2013 Next Generation Manufacturing Study

National Executive Summary

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American Small Manufacturers Coalition

The MPI Group

Why a Next Generation Manufacturing (NGM) Study?

The *2013 Next Generation Manufacturing (NGM) Study* identifies performances and practices in place among U.S. manufacturers, to determine how much progress U.S. manufacturers have made in implementing Next Generation strategies, and to measure manufacturers' progress toward achieving world-class status in the 21st century.

The NGM Study is a biennial survey conducted by the Manufacturing Performance Institute (MPI) with the American Small Manufacturers Coalition (ASMC), an association of manufacturing extension centers that works to improve the innovation and productivity of America's manufacturing community. One ASMC program of primary focus is the National Institute of Standards and Technology (NIST) Manufacturing Extension Partnership (MEP) program. The Association for Manufacturing Excellence (AME) also supported the 2013 NGM Study.

The 2013 NGM Study finds that most of these manufacturers — successful as they are *today* — aren't investing in the strategies that will carry their firms into *tomorrow*. This is worrisome, because to prosper into the next generation, manufacturers must embrace and support six NGM strategies at a world-class level:

- *Customer-focused innovation:* Develop, make, and market new products and services that meet customers' needs at a pace faster than the competition.

- *Engaged people/Human-capital acquisition, development, and retention:* Secure a competitive performance advantage by having superior systems in place to recruit, hire, develop, and retain talent.

- *Superior processes/improvement focus:* Record annual productivity and quality gains that exceed the competition through a companywide commitment to continuous improvement.

- *Supply-chain management and collaboration:* Develop and manage supply chains and partnerships that provide flexibility, response time, and delivery performance that exceed the competition.

- *Sustainability:* Design and implement waste and energy-use reductions at a level that provides superior cost performance and recognizable customer value.

- *Global engagement:* Secure business advantages by having people, partnerships, and systems in place capable of engaging global markets and talents better than the competition.

U.S. Manufacturers Face Significant NGM Execution Gaps

Although most manufacturers recognize the importance of NGM strategies, few have made progress toward world-class status in implementing them. In fact, the 2013 NGM Study identifies a series of execution gaps — the difference between the number of firms that recognize the importance of a particular NGM strategy, and the number of firms that have approached or achieved world-class status in that strategy. For example, while 90% of manufacturing executives believe process improvement is important or highly important,[1] only 44% of their firms are near or at world-class status in process improvement[2] (*Figure 1*).

These execution gaps — across all six NGM strategies — represent substantial barriers to long-term success for U.S. manufacturing.

Figure 1. U.S. manufacturers know where they need to invest for the future, but fail to achieve world-class status*

	Important 2009	World-class 2009	Important 2011	World-class 2011	Important 2013	World-class 2013
Customer-focused innovation	85%	46%	84%	43%	83%	42%
Human-capital management	77%	31%	78%	30%	84%	31%
Process improvement	86%	44%	87%	43%	90%	44%
Supply-chain management	68%	28%	72%	29%	72%	31%
Sustainability	35%	20%	59%	28%	55%	29%
Global engagement	46%	25%	50%	25%	49%	24%

*at or near world-class status

Many U.S. Manufacturers Aren't Ready for Growth

Cost controls and belt-tightening during the Great Recession forced many manufacturers to cancel or delay investments in the future. This means that today many manufacturers lack three *critical elements* necessary to achieve world-class status — talented people, state-of-the-art business systems and equipment, and company-specific strategies (*Figure 2*) — and face serious competitive disadvantages:

- *Leadership/talent and talent-development programs:* Manufacturing executives frequently lament a talent shortage. But NGM data indicate that few are taking the initiative to actually address talent gaps. For example, 56% of manufacturers have the leadership and talent to drive world-class supply-chain management and collaboration, but only 28% have the talent-development programs to support world-class supply-chain management. Only 26% have both talent and programs in place — and *42% have neither talent or development programs in place.*

- *State-of-the-art business systems and equipment:* Most manufacturers have the tools and technologies they need today, but those tools won't meet the needs of the future. For example, 69% of executives report that their organization has business systems and equipment to support "current requirements" for world-class customer-focused innovation. Yet only 18% describe their tools as "state-of-the-art" and capable of providing long-term support. Approximately 13% of manufacturers report inadequate or no systems and equipment to support customer-focused innovation.

[1] Rated 4 or 5 on a scale of 1–5 where 5 equals "highly important."
[2] Rated 1, 2, or 3 on a scale of 1–5 where 5 equals "world-class."

