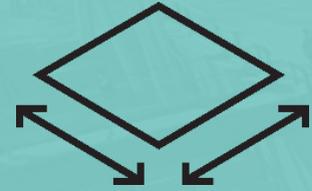




EQ | BUILDING
PERFORMANCE
**2020 CORPORATE
SUSTAINABILITY REPORT**
PUBLISHED: 29 July 2021

Highlights



2.2 Million Square Meters

of new construction development that EQ was involved with in 2020 across all disciplines.



10 Building Certifications

achieved in 2020 as a result of collaboration between builders and designers, including our first ever Fitwel Design Certification.



845 Deficiencies

identified by our team across 31 buildings in 2020.



35 Site Plan Applications

where EQ was the energy/sustainability consultant involved in the City of Toronto in 2020.



9 Fully Commissioned Buildings

in 2020, verifying the correct installation and operation of major equipment and terminal units.

A Message from our President



Thank you for taking the time to look at EQ Building Performance's third annual Corporate Sustainability Report covering our operations for the 2020 calendar year. We can say with some certainty that no one expected the 2020 that we have now collectively experienced, and we are impressed with the flexibility and resilience that our industry has demonstrated. We would like to thank our many clients for their continued support and use of our sustainability, commissioning and energy modelling services. We have accomplished some great things this past year, in spite of considerable challenges.

We are also fascinated by the shifts we are seeing in how buildings are used and what we should expect from a high performance building going forward. Health and wellbeing were already starting to become significant drivers in new office building design, but will likely be key considerations in all buildings as we find ways to not only stop the spread of sickness but to support overall health for building occupants. The pandemic has forced all of us to be flexible and explore new ways of doing things, and it will be interesting to see whether some of these lifestyle and building design changes endure after the pandemic has subsided.

We are looking forward to see how our industry has evolved in a post-pandemic landscape, especially with more emphasis on occupant-oriented health and wellness and the Toronto Green Standard version 4 on the horizon.

Craig McIntyre
President

Our Work

Despite remote-working conditions, government shutdowns, and workplace restrictions, new development in Toronto remained steady, with 197 new Site Plan Applications being submitted to the City of Toronto in 2020. Of these nearly 200 applications, 109 had a listed energy/sustainability consultant. EQ was involved with 35 of these developments in 2020.

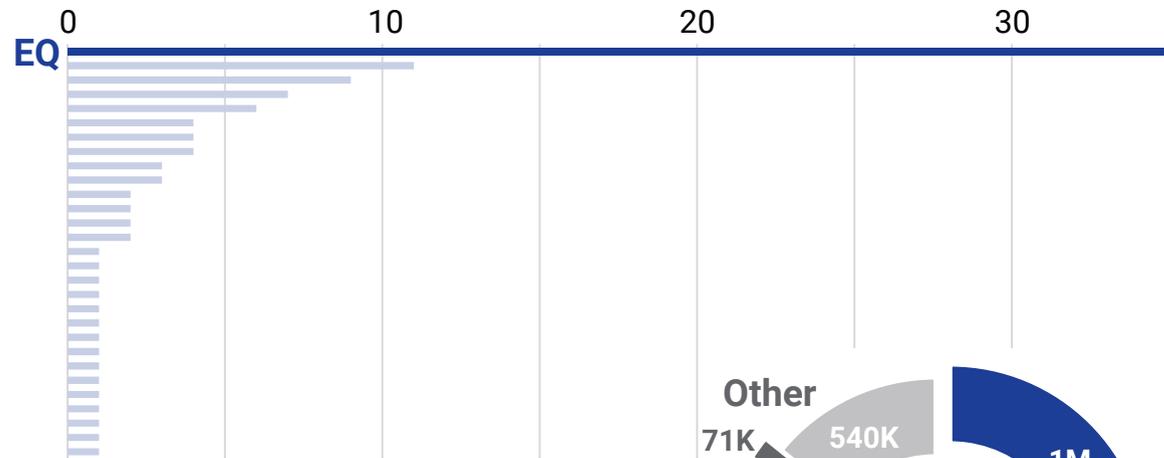


Figure 1. No. of Multi-Unit Residential building (MURB) Toronto Site Plan Applications that Identify the Energy/Sustainability Consultant

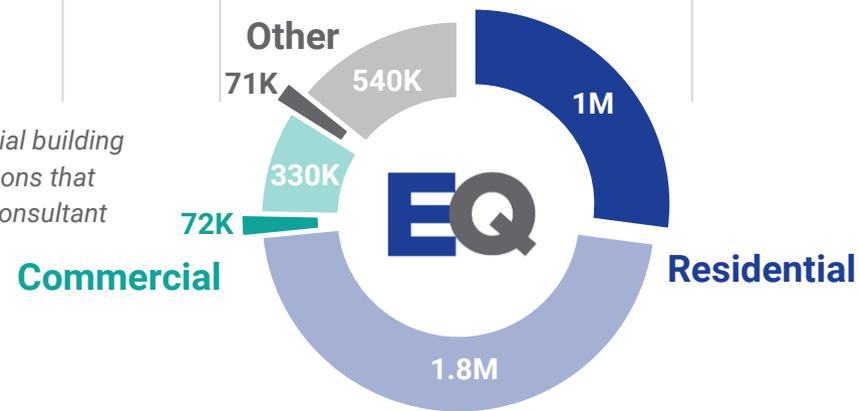
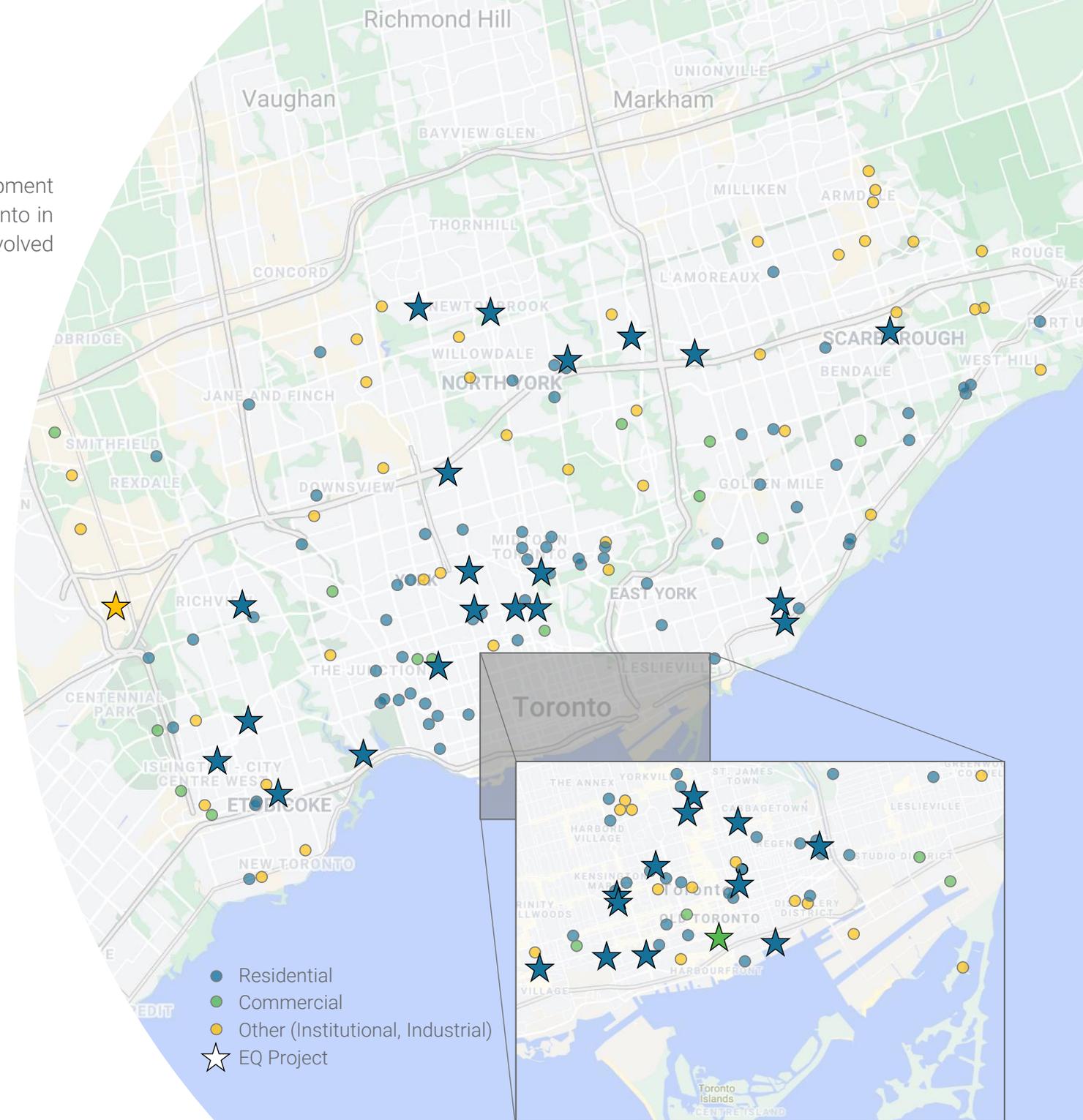


Figure 2. Breakdown of 2020 Toronto New Development as per Site Plan Applications (m²)

The 2020 Site Plan Applications proposed a total of 3.8 million square meters of new development, most of which was residential. In 2020 EQ worked on over 2.2 million square meters of new development, of which approximately 1.2 million square meters was in Toronto, representing nearly 30% of the total proposed development.



