

## Attachment A: Kelowna's Existing Building Stock

Understanding the challenges and opportunities of retrofitting Kelowna's existing buildings first requires an understanding of the current building stock. The following section summarizes greenhouse gas (GHG) emissions sources from the buildings sector, the age of existing buildings, and the number of renovation permits issued on an annual basis between 2014 and 2019.

### GHG Emissions Sources from the Building Sector

Within the building sector, natural gas consumption accounts for 92 per cent of GHG emissions in Kelowna. Residential natural gas use contributes 52 per cent of this total, while natural gas consumed by industrial, commercial and institutional buildings (ICI) account for the remaining 40 per cent.

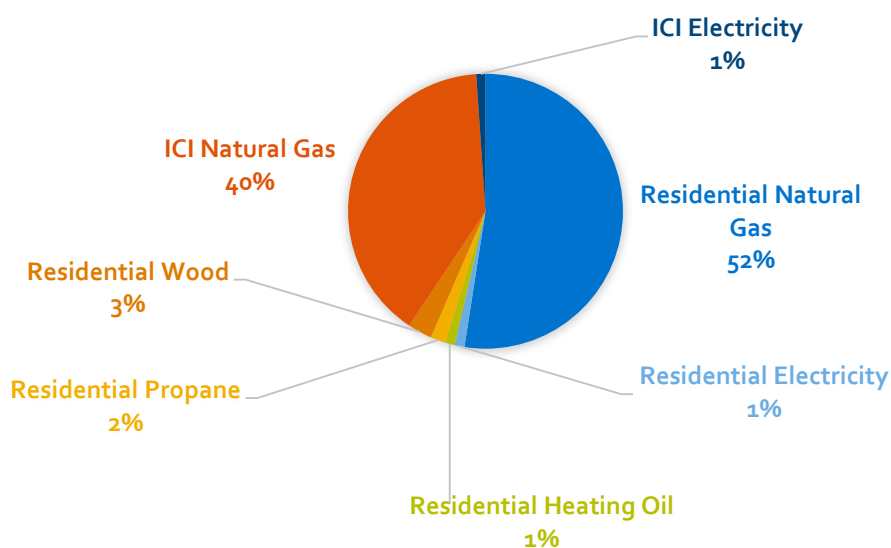


Figure 1: Kelowna's Sector Building Emissions (tCO<sub>2</sub>e) - 2012<sup>1</sup>

### Residential

#### *Building Makeup*

Approximately 27 per cent of the current housing stock in Kelowna was built prior to 1980, and 52 per cent was built prior to 2000. Many houses are therefore reaching the age where major structural components will need to be replaced. This offers an excellent opportunity to not only bring these dwellings up to current codes but to dramatically increase efficiency through envelope and mechanical system upgrades.

---

<sup>1</sup> BC Government. Community Energy and Emissions Inventory (CEEI). Retrieved from: <https://www2.gov.bc.ca/gov/content/environment/climate-change/data/ceei>.

## Attachment A: Kelowna's Existing Building Stock

Table 1: Vintage of Existing and Projected Residential Housing Units

Build Date Range <sup>2</sup>	# of Units	Proportion of Total
Pre-1960	3,950	5.3%
1961-1980	16,155	21.8%
1981-1990	8,160	11.0%
1991-2000	10,500	14.2%
2001-2010	11,645	15.7%
2011-2016	3,500	4.7%
2017-2040	20,130	27.2%
Total	74,040	100.0%

### Renovation Permits Issued Annually

From 2014 to 2018, an average of 669 residential renovation permits were issued on an annual basis (Table 2). This represents 1.2 per cent of the existing residential building stock. To reach the goals of Community Energy Retrofit Strategy outlined in the *Community Climate Action Plan* (CCAP) (i.e., one per cent of the existing residential building stock will need be retrofitted annually, achieving a 30 per cent improvement in energy efficiency in each of these units), every one of the residential renovations would need to be targeted toward energy efficiency – a motivation that often ranks near the bottom of motivations for renovating.<sup>3</sup> Additionally, it is widely assumed that a large portion of the renovation market is “underground,” meaning that a large majority of renovations would not be permitted with the City (and therefore not captured in the development statistics in Tables 2 and 3).<sup>4</sup> On one hand this is positive because it assumes there are more renovations occurring, and therefore more opportunities to encourage energy retrofits. Conversely, unpermitted renovations mean there is no “trigger” to engage with homeowners at the time of permit (could engage with them through promotion, etc.).