Figure 2. Talent, tools, and strategy drive manufacturing success

	Both leadership/talent and talent development programs	State-of-the-art business systems and equipment	Company-specific strategy with full functional involvement and buy-in
Customer-focused innovation	35%	17%	26%
Human-capital management	27%	8%	16%
Process improvement	40%	13%	29%
Supply-chain management	26%	11%	16%
Sustainability	21%	9%	13%
Global engagement	17%	9%	15%

- *Company-specific strategy with full functional involvement and buy-in:* Few manufacturers have invested the time and effort to craft strategic visions for their firms and then motivate and inspire employees to contribute to, support, and execute the strategies. For example, only 16% of manufacturers have a company-specific strategy with full functional involvement and buy-in for world-class human-capital management; another 46% have a company-specific strategy with some involvement and buy-in. But *11% of manufacturers have no strategy for human-capital management.*

This underinvestment and/or inability to support the NGM strategies is damaging to individual manufacturers, and U.S. manufacturing in general, because the combination of the *right* talent, the *right* tools, and the *right* plan is the secret to success. For example, 79% of manufacturers with the talent and talent-development programs, state-of-the-art systems and equipment, and a company-supported strategy for customer-focused innovation[3] are at or near world-class status for the strategy — vs. only 23% of manufacturers that lack the talent, tools, and plan.

U.S. Manufacturers Are Looking to New Leaders and for Outside Assistance

One-third of manufacturing executives (33%) anticipate a planned leadership succession at their firms in the next five years, and another 28% of executives indicate a succession may occur. The percentage of planned successions continues to rise among manufacturers — 25% in 2009 and 30% in 2011 — and with a healthier economy and, consequently, better-performing retirement plans, the swell of baby boomers entering retirement age could pull even more young executives into manufacturing leadership roles, ready or not.

This means that U.S. manufacturing is at an inflection point, with a new generation about to take the helm at companies across the country. Making sure that this generation of leadership is well-versed in the NGM strategies will be critical to the long-term success of their firms — and the manufacturing sector.

One way to bridge the gap between current knowledge and current needs is to seek outside assistance, which most manufacturers do for a range of training, development, and strategic activities. For example, 72% of manufacturers get help with regulatory/compliance issues.

Smaller manufacturers often lack the internal expertise to tackle NGM strategies, not to mention the resources to secure outside support. This leads to a competitive disadvantage for smaller firms. For example, 34% of small manufacturers (less than $10 million in revenues) are near or at world-class process improvement vs. 46% of large manufacturers ($100 million or more revenues).

[3] 19 manufacturers

Larger manufacturers with deeper pockets typically find the external support they need. For example, 87% of manufacturers with $100 million or more in revenues get support for operations improvements vs. 62% of manufacturers with revenues of less than $10 million (*Figure 3*).

Figure 3. U.S. manufacturers look for help outside of their organizations*

	All respondents	Less than $10 million	$10 million to $99.9 million	$100 million or more
Regulatory/compliance issues	72%	67%	72%	80%
Workforce skills development	69%	57%	78%	80%
Operations improvement (e.g., lean)	69%	62%	71%	87%
Strategic planning	56%	52%	56%	71%
Business development	54%	51%	57%	53%
Innovation/R&D	52%	49%	47%	73%
Government credits/grants	44%	41%	46%	47%
Supply-chain development	37%	32%	36%	49%
Sustainability initiatives	27%	23%	24%	47%
Global sales and/or procurement	34%	25%	37%	44%

* as needed or on an ongoing basis

World-Class Practices and Performances

Manufacturers near or at world-class status[4] for any of the strategies are more likely to consider that strategy "highly important" compared to those furthest from world-class status.[5] For example, 72% of manufacturers at or near world-class customer-focused innovation rate the strategy "highly important" vs. 39% of manufacturers farther from world-class status.

Manufacturers near or at world-class status also are more likely to have the three critical elements — strategy, talent and talent-development programs, and capable business systems and equipment — necessary to execute an NGM strategy:

1. **A companywide strategy with full functional involvement and buy-in:** For example, 93% of manufacturers at or near world-class process improvement vs. just 64% of manufacturers furthest from world-class status.

2. **Both leadership and talent and talent-development programs to drive the strategy:** 54% of manufacturers at or near world-class process improvement vs. just 12% of manufacturers furthest from world-class status.

3. **State-of-the-art business systems and equipment to support the strategy long-term:** 28% of manufacturers at or near world-class customer-focused innovation vs. just 10% of manufacturers furthest from world-class status.

