Greenhouse Gas Emissions Inventory Summary

Fiscal year 2018-19

Preamble:

The University of Alberta is currently using the Campus Carbon Calculator that was developed by Clean Air - Cool Planet, the University of New Hampshire and The Sustainability Institute. Over 600 college and university signatories of the American Colleges and University Presidents Climate Commitment employ this tool. The tool is now available online as SIMAP®, however the ability to account for multiple campuses was not yet available at the time of this inventory update so the Excel-based version of the calculator was employed.

Greenhouse Gas Protocol:

The University of Alberta's greenhouse gas reporting, and the Campus Carbon Calculator are based on the following principles as defined by the Greenhouse Gas (GHG) Protocol and guided under the ISO-14000 Environmental series:

> ***RELEVANCE*** *Ensure the GHG inventory appropriately reflects the GHG emissions of the company and serves the decision-making needs of users – both internal and external to the company.*
>
> ***COMPLETENESS*** *Account for and report on all GHG emission sources and activities within the chosen inventory boundary. Disclose and justify any specific exclusions.*
>
> ***CONSISTENCY*** *Use consistent methodologies to allow for meaningful comparisons of emissions over time. Transparently document any changes to the data, inventory boundary, methods, or any other relevant factors in the time series.*
>
> ***TRANSPARENCY*** *Address all relevant issues in a factual and coherent manner, based on a clear audit trail. Disclose any relevant assumptions and make appropriate references to the accounting and calculation methodologies and data sources used.*
>
> ***ACCURACY*** *Ensure that the quantification of GHG emissions is systematically neither over nor under actual emissions, as far as can be judged, and that uncertainties are reduced as far as practicable. Achieve sufficient accuracy to enable users to make decisions with reasonable assurance as to the integrity of the reported information.*

The GHG Protocol defines the Scopes as follows (Figure No.1 is added for clarity):

- **Scope 1 Direct Emissions - Mandatory**
  - From sources that are owned or controlled directly by the organization.
- **Scope-2 Indirect Emissions - Mandatory**
  - From grid-purchased electricity.
- **Scope-3 Indirect Emissions - Optional**
  - Result as a consequence of the organization's activities, but from sources not owned or controlled by the organization.
- **Offsets - Optional**
  - e.g., RECs, forest or land holdings

The University of Alberta's emission sources are broken down into these scopes as follows:

Scope 1	Scope 2	Scope 3
Heating Plant combustion processes Other on-campus stationary combustion Direct transportation Refrigerants and chemicals Agriculture	Purchased electricity	Scope 2 Transmission and Distribution (T&D) losses Solid waste Waste water ***Categories under consideration for future addition:*** *Air travel, student and staff commuting, paper use.*

The GHG emissions inventory follows the "operational control" approach to define its organizational boundary. Operational control is defined as having full authority to introduce and implement the university's operating policies. As a result, Enterprise Square, the Jubilee Auditorium and properties operated by Alberta Health Services and Canadian Blood Services are not included in our inventory because the university does not have operational control of these buildings.

The University of Alberta has reserved approximately 8 hectares of land on the south bank of the North Saskatchewan River adjacent to North Campus. This land is set aside and will not be developed. The GHG emissions sink resulting from this forest reserve is approximately 55 tonnes per year. In addition, reserving this land maintains an unbroken length of the river valley, helping to preserve wildlife habitat and biodiversity.

The University of Alberta tracks and reports its inventory by Fiscal Year (April 1st through March 31st).

UAlberta uses a customized electricity emission factor for the North Campus to reflect the District Energy System's impact due to self generation. All other sites use the published Alberta grid emission factor.

Greenhouse Gas Emissions Inventory Summary

The University of Alberta set a goal to reduce its GHG emissions 17 per cent below 2005 baseline emissions by 2020. The following figures show progress towards this goal and the gap remaining to achieve this target (Figure 1), the breakdown of emissions by location and scope for the most recent inventory (Table 1), and explanatory notes by location (Table 2).