Project Highlights

The Saint

Client: Minto Communities
Property: High-Rise Residential
GFA: 28,000 m²
EQ's Role: Sustainability, Commissioning

The Saint is a residential development in the core of downtown Toronto with added emphasis on sustainable design and tenant-oriented wellness, as evidenced by the project's pursuit of both LEED and WELL certification. To maximize wellness in the development, amenities such as dedicated yoga and meditation rooms were incorporated in the design.



Baker District

Client: City of Guelph, Windmill Development Group
Property: Mixed-Use
GFA: 35,000+ m²
EQ's Role: Energy Modelling

The Baker District redevelopment is a massive undertaking from the City of Guelph to revitalize the downtown core with new residential buildings, community service, commercial and retail spaces, and a new library. The development is adopting the One Planet Living as a framework for the site and pursuing the Zero Carbon Building certification for multiple buildings on-site.



Mount Pleasant Village

Client: Choice Properties, Daniels Corporation
Property: Residential
GFA: 31,000 m²
EQ's Role: Energy Modelling

Situated adjacent to the Mount Pleasant GO station in Brampton, this residential development consists of low-rise townhome units, a mid-rise MURB, and a high-rise rental property that uses an on-site geo-exchange system to provide low-carbon heating and cooling.



Industry Leadership

Building Lasting Change

In September of 2020 EQ's Hillary Geer in collaboration with Steven Law from the Resilient World Institute delivered a presentation on energy storage in buildings at the Building Lasting Change 2020 online conference.

This session explored how smart grids and energy storage can mitigate energy and carbon issues, from both a building and a grid perspective. As buildings transition away from fossil fuels, they will become increasingly dependent on the grid and subsequent grid-based emissions. She examined lessons learned from California's deployment of energy storage solutions, and explored the potential opportunities and barriers in Ontario for municipalities and building owners.



Aya El-Halabi
Sustainability Analyst



Sheriza Jiwani
Energy Analyst



Mayan Reicher
Project Manager

CaGBC Emerging Green Professionals

The CaGBC Emerging Green Professionals (EGP) are comprised of young professionals and students committed to being leaders of change in the green building industry. The EGP Committee organizes mentorship, educational and networking activities, where Aya El-Halabi and Sheriza Jiwani volunteer their time and effort. Aya is one of the co-chairs, overseeing all committee activities, while Sheriza is responsible for developing and organizing the 2021 Design Charrette and providing support for other events that take place throughout the year.

Mayan Reicher also plays an active role with the CaGBC as a Mentor in the Mentorship Pilot Program offering advice, guidance, and support to individuals getting started in the Canadian green buildings industry.

Helsinki Challenge

EQ collaborated with representatives from over 20 other organizations to form Toronto's "Team Absolute Zero" in the Helsinki Energy Challenge. The City of Helsinki set the international challenge, seeking innovative solutions to de-carbonize the district heating system that serves Finland's capital. Although the solution Team Toronto developed did not ultimately advance to the final round of the competition, it was a great opportunity to use our expertise in building performance and low-carbon developments to contribute to the overall design concept and share ideas with industry peers.



Sustainability

“ We help clients by advising them on the feasibility for their projects to pursue various green building certifications and helping them decide the best way to achieve their sustainability goals. In doing so, green buildings encourage sustainable innovation, advance and tighten existing building codes, and improve the sustainability of the built environment. ”



Alexandra Lucki
M.E.S., B.Sc.
Sustainability Analyst



Certifications Update

Building certifications help projects set research-driven performance targets, whether the focus is in building performance or occupant health and wellness. While LEED and the Toronto Green Standard (TGS) dominate the market in the GTA, there is increased interest in newer wellness-based certifications like WELL and Fitwel, especially considering the impacts of COVID-19. In 2020 we also saw our first registration under the Energy Star Multifamily High-Rise Pilot Program.

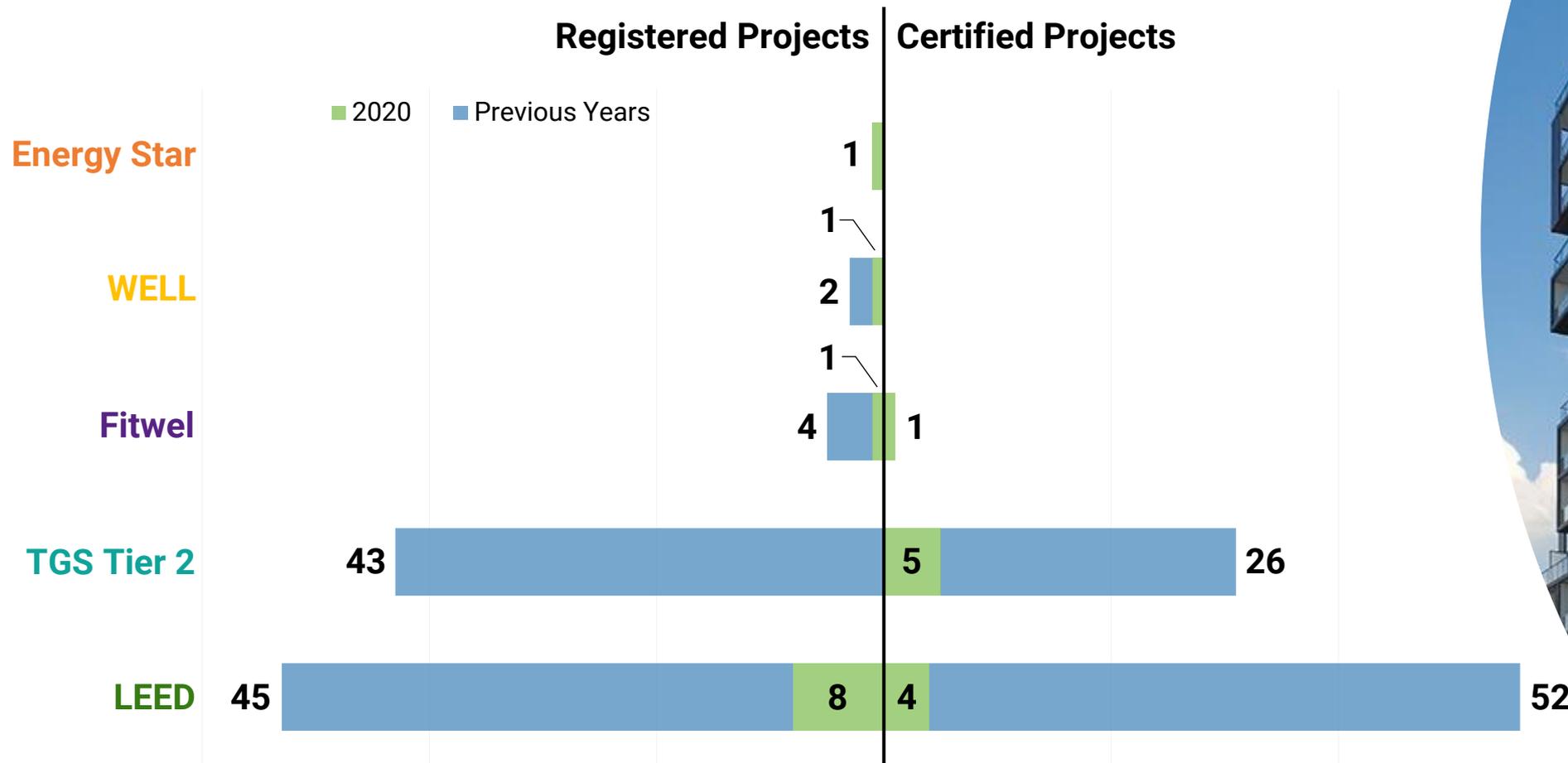
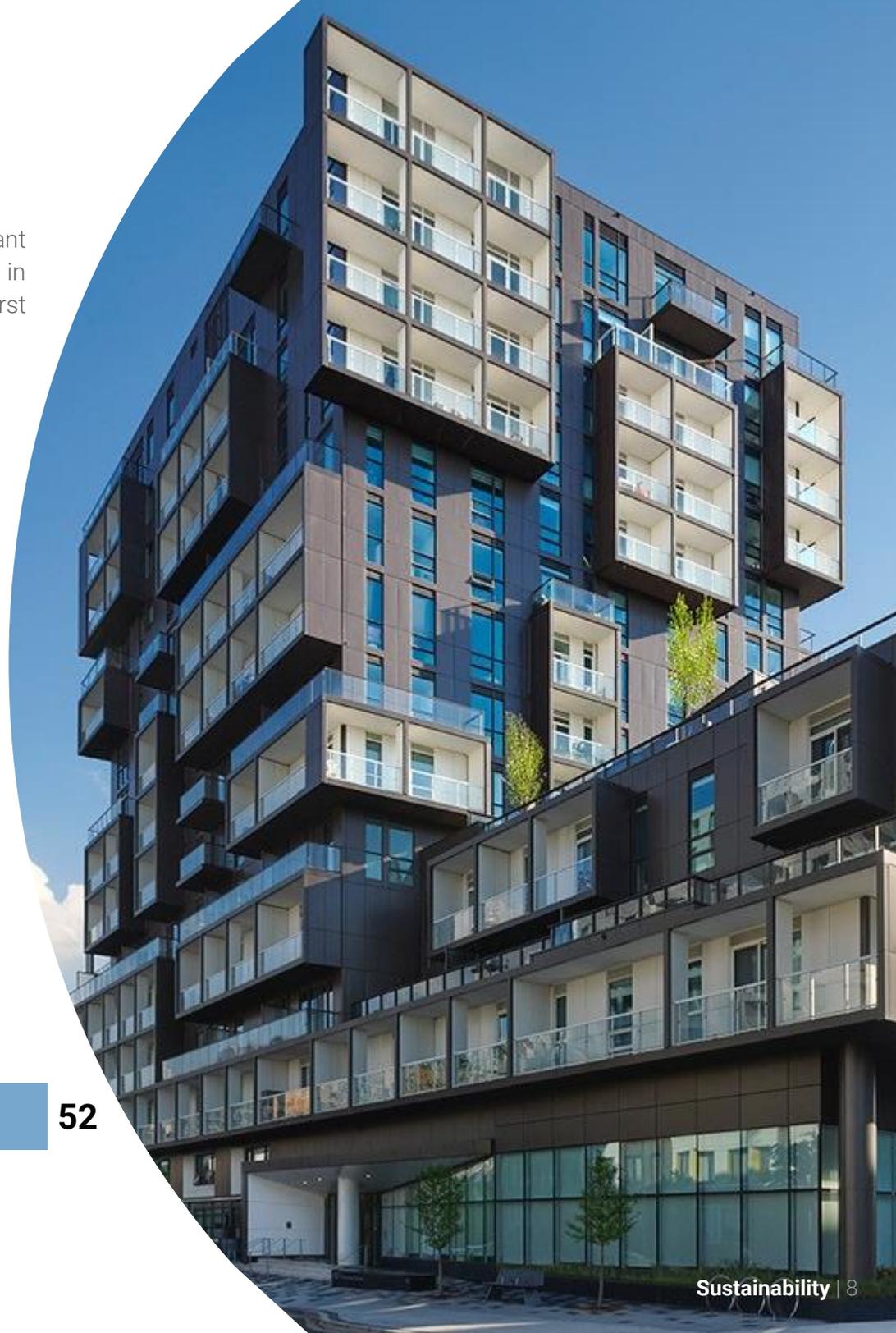


