



The 2012 World Machine-Tool Output & Consumption Survey

Presented by

METALWORKING
Insiders Report
THE GLOBAL NEWSLETTER
ON FACTORY EQUIPMENT

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About the Survey

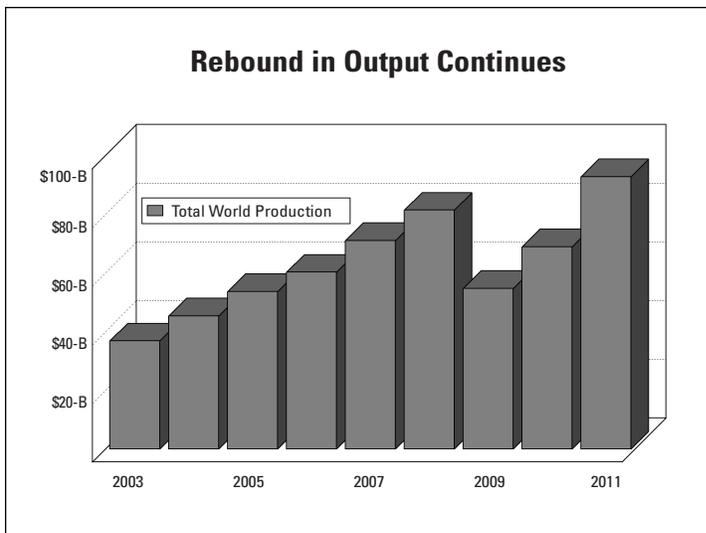
This is the 47th edition of an independent annual survey that collects statistics from machine-tool-producing countries and compares them in U.S. dollars. It is conducted by Joe Jablonowski, editor of this newsletter, and Nancy Eigel-Miller, research manager at Gardner Publications, Inc.

Methodology remains constant. Data comes from official sources including trade associations and government ministries. Local currencies are converted to U.S. dollars at average interbank rates for the entire year, not at end-of-year rates. For the complete methodology, revisions throughout the year, plus links to other sources, please visit www.gardnerweb.com/consump/survey.html. For detailed statistics, we recommend the *Economic Handbook of the Manufacturing Technology Industry*, published on CD-ROM by AMT (www.amtonline.org).

THE WORLD SURVEY AT A GLANCE

¶ Dollar-volume **production** of machine tools around the world **during 2011 grew at 35%**. Output by the 28 principal producing countries was \$92.7-billion. That represents a gain from 2010's \$68.8-billion, which in turn had been an increase of one-quarter from 2009. The hole caused by the deep worldwide recession in 2009 was being filled.

¶ **Biggest percentage increases** in production came from Japan, Germany, France, China, the United States, South Korea, and the United Kingdom, when measured in their own currencies. Many showed even steeper year-to-year percentage increases when their output is converted to U.S. dollars.



¶ China's 32% boost in shipments cements its place as number-one producer. At \$27.7-billion in estimated output in 2011, **China** is more than \$9.3-billion ahead of second-place **Japan**. **Germany** ranks third among producing countries. **Output from those top three** account for 64% of 2011's total world output measured in this survey.

¶ The United States had a solid 25% gain in production, which increased to \$4.1-billion in 2011. Consumption grew at an even faster pace, up 53%, as imports also zoomed.

¶ **Largest consuming country** in the world continues to be **China**, which installed an almost-unbelievable \$38.4-billion worth of machine tools, one-third of it in imports. Looking at consumption on a **per-capita basis** China, with its huge population, in the past had ranked low. Now, with burgeoning local production and a continued low export pace, its expenditure per capita of \$29/person/year puts it in the middle of the pack, with the likes of Canada and Belgium.

Rebound Complete

Taken as a whole, the global machine-tool-producing industry finished making its comeback from the precipitous decline of 2009, in which some countries saw production fall by half.