Manufacturers near or at world-class status in a given NGM strategy also are more likely to implement best practices and report superior performances. For example:

Customer-focused innovation

- *Best practice:* 79% of manufacturers at or near world-class status invest more than

[4] Rated 4 or 5 on a scale of 1–5, where 5 equals "world-class" and 1 equals "no progress."
[5] Rated 1, 2, or 3 on a scale of 1–5, where 5 equals "world-class" and 1 equals "no progress."

1% of sales into new-product development vs. 60% of manufacturers furthest from world-class status.

- *Performance:* 50% of manufacturers at or near world-class status get "game-changing" market breakthroughs from 5% or more of their R&D spend vs. 27% of manufacturers furthest from world-class status.

Human-capital management

- *Best practice:* 52% of manufacturers at or near world-class status train each employee more than 20 hours annually vs. just 25% of manufacturers furthest from world-class status.

- *Performance:* 41% of manufacturers at or near world-class status report sales per employee of $250,000 or higher vs. just 27% of manufacturers furthest from world-class status.

Superior processes/improvement focus

- *Best practice:* 70% of manufacturers at or near world-class status have at least a majority of their workforces engaged in their improvement method vs. just 31% of manufacturers furthest from world-class status.

- *Performance:* 54% of manufacturers at or near world-class status have reduced per-unit manufacturing costs over the past three years vs. just 41% of manufacturers furthest from world-class status.

Supply-chain management and collaboration

- *Best practice:* 56% of manufacturers at or near world-class status have a significant or complete ability to monitor supplier goods and behaviors throughout the supply chain vs. just 18% of manufacturers furthest from world-class status.

- *Performance:* 69% of manufacturers at or near world-class status describe their relationship with suppliers as "cooperation" or "partnership" vs. just 44% of manufacturers furthest from world-class status.

Sustainability

- *Best practice:* 50% of manufacturers at or near world-class status have regular monitoring and review of returns from sustainability efforts vs. just 8% of manufacturers furthest from world-class status.

- *Performance:* 39% of manufacturers at or near world-class status have reduced energy per unit of product by 10% or more vs. just 9% of manufacturers furthest from world-class status.

Global engagement

- *Best practice:* 71% of manufacturers at or near world-class status have at least some percentage of their total direct workforce located overseas and/or located domestically and responsible for global business activities vs. just 30% of manufacturers furthest from world-class status.

- *Performance:* 39% of manufacturers at or near world-class status pull one-quarter or more of sales from outside the United States vs. just 11% of manufacturers furthest from world-class status.

Profitability, Leadership, and Investments

Most U.S. manufacturers (88%) were profitable in their most recent fiscal year, a 5-percentage-point improvement vs. 2011 (*Figure 4*). Profitability was more likely among organizations with higher revenues:

- *Revenues less than $10 million:* 79% of companies were profitable.
- *Revenues $10 million to $99 million:* 94% of companies were profitable.
- *Revenues $100 million or more:* 98% of companies were profitable.

Three-quarter of manufacturers (74%) are led by chief executives older than 50 years of age. Baby-boomer CEOs and owners are now approaching retirement age, as evidenced by the 32% of leaders older than 60 years of age (*Figure 5*).

Almost two-thirds of executives (63%) anticipate (yes) or see as possible (maybe) a planned leadership succession for their firms in the next five years, (*Figure 6*).

Figure 4. Was your company profitable for the most recent fiscal year?

	2011	2013
Yes	83.2%	88.1%
No	16.9%	11.9%

Figure 5. What is the age of your organization's chief executive?

	2009	2011	2013
< 30	0.4%	0.4%	0.0%
31 – 40	5.7%	4.0%	3.0%
41 – 50	29.8%	25.5%	22.6%
51 – 60	40.7%	43.1%	42.9%
>60	23.5%	27.0%	31.5%

Figure 6. Do you anticipate a planned succession of leadership in the next five years?

	2009	2011	2013
Yes	24.9%	30.1%	33.2%
Maybe	29.3%	29.2%	28.0%
No	45.9%	40.7%	38.9%

A majority of manufacturers spend less than 5% of sales (three-year average) on capital equipment (65%) and information technologies (89%) (*Figures 7* and *8*). Smaller manufacturers are more likely to spend above the 5% level for capital equipment (38% of manufacturers with less than $10 million in revenue), likely driven by a lower denominator (sales).

A majority of firms (62%) design their own products (*Figure 9*). Larger companies are more likely to design their own products (81% of manufacturers with revenues of $100 million or more).

