor is 53 times higher in Alberta than neighbouring British Columbia. This means that for every tonne of CO_2e emitted in Alberta, it accounts for 53 times more emissions than if it was generated from sources in B.C.

d. Scope 3

For the past several years, TELUS has reported emissions linked to employees' business travel and employee commuting. In 2015, we also shared data with respect to the upstream and downstream emissions from mobile devices. As part of our ongoing analysis of the Scope 3 emissions of our mobile devices, we now believe that aspects of the data we have available are not reliable enough for us to continue to report on these emissions. We commit to continue our analysis and seek process improvement, so that we can, in the future, report Scope 3 emissions associated with the manufacture, distribution and use of mobile devices and other products we sell.

Source	Tonnes CO_2e
Business Air Travel	7,020
Employee Commuting	14,713

Business air travel data is produced by a dedicated energy manager using an internal database and data collected from our flight agency partners. This information is detailed, reliable and consistent year over year.

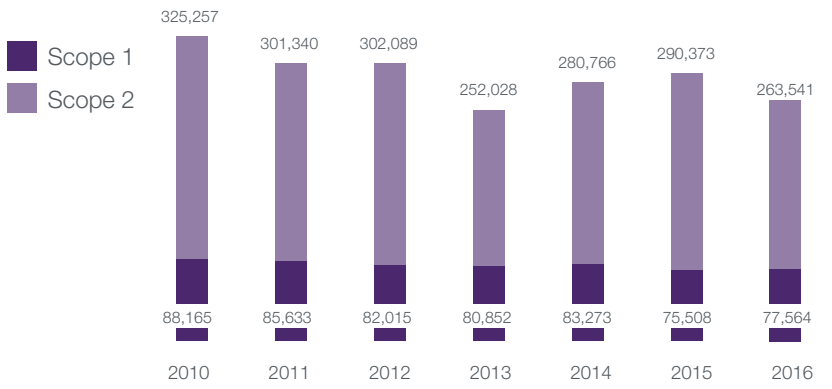
In 2016, we made improvements in the way we collect data used to report the impacts of employee commuting. Previously, we used Statistics Canada data as a proxy for employee commuting distance and travel time. In 2016, we sent an employee commuting survey to a sample of domestic employees and 2,325 people responded, a 9 per cent sample of the domestic employee population of 25,695 with a margin of error of 2 per cent.

II. Emissions over time

a. Tracking emissions from 2010 to today

In tonnes of GHG

	2010	2011	2012	2013	2014	2015	2016
Scope 1	88165	85633	82015	80852	83273	75508	77564
Scope 2	325257	301340	302089	252028	280766	290373	263541
Grand Total	413423	386973	384104	332880	364039	365881	341106



Total Domestic Emissions[1,2]

	tonnes of CO_2e		
	2016	% change	2015
Scope 1[3]	77,564	2.7	75,508
Scope 2[4]	263,541	-9.2	290,373
Total	341,106	-6.8	365,881

1 Emission factors from Canadian National Inventory Report.
2 Intergovernmental Panel on Climate Change Fourth Assessment Global Warming Potential used as per recommendation from Environment Canada.
3 Scope 1 emissions include: Fuel sources such as biodiesel, diesel, gasoline, natural gas, propane, light oil, and halocarbon
4 Scope 2 emissions include Electricity, Heating/Cooling Loop, Steam.

GHG emissions are dependent on internal factors, such as actual energy usage and external factors, such as emission factors that are applied to TELUS' energy usage depending on the location and type of energy used.

