

# EQ | BUILDING PERFORMANCE

## 2019 CORPORATE SUSTAINABILITY REPORT

PUBLISHED: 10 September 2020



**EQ**  
BUILDING  
PERFORMANCE



## Message from our President

Welcome to EQ Building Performance's second annual corporate sustainability report. We remain committed to reducing the negative impacts that buildings have on the environment. We believe that a comprehensive understanding of building performance is essential for responsible buildings. We are passionate about helping others in this pursuit by providing energy modelling, sustainability consulting, and building commissioning services to building designers, developers, and owners.

This report covers our work and operations for the 2019 calendar year. In addition to project performance data, we are pleased to share some insights on emerging trends we are seeing in the building industry. We have also included some highlights from our strategic planning initiative that we undertook towards the end of 2019. We hope that this information will provide some sense of where we think the building industry is headed as well as EQ's unique culture and approach.

As always, we would like to extend our thanks to all of our project partners for providing the opportunity to work together on so many interesting projects over the past year. It is exciting to see the improvements that continue to be made in these buildings. We look forward to continued collaboration in the future.



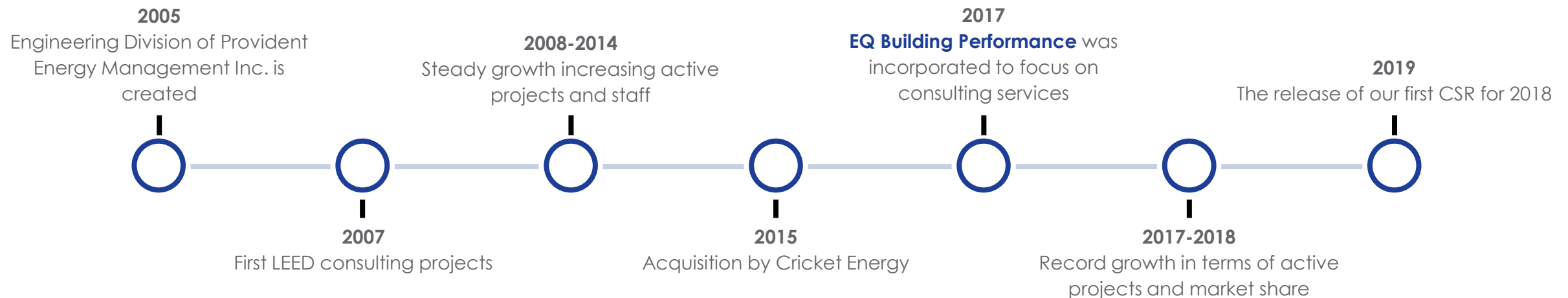
Craig McIntyre  
President



## Who We Are

EQ has a rich history initially consulting as the Engineering Division of Provident Energy Management Inc. Growing over the years in both practice and staff, we branched out in 2017 to become EQ Building Performance.

Since then, we have had the pleasure of collaborating with architects, developers, mechanical and electrical designers, landscape architects, and many other consultants to make better buildings. Our team has continued to grow and diversify, delivering detailed energy analysis for both new construction and existing developments, advising on high-performance building certifications, and providing whole-building commissioning.





## Mission / Vision

Although the shared principles and motivations that drive us here at EQ Building Performance have been an integral part of our internal culture from the beginning, until recently we had not formalized these values to share publicly.

Towards the end of 2019, all of our employees gathered for a full-day workshop and began a strategic planning process to collectively discuss, explore, and ultimately define our Mission, Vision, and Values. We hope that by sharing the results of this process, we will help those not yet familiar with EQ, better understand what is most important to us.



Our mission is **to guide the creation of responsible buildings.**

Our vision is **to be sought out as unique and forward-thinking experts in better buildings.**

Our values are to

**embrace diversity,  
help others succeed,  
work with passion,  
improve continuously, and to  
craft a better future.**

# Values

While our company and staff are a diverse group with many different backgrounds and personalities, we share many common values in how we act personally and professionally.

## Embrace Diversity

Diversity isn't just about accepting and respecting our differences, but realizing the value those differences provide. Our breadth of experiences, beliefs, and backgrounds provide a wealth of different perspectives that help us foster innovation and generate unique solutions to even the most challenging problems.

## Help Others Succeed

We are committed to working collaboratively. Whether in our day-to-day project work or individual professional development, we constantly strive to help each other accomplish great things. This extends to the way we work with our clients and industry peers as well. Success isn't about being the first across the finish line. It is about getting everyone to the finish line faster so that we can all celebrate together.

## Work with Passion

Our work is very meaningful to us. As self-proclaimed "building nerds" we are particularly excited by all aspects of building design, construction, and performance. Our insatiable sense of curiosity and our shared belief that buildings should function in harmony with their environment, while keeping us engaged and focused on enthusiastically delivering exceptional results.

## Improve Continuously

Working in our fast-paced industry requires us to work flexibly and embrace whatever changes come our way. We learn from past challenges, successes, and each other. We constantly seek out new ideas, approaches, and technologies, so that we can improve together. Whether we are talking about ourselves, our company, the buildings we work on, or the industry we work in, there is always a way to make things better.

## Craft a Better Future

The environmental impacts associated with the construction and operation of buildings are considerable. We believe that we have a responsibility to society and the planet to minimize those impacts. It will take the combined efforts of us all to reverse the damage done to the environment. At EQ we hope to have a leading role in making those changes.

# Our Work

In 2019 we were so proud to be able to join nearly 150 new project teams to further sustainable development. Our 2019 profile consisted of nearly 2 million square meters of new construction (Figure 1).