Figure 3. 2020 Certifications and Registrations Update



High Performance Metrics

**Total Certified Area in 2020:
154,000 m²**

Our sustainability team captured and recorded the progress of projects and helped a number of them achieve their target certification under LEED or TGS Tier 2 in 2020. We'd like to provide an update on the status of our project portfolio of certified buildings and gauge where the industry is, and where it's headed.

For a more detailed year-over-year analysis our Appendix also contains our data from 2018 and 2019.

Ecology

Green Roof

2020 - 45% of available roof
2019 - 48% of available roof

Water

Irrigation Intensity

2020 - 4.7 L/m² Site Area
2019 - 2.4 L/m² Site Area

Indoor Water Use Intensity

2020 - 1045 L/m²
2019 - 1031 L/m²

Energy

EUI

2020 - 176.0 ekWh/m²
2019 - 235.5 ekWh/m²

GHGI

2020 - 20.7 kg CO₂e/m²
2019 - 28.6 kg CO₂e/m²

Waste

Landfill Intensity

2020 - 31.0 kg/m²
2019 - 20.3 kg/m²

Waste Intensity

2020 - 131.2 kg/m²
2019 - 119.8 kg/m²

Diversion Rate

2020 - 76%
2019 - 83%

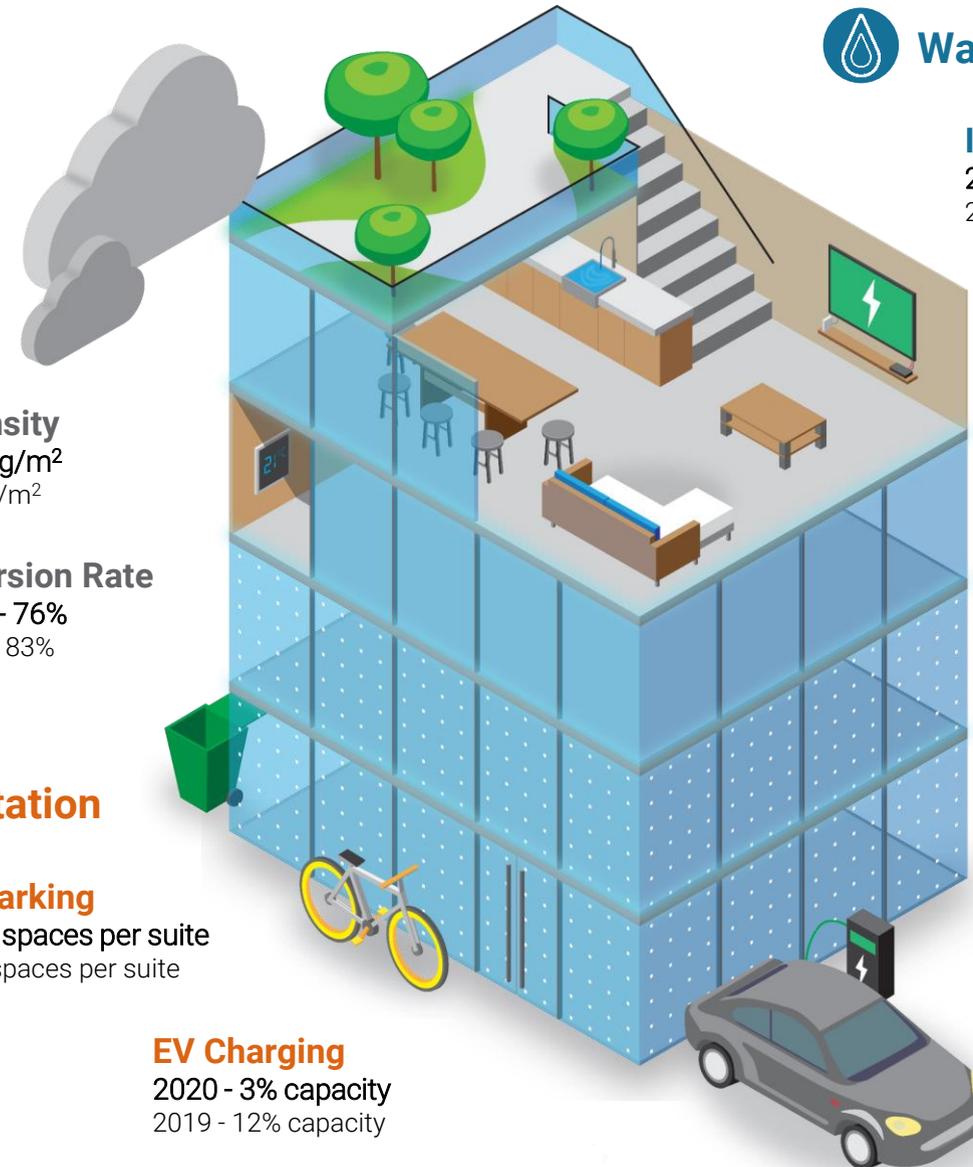
Transportation

Bicycle Parking

2020 - 1.03 spaces per suite
2019 - 1.04 spaces per suite

EV Charging

2020 - 3% capacity
2019 - 12% capacity



Construction Waste



An upward trend is observed on total waste intensity for our certified projects. While most projects exceeded the minimum 75% waste diversion target set under TGS Tier 2 (as an optional credit) and LEED, the amount of total waste generated per GFA has been steadily increasing.

USGBC responded by introducing a new compliance path on waste prevention under LEED v4, with updated thresholds of 75 kg/m² (1 point) & 50 kg/m² (2 points) under v4.1 due to limited uptake from projects enrolled in v4. While a handful of our projects may be able to achieve the 75 kg/m² target, the industry as a whole will have to undergo a paradigm shift to this improved metric and find creative ways to minimize construction waste with focus on waste prevention and not diversion.

