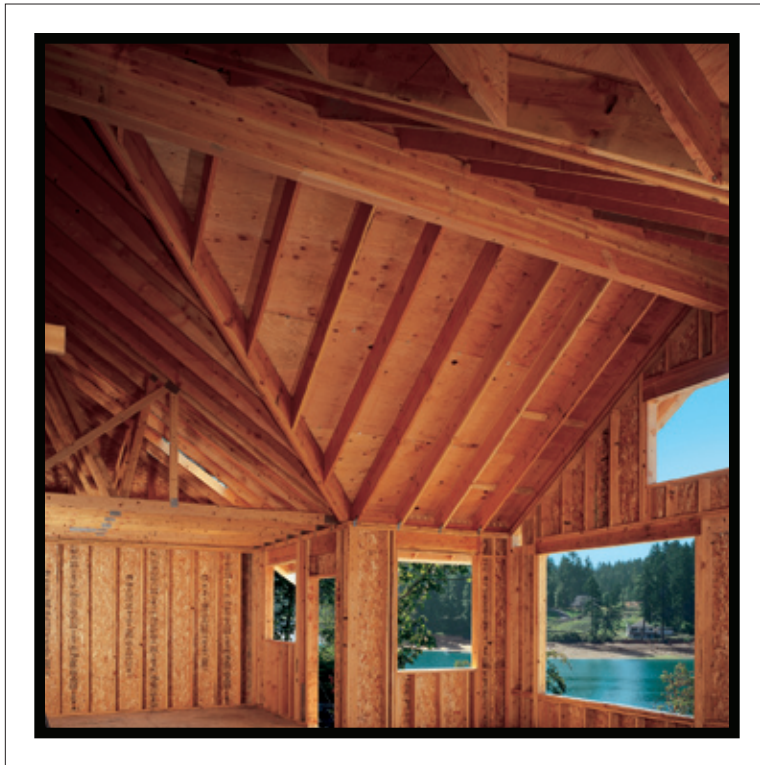


2006

Wood Used in New Residential Construction U.S. and Canada

WITH COMPARISON TO 1995, 1998 AND 2003



WOOD PRODUCTS COUNCIL

2006
Wood Used in New Residential
Construction U.S. and Canada,
With Comparison to 1995, 1998 and 2003

Prepared for:

The Wood Products Council

APA

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FP Innovations

US Forest Products Lab

Natural Resources Canada

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Executive Summary

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The construction of new single family, multifamily, and manufactured housing is an important market for wood products in both the United States and Canada. Annual wood products consumption is dependent on many factors, including the number of new units started, the size of units started, architectural characteristics, and consumer preferences. In 2006, about 39 percent of all solid wood products consumed in the United States and 28 percent of all solid wood products consumed in Canada were used for new residential construction (Adair 2008, FAO 2008, McKeever 2009). New residential construction continues to be the leading market for solid softwood products in the United States and second only to residential repair and remodeling in Canada.

Between 2003 and 2006 the consumption of lumber and structural panels for new residential construction increased, while nonstructural panel consumption remained virtually unchanged. Lumber (including the board foot equivalent of engineered lumber) consumption increased by 10 percent to nearly 32 billion bf, and structural panels by 6 percent to 23 billion ft² (3/8-inch basis). Nonstructural panels consumption was 3 billion ft² (3/8-inch basis). Per capita consumption also increased to 96 bf, 68 ft² (3/8-inch basis) for lumber, and structural panels, and remained unchanged at 9 ft² (3/8-inch basis) for nonstructural panels.

While this study was in progress, the housing market in the United States began to steadily decline. By the end of 2008, U.S single family housing starts for the year totaled just 622 thousand. Wood products consumption in 2008 was estimated by applying 2006 average wood products consumption per house to the number of starts in 2008. The decline in single family starts in 2008 caused overall wood products consumption in 2008 to be 58 percent below consumption levels in 2006.

Competition

Wood products compete with a variety of non-wood products for market share. A series of residential construction studies have documented the use of wood products, but only highlighted the use of competitive products. Here, we have added additional documentation in the use of competitive materials. Competitors to wood include concrete floors, steel framing, non-wood sheathing products, and plastic composite products typically used for outdoor decks.

Total non-wood products use in 2006 in the U.S. and Canada is shown in Table ES-1. They were equivalent to 7.7 BBF of lumber and engineered wood and 11.3 BSF of wood panels. These are large potentials compared to the North American capacity that has been idled in the recent recession. At the end of 2008, lumber capacity was about 75-77 BBF with production of only about 53 BBF, leaving over 20 BBF of unused capacity. Potential gains represent over one-third of the unused capacity. For structural panels, year-end 2008 capacity was 42 BSF and production was 31 BSF leaving 11 BSF unused. Potential panel gains equal the unused capacity.