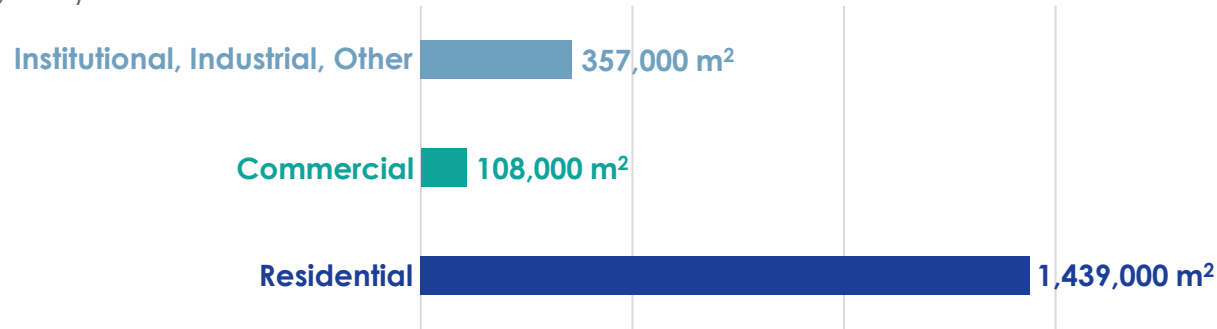
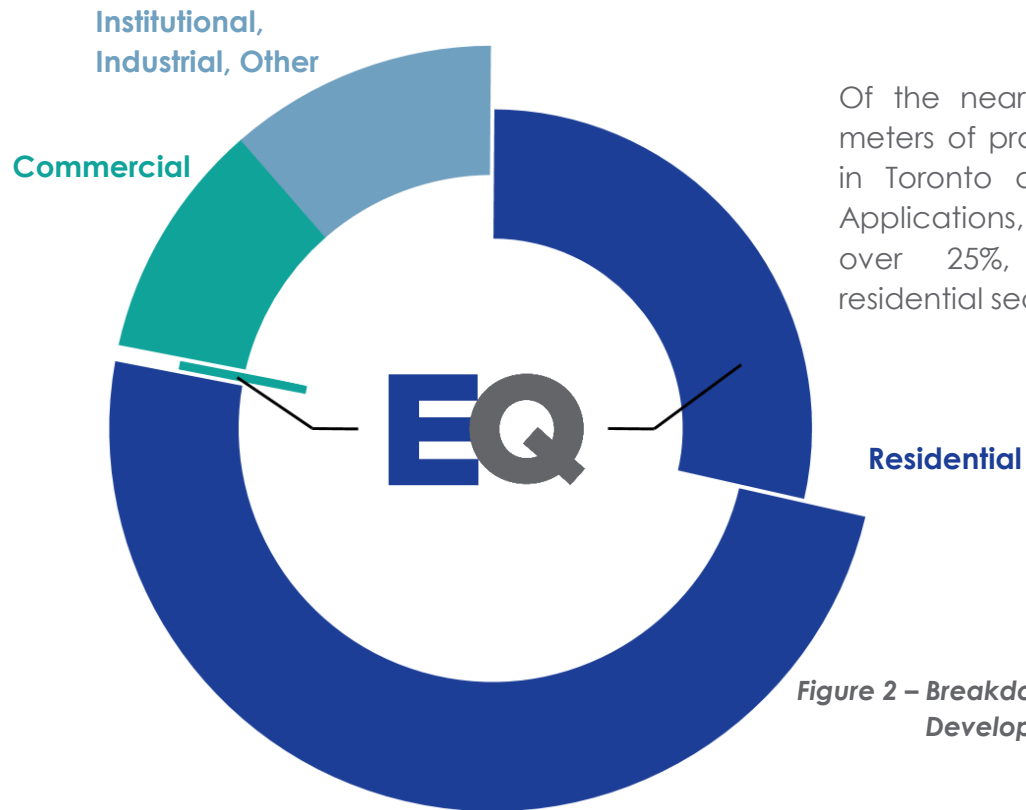
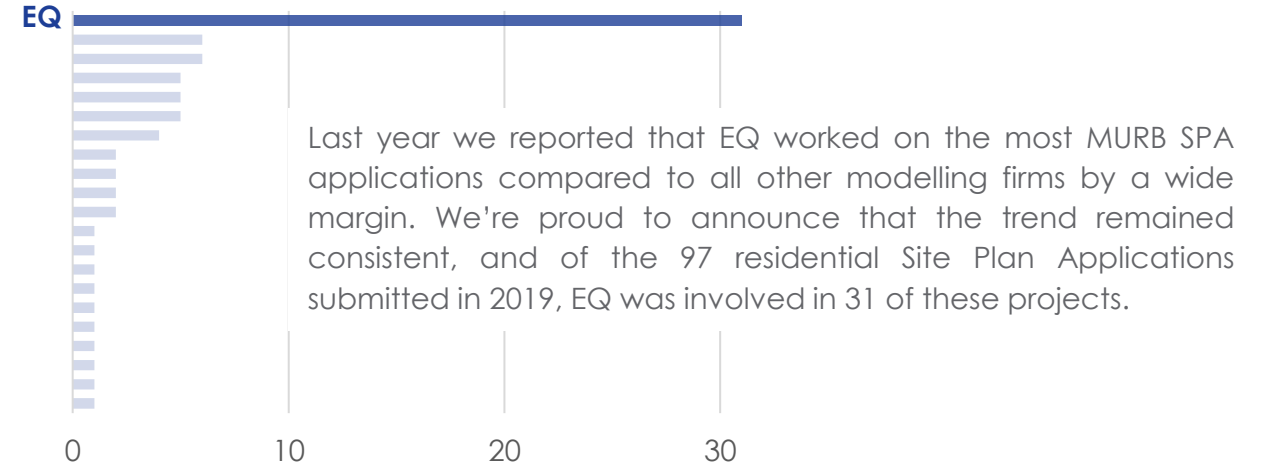