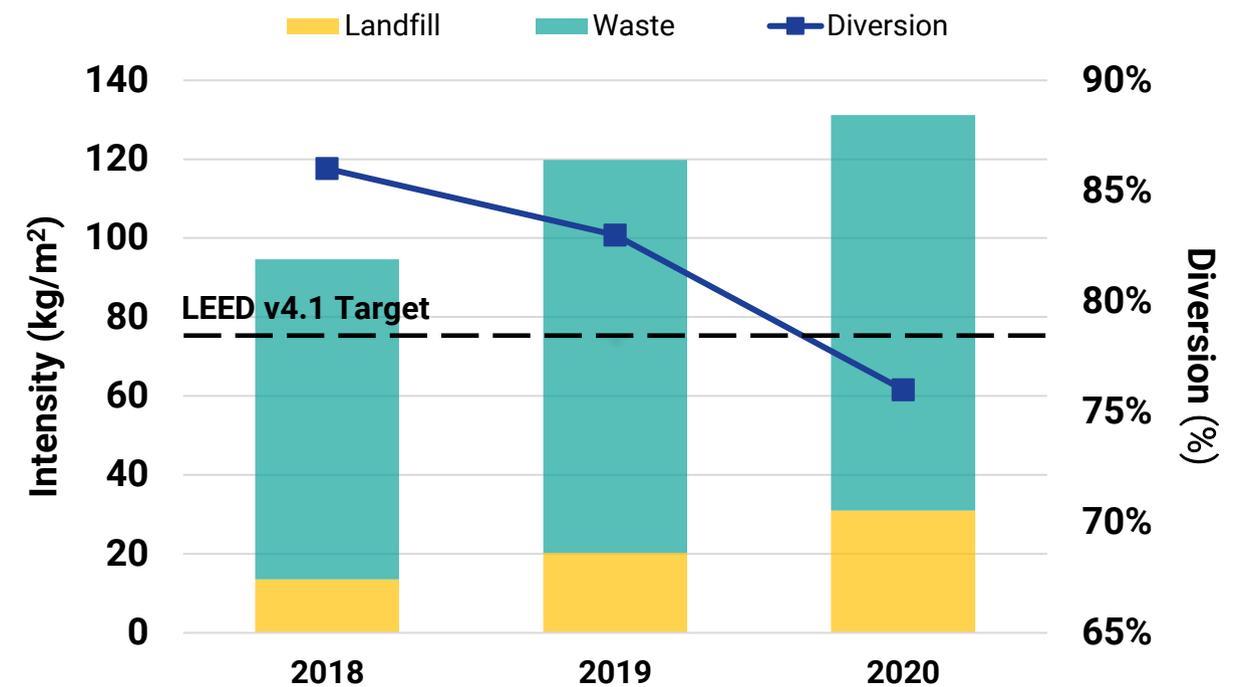


Figure 4. Year-Over-Year Waste Analysis



EV Charging



The total percentage of parking spaces equipped with EV stations and rough-in's dropped significantly in 2020. This sharp decline was primarily due to the decrease in rough-in's, which were only required under older versions of TGS if the project exceeded zoning by-law parking requirements, and occurs less and less as projects provide fewer parking spaces. Projects pursuing LEED v4.1 could potentially gain a LEED point by providing Level 2 EV charging stations for 5% of all parking spaces.

We anticipate an increase in the percentage of EV-capable parking spaces as TGS v3 projects require developments to provide EV charging stations for 20% of total parking, and the remaining 80% must be EV-ready. We also suspect that projects, especially in the downtown core, will try to reduce parking rates to meet or go below the zoning by-law parking requirements as Toronto becomes more bike-friendly.

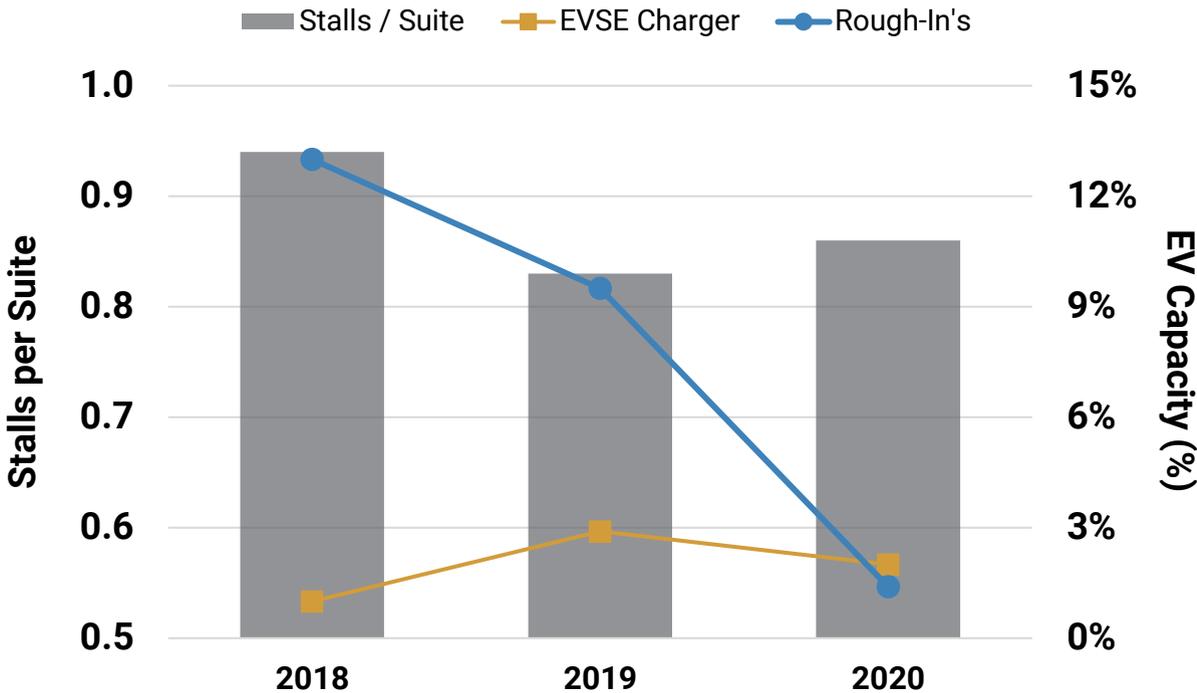


Figure 5. Year-Over-Year Transportation Analysis

Fitwel Project Profile



Tridel's Signature Series at The Well

Our 2019 CSR report introduced our first Fitwel registrations, which help guide clients to improve occupant wellness through better design and construction practices. The COVID-19 pandemic had certainly changed the way indoor environmental quality was being valued, where people try to find solutions to improve the air quality and comfort in their homes and indoor environment. Over this pandemic, more clients inquire about strategies to promote occupant health and wellness, resulting in Fitwel becoming more widely known and accepted in the industry.

100 total **Bicycle Parking** spots and access to **Bike Sharing** less than 200m away encourage cycling and reduce congestion and air pollution



Enhanced Walkability throughout the entire development increases opportunities for physical activity, social interactions, and access to diverse amenities, as evidenced by a Walk Score of 90



Beautiful Outdoor Spaces and amenities help connect occupants to nature, whether in the form of one of the many surrounding parks, bike paths, playgrounds or the Well outdoor marketplace



Biophilic design strategies are achieved by ensuring all 99 dwelling units and common amenity spaces have a direct view of nature



Fitness is advocated by the provision of a fitness and stationary equipment room, accessible and free of charge



Active Pedestrian Areas help foster neighbourhood walkability and enhance physical and mental health



Stair access, location, and design was considered to encourage pedestrian movement in the building and throughout the pedestrian retail spaces and promote fitness



Optimal Nutrition is supported by the availability of restaurants and grocery stores that provide healthy food options within a 800m walking distance



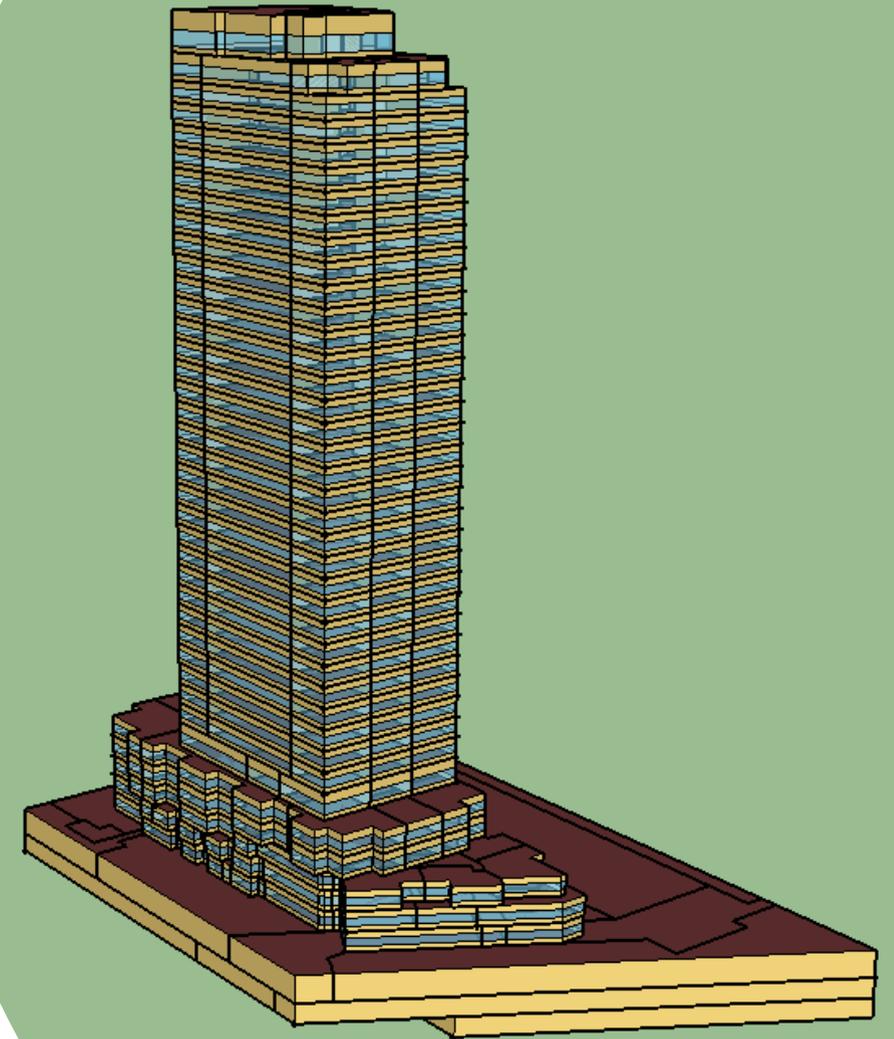
Energy

“ We help ensure developers design and construct their buildings to meet the energy efficiency requirements of whichever energy code or green building standard they are targeting. In doing so, we are helping buildings reduce their fossil fuel and overall energy consumption, which helps to create a more sustainable future.”