In 2011, total shipments by the national industries that participate in this *World Machine Tool Output & Consumption Survey* amounted to \$92.7-billion, an increase of 35% over the \$68.8-billion for 2010 (table, left). Moreover, that 2010 figure in turn represented a 26% gain over the dismal sum of \$54.7-billion for 2009. So, last year's output just surpassed the total for 2008 when the downward slide started.

But what may be true for producers at large doesn't necessarily apply evenly across the board. Calamitous drops and subsequent rebounds never treat all participants equally.

Some weren't hit by the recession as hard as others. China is the classic case in point: between 2008 and 2009, when every other country in the survey saw output decline, China's increased 10%, and its market share thus climbed (graph, below).

Another aspect has been the rate of recovery—call it the “bounce-back” factor. In the 2008-to-2009 comparison, six countries suffered production crashes of 50% or more. Of those, Japan and Taiwan subsequently have been able to post substantial increases (see last columns in Production table); France and the Czech

Republic have showed only moderate resilience; and Finland and Denmark continued to have slumps and only in the past year have been able to post increases.

United States production in that '08-

'09 crash dropped almost as precipitously—down 44%—but it's managed a 50% comeback in 2010 and another 25% gain last year.

Other countries in the Americas haven't

Production

Country	2011 (est.) \$-Millions	Cut-Form	2010 (rev.) \$-Millions	Change in local currency	Change in U.S. dollars
1. China	27,680.0	69-31%	20,910.0	\$	32%
2. Japan	18,353.1	89-11%	11,971.4	39%	53%
3. Germany	13,494.7	74-26%	9,488.8	35%	42%
4. Italy	6,232.6	49-51%	5,017.9	18%	24%
5. Korea, Rep. of	5,641.0	69-31%	4,498.0	\$	25%
6. Taiwan	5,000.0	80-20%	3,877.0	29%	29%
7. United States	4,161.1	73-27%	3,340.1	\$	25%
8. Switzerland	3,462.7	84-16%	2,395.2	23%	45%
9. Spain	1,053.3	64-36%	836.9	20%	26%
10. Austria	1,001.8	54-46%	844.0	13%	19%
11. France	930.7	61-39%	662.2	34%	41%
12. Brazil	873.4	81-19%	837.4	\$	4%
13. Turkey	668.0	25-75%	555.0	20%	20%
14. United Kingdom	658.0	72-28%	507.2	25%	30%
15. Canada	c639.3	60-40%	c546.8	17%	17%
16. India	576.0	87-13%	512.0	13%	13%
17. Czech Republic	446.0	80-20%	372.0	20%	20%
18. Netherlands	400.7	20-80%	317.8	20%	26%
19. Belgium	375.6	20-80%	298.0	20%	26%
20. Russia	263.0	41-59%	219.0	20%	20%
21. Sweden	218.4	38-62%	207.9	0%	5%
22. Finland	166.9	20-80%	135.1	18%	24%
23. Mexico	c122.4	58-42%	c165.5	\$	-26%
24. Australia	100.9	86-14%	113.6	\$	-11%
25. Denmark	76.5	40-60%	72.8	0%	5%
26. Portugal	73.7	21-79%	66.2	6%	11%
27. Romania	u42.5	71-29%	42.5	\$	0%
28. Argentina	32.3	50-50%	29.0	\$	11%
Total	\$92,744.7		\$68,839.3		35%

u = unrevised from previous year but converted at current rates

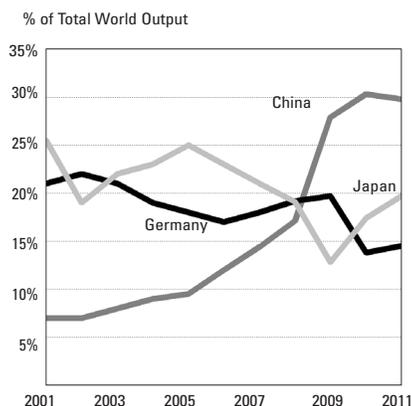
c = circa; rough estimate from fragmentary reports.

\$ = reported in U.S. dollars.

% = ratio of cutting/forming in some cases estimated from previous reports

Source: Gardner Publications, Inc.