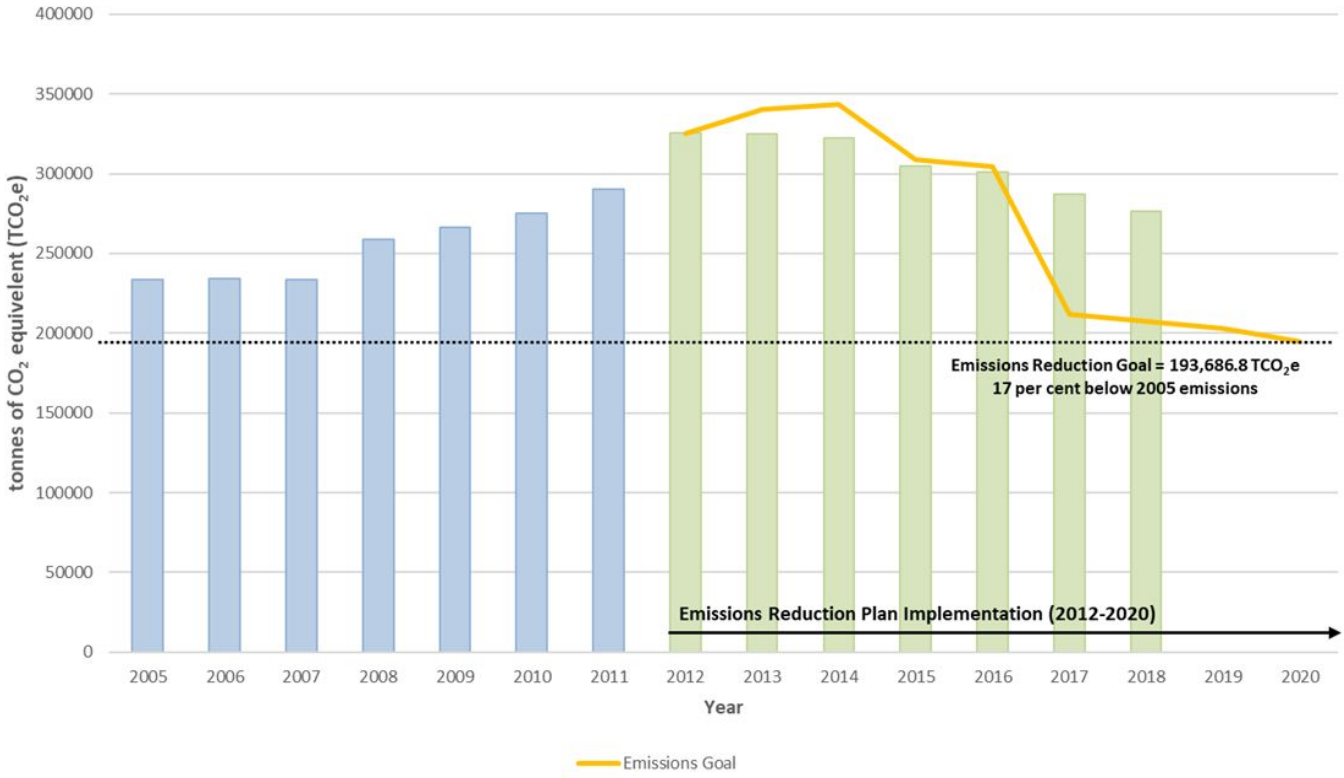

Figure 1. UAlberta greenhouse gas emissions over time (Fiscal Years 2005/06 to 2018/19).

Table 1. UAlberta greenhouse gas emissions by scope and location (April 1, 2018 to March 31, 2019).

Location *(high to low emissions)*	**Scope 1** *(metric tonnes CO_2e)*	**Scope 2** *(metric tonnes CO_2e)*	**Scope 3** *(metric tonnes CO_2e)*	**TOTAL** *(by location)* *(metric tonnes CO_2e)*
North Campus	120,660	109,509	13,304	**243,473**
South Campus	14,322	8,160	834	**23,316**
Augustana Campus	2,227	2,256	266	**4,750**
Campus Saint-Jean	1,297	1,284	151	**2,730**
Botanic Garden	785	387	38	**1,210**
Kinsella Research	130	330	34	**494**

Others	179	216	21	**417**
Ellerslie Research	42	58	6	**106**
SUBTOTAL *(by scope)* *(metric tonnes CO_2e)*	**139,643**	**122,201**	**14,654**	**276,496**
Offsets from North Campus Forest Reserve				**-55**
Offsets generated from waste heat recovery				**-586**
Offsets sold from waste heat recovery				**586**
TOTAL NET EMISSIONS *(metric tonnes CO_2 e)*				**276,441**

Table 2. UAlberta greenhouse gas inventory explanatory notes by location.

Location	Notes
North Campus	Includes all refrigerant data. The University of Alberta has reserved approximately 8 hectares of land on the south bank of the North Saskatchewan River adjacent to North Campus. This land is set aside and will not be developed. The GHG emissions sink resulting from this forest reserve is approximately 55 tonnes per year. In addition, reserving this land maintains an unbroken length of the river valley, helping to preserve wildlife habitat and biodiversity. UAlberta uses a customized electricity emission factor for the North Campus to reflect the District Energy System's impact due to self generation.
South Campus	Includes all research animal data. Includes fertilizer data. Between the dates of 1990 and 1996, the data was extrapolated using weather data, utility cost data and engineering best practices. Refrigerant inventories are negligible.
Augustana Campus	Augustana Campus was acquired by the university in 2004. Scope 1 and Scope 2 inventory complete from 2006-2018. Between 2004 and 2006, the data was extrapolated using weather data, utility cost data and engineering best practices. Refrigerant inventories are negligible.
Campus Saint-Jean	Between the dates of 1990 and 1996, the data was extrapolated using weather data, utility cost data and engineering best practices. Refrigerant inventories are negligible.
Others	"Others" includes George Lake, Breton, Whitemud Drive, and Bard 2
Nothing to note for Botanic Garden, Kinsella Research Station, or Ellerslie Research Station.	