Christopher Mohabir

P.Eng
Senior Energy Analyst



Energy and Carbon

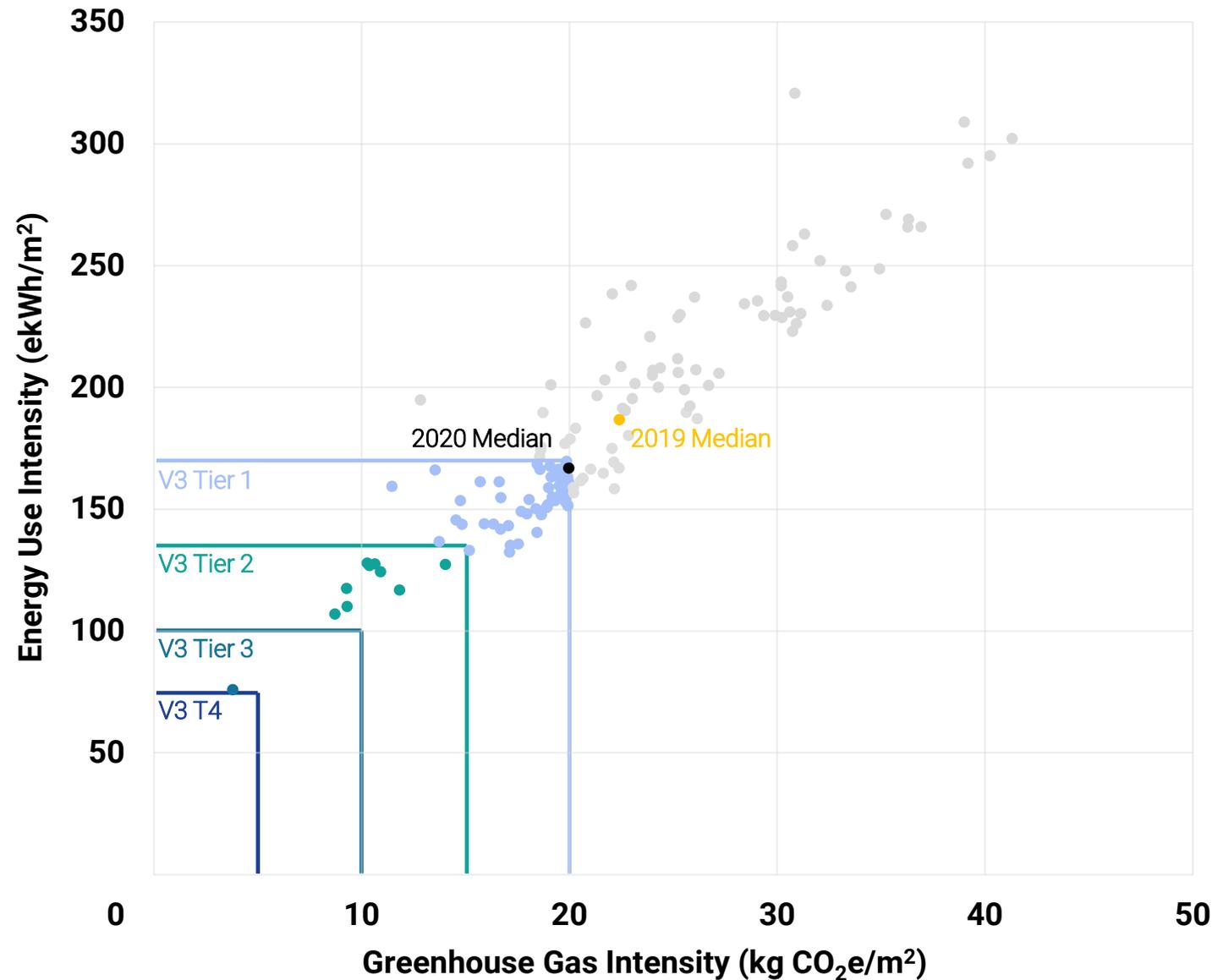


Figure 6. EQ 2020 MURB Modelling Database (Absolute Performance)

For 2020, our internal dataset of modelling data grew by over 150 MURBs, consisting of primarily a mix of TGS and Ontario Building Code (OBC) SB-10 models. The median of our 2020 dataset improved from last year from an EUI of 187 to 167.

While building performance is generally improving year-over-year, a large portion of this shift is due to the absolute targets of TGS which became mandatory at the beginning of 2020. TGS version 4 will come into effect in 2022, which should result in an even sharper increase in performance for new developments in the City of Toronto. The data points that did not meet the TGS Tiers were either located outside of Toronto or subjected to an older version of TGS that did not require compliance with the absolute targets.

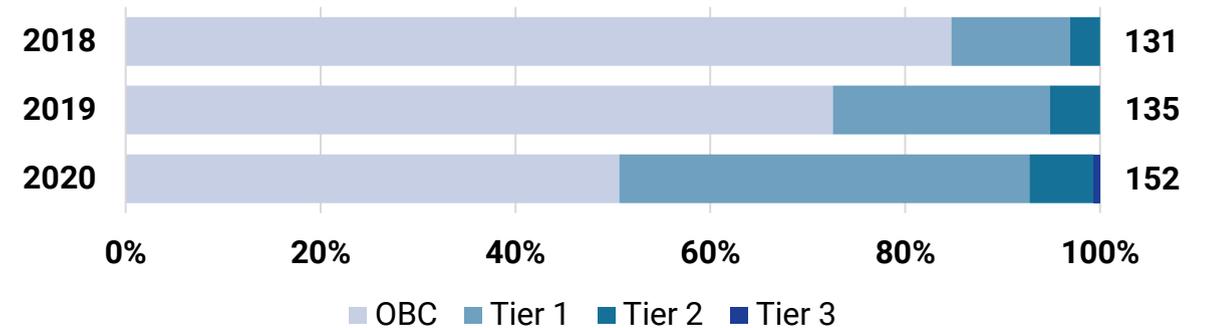


Figure 7. EQ MURB Modelling Database Size Year-over-Year Comparison

The Power of Absolute Targets

When TGS version 3 (v3) was first implemented in 2018, there was a transition period where projects could comply with Tier 1 requirements by pursuing the absolute targets or by achieving a 15% improvement over the Ontario Building Code. While these two pathways were intended to be equivalent, not all code compliant buildings are built to the same standard.

In Figure 8, projects from EQ's database that were subject to TGS v3 Tier 1 have been mapped to compare the energy and carbon performance of projects that followed the two compliance paths. The buildings that complied via the reference building approach on average used 17% more energy and 23% more carbon than the absolute v3 Tier 1 targets. With the relative performance path, the actual energy consumption of a building is not as important as long as it meets the minimum performance required by the building code. Focusing on absolute performance leads to better buildings and encourages modelling rules that better reflect the actual design.

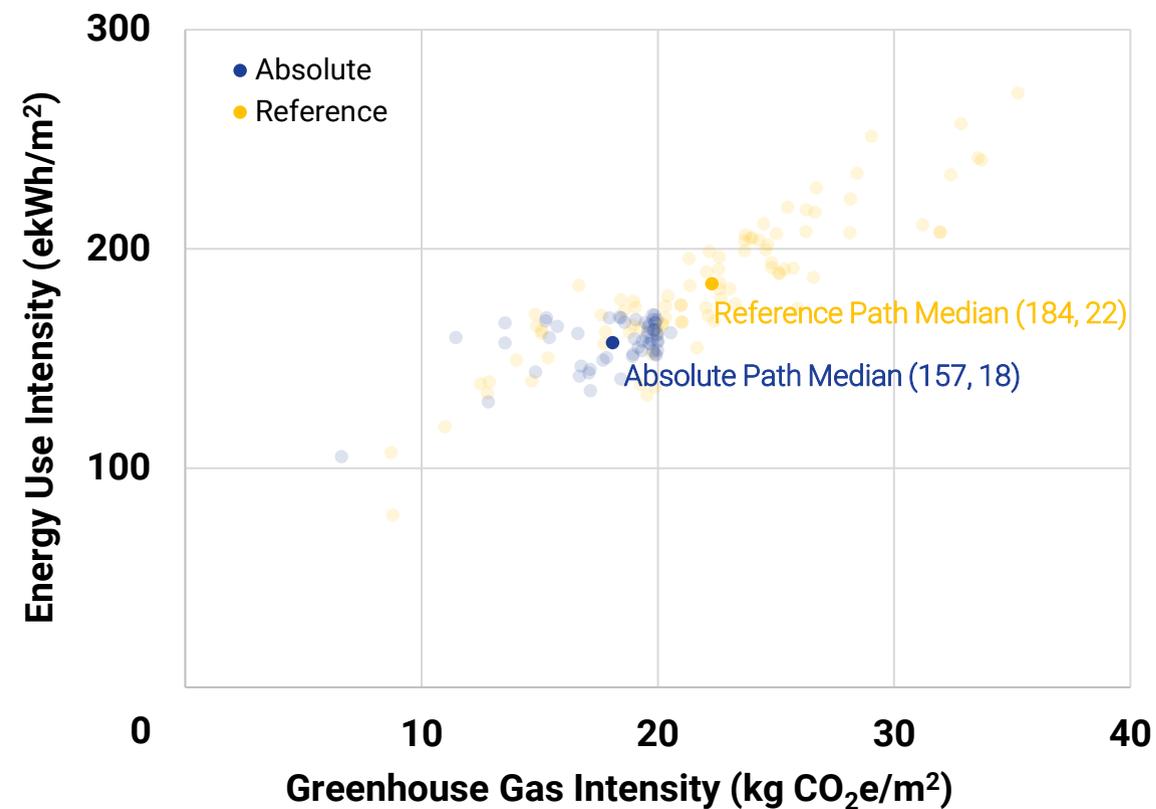


Figure 8. EQ 2020 TGS v3 Comparison: Absolute versus Reference



Building Loads and Climate Change

Due to the historical climate conditions in Toronto, design emphasis has typically been placed on reducing heating loads within buildings. With the changing climate, however, Toronto is expected to move to a warmer climate zone by the year 2040.