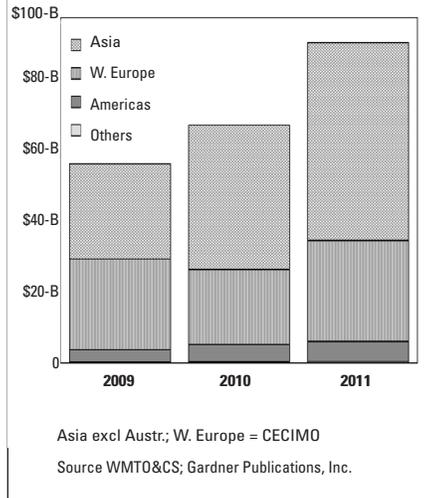
Production Share of Leading Builder Countries



Source: WMT0&CS; Gardner Publications, Inc.

World Output by Region

Asia's Share Grows



been able to regain production rates as quickly however.

One result of this uneven response to global market turmoil is a geographical shift in where most cutting and forming machine tools are made. During the recessionary 2009 and for several years prior, Asian countries produced around 48% of total world output while the 15 Western European countries in the CECIMO consortium built around 46%. In 2010 those Asia/Europe production shares shifted to 61% and 32%, respectively, and in 2011 the same percentages were seen (bar chart, above).

The China Factor

The 13th-century travelogue of Marco Polo's experiences in China gained avid attention in Europe. But after the first transcription its publisher quickly renamed it *Il Milione* ("The Million"), in a nod to his audience. European readers, it seems, couldn't grasp the size and scope of the culture Polo described, so the title reflected the notion it was full of a 'million' lies.

Westerners today sometimes raise eyebrows at the pace of Chinese machine-tool expansion. Statistics here are reported in U.S. dollars rather than yuan renminbi by the national builders' trade association, and they reflect a continuing expansion of an industry strained to meet voracious domestic demand. China has been the world's

biggest consumer of machine tools since 2002; back then imports satisfied much of its requirements.

Inevitably Chinese production of factory equipment grew as indigenous entities like

Shenyang and Dalian MT Group integrated and expanded smaller factories and as builders in Taiwan, Japan and elsewhere opened Chinese facilities.

For 2011, Chinese output of machine

Consumption

Country	2011 (est.) \$-Millions	2010 (rev.) \$-Millions	Change in local currency	Change in U.S. dollars
1. China	38,370.0	28,480.0	\$	35%
2. Japan	7,620.5	4,889.8	41%	56%
3. Germany	6,956.0	4,677.5	42%	49%
4. United States	6,611.9	4,313.4	\$	53%
5. Korea, Rep. of	5,131.0	4,264.0	\$	20%
6. Italy	2,963.3	2,672.5	6%	11%
7. India	2,352.0	1,775.0	\$	33%
8. Brazil	1,990.0	1,861.3	\$	7%
9. Taiwan	1,800.0	1,623.0	11%	11%
10. Mexico	c1,360.9	c1,060.4	\$	28%
11. Russia	1,317.0	1,165.0	13%	13%
12. Turkey	1,285.0	864.9	\$	49%
13. Switzerland	1,240.7	850.5	24%	46%
14. France	1,182.5	850.2	32%	39%
15. Canada	c1,143.6	c848.8	\$	35%
16. Austria	632.2	446.3	35%	42%
17. United Kingdom	561.7	422.1	28%	33%
18. Spain	451.5	473.4	-9%	-5%
19. Sweden	372.8	259.6	37%	44%
20. Netherlands	328.3	256.9	22%	28%
21. Belgium	301.9	252.9	14%	19%
22. Czech Republic	291.0	130.0	\$	124%
23. Romania	u243.0	243.0	0%	0%
24. Argentina	211.5	146.3	\$	45%
25. Australia	167.0	220.9	\$	-24%
26. Finland	128.0	108.6	12%	18%
27. Portugal	104.3	115.2	-14%	-9%
28. Denmark	43.1	41.1	0%	5%

Apparent Consumption = local Production, less Exports, plus Imports

u = unrevised from previous year but converted at current rates.

c = circa; rough estimate from fragmentary reports.