Figure 1 – Breakdown of all EQ 2019 Projects



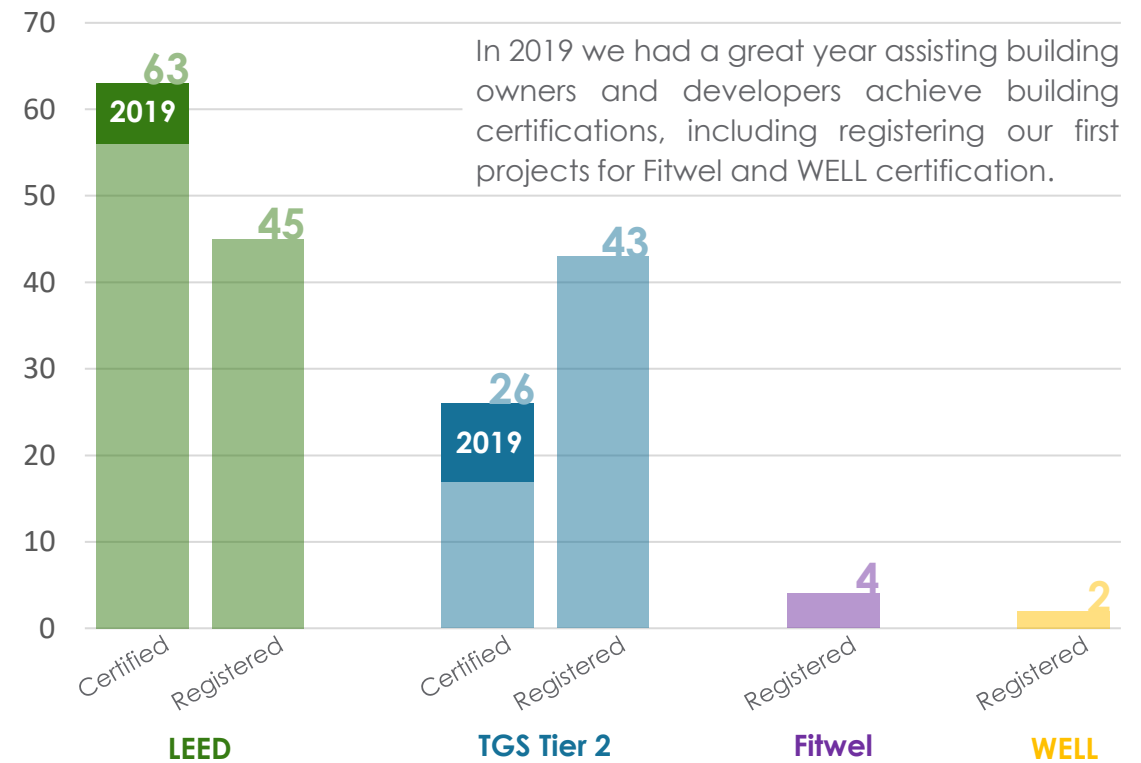
Of the nearly 3.7 million square meters of proposed development in Toronto across 202 Site Plan Applications, EQ was involved in over 25%, primarily in the residential sector, seen in Figure 2.

Figure 2 – Breakdown of 2019 Toronto New Development as per SPA Applications (m²)



Last year we reported that EQ worked on the most MURB SPA applications compared to all other modelling firms by a wide margin. We're proud to announce that the trend remained consistent, and of the 97 residential Site Plan Applications submitted in 2019, EQ was involved in 31 of these projects.

Figure 3 – No. of MURB Toronto SPA Applications Listing Firms as Energy/Sustainability Consultant



In 2019 we had a great year assisting building owners and developers achieve building certifications, including registering our first projects for Fitwel and WELL certification.

Figure 4 – EQ Building Certifications through 2019



## 2019 Project Highlights

In 2019 we worked on a variety of projects that allowed us to help project teams navigate evolving building standards and assist with achieving high-performing certifications. A few that stand out are:

### 1140 Yonge



**Client:** Devron Developments

**Target(s):** Toronto Green Standard v3 Tier 3

This heritage development is being developed right from the start with community and sustainability in mind. In addition to pursuing Tier 3 energy and sustainability, the project team is also investigating the steps to have 1140 Yonge as the first Passive House certified condominium in Toronto.

### Hamilton Transit



**Client:** City of Hamilton

**Target(s):** LEED v4

To accommodate increasing transit demand, the City is designing a new transit centre to store and maintain 200 buses, a 30-bay maintenance area, and support and program spaces for staff. The project has placed a strong emphasis on natural heritage, public and Indigenous consultation, and sustainability.

### T3 Sterling Road



**Client:** Hines Construction Canada

**Target(s):** LEED v4, WELL

This heavy timber creative office development will provide over 37,000 square meters of open office floor plans, floor-to-ceiling windows, and on-site amenities to encourage employee collaboration. Pursuing both LEED v4 Gold and WELL certifications demonstrates this development's aspirations to not only provide a sustainable building, but also create a wellbeing-focused environment that contributes to a positive office atmosphere.

# Industry Leadership

In 2019 we strived to embody our values and mission to demonstrate a commitment to our work and our peers. We pushed ourselves to new levels on innovative projects working towards low-carbon goals, or using cutting-edge technology or equipment.

## 2019 CaGBC Ontario Green Building Excellence and Leadership Awards



### Aqualina

In 2019, Aqualina was awarded a LEED Platinum Certification, and was the first high-rise residential condominium in Toronto to receive this honour. As part of the Bayside Toronto development by Tridel and Hines, sustainability was always a focus. Aqualina features an innovative NetZed Suite - a net-zero energy suite at the penthouse level - as well as rooftop solar PV, rainwater reuse, building automation systems, a high performance envelope, and green roofs among other energy and water saving features. Aqualina was the recipient of the CaGBC 'Inspiring Home' award in the 2019 CaGBC Ontario Green Building Excellence and Leadership Awards. EQ is proud to have been able to support this development since the beginning, offering services for Energy Modelling, Sustainability Consulting, and Commissioning.