While Toronto has introduced the TEDI metric to monitor the heating loads within a building, cooling loads should also be monitored as they will increase significantly over the next twenty years. Using some MURB models from EQ's database, we have compared TEDI to the Cooling Energy Demand Intensity (CEDI). Our modelling study shows that cooling loads will likely exceed heating loads within the next 20-30 years. This shift could have a number of impacts on buildings built to current (or past) standards including:

- Thermal comfort issues;
- Larger equipment sizing at end of life replacement; and
- Increased operational costs.

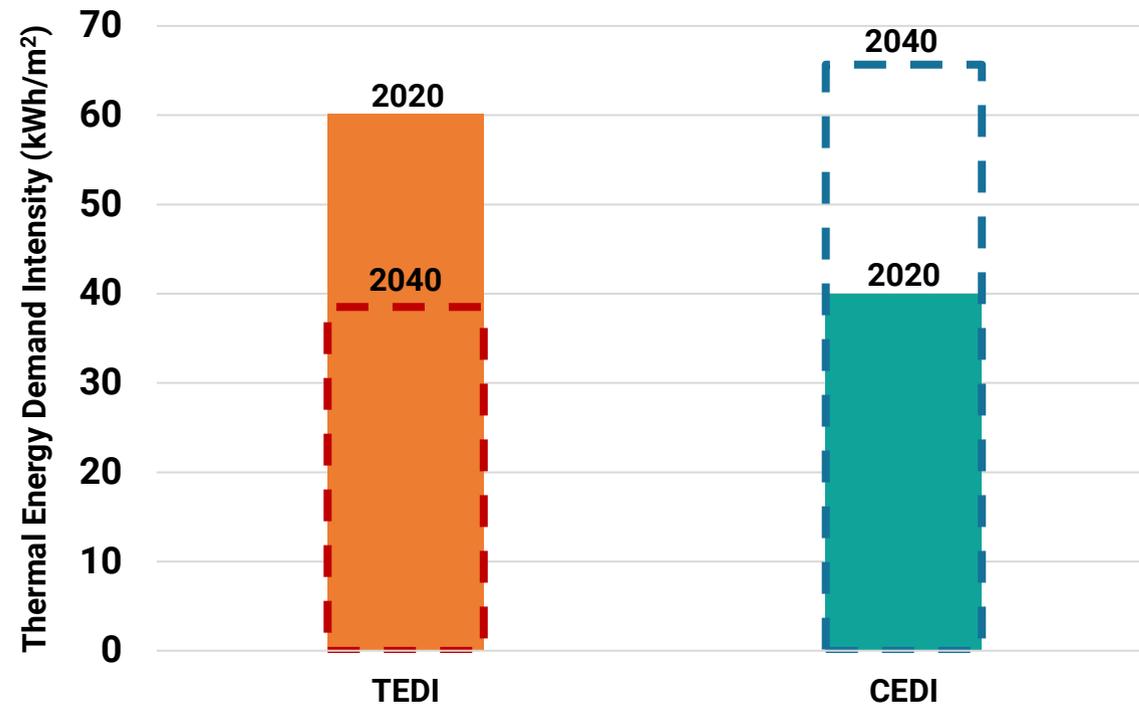


Figure 9. EQ 2020 versus 2040 TEDI & CEDI Analysis



Commissioning

“ By providing commissioning activities for building systems and providing guidelines and recommendations to building operators, we ensure that everything operates efficiently to minimize unnecessary energy consumption and carbon production. ”



Garrett Wu
B.Eng
Commissioning Specialist





Commissioning Deficiency Breakdown

EQ's commissioning team identified 845 deficiencies across 31 buildings in 2020. Most of these deficiencies were observed during construction and occupancy phases of our projects though rigorous testing of building equipment and systems. We work closely with owners, developers, contractors, and other consultants to resolve deficiencies and deliver more sustainable and functional building projects.

The deficiencies found in 2020 are broken down by equipment type below. Terminal HVAC units, like fan coils, heat pumps, and variable air volume boxes, accounted for the highest number of deficiencies found (approximately 20%). Piping, ducting, and accessory deficiencies accounted for about 14% of the deficiencies, fans about 13%, and controls about 12%.

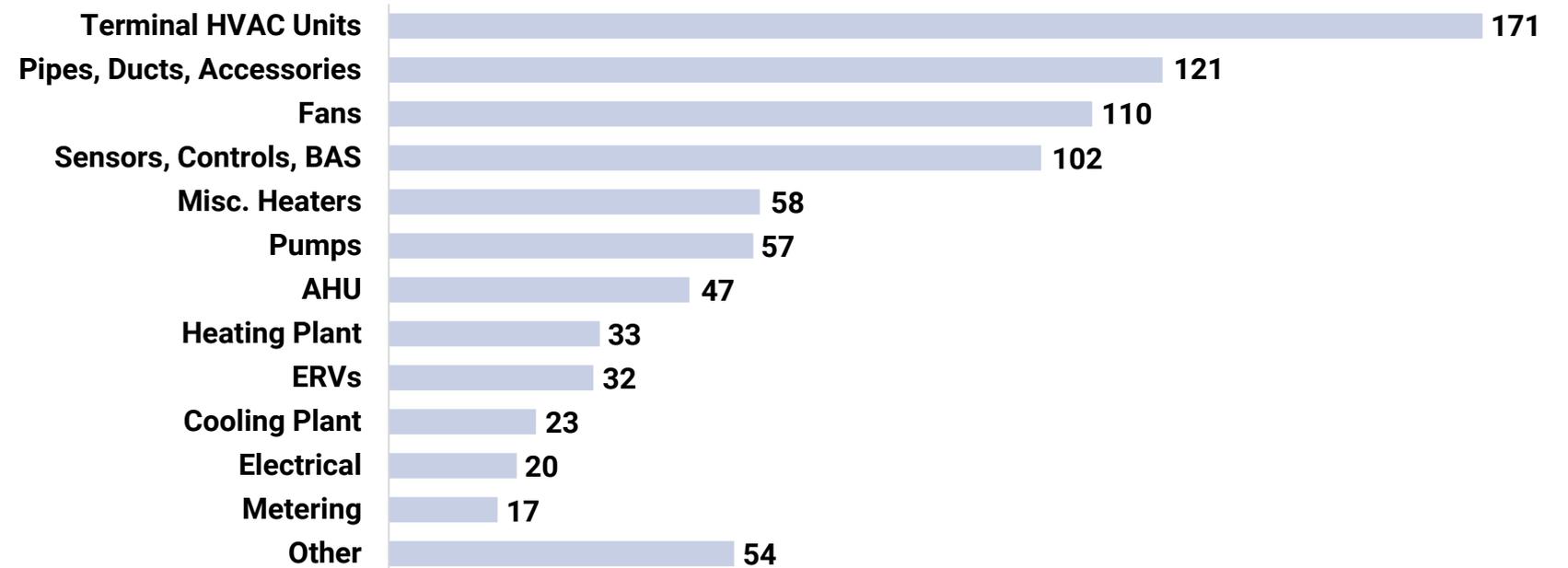


Figure 10. EQ 2020 Commissioning Deficiency Breakdown

Commissioning Deficiency Stats

EQ's commissioning team closed nine projects in 2020. As we wrap up each project, we like to look back and see how we've benefitted each building we work on.

The chart on the right shows our commissioning deficiency statistics for the projects we closed this year. We observed that a larger building does not necessarily mean there will be more deficiencies. There are many other factors that contribute to the number of deficiencies found, such as: commissioning scope of work, equipment variety, equipment and system complexity, equipment and system controllability, and client-specific energy efficiency and occupant comfort goals.