Table ES-1 provides estimates of the volume of competitive products used in new residential construction in 2006. In the U.S., the largest volumes of competitive products are in single-family construction where 5.9 BBF of lumber equivalent and 9.0 BSF of structural and non-structural panels were found. Within single-family, the largest gains are in floors and siding. U.S. multifamily construction has the non-wood equivalent of 575 MMBF of lumber and 640 MMSF of wood panels. The largest potential multifamily gains are in floors, walls and siding.

Table ES-1. Potential gains for wood products in new residential construction in the U.S. and Canada, 2006.

	Lumber, Beams & EWP (Mil bf)					Wood Based Panels (Mil ft ² , 3/8" basis)				
UNITED STATES										
	Northeast	Midwest	South	West	Total	Northeast	Midwest	South	West	Total
U.S. single family housing										
A. Structural applications	40	60	1,955	725	2,780	45	70	2,095	775	2,985
Floors	10	25	560	65	660	70	360	1,475	470	2,375
Walls	0	5	0	5	10	0	0	0	0	0
Roofs	50	90	2,515	795	3,450	115	430	3,570	1,245	5,360
Subtotal	25	30	165	265	485	0	0	0	0	0
B. Outdoor structures	355	220	790	240	1,605	80	640	1,440	1,005	3,165
C. Siding	50	60	180	60	350	20	80	315	65	480
D. Soffits, fascia, trim	480	400	3,650	1,360	5,890	215	1,150	5,325	2,315	9,005
Total										
U.S. multifamily housing										
A. Structural applications	50	30	130	115	325	35	30	180	60	305
Floors	5	5	100	10	120	10	25	60	10	105
Walls	0	0	0	0	0	0	0	0	0	0
Roofs	55	35	230	125	445	45	55	240	70	410
Subtotal	0	0	0	0	0	0	0	0	0	0
B. Outdoor structures	35	25	0	45	105	20	10	160	25	215
C. Siding	5	5	10	5	25	0	5	5	5	15
D. Soffits, fascia, trim	95	65	240	175	575	65	70	405	100	640
Total										
Total, U.S. single family and multifamily housing										
A. Structural applications	90	90	2,085	840	3,105	80	100	2,275	835	3,290
Floors	15	30	660	75	780	80	385	1,535	480	2,480
Walls	0	5	0	5	10	0	0	0	0	0
Roofs	105	125	2,745	920	3,895	160	485	3,810	1,315	5,770
Subtotal	25	30	165	265	485	0	0	0	0	0
B. Outdoor structures	390	245	790	285	1,710	100	650	1,600	1,030	3,380
C. Siding	55	65	190	65	375	20	85	320	70	495
D. Soffits, fascia, trim	575	465	3,890	1,535	6,465	280	1,220	5,730	2,415	9,645
Total										
U.S. manufactured housing										
A. Structural applications	--	--	--	--	0	--	--	--	--	0
Floors	--	--	--	--	0	--	--	--	--	204
Walls	--	--	--	--	0	--	--	--	--	0
Roofs	--	--	--	--	0	--	--	--	--	204
Subtotal	--	--	--	--	0	--	--	--	--	0
B. Outdoor structures	--	--	--	--	10	--	--	--	--	249
C. Siding	--	--	--	--	4	--	--	--	--	23
D. Soffits, fascia, trim	--	--	--	--	15	--	--	--	--	476
Total										
CANADA										
A. Structural applications	Single family			Multi-family	Total	Single family			Multi-family	Total
	North	South	Total			North	South	Total		
Floors	10	0	15	15	40	10	0	15	10	35
Walls	40	5	45	10	100	175	5	180	50	410
Roofs	0	0	0	0	0	0	0	0	0	0
Subtotal	50	5	60	25	140	185	5	195	60	445
B. Outdoor structures	10	25	40	235	310	0	0	0	0	0
C. Siding	110	95	205	55	465	185	105	290	55	635
D. Soffits, fascia, trim	65	60	125	45	295	5	20	25	30	80
Total	235	185	430	360	1,210	375	130	510	145	1,160

¹ At the end of the table title: Volume estimates were made by converting the use of mostly concrete, steel and composite plastic products to equivalent wood product volumes.

² At the end of the heading Wood Based Panels 3/8": Wood based panels include softwood plywood, OSB and

³ On the first B. Outdoor Structures: Outdoor structures include deck and porch surfaces and fencing.

The use of non-wood products in U.S. manufactured housing was relatively small for lumber with only 15 MBF because manufactured homes are essentially all wood framed. The potential gain of 476 MMSF of panels would come from non-wood sheathing and siding.