### Leadership

Aqualina was not the only EQ success at the 2019 CaGBC Ontario Green Building Excellence and Leadership Awards. We're thrilled that the skills and hard work of Wells Baker (Green Building Champion) and Samantha Menard (Emerging Green Leader) were recognized and celebrated with our industry partners and peers.



## Knowledge Sharing

To help lead the industry we believe that educating our clients and our peers with our lessons learned is key to crafting a better future. In 2019 we were honoured to be invited to speak at seminars, conferences, lunch & learns, and participate in workshops and committees.

### Sidewalk Labs Toronto MURB Study: Energy Use and the Performance Gap

Speaker(s): Craig McIntyre, Co-Presented with Charlotte Matthews from SWL Toronto, Adam Barker  
Presented at: Building Lasting Change, the Royal Architects Institute of Canada

### Understanding TGSv3 and the Challenges Faced by Builders and Designers

Speaker(s): Adam Barker, Aya El-Halabi, Mayan Reicher  
Presented at: Building Lasting Change, the Royal Architects Institute of Canada



**RAIC | IRAC**  
Royal Architectural Institute of Canada  
Institut royal d'architecture du Canada

### New Energy Star for Multifamily High-Rise

Speaker(s): Wells Baker  
Presented at: The Ontario Home Builders Association Conference

### Toronto Green Standard Tier 2: Overview, Insights & Benefits

Speaker(s): Aya El-Halabi  
Presented at: The Green Living Show



# Sustainability

In 2018 we were proud to publish and share our building performance data on some of our projects that achieved certification. We collected data on green roof implementation, waste tracking, transportation infrastructure, and energy and water consumption. To reflect changes to the industry and to help us better discuss year-over-year performance of what achieved certification, we've re-organized our metrics to capture our project portfolio of certified buildings.

## Benchmarking

Most available benchmarked data such as Energy Star Portfolio Manager and CBECS are calculated as an intensity value. Organizing our data to standardized intensity metrics gives us the opportunity to easily compare our performance to national datasets.

## Building-to-Building Comparison

In the same way that we can compare performance of buildings to a national dataset, we can compare our own individual buildings' performance against each other to identify outliers and find opportunities for savings and design improvements.

## Measuring what Matters

As considerations into building design change and re-define what it means to be a high-performing building, we are exploring new metrics to communicate these performance indicators to our clients and stakeholders. With the introduction of newer wellbeing-focused certifications which highlight the importance of occupant health and wellness, new metrics like daylighting, thermal comfort, and access to amenities are gaining prominence in the industry.

## Ecology

### Green Roof

2019 – 48% of available roof  
2018 – 59% of available roof

## Water

### Irrigation Intensity

2019 – 2.4 L/m<sup>2</sup> Site Area  
2018 – 8.1 L/m<sup>2</sup> Site Area

### Indoor Water Use Intensity

2019 – 1030.6 L/m<sup>2</sup>  
2018 – 1172.5 L/m<sup>2</sup>

## Energy

### EUI

2019 – 235.5 ekWh/m<sup>2</sup>  
2018 – 197.1 ekWh/m<sup>2</sup>

### GHGI

2019 – 28.6 kg CO<sub>2</sub>e/m<sup>2</sup>  
2018 – 24.3 kg CO<sub>2</sub>e/m<sup>2</sup>