- 9** Fully Commissioned Buildings
- 382** Total Deficiencies
- 3,328** Total Residential Suites
- 11.5** Deficiencies per 100 Suites

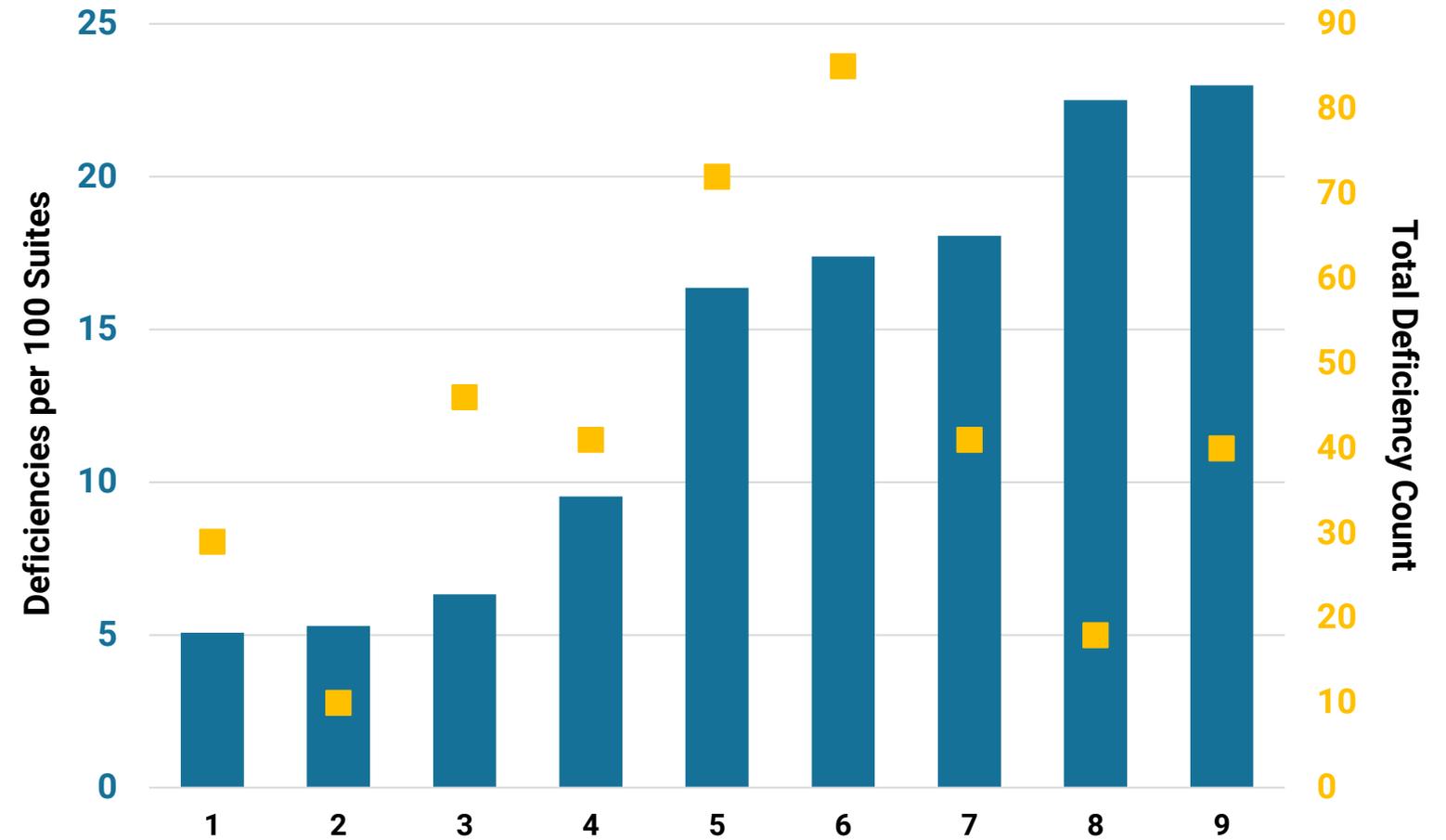


Figure 11. EQ 2020 Fully Commissioned Deficiency Count per Building



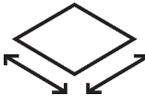
Commissioning Case Study

Last year we piloted our commissioning case study series to showcase the benefits of commissioning in terms of both qualitative and quantitative results. This year we completed a second case study to begin benchmarking and analyzing our commissioning benefits across multiple projects.

While the full study is ongoing and will be presented on our website after publication of this report, we wanted to share the results of the year-one energy, water, utility cost, and carbon savings associated with the resolution of deficiencies compared to whole building consumption and emissions. In addition to these savings, commissioning can positively impact tenant comfort, health, and satisfaction issues, and improve equipment life expectancy and plant operation.



**LEED
Certified**



19,000 m²



**240+
Suites**

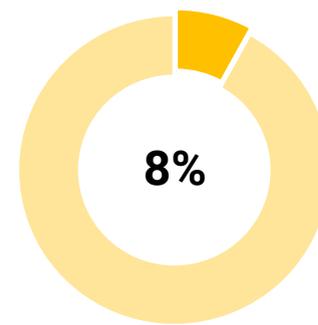


Fan Coil



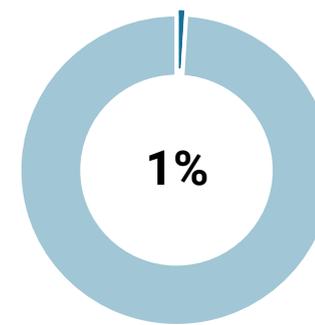
**50+
Deficiencies**

Energy



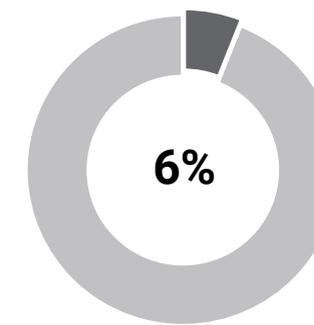
404,700 ekWh Saved

Water



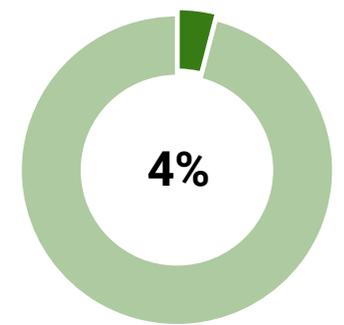
170 m³ Saved

Carbon



9,900 kg CO₂e Saved

Utility Cost



\$21,000 Saved

Our Carbon Footprint

This year we asked our team to again estimate their carbon footprint to help us all understand the carbon emissions associated with our everyday lives and also to get a snapshot of how COVID-19 impacted our carbon emissions. Overall, we saw a 43% reduction in carbon emissions compared to our 2019 baseline. A 2021 *Nature* study looking at how COVID-19 impacted daily global CO₂ emissions suggested an 11-25% decrease in total emissions.

While 2020 showed a 47% reduction in EQ secondary source carbon, this value may be inflated. Due to limitations in our 2019 analysis, secondary sources were estimated for the team. As such, there is a chance our 2019 analysis was too conservative. Our 2020 savings are also due to a 53% reduction in car usage and a 56% reduction in flights, heavily due to travel restrictions, improved remote work options, and public health measures.

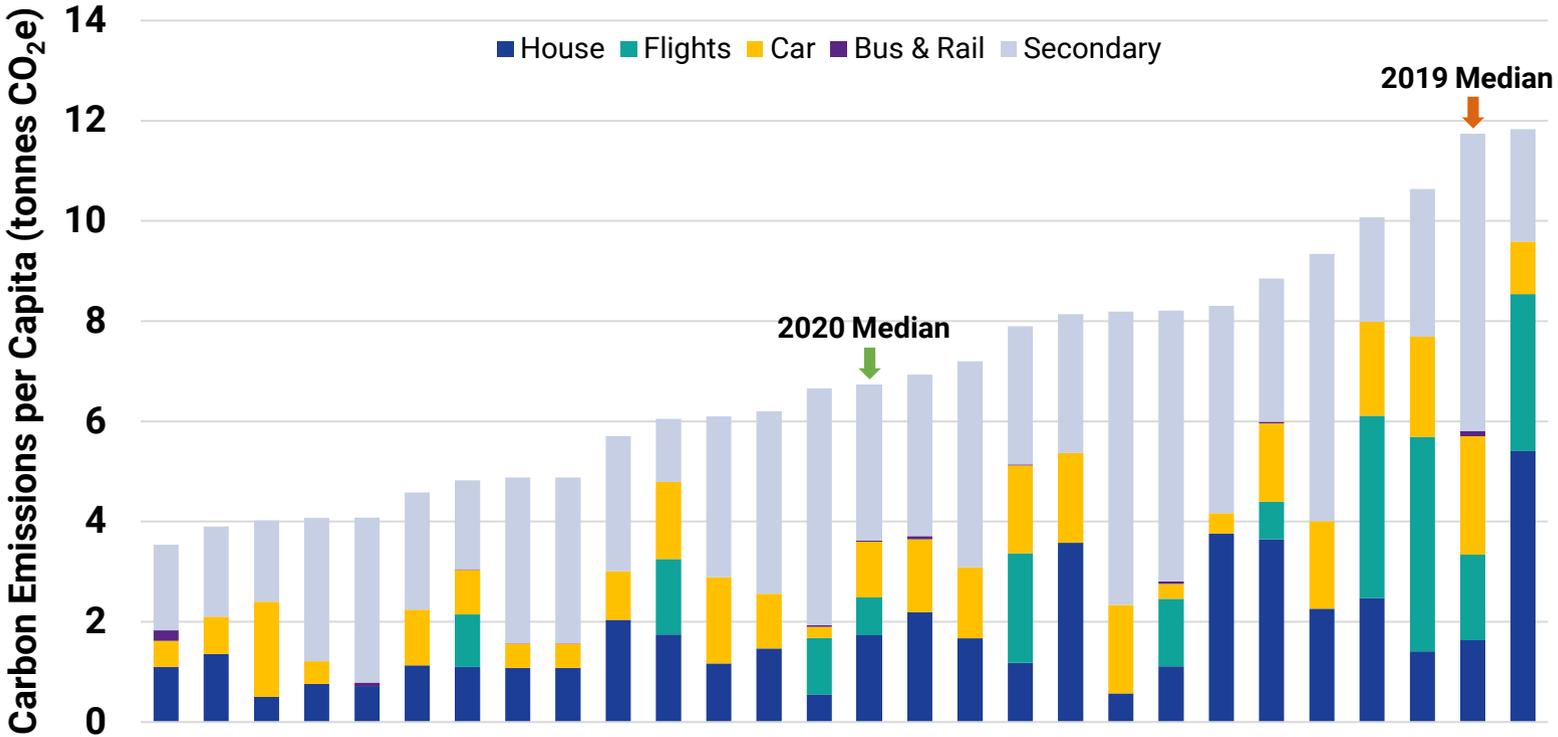


Figure 12. Individual 2020 Carbon Footprint of EQ Staff



Our Team



Our EQ Sustainability Team participated in a community tree planting event

Despite our team working apart, we're proud of how we stayed connected. Through countless video conferences, virtual socials, socially distanced gatherings and even sharing our favourite tunes in a collaborative Summer Playlist, the EQ team continued to deliver industry-leading sustainable solutions.