\$ = reported in U.S. dollars.

Source: Gardner Publications, Inc.

tools is estimated at \$27.7-billion, or more than the combined shipments of Italy, Korea, Taiwan, the U.S., Switzerland, Spain, and Austria.

A different view of the global machine-tool scene comes from looking at con-

sumption. For the purposes of this survey, consumption is defined as a country's domestic production, less its exports, and plus its imports. It represents machines that have been installed.

In 2011 the United States showed the

fastest growth rate in equipment consumption among all major industrialized countries, with a 53% increase in installations compared to 2010. It remains a solid fourth in the world in machine-tool consumption, after China, Japan, and Germany.

It should be said, however, that the growth rates, both in production and in consumption, may be starting to retreat from their catch-up pace of the past two years. Recent reports from trade associations that measure orders for new machines show a slackening in the pace of bookings, as pent-up demand is starting to become satisfied.

Trade Increases

Whether output will continue at the current pace is unknown. What the *WMTO&C Survey* shows, however, is that imports and export activities in the past year have regained momentum.

Japan and Germany continue as the leading exporters of machine tools, but their percentage gains in 2011 exports were matched by the French, Koreans, Spaniards, Taiwanese, and several others. American exports grew 20%.

The top five countries on the Exports table all show a very high ratio of exports to production. That metric, the last column in the table, can provide an interesting perspective on a nation's reputation as a major supplier to outside countries. China, on the other hand, hardly exports at all; despite placing at sixth position with 2011 exports of nearly \$2.4-billion, its shipments outside China are less than one-tenth of its production.

The ratios must be viewed with caution, though. Some entrepôt nations like Belgium, Denmark, and Holland traditionally have exports that are far in excess of their production as they ship out machines that had been taken in for re-export. Similarly, the last column in the Imports table, which tracks imports as a percent of local consumption, can in some cases reflect port activity as much as import penetration. Nevertheless, survey figures provide insight to each country's proclivity toward offshore sourcing.

The United States with its very open market—showing an import penetration of

Exports

Country	2011 (est.) \$-Millions	2010 (rev.) \$-Millions	Change in local currency	Change in U.S. dollars	Exports * as % of 2011 Pdtn
1. Japan	11,380.6	7,517.2	37%	51%	62%
2. Germany	9,460.2	6,721.0	34%	41%	70%
3. Italy	4,451.9	3,260.5	30%	37%	71%
4. Taiwan	4,000.0	2,960.0	35%	35%	80%
5. Switzerland	2,955.1	2,058.7	22%	44%	85%
6. China, Peoples Rep.	2,380.0	1,850.0	\$	29%	9%
7. Korea, Rep. of	2,301.0	1,678.0	\$	37%	41%
8. United States	1,874.0	1,559.6	\$	20%	45%
9. Spain	918.9	641.2	36%	43%	87%
10. Belgium	870.9	642.3	29%	36%	232%
11. Austria	820.3	743.6	5%	10%	82%
12. United Kingdom	818.5	629.7	25%	30%	124%
13. France	747.1	513.8	38%	45%	80%
14. Netherlands	484.1	401.3	15%	21%	121%
15. Czech Republic	473.0	441.0	7%	7%	106%
16. Turkey	413.0	380.8	8%	8%	62%
17. Canada	c266.2	c264.6	\$	1%	42%
18. Sweden	179.5	213.2	-20%	-16%	82%
19. Finland	139.1	112.6	18%	24%	83%
20. Brazil	107.8	100.4	\$	7%	12%
21. Denmark	96.0	91.4	0%	5%	125%
22. Romania	u85.2	85.2	\$	0%	200%
23. Australia	78.0	87.7	\$	-11%	77%
24. Russia	64.0	60.0	\$	7%	4%
25. Portugal	50.1	43.7	9%	15%	68%
26. Mexico	c30.6	c41.4	\$	-26%	25%
27. India	28.0	22.0	27%	27%	5%
28. Argentina	10.4	11.0	\$	-5%	32%

* = includes re-exported machines

u = unrevised from previous year but converted at current rates.

c = circa; rough estimate from fragmentary reports.