## Waste

### Landfill Intensity

2019 – 20.3 kg/m<sup>2</sup>  
2018 – 13.6 kg/m<sup>2</sup>

### Waste Intensity

2019 – 119.8 kg/m<sup>2</sup>  
2018 – 94.6 kg/m<sup>2</sup>

### Diversion Rate

2019 – 83%  
2018 – 86%

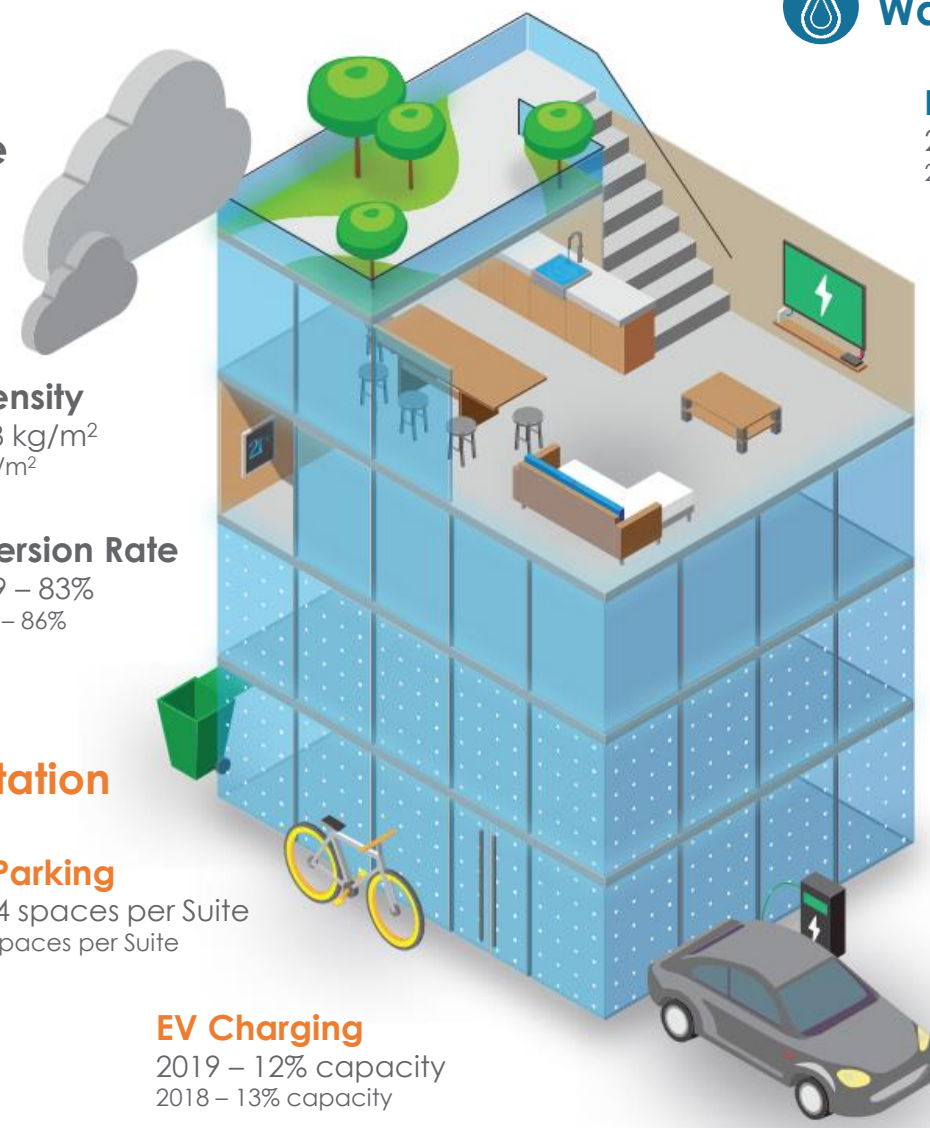
## Transportation

### Bicycle Parking

2019 – 1.04 spaces per Suite  
2018 – 0.76 spaces per Suite

### EV Charging

2019 – 12% capacity  
2018 – 13% capacity



## Insight: It's Swell to be Well

The construction industry is beginning to develop a deeper understanding about the relationship between the built environment and human health. Over the last year, clients have asked for direction on what they can do to improve occupant wellness through better design and construction practices. The **WELL** and **Fitwel** certification programs are two distinct rating systems that best address these questions and offer various strategies to help occupants thrive.



**WELL** was initially developed for office buildings, but was revised to suit other building types, including residential applications in 2018, with the release of the WELL v2 pilot program. Performance testing during the pre- and post-occupancy period plays a big role in verifying program requirements, as most WELL features call for third-party providers to test indoor air quality, water quality, and other performance measures.



Figure 5 – WELL Concepts



**Fitwel** looks at the greater context in which buildings are situated to assess how community amenities contribute to occupant wellbeing. Proximity to transit, restorative gardens, farmer's markets, playgrounds, and walking trails matter, as does neighbourhood walkability and access to bike share programs. The use of stairs within the building is of great focus, as Fitwel uses stairs to promote physical activity among occupants.



Figure 6 – Fitwel Health Impact Categories

We expect to see more growth in this field in future years as occupants and developers alike become more cognizant of how buildings affect their health. This awareness is expected to drive market demand for more livable work and living spaces which developers can accommodate with better design, construction, and operational practices.



# Energy

Last year, for the first time we were able to publicly share some of our insights on the energy performance of our MURB database. This year, we were able to organize our datasets in the same format, but also compare the two years of data. Looking both at the annual medians and the count of each building in each performance tier, the trend suggests that building performance is improving.

While there are many factors driving this improvement, one potential reason is the complete adoption of TGS v3 in 2019, versus in 2018 when v3 was only in effect after April, which demonstrates how effectively policy can drive change in the market.

## Insight: The Path to Decarbonization

With the carbon tax, new greenhouse gas targets, and the introduction of the CaGBC's Zero Carbon Building Standard, there is more attention to carbon now than ever. We're seeing projects implement more and more high-performance measures to lower carbon emissions.

Designing and building a **well-insulated envelope** will significantly lower heating loads and reduce the heating energy required to maintain setpoints and occupant thermal comfort.

Using either **water-source** or **air-source heat pumps** in your building shifts a portion of the gas heating load onto an electric source that is much more efficient than conventional condensing boilers.

**Variable Refrigerant Flow (VRF)** systems are available as either water-cooled or air-cooled systems and are seeing increasing popularity in the Toronto market. The increased efficiency from VRF systems comes at the cost of significantly more refrigerant flowing through the building.

While on-site **geothermal** heat exchange requires large amounts of up-front capital, it offers massive long-term energy and carbon savings for heating, cooling, and domestic energy.