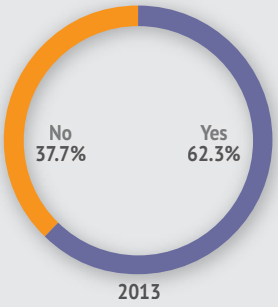
Figure 7. What is your organization's investment in capital equipment as a percentage of sales (three-year average)?

	2011	2013
<1%	10.8%	11.4%
1 – 5%	56.2%	53.6%
6 – 10%	21.9%	23.6%
>10%	11.1%	11.4%

Figure 8. What is your organization's investment in information technologies (hardware and software) as a percentage of sales (three-year average)?

	2011	2013
<1%	37.1%	35.8%
1 – 5%	53.4%	53.7%
6 – 10%	6.8%	7.7%
>10%	2.7%	2.8%

Figure 9. Does your organization design the majority of products it manufacturers?



World-Class Customer-Focused Innovation

Innovation Strategy and Practices

Four out of five manufacturers (83%) recognize the importance of customer-focused innovation (*Figure 10*).[6] Approximately 42% of manufacturers report that they are near or at world-class status in customer-focused innovation,[7] and 5% report no progress toward world-class status (*Figure 11*).

Figure 10. Rate the importance of customer-focused innovation to your organization's success over the next five years:

	2009	2011	2013
1=Not important	1.8%	1.2%	0.8%
2	3.6%	4.0%	4.6%
3	10.0%	10.7%	11.9%
4	26.4%	27.0%	29.8%
5=Highly important	58.2%	57.0%	52.9%

Figure 11. Rate your organization's progress toward world-class customer-focused innovation:

	2009	2011	2013
1=No progress	4.7%	5.4%	4.6%
2	14.9%	16.9%	18.1%
3	34.8%	34.5%	35.6%
4	33.3%	30.9%	32.6%
5=World-class	12.2%	12.3%	9.2%

The three critical elements necessary for achieving world-class customer-focused innovation are:

1. *Strategy:* Most manufacturers have a *company-specific* strategy to guide innovation (74%), but only 26% define that company-specific strategy as having full functional involvement and buy-in. Six percent of firms have no strategy (*Figure 12*).

[6] Rated 4 or 5 on a scale of 1–5, where 5 equals "highly important."
[7] Rated 4 or 5 on a scale of 1–5, where 5 equals "world-class."

2. *Talent and development programs:* Two-thirds of manufacturers (70%) report sufficient talent for customer-focused innovation, but only 37% have talent-development programs in place to drive the strategy (*Figure 13*). Approximately 35% of manufacturers have *both* talent and development programs, but 28% have *neither* talent nor development programs.

3. *Business systems and equipment:* Approximately 18% of manufacturers report that their business systems and equipment are state-of-the-art and can support customer-focused innovation long-term. Another 69% report that systems and equipment meet current requirements. But 13% have either inadequate systems and equipment or none at all (*Figure 14*).

Figure 12. What best describes your customer-focused innovation strategy?

	2011	2013
No strategy	7.4%	6.2%
Generic strategy with little or no functional involvement and buy-in	20.9%	20.2%
Company-specific strategy with some functional involvement and buy-in	47.6%	48.1%
Company-specific strategy with full functional involvement and buy-in	24.2%	25.5%

Figure 13. Does your organization have the skilled innovation leadership and talent (e.g., product engineers) and talent-development programs to drive world-class customer-focused innovation into the next generation?

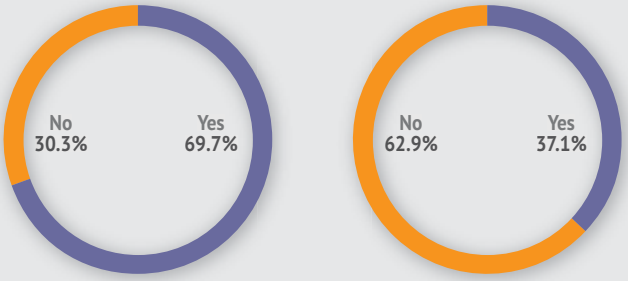


Figure 14. What best describes the quality of your business systems and equipment to support world-class customer-focused innovation?

	2011	2013
None	2.7%	1.6%
Inadequate for current requirements	15.1%	11.6%
Adequate but limited to current requirements	64.4%	69.4%
State-of-the-art and able to provide long-term support	17.8%	17.5%

Approximately 23% of manufacturers invest more than 5% of sales into new-product development/R&D (*Figure 15*).