All Canadian residential construction contained the non-wood equivalent of 1.2 BBF of lumber, mostly from decks, siding and trim. Wood panels have a potential 1.2 MMSF gain primarily from non-wood wall sheathing and siding.

Regionally, the U.S. South and West offer the largest potential gain for increasing wood products use. Regionally, the U.S., single-family and multifamily residential potential gain of 6.5 BBF is: South-60%, West-24%, Northeast-9% and Midwest-7%. For wood panels, the residential potential gain of 9.6 BSF: South-59%, West-25%, Midwest-13% and Northeast-3%.

Table ES-2 provides more detailed information on potential wood product gains by focusing on the U.S. single-family market by region and looking only at softwood lumber and engineered wood products, and structural panels (softwood plywood and OSB). Volumes identified in Table ES-2 include 67% of the total lumber and engineered wood potential and 75% of the structural panel potential gains identified in Table ES-1. A total of 5.18 BBF of lumber and 8.52 BSF of structural panel potential was identified.

The largest potential gain for lumber and engineered wood is in converting concrete slab floors to raised wood floors. This would be a gain of 2.74 BBF. Seventy-one percent of this volume was in the South, 26% in the West. The next largest gain for lumber would be to convert concrete walls to wood. This would be a gain of 513 MMBF with 85% in the South and 10% in the West. Converting concrete to wood has a total potential of 3.25 BBF. This is 63% of the gains identified in this study.

Converting steel framing to wood framing could result in a 201 MMBF gain in 2006. Almost all of the steel framing was in interior walls, 70% in the South, 16% in the West.

Composite or "plastic wood" decking has grown substantially in recent years. In 2006, composite deck and porch surfaces and fencing added up to 120 MMBF equivalent with 49% in the South, 22% in the Northeast, 15% in the West and 14% in the Midwest. Seventy-five percent was in deck and porch surfaces and 25% in fencing.

The potential gains for lumber and wood panel siding were estimated by proportioning the non-wood siding area by current market shares for lumber and panel siding. This provided a gain for lumber siding of 1.61 BBF with 49% in the South, 22% in the Northeast, 15% in the West and 14% in the Midwest.

The largest potential gain for structural panels is in converting non-wood siding to wood panels, resulting in a gain of 3.17 BSF in 2006. Most of the gain would be in the South and West.

The next largest potential gains for structural panels are to convert concrete slab floors and concrete walls to wood framed. Gains for floor sheathing and underlayment over wood framing would be 2.98 BSF with 70% in the South and 26% in the West. For the conversion of concrete walls, the structural panel gain would be 784 MMSF with 79% in the South, 13% in the West, 5% in the Midwest and 3% in the Northeast.

Converting non-structural sheathing such as foam and kraftboard to structural panels offers a potential gain of 1.59 BSF. Regionally, 54% is in the South, 23% in the West, 20% in the Midwest and 3% in the Northeast.