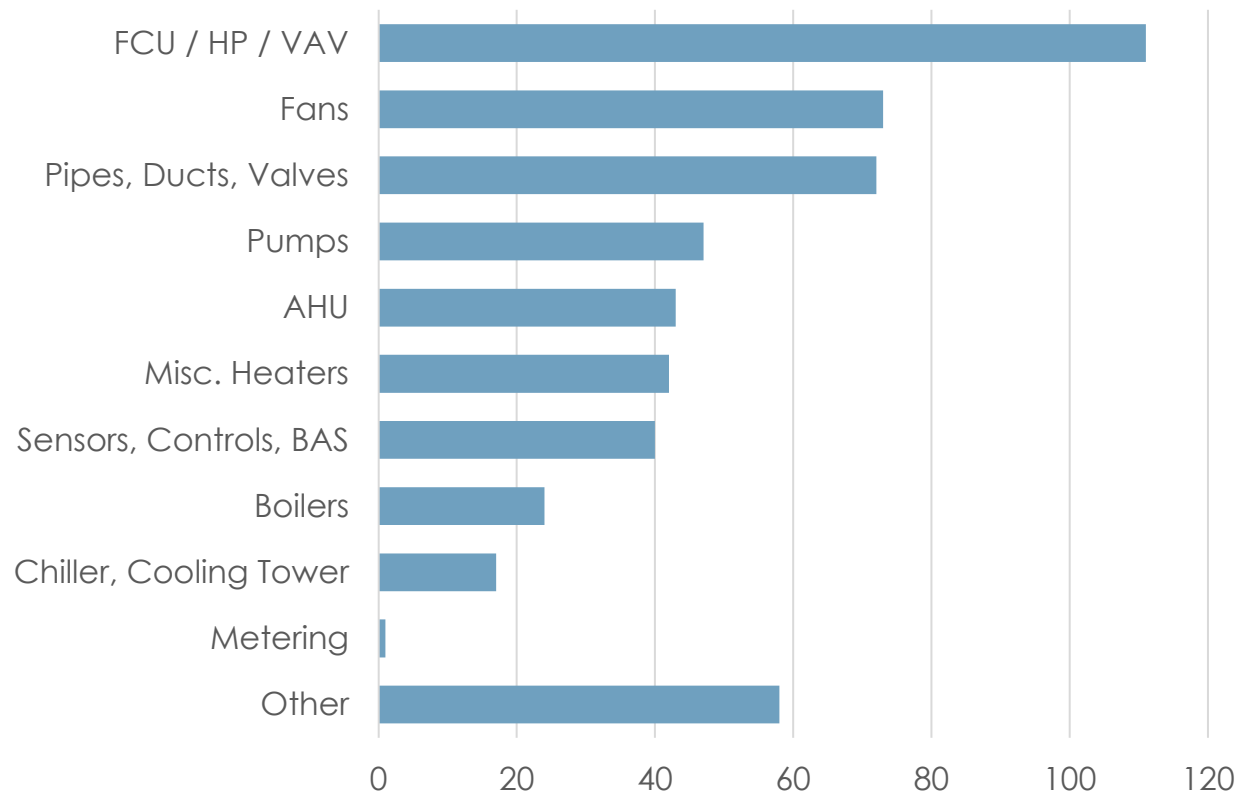


Figure 7 – EQ 2018 MURB Modelling Database (Absolute Performance)

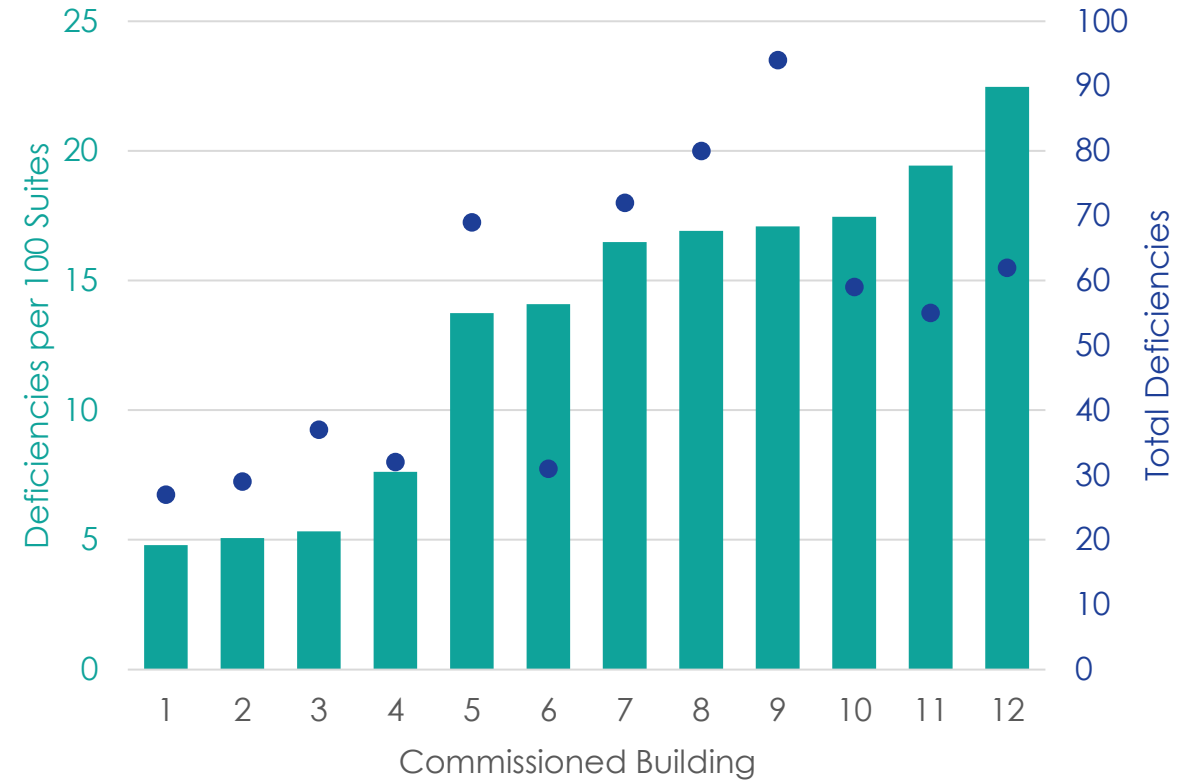
# Commissioning

Whole-building commissioning allows us to identify any deficiencies in each building early on and come to a speedy resolution. We investigated terminal air-side equipment, plant equipment, BAS, valve connections, and performed functional testing to ensure everything is installed correctly and running optimally.

Throughout 2019 we found over 500 different deficiencies in over 20 different buildings, as shown in Figure 8.



**Figure 8 – EQ 2019 Commissioning Deficiency Breakdown**



**Figure 9 – EQ 2019 Fully Commissioned Deficiency Count per Building**

To provide more context, we analyzed the 12 buildings that we completed our commissioning on in 2019 and compared the deficiency count per 100 suites against the total deficiency count on a per building basis.

Much like the way we re-organized our sustainability metrics, we wanted to analyze the performance of our buildings against each other to demonstrate how projects stack up to each other. We found that the best performer (fewest deficiencies per 100 suites) had less than 4x the number of deficiencies found after adjusting for size.