A majority of firms (52%) have either ad hoc or no regular monitoring or reviews for measuring their return on investment from customer-focused innovation. Just 14% describe their measurement systems as "regular monitoring and review of company-specific metrics by CEO and senior staff and transparency and clarity throughout the organization" (*Figure 16*).

Figure 15. What percentage of sales is invested into new-product development/R&D?

	2009	2011	2013
<1%	23.1%	31.5%	32.1%
1 – 5%	44.7%	46.4%	45.2%
6 – 10%	17.6%	14.2%	16.4%
>10%	14.6%	7.9%	6.3%

Figure 16. What best describes your measurement system for reviewing return from customer-focused innovation?

	2009	2011	2013
No measurement system per se or reviews	27.6%	20.2%	18.5%
Ad hoc monitoring of basic measures and ad hoc reviews	31.1%	36.2%	33.4%
Company-specific metrics monitored regularly by operations staff	10.7%	14.4%	13.0%
Regular monitoring and review of company-specific metrics by CEO and senior staff	19.2%	18.5%	21.5%
Regular monitoring and review of company-specific metrics by CEO and senior staff and transparency and clarity throughout the organization	11.4%	10.7%	13.6%

Innovation Results

Approximately 65% of manufacturers report that 5% or more of sales are derived from products introduced in the past three years, a slight increase from 2011 (*Figure 17*).

Figure 17. Approximately what percentage of annual sales are derived from products introduced in the past three years (new SKUs, not a product iteration or line extension)?

	2009	2011	2013
<5%	30.4%	40.0%	35.3%
5 – 25%	45.0%	43.4%	45.5%
26 – 50%	16.0%	11.5%	12.4%
>50%	8.6%	5.1%	6.9%

Most manufacturers (70%) commercialize less than one-quarter of R&D expenses (*Figure 18*), and 64% achieve game-changing market breakthroughs for less than 5% of their R&D expenses (*Figure 19*). Fifty-nine percent of manufacturers have retained nine out of 10 customers over the past 12 months, and 13% have retained all customers (*Figure 20*).

Customer relationships vary considerably, with 29% at one end of the relationship spectrum ("buy and sell") and 21% at the other ("partnership") (*Figure 21*).

Figure 18. What percentage of R&D (by expense) is commercialized?

	2011	2013
<25%	70.1%	69.6%
25 – 50%	17.6%	15.2%
51 – 75%	6.3%	7.3%
>75%	6.0%	7.9%

Figure 19. What percentage of R&D (by expense) results in "game-changing" market breakthroughs?

	2011	2013
<5%	66.3%	63.8%
5 – 10%	20.5%	21.2%
11 – 25%	7.4%	9.2%
>25%	5.8%	5.9%

Figure 20. What was your customer-retention rate over the past 12 months?

	2013
<25%	1.4%
25 – 50%	3.3%
51 – 75%	8.3%
76 – 90%	28.4%
91 – 99%	45.5%
100%	13.2%

Figure 21. Which of the following best describes your organization's relationship with its customers?

	2013
Buy and sell (e.g., cost and quality focus)	28.9%
Certification (e.g., broad qualifications established)	13.8%
Cooperation (e.g., sharing product ideas, best practices)	36.0%
Partnership (e.g., sharing resources, intellectual property, cost savings)	21.4%

World-Class Engaged People/Human-Capital Acquisition, Development, and Retention

Secure a competitive performance advantage by having superior systems in place to recruit, hire, develop, and retain talent.

Human-Capital Strategy and Practices

Approximately 84% of manufacturers recognize the importance of human-capital acquisition, development, and retention (human-capital management), an increase likely driven by increased competition for talent in the manufacturing sector (*Figure 22*).[8] Still just 31% of manufacturers report that they are near or at world-class status in human-capital management,[9] and 8% report no progress toward world-class status (*Figure 23*).

Figure 22. Rate the importance of human-capital acquisition, development, and retention to your organization's success over the next five years:

	2009	2011	2013
1=Not important	2.5%	2.0%	0.5%
2	6.1%	5.4%	4.4%
3	14.6%	15.0%	10.9%
4	30.8%	29.0%	30.3%
5=Highly important	45.9%	48.7%	54.0%

Figure 23. Rate your organization's progress toward world-class human-capital acquisition, development and retention:

	2009	2011	2013
1=No progress	9.4%	8.9%	7.6%
2	22.5%	23.4%	21.2%
3	37.6%	37.3%	40.2%
4	24.4%	26.5%	27.7%
5=World-class	6.1%	3.9%	3.3%

[8] Rated 4 or 5 on a scale of 1–5, where 5 equals "highly important."
[9] Rated 4 or 5 on a scale of 1–5, where 5 equals "world-class."