Figure ES-1 Potential Gains – Single Family 2006

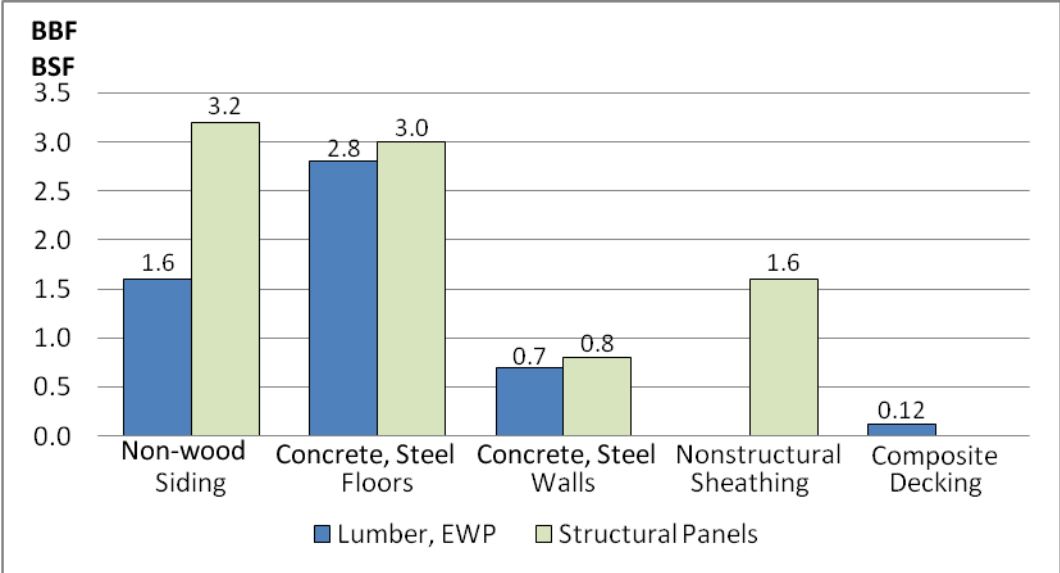


Figure ES-1 summarizes the potential single-family gains shown in Table ES-2. Wood products have only 13.1% of the single-family siding market and converting the rest of the market would result in a gain of 1.6 BBF of lumber and 3.2 BSF of structural panel siding. Converting concrete floors and steel framed floors to wood results in a gain of 2.8 BBF of lumber and engineered wood with 99% of this coming from concrete floor conversion. Converting concrete floors to raised wood floors also results in a gain of 3.0 BSF of structural panels used for floor sheathing and underlayment. Converting concrete and steel framed walls to wood results in a gain of .7 BSF of lumber and engineered wood with 78% of this coming from concrete wall conversion. Converting concrete walls to wood results in a potential gain of .8 BSF of structural panel sheathing. If nonstructural sheathing was converted to structural, the gain would be 1.6 BSF. Converting composite decking products to wood results in a gain of 120 MMBF of lumber. It should be remembered that the remodeling market represents a much larger opportunity to convert composite decking to wood.

In summary, this report identified substantial gains for wood products by gaining market share from competitive non-wood products. Most of the gains are in U.S. single-family construction. Regionally, most of the gains are in the U.S. south and west. Some may ask if these potential gains are valid because of the declining housing market. The answer is “Yes”. The 1.9 million U.S. housing starts and manufactured homes and the 227 thousand Canadian housing starts are within the range for the long-term annual demand for housing identified by the National Association of Home Builders, Harvard’s Joint Center for Housing Studies and others. Whatever the size of the market, volumes captured from the competition can be viewed as incremental to what was attained before.

New Construction Activity

Annual activity in the new residential construction market is measured in many ways. Two common measures are the value of new construction put in place, and the number of new housing units started. These data are collected annually in the United States by the U.S. Department of Commerce, Bureau of the Census, and in Canada by the Canada Mortgage and Housing Corporation. The value of new construction put in place includes all new single family and new multifamily housing. Manufactured housing, which is defined to be U.S. Department of Housing and Urban Development qualified movable dwellings, is not included. Housing starts include new single family and new multifamily housing units plus the number of manufactured housing units shipped.

In 2006 the value of new residential construction put in place totaled \$469 billion (US) in the United States, and nearly \$48 billion (CA) in Canada (Table ES-3). These levels of value represent an average of \$1,569 (US) for every person in the United States, and \$1,457 (CA) per person in Canada. When converted to constant 2005 (US) dollars, value put in place totaled nearly \$482 billion in 2006 for the two countries combined. The United States accounted for 92 percent of total value, Canada 8 percent. Between 1988 and 1995, total constant dollar value of new construction put in place varied from a high of \$317 billion in 1988 to a low of \$234 billion in 1991 (Fig. ES-2). The large drop in value of new construction put in place in the early 1990s was directly attributable to the economic recession which occurred in the United States between 1990 and 1991 (NBER 1992). Since 1996 value has increased steadily through 2005 which was the all time record high year for new single family construction in the United States resulting in total combined value of new residential construction in the United States and Canada of \$517 billion (2005 US). Values declined in 2006, but 2006 was still about 20 percent greater than the 1996 to 2006 10 year average value. The distribution of value between the United States and Canada has always favored the U.S. During the late 1980s and early 1990s Canada accounted for more than 10 percent of total value. Since 1993 Canada's share has fallen into the single digits.

Table ES-3. Residential construction value put in place in the United States and Canada, 1988-2006.