Our Scope 1 and 2 emissions decreased by 6.8 per cent in 2016, from 2015. This was due to a:

- 2.6 per cent decrease in our fleet emissions
- 13.5 per cent reduction in emissions associated to energy usage in our retail stores
- 47 per cent decrease in the Ontario emission factor.

b. Trending

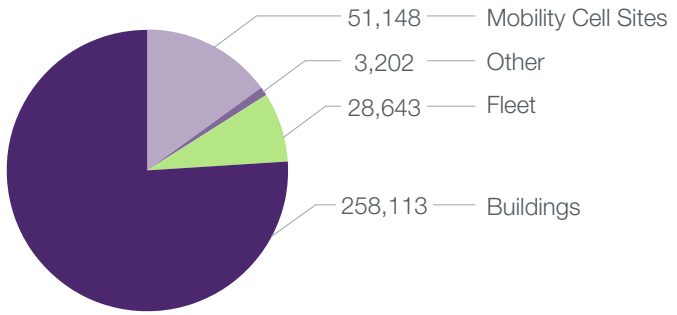
Total domestic scope 1 and 2 GHG vs. base year

	2016	Compared to base year	2010
Scope 1	77,564	-12.0%	88,165
Scope 2	263,541	-19.0%	325,257
Total	341,106	-17.5%	413,423

Compared to our base year, our annual 2016 emissions are 17.5 per cent lower than in 2010. This significant decrease puts us on track for to meet our 2020 emission reduction goal of 25 per cent. We will continue to reduce our emissions using a balanced approach of reduction programs, purchasing renewable energy certificates, and directly investing in renewable energy projects.

The provincial emissions factors in B.C., Alberta and Ontario have a strong impact on our results as they account for over 85 per cent of our energy usage. In 2016, the electricity emission factor for B.C. decreased by 3.3 per cent and Alberta's decreased by 3.6 per cent. In Ontario, the emission factor decreased by 47 per cent. The emission factor decreases in these three provinces will give us a lower overall emissions output per the same input of electricity.

III. Key emission analysis by category



We are continuing to consolidate our real estate footprint through Work Styles™, a program that enables employees to work when, where and how they are most effective. While our buildings account for the majority of our emissions footprint, we have realized consistent improvement in our square foot per employee ratio by giving our team the flexibility to work from home or in the office when it makes sense to them. Our real estate square foot per full-time equivalent employee ratio decreased 2.6 per cent in 2016 from 2015 primarily because we were able to exit leased space that was no longer required.

IV. Emission intensity metrics

Emission intensity is used to examine emissions efficiency against a relevant business indicator. Customer connections and revenue are an example of indicators that are used to measure growth in an organization. When measured against both customer connections and revenue, we have become much more efficient by reducing relative emissions while realizing business growth.

a. GHG Intensity: customer connection

	2016	Compared to Base Year	2010
Net Customer Base	12,673,000	20.0%	10,560,000
Tonnes of CO_2e per customer	0.0269	-31.2%	0.0391

b. GHG Intensity: revenue

	2016	Compared to Base Year	2010
Annual Revenue ($M)	12,799	30.7%	9,792
Tonnes of CO_2e per revenue	26.651	-36.9%	42.220

V. Energy programs in 2016

In 2016, we implemented over 80 energy efficiency initiatives, resulting in the elimination of 44.1 GWh of annualized energy consumption and $1 million in avoided energy costs.

80 initiatives

Key program highlights:

- $89 million cumulative operational costs avoided from program inception
- 4.6 GWh of improved efficiency of power and cooling systems in buildings
- 29 GWh eliminated through legacy equipment turndowns and server/storage decommissioning
- 10.5 GWh of reduced energy consumption from real estate consolidation, energy efficiency programs and our Work Styles™ program implementation.

VI. Investments in renewable energy

a. Renewable energy credits

As part of our balanced approach to addressing climate change, in 2016, we purchased 23 million kWh of EcoLogo™ certified renewable energy credits in Alberta, which accounts for 18,330 tonnes of CO2e.

b. Existing solar installations

TELUS has approximately 27 mountain top solar arrays in commission used to power remote cellular sites. As well we have:

- West Telephone Service Centre: 46 solar panels producing 12,000 kWh per year
- Banff Central Office, AB: 44 solar panels generating 13,000 kWh per year
- Lendrum Building, Edmonton, AB: 150 solar panels generating 44,000kWh per year
- TELUS Garden, Vancouver, BC: 288 solar panels generating 65,000 kWh per year.