The three critical elements necessary for world-class human-capital management are:

- S*trategy:* Nearly two-thirds of manufacturers have a *company-specific* strategy for human-capital management (62%), but only 16% define that company-specific strategy as having full functional involvement and buy-in. Approximately 11% have no strategy, a decrease from 2011 (*Figure 24*).

- *Talent and development programs:* Half of manufacturers (50%) report sufficient talent for human-capital management, but only 30% have talent-development programs in place to drive the strategy (*Figure 25*). Approximately 27% of manufacturers have *both* talent and development programs, but 46% have *neither* talent nor development programs.

- *Business systems and equipment:* Just 8% of manufacturers report that their business systems and equipment are state-of-the-art and can support human-capital management long-term. Another 59% report that systems and equipment meet current requirements. One-third of manufacturers (33%) have either inadequate systems and equipment or none at all (*Figure 26*).

Figure 24. What best describes your human-capital management strategy?

	2011	2013
No strategy	15.1%	11.1%
Generic strategy with little or no functional involvement and buy-in	28.6%	26.6%
Company-specific strategy with some functional involvement and buy-in	43.8%	46.3%
Company-specific strategy with full functional involvement and buy-in	12.5%	16.0%

Figure 25. Does your organization have the skilled HR leadership and talent (e.g., recruiters, benefits experts) and talent-development programs to drive world-class human-capital management into the next generation?

	2013
Leadership and talent	
Yes	50.3%
No	49.7%
Talent-development programs	
Yes	30.4%
No	69.6%

Figure 26. What best describes the quality of your business systems and equipment to support world-class HR?

	2011	2013
None	12.4%	10.0%
Inadequate for current requirements	20.9%	22.8%
Adequate but limited to current requirements	57.6%	58.8%
State-of-the-art and able to provide long-term support	9.2%	8.4%

Half of manufacturers (52%) report that a majority of their workers are capable of excelling in high-performance work teams (*Figure 27*). Similarly, 50% percent of manufacturers report that they have established skill standards, and have aligned training to those standards for a majority of workforce positions (*Figure 28*).

One-third of firms train each employee more than 20 hours annually (*Figure 29*). Manufacturers that train 40 hours or more report that a majority of their workers excel in high-performance teams vs. just 34% of manufacturers that train eight hours or less.

Figure 27. What percentage of employees have the technical skills, problem-solving skills, and work ethic to excel in high-performance work teams?

	2011	2013
<25%	22.0%	18.8%
25 – 50%	31.3%	28.5%
51–75%	25.8%	30.2%
76 – 90%	14.6%	18.8%
>90%	6.4%	3.8%

Figure 28. To what degree has your organization established skill standards and aligned training with employee mastery of these skill standards?

	2011	2013
No established skill standards	16.9%	15.1%
Skill standards and training alignment for a few positions	40.7%	34.8%
Skill standards and training alignment for majority of positions	34.7%	40.4%
Skill standards and training alignment for all positions	7.7%	9.7%

Figure 29. How many formal training hours are devoted annually to each employee?

	2009	2011	2013
8 or fewer	29.6%	29.3%	28.7%
9 – 20	41.1%	38.8%	38.2%
21 – 40	18.8%	21.7%	19.8%
>40	10.5%	10.2%	13.3%

Only 23% of manufacturers report regular senior-level monitoring and reviews to measure return on investment from human-capital management.[10] Approximately 22% manufacturers have no measurement systems or reviews, and 36% have ad hoc monitoring and ad hoc reviews (*Figure 30*).

The vast majority of manufacturers rely on internal resources for hiring processes — 45% report the effort is led by function or department personnel, and 38% are led by an internal HR department (*Figure 31*). Most manufacturers (72%) partner with outside organizations (e.g., vocational schools, community colleges) to nurture a manufacturing workforce (*Figure 32*).

Figure 30. What best describes your measurement system for reviewing return from human-capital acquisition, development, and retention?

	2009	2011	2013
No measurement system per se or reviews	29.1%	27.2%	22.4%
Ad hoc monitoring of basic measures and ad hoc reviews	33.7%	35.3%	36.0%
Company-specific metrics monitored regularly by operations staff	13.5%	18.0%	18.7%
Regular monitoring and review of company-specific metrics by CEO and senior staff	17.2%	12.8%	17.0%
Regular monitoring and review of company-specific metrics by CEO and senior staff and transparency and clarity throughout the organization	6.5%	6.7%	6.0%

Figure 31. Which strategy best describes your primary hiring process?