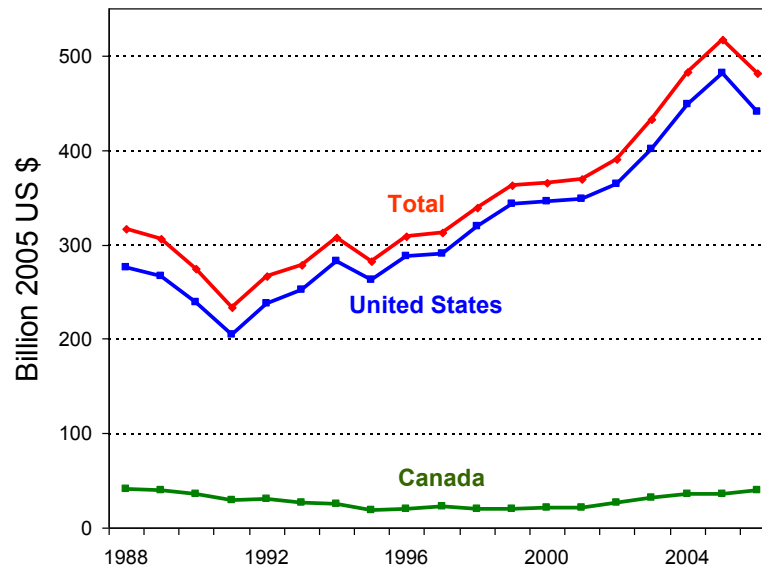
Year	United States			Canada			Total value		
	Value		Per capita (05 US \$)	Value		Per capita (05 US \$)	(Bil. 05 US \$)	U.S. share	Canada share
	(Bil. US \$)	(Bil. 05 US \$) ¹		(Bil. CA \$)	(Bil. 05 US \$) ^{1,2}				
1988	142.4	276.0	1,129	25.6	41.1	1,533	317.0	87%	13%
1989	143.2	266.7	1,081	25.2	39.4	1,444	306.1	87%	13%
1990	132.1	238.5	956	23.1	36.0	1,300	274.5	87%	13%
1991	114.6	205.0	813	18.8	29.2	1,043	234.2	88%	12%
1992	135.1	237.0	929	20.7	30.4	1,072	267.4	89%	11%
1993	150.9	252.4	979	19.9	25.9	904	278.3	91%	9%
1994	176.4	282.2	1,084	21.8	25.2	869	307.4	92%	8%
1995	171.4	262.9	1,000	17.3	19.5	665	282.4	93%	7%
1996	191.1	287.8	1,085	18.1	19.9	673	307.8	94%	6%
1997	198.1	289.6	1,081	21.5	22.8	763	312.4	93%	7%
1998	224.0	319.1	1,181	21.1	20.2	670	339.3	94%	6%
1999	251.3	342.8	1,257	22.3	20.5	673	363.2	94%	6%
2000	265.0	345.6	1,225	23.7	20.9	680	366.5	94%	6%
2001	279.4	348.4	1,222	25.9	21.1	681	369.5	94%	6%
2002	298.8	364.0	1,264	33.2	26.2	835	390.2	93%	7%
2003	345.7	401.5	1,382	37.0	31.1	983	432.6	93%	7%
2004	417.5	448.9	1,531	42.5	34.6	1,070	483.5	93%	7%
2005	480.8	480.8	1,625	44.3	36.2	1,111	517.0	93%	7%
2006	468.8	441.4	1,478	48.1	40.1	1,215	481.5	92%	8%

¹Based on price deflator (Fisher) index of new one-family houses under construction as reported by the U.S. Dept. of Commerce.

²Based on Federal Reserve Bank of St. Louis exchange rates.

Sources: CMHC 2008a, FRB 2009, USDC BC 2009b and 2009c.

Figure ES-2 – Value of new residential construction put in place in the United States and Canada, 1988-2006.



A second measure of activity in the new residential construction market is the number of housing units started annually. In general, as the number of housing starts increases, so does total wood products consumption. In 2006 nearly 2.1 million conventional (single family and multifamily) housing units were started in the United States and Canada (Table ES-4). An additional 0.1 million manufactured housing units were shipped in the U.S. New single family houses are the residence of choice in both the United States and Canada. Overall single family houses accounted for just over three-fourths of all conventional housing units started – 81 percent in the U.S and 69 percent in Canada.

Table ES-4. Residential housing starts in the United States and Canada, 1988-2006.