# Insight: The Costs of (Not) Commissioning

In last year's report we discussed the importance of commissioning and its benefits in a qualitative sense. This year we decided to take a closer look and quantify commissioning results of one of our recently-completed projects through a case study.

We selected a MURB that went for LEED certification and had pursued the Enhanced Commissioning credit as well. The building has a GFA over 30,000 m<sup>2</sup>, over 350 suites, and is serviced by a hot and chilled water plant. The commissioning process revealed nearly 50 deficiencies affecting central plant equipment, in-suite and amenity terminal units, and central ventilation equipment.

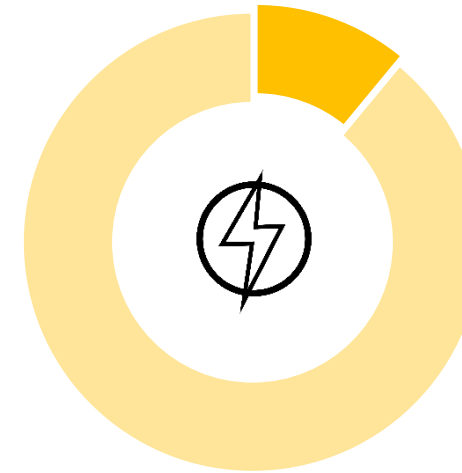


While the study is still currently in progress and will be presented on our website later, we wanted to share the results of the Year-One energy, water, utility cost, and carbon savings associated with these deficiencies, and compared that to the estimated energy and water consumption for the whole building, as presented in our Results section.

Commissioning also brings other benefits that are not as easy to quantify. Any tenant-side equipment problems would have resulted in tenant comfort and satisfaction issues and increased service calls. Finding and resolving issues related to plant-side equipment can improve its life expectancy, prevent damage, and smooth out overall energy and water performance and system controllability.

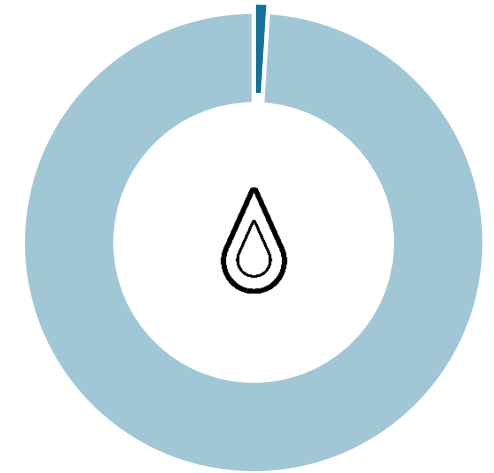
## Results

12% Energy Savings



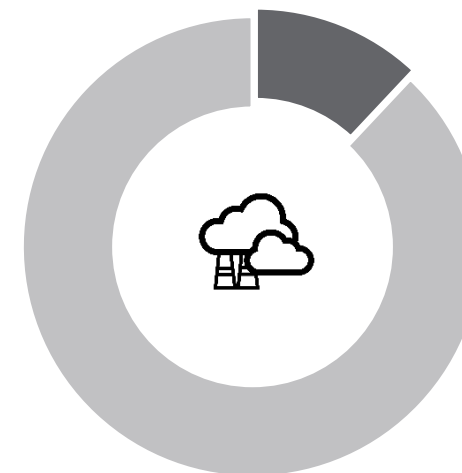
739,700 ekWh Saved

1% Water Savings



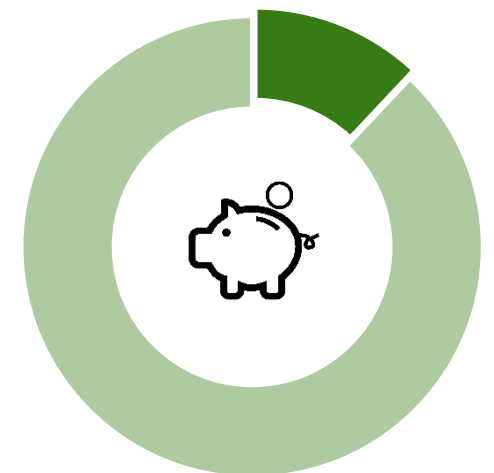
200 m<sup>3</sup> Saved

11% Carbon Savings



29,500 kg CO<sub>2</sub>e Saved

11% Utility Cost Savings



\$79,600 Saved

# Individual Carbon Footprint Analysis

Early in 2020 we asked our staff to take part in a survey to estimate the associated carbon emissions of our everyday lives. We focused primarily on housing and transportation, as these are easily estimated at an annual level. The individual performance of our staff not including secondary sources (such as food, clothing, services, and other purchases) varied greatly, as seen in Figure 10.

Comparing our average carbon footprint (including estimated secondary sources) it's clear that while our typical staff member is below the Canadian average, on a global perspective we have a long way to go.