---

<sup>2</sup> Data to 2016 was retrieved from <http://www12.statcan.gc.ca/census-recensement/2016/dp-pd/prof/details/page.cfm?Lang=E&Geo1=CSD&Code1=5935010&Geo2=PR&Code2=01&Data=Count&SearchText=kelowna&SearchType=Begins&SearchPR=01&B1=Housing&TABID=1>; 2017-2031 data was retrieved from the *City of Kelowna Housing Demand Forecast: Looking to 2040* (June, 2018).

<sup>3</sup> CIBC. 2016. CIBC Home Renovation Poll.

<sup>4</sup> BC Housing. 2017. Encouraging Green Renovations: Research Overview – Presentation to Community Energy Managers. Presentation on September 28, 2017.

## Attachment A: Kelowna's Existing Building Stock

Table 2: Renovation Permits and Value Across Residential Renovation Types (2014-2019)

Year		Residential Renovation Type									Res Totals
		Apartment	SFD - Reno	SFD - Addition	SFD - Addition Suite	SFD - Suite	2 Family - Reno	2 Family Addition	3 Family - Reno	Townhouse - Reno	
2014	Permits	26	335	85	7	117	18	4	0	21	613
	Value (\$)	4,228,000	9,615,219	9,463,435	1,478,000	2,421,510	399,000	90,000	0	666,000	28,361,164
Average Renovation Value											\$46,266
2015	Permits	27	294	96	13	135	8	2	0	23	598
	Value (\$)	1,514,000	9,235,697	5,661,200	1,197,500	2,404,820	311,087	20,000	0	407,500	20,751,804
Average Renovation Value											\$34,702
2016	Permits	36	380	97	11	166	15	1	0	27	733
	Value (\$)	1,432,000	10,154,711	6,491,100	790,940	4,481,500	282,381	180,000	0	496,955	24,309,587
Average Renovation Value											\$33,164
2017	Permits	48	299	104	21	189	18	4	1	25	709
	Value (\$)	2,621,093	10,863,378	7,686,410	2,591,550	5,782,175	582,180	48,000	10,000	1,093,000	31,277,786
Average Renovation Value											\$44,115
2018	Permits	57	309	121	20	166	15	2	1	1	692
	Value (\$)	17,984,968	9,453,791	9,899,600	2,798,000	5,107,367	741,923	80,000	10,000	10,000	47,097,080
Average Renovation Value											\$68,059
2019 (YTD)*	Permits	63	234	100	13	113	8	3	2	0	536
	Value (\$)	6,773,551	8,964,163	8,506,920	3,392,628	4,337,499	189,530	30,000	58,000	0	32,727,926
Average Renovation Value											\$61,059

\*YTD: year-to-date (permits issued between January and the end of September in 2019)

## Attachment A: Kelowna's Existing Building Stock

### Industrial, Commercial, and Institutional Buildings

#### *Building Makeup*

The industrial, commercial, and institutional buildings (ICI) built environment is not as well understood as low density residential (the best we can do is use proxy measures to gather information about the number of buildings, age, and use). There is a great need to better understand the makeup and energy consumption patterns of non-residential buildings to enable informed decision making regarding how or if to target ICI structures with a retrofit program.

#### *Renovation Permits Issued Annually*

From 2014 to 2018 an average of 343 ICI renovation permits were issued on an annual basis (Table 3).

Table 3: Renovation Permits and Value Across ICI Renovation Types (2014-2019)

Year		Industrial, Commercial & Institutional Renovation Type			
		Industrial - Reno	Commercial - Reno	Institutional - Reno	Total
2014	Permits	35	283	21	339
	Value (\$)	2,264,000	30,007,872	5,872,317	38,144,189
Average Renovation Value (\$)		64,685	106,034	279,634	112,519
2015	Permits	34	284	29	347
	Value (\$)	1,857,836	26,658,075	24,844,600	53,360,511
Average Renovation Value (\$)		54,642	93,866	856,710	153,776
2016	Permits	50	243	23	316
	Value (\$)	3,825,930	40,283,605	29,056,810	73,166,345
Average Renovation Value (\$)		76,518	165,776	1,263,339	231,539
2017	Permits	41	292	18	351
	Value (\$)	3,817,800	41,527,623	2,591,775	47,937,198
Average Renovation Value (\$)		93,117	142,217	143,987	136,573
2018	Permits	63	283	16	362
	Value (\$)	19,879,092	39,837,250	2,307,730	62,024,072
Average Renovation Value (\$)		315,541	140,767	144,233	171,337
2019 (YTD)*	Permits	49	275	16	340
	Value (\$)	6,808,766	35,814,744	2,208,915	44,832,425
Average Renovation Value (\$)		138,954	130,235	138,057	131,860

\*YTD: year-to-date (permits issued between January and the end of September in 2019)