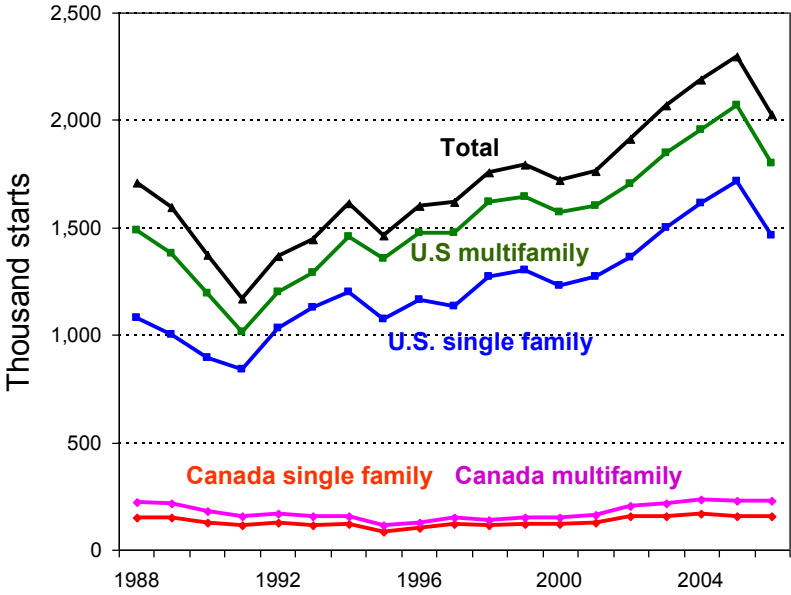
Year	United States				Canada			Total		
	Single family (Thou)	Multi-family (Thou)	Mfg housing ¹ (Thou)	Total (Thou)	Single family (Thou)	Multi-family (Thou)	Total (Thou)	(Thou)	U.S. share	Canada share
1988	1,081	407	218	1,706	151	71	223	1,929	88%	12%
1989	1,003	373	198	1,574	148	67	215	1,790	88%	12%
1990	895	298	188	1,381	126	56	182	1,563	88%	12%
1991	840	174	171	1,185	112	44	156	1,341	88%	12%
1992	1,030	170	211	1,410	123	45	168	1,579	89%	11%
1993	1,126	162	254	1,542	115	40	155	1,697	91%	9%
1994	1,198	259	304	1,761	119	35	154	1,915	92%	8%
1995	1,076	278	340	1,694	84	27	111	1,805	94%	6%
1996	1,161	316	363	1,840	102	23	125	1,965	94%	6%
1997	1,134	340	354	1,828	122	25	147	1,975	93%	7%
1998	1,271	346	373	1,990	112	26	137	2,127	94%	6%
1999	1,302	339	348	1,989	118	32	150	2,139	93%	7%
2000	1,231	338	250	1,819	119	33	152	1,971	92%	8%
2001	1,273	329	193	1,796	123	40	163	1,959	92%	8%
2002	1,359	346	169	1,874	157	48	205	2,079	90%	10%
2003	1,499	349	131	1,979	157	61	218	2,197	90%	10%
2004	1,611	345	131	2,087	166	68	233	2,320	90%	10%
2005	1,716	353	147	2,215	156	69	225	2,441	91%	9%
2006	1,465	336	117	1,918	157	71	227	2,146	89%	11%

¹U.S. Dept of Housing & Urban Development (HUD) qualified movable dwellings.

Sources: CMHC 2008b, USDC BC 2009d and 2009e.

Housing starts are dependent on many factors including overall performance of the economy, availability and cost of credit, household formations, the numbers of new unsold houses on the market, the number of houses for sale from the existing housing stock, and consumer confidence. These factors can cause annual production to differ substantially from year to year, and from decade averages. Between 1988 and 1991 total housing starts in the U.S. and Canada fell by more than one-half million units from 1.9 to 1.3 million (Fig. ES-3). As noted above for value of new construction put in place, the decline in housing starts in the early 1990s is directly attributable to the 1990-1991 economic recession. Starts in the United States declined by nearly 32 percent during this period while those in Canada by 30 percent. Since 1991 starts have generally trended upwards through 2005. Although 2005 was not the all time record high year for total housing starts in the United States, it did set the all time record for single family starts. In 2006, a large drop in housing starts occurred in the United States compared a modest increase in Canada. Compared to ten years averages, starts in the United States in 2006 were 10 percent above average and Canada 26 percent.

Figure ES-3 – Housing starts in the United States and Canada, 1988-2006.



Wood Products Use

The construction of new conventional single family and multifamily residential units in the United States and Canada, and manufactured housing in the United States required an estimated 31.7 billion bf of lumber, 22.6 billion ft² (3/8-inch basis) of structural panels, and 3.0 billion ft² (3/8-inch basis) of nonstructural panels in 2006 (Table ES-5). The average residential unit required about 14,800 bf of lumber, 10,600 ft² (3/8-inch basis) of structural panels, and 1,400 ft² (3/8-inch basis) of nonstructural panels. This level of consumption is equivalent to each person in the United States and Canada consuming 96 bf of lumber, 68 ft² (3/8-inch basis) of structural panels, and 9 ft² (3/8-inch basis) of nonstructural panels for new housing.

Table ES-5. Wood products consumption for new residential construction in the United States and Canada, 1988, 1995, 1998, 2003 and 2006.