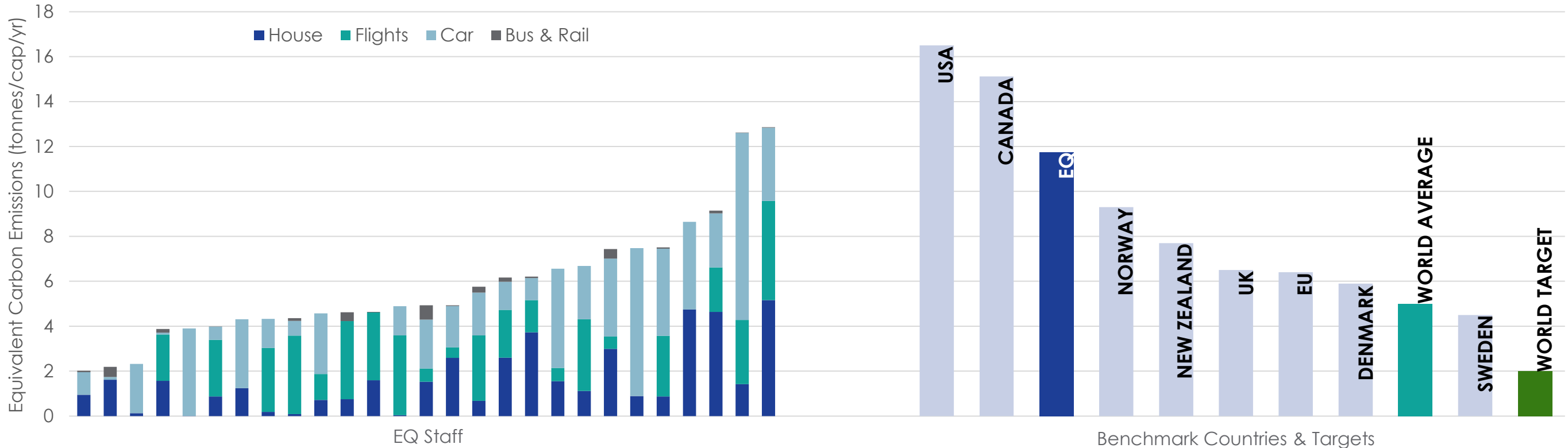


Figure 10 – Individual Carbon Footprint of EQ Staff (excl. Secondary Sources)

Figure 11 – Average Individual Carbon Footprint

After we shared the results of this study internally, we've had a number of staff share how they were surprised at their results, or how they felt encouraged to reduce their footprint. As a team, we began outlining some ideas that we're excited to implement throughout 2020 and beyond to minimize our impact. Some of our individual environmental goals are to:

“Grow your own food”

“Travel locally, take fewer/shorter flights”

“Consume less red meat, or consume less meat in general”

“Support local food providers”

“Commute with low-emitting methods of transportation (cycling, carpooling, public transit etc.)”



# Our Team

At EQ we're incredibly proud of our award-winning team. We draw on the diversity and different technical backgrounds of our people to collaboratively achieve creative solutions for unique problems. Our success and growth in size and influence is due to our strong foundation built on our commitment to our clients, peers, the environment, and to each other.







## Going Forward

Working on our second annual sustainability report has allowed us to share our performance data, and we look forward to updating these numbers in the future. When writing this report we were working off our experiences from our first report, and are excited to make next year's report even better. Some ideas that we have for next year's report are:

- Conduct more analyses on our performance data
- Share more energy metrics, especially TEDI
- Continue tracking and reporting on employee carbon emissions
- Share some of our insights on COVID-19's impact on the industry

 [eqbuilding.com](http://eqbuilding.com)

 [linkedin.com/company/eq-building-performance-inc./](https://linkedin.com/company/eq-building-performance-inc/)

 [instagram.com/eqbuilding/](https://instagram.com/eqbuilding/)



# Appendix

## Carbon Factors

Carbon emission factors for electricity and natural gas in Ontario were obtained from [SB-10](#).

## Our Work

Data in this section of the report is largely based on the [Development Applications](#) page of the City of Toronto website. SPA applications first submitted in 2018 (with the first two digits of the application being 18) were reviewed in order to conduct this analysis. A total of 202 applications met this criteria.

The totals for Figure 1 were determined from our internal project database, and were separated individually by category.

Figure 2 was determined from the GFAs from Site Plan Applications from the City of Toronto, and categorized by usage and if EQ was the energy & sustainability consultant on file.

For Figure 3, the relevant SPA application energy modelling report and Toronto Green Standard checklists were reviewed and the consultant listed on them was noted. Where either of these documents was listed, or the consultant was unclear, the consultant was categorized as unknown. Of the total applications reviewed, EQ was the consultant on 33 of the 202 applications. Reviewing the multi-unit residential developments, 97 applications were submitted in 2019. Of these, EQ was the consultant on 31 of them. There were 17 applications that did not list any consultant; these were not included in Figure 3.

## Sustainability

Performance metrics are based on LEED and TGS project statistics. Only projects that achieved certification in 2019 were included.

## Energy

Energy and carbon intensity data was pulled from EQ's internal modelling database which tracks performance of all our projects.

## Commissioning

Data presented in Figures 8 is based off of deficiency reports prepared through site visits during 2019. Figure 9 was prepared based on projects with commissioning completed in 2019, and includes deficiency counts from reports in previous years as well.

For the case study, whole-building consumption was primarily estimated from the energy model and LEED Indoor Water Use Calculator. Utility costs were assumed to be blended rates and are as follows:

Electricity: 0.14 \$/kWh  
Natural Gas: 0.28 \$/m<sup>3</sup>  
Water: 3.95 \$/m<sup>3</sup>

## Carbon Accounting

For Figure 9, we had sent out a survey to our team asking them to fill out estimate their carbon footprint using [this online calculator](#). The results were divided based on category and only some staff had selected to optionally estimate emissions from their secondary sources. Because the results were anonymous there was no QA/QC and the surveyed results may have some errors.

Based on the handful of staff that estimated their secondary sources emissions, an average was assumed to be representative of EQ and combined with our average excluding secondary sources for Figure 10.

Benchmarking statistics were taken from either [Carbon Footprint](#) or the [World Bank](#).

## Image Sources

Cover Page – Image of The Well obtained from [here](#).  
Page 7 – Image of 1140 Yonge obtained from [here](#).  
Page 7 – Image of Hamilton Transit obtained from IBI Group.  
Page 7 – Image of T3 Sterling obtained from [here](#).  
Page 8 – Image of Aqualina obtained from [here](#).  
Page 10 – Icons of WELL Concepts obtained from [here](#).  
Page 10 – Icons of Fitwel Impact Categories obtained from [here](#).