\$ = reported in U.S. dollars.

Source: Gardner Publications, Inc.

65%—ranks number two in dollar-volume imports behind China. American equipment consumption grew 53% last year, and its 71% change in imports suggests that much of that demand was filled from overseas.

High import-penetration rates are also

evident in Mexico, Russia, France, Turkey, and India during 2011.

American dependence on foreign suppliers for its factory-equipment demand is also seen in its balance of trade in machine tools. The largest exporters typically top the trade-

balance rankings, and the largest importers are at the bottom. At a minus-\$2.5-billion for 2011, American trade balance worsened dramatically from a negative-\$975-million in 2010. The U.S. has the second-poorest balance after China among countries that have domestic machine-tool-producing industries.

Dollar-volume balance in machine-tool trade for 2011 is seen in the table below. Compared to 2010, the largest increases in positive trade balance were made by usual-leader Japan and by Germany, Switzerland, and Taiwan.

Imports

Country	2011 (est.) \$-Millions	2010 (rev.) \$-Millions	Change in local currency	Change in U.S. dollars	Imports* as % of '11 cnsmpn
1. China, Peoples Rep.	13,070.0	9,420.0	\$	39%	34%
2. United States	4,324.8	2,532.9	\$	71%	65%
3. Germany	2,921.5	1,909.7	46%	53%	42%
4. India	1,804.0	1,285.0	40%	40%	77%
5. Korea, Rep. of	1,791.0	1,444.0	\$	24%	35%
6. Mexico	c1,269.1	c936.3	\$	36%	93%
7. Brazil	1,224.4	1,124.3	\$	9%	62%
8. Italy	1,182.5	915.1	23%	29%	40%
9. Russia	1,118.0	1,006.0	11%	11%	85%
10. Turkey	1,030.0	690.7	49%	49%	80%
11. France	998.9	701.9	35%	42%	84%
12. Taiwan	800.0	706.0	13%	13%	44%
13. Belgium	797.2	597.3	27%	33%	264%
14. Canada	c770.5	c566.5	\$	36%	67%
15. Switzerland	733.1	514.0	21%	43%	59%
16. United Kingdom	722.2	544.6	28%	33%	129%
17. Japan	648.0	435.6	35%	49%	9%
18. Austria	450.6	345.9	24%	30%	71%
19. Netherlands	411.8	340.4	15%	21%	125%
20. Sweden	333.9	264.9	20%	26%	90%
21. Czech Republic	318.0	199.0	60%	60%	109%
22. Spain	317.2	277.7	9%	14%	70%
23. Romania	u285.7	285.7	\$	0%	118%
24. Argentina	189.6	128.3	\$	48%	90%
25. Australia	144.0	195.1	\$	-26%	86%
26. Finland	100.2	86.1	11%	16%	78%
27. Portugal	80.7	92.7	-17%	-13%	77%
28. Denmark	62.6	59.6	0%	5%	145%

* = includes machines imported for re-export

u = unrevised from previous year but converted at current rates.

c = circa; rough estimate from fragmentary reports.

\$ = reported in U.S. dollars.

Source: Gardner Publications, Inc.