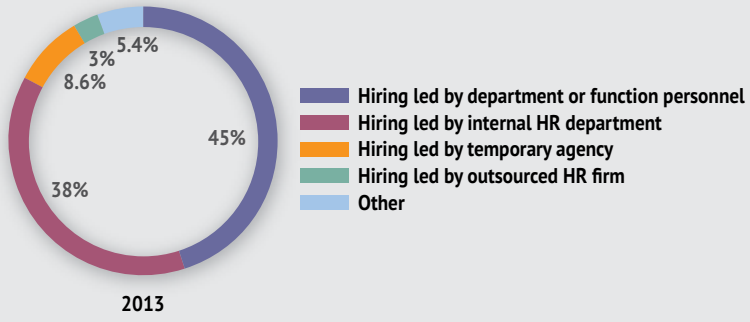


Figure 32. To what extent does your organization partner with vocational schools, high schools, community colleges, universities, and similar institutions to nurture a manufacturing workforce?

	2013
No partnering	28.0%
Some partnering	44.3%
Moderate partnering	19.8%
Extensive partnering	7.9%

[10] "Regular monitoring and review of company-specific metrics by CEO and senior staff" or "Regular monitoring and review of company-specific metrics by CEO and senior staff and transparency and clarity throughout the organization."

Human-Capital Results

Approximately one-third of manufacturers report sales per employee of $250,000 or more (*Figure 33*) — this percentage is identical to findings from the 2012 MPI Manufacturing Study[11] of plant-level practices and performances.

Annual labor turnover rose in 2013 compared to 2011 — 38% report turnover of greater than 5% vs. 33% (*Figure 34*). Workforce stability appears to be the norm for most firms — 77% report that a majority of their workers have been in place for more than five years — but 6% of firms have kept less than one-fourth of their workforce in place over the same period (*Figure 35*).

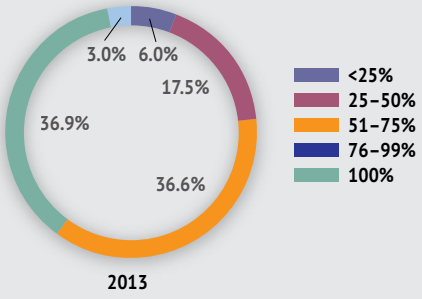
Figure 33. What are your sales per employee?

	2013
< $100,000	13.3%
$100,000 – $249,999	55.5%
$250,000 – $400,000	18.8%
> $400,000	12.4%

Figure 34. What is your organization's annual labor turnover rate (number of voluntary and involuntary separations ÷ typical staffing level)?

	2009	2011	2013
0%	8.2%	6.7%	6.0%
0.1 – 1%	21.1%	25.1%	20.4%
1.1 – 5%	32.6%	35.2%	35.6%
5.1 – 10%	24.5%	24.2%	25.8%
>10%	13.6%	8.8%	12.2%

Figure 35. What percentage of your workforce has been with your organization for more than five years?



[11] *Manufacturing 2013*, results of the 2012 MPI Manufacturing Study, The MPI Group, 2013.

World-Class Superior Processes/Improvement Focus

Record annual productivity and quality gains that exceed the competition through a companywide commitment to continuous improvement.

Process Improvement Strategy and Practices

Nine out of 10 of manufacturers recognize the importance of process improvement (*Figure 36*).[12] Fully 44% of manufacturers report that they are near or at world-class process improvement;[13] only 2% of firms report no progress toward world-class status (*Figure 37*).

Figure 36. Rate the importance of process improvement to your organization's success over the next five years:

	2009	2011	2013
1=Not important	0.8%	0.4%	0.5%
2	2.8%	4.2%	2.5%
3	10.1%	8.9%	6.8%
4	26.5%	29.8%	29.7%
5=Highly important	59.8%	56.7%	60.5%

Figure 37. Rate your organization's progress toward world-class processes and process improvement:

	2009	2011	2013
1=No progress	3.3%	4.6%	2.4%
2	16.3%	17.2%	15.7%
3	36.6%	35.5%	37.8%
4	33.2%	35.7%	36.2%
5=World-class	10.6%	7.0%	7.8%

The three critical elements necessary for world-class process improvement are:

- S*trategy:* Three-fourths of manufacturers (77%) have a company-specific strategy for process improvement, but only 29% define that company-specific strategy as having full functional involvement and buy-in. Approximately 18% have a generic strategy with little or no functional involvement or buy-in, and 5% of firms have no strategy (*Figure 38*).