For Halloween we held a remote pumpkin carving contest

Going Forward

Thank you for taking the time to browse our third annual corporate sustainability report. We are thrilled at the opportunity to not only share some of our work and successes, but also our insights on where we think our industry is headed.

While 2020 was a challenging year for many of us, EQ is proud of how our employees adapted to stay connected and agile in a remote work setting. We are confident that in 2021 and onwards, our team will find new ways to strive for excellence, connect designers and builders, and continue guiding the creation of responsible buildings.

Next year we hope to continue with our metrics reporting and continue to keep having insightful and thought-provoking conversations about the journey so far and the steps we need to take to reach a net-zero carbon future.

EQ eqbuilding.com

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

ig instagram.com/eqbuilding/





Appendix I – Additional Data

Sustainability

Table A-1: Portfolio Performance of EQ Certified Buildings (LEED and TGS Tier 2)

Metric	Units	2018	2019	2020
Green Roof	% of Available Roof	59%	48%	45%
Irrigation Intensity	L/m ² of Site Area	8.1	2.4	4.7
Indoor Water Use Intensity	L/m ²	1172.5	1030.6	1045.0
Energy Use Intensity (EUI)	ekWh/m ²	197.1	235.5	176.0
Greenhouse Gas Intensity (GHGI)	kg CO ₂ e/m ²	24.3	28.6	20.7
Bicycle Parking	Spaces per Suite	0.76	1.04	1.03
EV Charging Capacity	% of Parking Stalls	13%	12%	3%
Landfill Intensity	kg/m ²	13.6	20.3	31.0
Waste Intensity	kg/m ²	94.6	119.8	131.2
Diversion Rate	%	86%	83%	76%

Appendix I – Additional Data

Energy

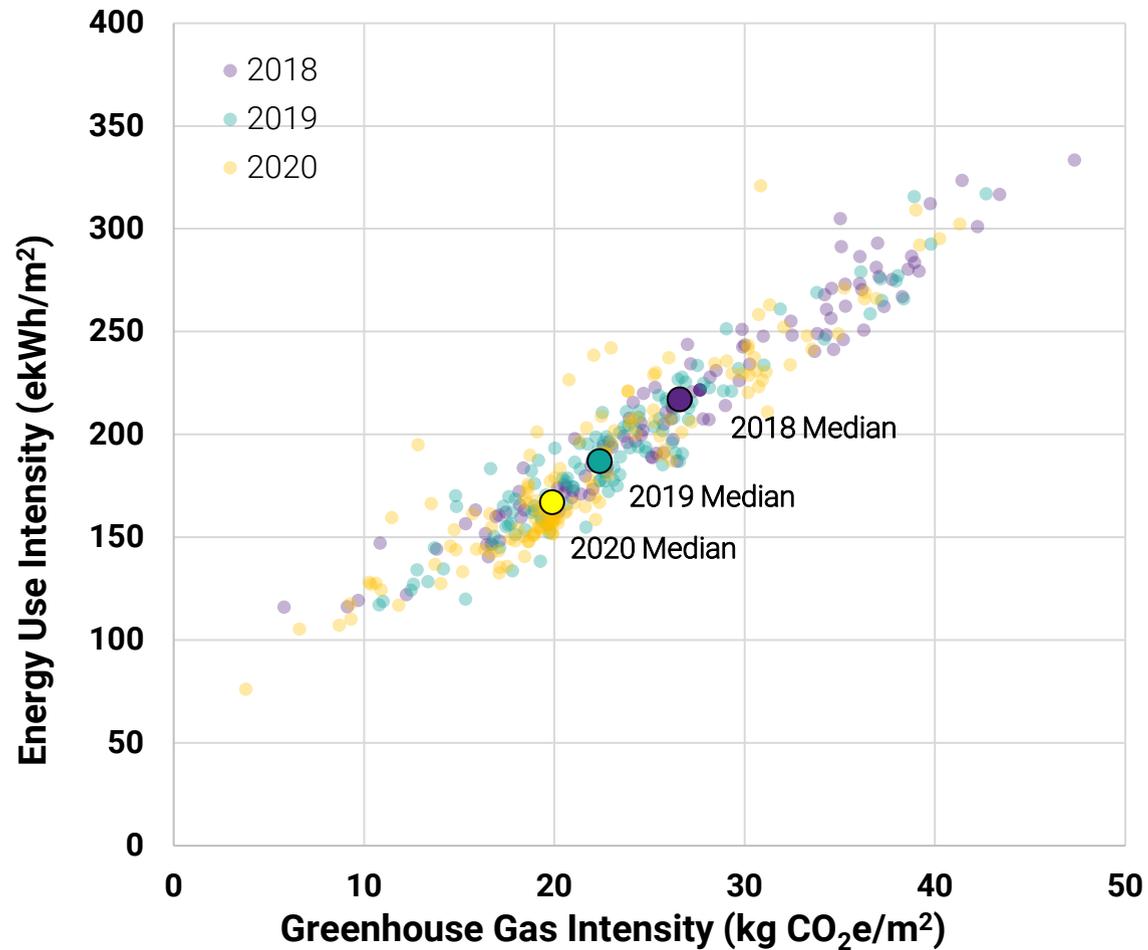


Figure A-1: EQ MURB Modelling Database

Table A-2: EQ MURB Modelling Database Median Performance

	Units	2018	2019	2020
Energy Models	-	131	135	152
Median EUI	ekWh/m ²	216.5	188.7	167.8
Median GHGI	kg CO ₂ e/m ²	26.6	22.6	20.0

Table A-3: EQ MURB Modelling Database Size Breakdown

TGS v3 Tier	2018	2019	2020
None	111	98	77
Tier 1	16	30	64
Tier 2	4	7	10
Tier 3	0	0	1



Appendix I – Additional Data

Commissioning

Table A-4: EQ Total Deficiency Counts

Deficiency	2018		2019		2020	
	Count	%	Count	%	Count	%
Terminal HVAC Units	139	24%	111	21%	171	20%
Pipes, Ducts, Accessories	49	8%	72	14%	121	14%
Fans	69	12%	73	14%	110	13%
Sensors, Controls, BAS	61	11%	40	8%	102	12%
Misc. Heaters	38	7%	42	8%	58	7%
Pumps	37	6%	47	9%	57	7%
AHU	53	9%	43	8%	47	6%
Heating Plant	33	6%	24	4%	33	4%
ERV's	27	5%	0	0%	32	4%
Cooling Plant	24	4%	17	3%	23	3%
Electrical	0	0%	0	0%	20	2%
Metering	11	2%	1	0%	17	2%
Other	37	6%	58	11%	54	6%
Total Deficiency Count	578	100%	528	100%	845	100%
Number of Buildings	20		24		31	

Appendix II - References

Carbon Factors

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

Development (pg. 4)

The data in this section of the report is largely based on the [Application Information Centre](#) on the City of Toronto website. Site Plan Applications first submitted in 2020 were reviewed in order to conduct this analysis. A total of 197 unique applications met this criteria. This data was used to create the map of new proposed development in the City of Toronto.

For Figure 1, the relevant Site Plan Application energy modelling report and Toronto Green Standard (TGS) checklists were reviewed and the consultant listed on each was noted. Where neither of these documents was listed or the consultant was unclear, the consultant was categorized as unknown. Of the 197 submitted applications, 60 were not subjected to the requirements of TGS, and 28 did not list any consultant.

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 consultant on file.

Sustainability (pg. 9, 10, 11)

Performance metrics are based on LEED and TGS project statistics. Only projects that achieved certification in 2020 were included.

Energy (pg. 14, 15, 16)

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

Commissioning (pg. 18, 19, 20)

Data presented in Figure 10 is based on deficiency reports prepared through site visits during 2020. Figure 11 was prepared based on projects with commissioning services completed in 2020, 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 ³
Water:	3.95 \$/m ³

Carbon (pg. 21)

For Figure 12, we surveyed the EQ team anonymously using this [carbon footprint calculator](#). As the results were anonymous, there was limited ability to QC the results, and may possess some errors. The impact of carbon as a result of COVID-19 was obtained from a [Nature study](#).

Image Sources

Pg. 2 – Image of *the Well* obtained from [here](#).

Pg. 3 – Base Map of Toronto obtained from Google My Maps.

Pg. 5 – Image of *the Saint* obtained from [here](#).

Pg. 5 – Image of *the Baker District* obtained from [here](#).

Pg. 5 – Image of *Mount Pleasant Village* obtained from [here](#).

Pg. 6 – Image of *the Helsinki Energy Challenge* obtained from [here](#).

Pg. 8 – Image of *SQ2* obtained from [here](#).

Pg. 12 – Image of *Tridel's Signature Series at the Well* obtained from [here](#).

All other images are royalty-free and were obtained from [Unsplash](#).