Year	United States			Canada			Total		
	Lumber ¹ (BF)	Struc- tural panels ² (Ft ²)	Non- struc- tural panels ² (Ft ²)	Lumber ¹ (BF)	Struc- tural panels ² (Ft ²)	Non- struc- tural panels ² (Ft ²)	Lumber ¹ (BF)	Struc- tural panels ² (Ft ²)	Non- struc- tural panels ² (Ft ²)
1988³									
Single family (Mil)	16,998	9,151	3,227	--	--	--	--	--	--
Multifamily (Mil)	2,614	1,405	510	--	--	--	--	--	--
Mobile homes (Mil)	725	512	515	--	--	--	--	--	--
Total	20,337	11,068	4,252	--	--	--	--	--	--
Per house	11,919	6,487	2,492	--	--	--	--	--	--
Per capita	83.2	45.3	17.4	--	--	--	--	--	--
1995⁴									
Single family (Mil)	15,419	11,510	2,396	904	496	70	16,323	12,006	2,466
Multifamily (Mil)	1,378	897	383	238	169	34	1,616	1,066	417
Mobile homes (Mil)	1,548	1,786	418	--	--	--	1,548	1,786	418
Total	18,345	14,193	3,197	1,142	665	104	19,487	14,858	3,301
Per house	10,829	8,378	1,887	10,295	5,995	938	10,797	8,232	1,829
Per capita	69.8	54.0	12.2	39.0	22.7	3.5	66.7	50.9	11.3
1998⁴									
Single family (Mil)	19,789	14,090	3,166	1,388	804	231	21,177	14,894	3,397
Multifamily (Mil)	1,886	1,224	454	427	273	146	2,313	1,497	600
Mobile homes (Mil)	2,130	1,585	909	--	--	--	2,130	1,585	909
Total	23,805	16,899	4,529	1,815	1,077	377	25,620	17,976	4,906
Per house	11,962	8,492	2,276	13,206	7,836	2,743	12,043	8,450	2,306
Per capita	88.1	62.5	16.8	60.2	35.7	12.5	85.3	59.8	16.3
2003⁴									
Single family (Mil)	23,178	17,218	2,335	1,868	1,273	170	25,046	18,491	2,504
Multifamily (Mil)	2,159	1,316	307	582	482	62	2,741	1,798	369
Mobile homes (Mil)	1,135	976	124	--	--	--	1,135	976	124
Total	26,471	19,510	2,766	2,450	1,755	232	28,921	21,265	2,998
Per house	13,380	9,861	1,398	11,217	8,035	1,062	13,165	9,680	1,365
Per capita	91.1	67.2	9.5	77.3	55.4	7.3	87.2	64.1	9.0
2006									
Single family (Mil)	24,974	18,131	2,266	2,705	1,792	213	27,679	19,923	2,478
Multifamily (Mil)	2,339	1,508	267	707	467	66	3,046	1,974	333
Mobile homes (Mil)	1,024	749	157	--	--	--	1,024	749	157
Total	28,337	20,387	2,689	3,412	2,259	279	31,748	22,646	2,968
Per house	14,773	10,628	1,402	15,004	9,934	1,226	14,797	10,555	1,383
Per capita	94.8	68.2	9.0	103.4	68.5	8.5	95.7	68.3	8.9

¹Includes the board foot equivalent of engineered wood.

²3/8-inch basis.

³1988 is not strictly comparable to later years due to changes in survey methodology.

⁴Canada data revised for 1995, 1998 and 2003.

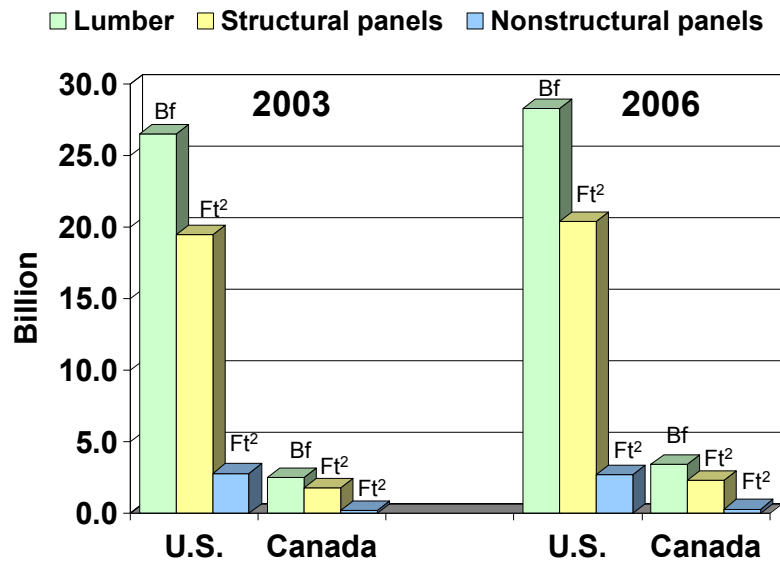
Sources: Anderson and McKeever 1991, CMHC 2008a and 2008b, USDC BC 2000, 2009a and 2009d, Wikipedia 2009, WPC 1999 and 2005.

Since 1995 lumber and structural panel consumption for new residential construction increased steadily (Table ES-5). Lumber use increased, on average, by about 4.5 percent per year between 1995 and 2006 while structural panels increased by 4.0 percent per year. Nonstructural panel use varied substantially between 1995 and 2006, and on average fell by nearly 1 percent per year. Wood products use per house and use per capita closely followed trends in total use. On average lumber use per house increased by 2.9 percent and structural panels 2.3 percent per year, while nonstructural panel use fell by 2.5 percent per year. Differences between average annual rates of change between total use and use per house are due to differences in numbers and types of units built, and average size of units built.