Trade Balance

in Millions of U.S. dollars*

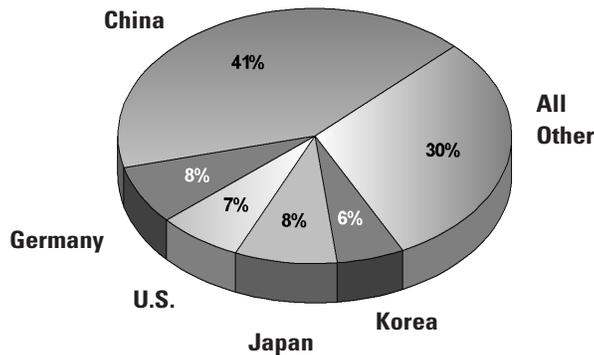
Country	2011
1. Japan	10,732.6
2. Germany	6,538.7
3. Italy	3,269.3
4. Taiwan	3,200.0
5. Switzerland	2,222.0
6. Spain	601.8
7. Korea, Rep. of	510.0
8. Austria	369.6
9. Czech Republic	155.0
10. United Kingdom	96.3
11. Belgium	73.7
12. Netherlands	72.3
13. Finland	39.0
14. Denmark	33.4
15. Portugal	-30.6
16. Australia	-66.1
17. Sweden	-154.4
18. Argentina	-179.2
19. Romania (u)	-200.5
20. France	-251.8
21. Canada	-504.4
22. Turkey	-617.0
23. Russia	-1,054.0
24. Brazil	-1,116.6
25. Mexico	-1,238.5
26. India	-1,776.0
27. United States	-2,450.8
28. China, Peoples Rep.	-10,690.0

* = Exports Minus Imports

u = unrevised from 2010

Source: Gardner Publications, Inc.

Five Countries Consume 70% of World Output



Source: Gardner Publications, Inc.

Per-Capita Consumption

Country	2011 Consumption \$-Millions	Population 000s	Spent \$/capita
1. Switzerland	1,240.7	7,604	\$163.16
2. Korea, Rep. of	5,131.0	48,508	\$105.78
3. Germany	6,956.0	82,329	\$84.49
4. Taiwan	1,800.0	22,974	\$78.35
5. Austria	632.2	8,215	\$76.95
6. Japan	7,620.5	127,078	\$59.97
7. Italy	2,963.3	58,126	\$50.98
8. Sweden	372.8	9,059	\$41.16
9. Canada	1,143.6	33,487	\$34.15
10. China	38,370.0	1,323,591	\$28.99
11. Belgium	301.9	10,414	\$28.99
12. Czech Republic	291.0	10,211	\$28.50
13. Finland	128.0	5,250	\$24.38
14. United States	6,611.9	307,212	\$21.52
15. Netherlands	328.3	16,715	\$19.64
16. France	1,182.5	64,420	\$18.36
17. Turkey	1,285.0	76,805	\$16.73
18. Mexico	1,360.9	111,211	\$12.24
19. Spain	451.5	40,525	\$11.14
20. Romania	243.0	22,215	\$10.94
21. Brazil	1,990.0	198,739	\$10.01
22. Portugal	104.3	10,707	\$9.75
23. Russia	1,317.0	140,041	\$9.40
24. United Kingdom	561.7	61,113	\$9.19
25. Australia	167.0	21,262	\$7.85
26. Denmark	43.1	5,500	\$7.84
27. Argentina	211.5	40,913	\$5.17
28. India	2,352.0	1,156,897	\$2.03

Source: Gardner Publications, Inc.

Patterns of Consumption

If machine tools are the basic building blocks of manufacturing-based societies, then the rate at which a country installs new ones ought to say something about its pace of industrialization. For the past decade China has led the world in acquisition. For 2011 the pattern continues, and as the pie chart above shows, more than two-fifths of the output by value of the world's machine-tool producers has been put in place on Chinese factory floors.

Another, perhaps more subtle, pattern emerges: one of consolidation. In 2011 the top five consumer countries accounted for installing 70% of surveyed world output. By contrast, in 1995 the top five—namely the U.S., Germany, Japan, China, and Italy, in that order—purchased only 55% of total surveyed output.

One more way of looking at consumption is the amount each country spends compared to its population (right). Switzerland, at \$163/Swiss, tops the list and has led for decades. China, with 1.3-billion people, not long ago had ranked with India at the bottom and now is in the middle.



The **World Machine Tool Output & Consumption Survey** presented in this newsletter also appears on the Internet at <http://www.GardnerWeb.com/consump/survey.html>. As data for the year just ended are revised, updates will be posted there.

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