Consumption of lumber and structural panels in both the United States and Canada was substantially higher in 2006 than in 2003 (Table ES-5, Fig. ES-4). Nonstructural panel consumption exhibited minor changes in use.

In 2006, on a cubic foot basis, the United States consumed 90 percent of all wood products used for new residential construction, Canada 10 percent. These percentages varied by less than 1 percent between wood product groups. Since the United States has 90 percent of the combined population of the two countries, it would indicate that the rate of wood use in the United States and Canada is about the same for new housing.

Figure ES-4 – Wood products consumption for new residential construction in the United States and Canada, 2003 and 2006.



Wood Products Use Per Unit

Wood products use per \$1,000 (constant 2005) of value, per house, and per square foot of floor area are all measures of the relative amounts of each wood product used per unit of construction activity. Each is affected by different aspects of construction. Between 2003 and 2006 overall amounts of lumber and structural panels increased in both the United States and Canada, while nonstructural panels decreased in the United States but increased in Canada (Table ES-6). However, use per \$1,000 (constant 2005) of construction value fell for all wood products in the United States, and increased or remained unchanged in Canada. Increasing total wood products use coupled with steady or falling use per \$1,000 of value indicates that nonwood building products and other components of new construction are becoming more costly than wood.

Changes in wood products use per square foot of floor area tended to follow changes in overall use between 2003 and 2006. Lumber and structural panel use per square foot of floor area in both the United States and Canada increased, and nonstructural panel use decreased or remained steady (Table ES-6). Overall, houses built in Canada tend to be more wood intensive than those built in the United States. In 2006, lumber user per square foot of floor area in Canada for single family houses was 9.3 bf compared to just 6.9 bf in the United States. Structural and nonstructural panel use was also higher.

Table ES-6. Wood products used per house, per square foot of floor area, and per \$1,000 of construction value for new residential construction in the United States and Canada, 2003 and 2006

Year	Total value (Mil. 05 US \$)		Average floor area ¹ (Ft ²)	Lumber			Structural panels (3/8-inch basis)				Nonstructural panels (3/8-inch basis)				
				Total use (Mil. bf)	Use per \$1000 (Bf)	Use per house (Bf)	Use per ft ² (Bf)	Total use (Mil. ft ²)	Use per \$1000 (Bf)	Use per house (Ft ²)	Use per ft ² (Ft ²)	Total use (Mil. ft ²)	Use per \$1000 (Bf)	Use per house (Ft ²)	Use per ft ² (Ft ²)
2003															
United States															
Single family	360,714	1,499	2,330	23,178	64	15,462	6.6	17,218	48	11,486	4.9	2,335	6	1,558	0.7
Multifamily	40,785	349	1,173	2,159	53	6,192	5.3	1,316	32	3,775	3.2	307	8	880	0.8
Mobile homes	--	131	1,620	1,135	--	8,675	5.4	976	--	7,463	4.6	124	--	950	0.6
Total	401,499	1,979	2,079	26,471	66	13,380	6.4	19,510	49	9,861	4.7	2,766	7	1,398	0.7
Canada ²															
Single family	--	157	1,806	1,911	--	12,156	6.7	1,273	--	8,098	4.5	169	--	1,078	0.6
Multifamily	--	61	1,067	595	--	9,726	9.1	481	--	7,866	7.4	62	--	1,019	1.0
Total	31,131	218	1,599	2,506	81	11,475	7.2	1,755	56	8,033	5.0	232	7	1,062	0.7
2006															
United States															
Single family	391,711	1,465	2,469	24,974	64	17,043	6.9	18,131	46	12,373	5.0	2,266	6	1,546	0.6
Multifamily	49,720	336	1,277	2,339	47	6,971	5.5	1,508	30	4,494	3.5	267	5	796	0.6
Mobile homes	--	117	1,605	1,024	--	8,726	5.4	749	--	6,383	4.0	157	--	1,336	0.8
Total	441,431	1,918	2,208	28,337	64	14,773	6.7	20,387	46	10,628	4.8	2,689	6	1,402	0.6
Canada															
Single family	--	157	1,864	2,705	--	17,271	9.3	1,792	--	11,441	6.1	213	--	1,358	0.7
Multifamily	--	71	1,162	707	--	9,986	8.6	467	--	6,598	5.7	66	--	936	0.8
Total	40,079	227	1,646	3,412	85	15,004	9.1	2,259	56	9,934	6.0	279	7	1,226	0.7

¹Average floor area of completed houses in year specified.

²Revised.

Sources: Table ES-1, Table ES-2, USDC BC 2009.

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