Figure 38. What best describes your continuous-improvement (CI) strategy?

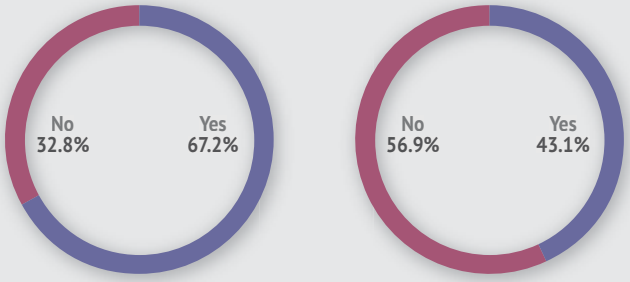
	2011	2013
No strategy	5.9%	5.2%
Generic strategy with little or no functional involvement and buy-in	20.8%	18.2%
Company-specific strategy with some functional involvement and buy-in	47.2%	48.0%
Company-specific strategy with full functional involvement and buy-in	26.0%	28.7%

[12] Rated 4 or 5 on a scale of 1–5, where 5 equals "highly important."
[13] Rated 4 or 5 on a scale of 1–5, where 5 equals "world-class."

- *Talent and development programs:* Two-thirds of manufacturers (67%) report sufficient talent for world-class processes and process improvements, but only 43% have talent-development programs in place to drive the strategy (*Figure 39*). Approximately 40% of manufacturers have both talent and development programs, but 29% have neither talent nor development programs.

- *Business systems and equipment:* Approximately 13% of manufacturers report that their business systems and equipment are state-of-the-art and can support continuous operations improvement long-term. Another 68% report that systems and equipment meet current requirements. About 18% of firms have either inadequate systems and equipment or none at all (*Figure 40*).

Figure 39. Does your organization have the skilled process-improvement leadership and talent (e.g., CI experts, black belts, lean experts) and talent-development programs to drive continuous operations improvement into the next generation?



Leadership and talent | Talent-development programs

Figure 40. What best describes the quality of your business systems and equipment to support continuous operations improvement?

	2011	2013
None	4.9%	3.8%
Inadequate for current requirements	18.9%	14.6%
Adequate but limited to current requirements	62.7%	68.4%
State-of-the-art and able to provide long-term support	13.5%	13.2%

Capturing and codifying improvement information disseminates best practice throughout an organization. Some 30% of manufacturers regularly capture such information via electronic formats, and another 38% have occasional manual or electronic capture of operations knowledge/experiences; 5% of firms do not capture operations information at all (*Figure 41*).

Forty-eight percent of manufacturers report that a majority of their workforces are fully engaged in their organization's specific improvement methodologies, an improvement over previous years (*Figure 42*). Approximately 38% of manufacturers report regular senior-level monitoring and reviews in place to measure return on investment from process improvement (*Figure 43*).[14]

Figure 41. How does your organization capture operations knowledge/ experiences, such as process improvements, production experiments, etc.?

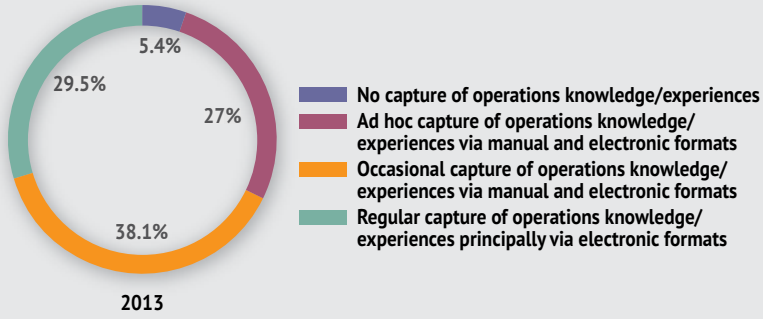


Figure 42. What percentage of your workforce has been fully engaged in your organization's specific improvement methodologies?

	2009	2011	2013
<25%	33.8%	34.1%	27.9%
25 – 50%	22.8%	21.2%	23.9%
51–75%	19.4%	18.6%	20.1%
76 – 99%	15.1%	17.0%	21.1%
100%	9.5%	9.0%	7.1%

Figure 43. What best describes your measurement system for reviewing return from process improvement?

	2009	2011	2013
No measurement system per se or reviews	16.8%	14.5%	10.6%
Ad hoc monitoring of basic measures and ad hoc reviews	29.3%	29.3%	28.5%
Company-specific metrics monitored regularly by operations staff	19.8%	21.4%	23.1%
Regular monitoring and review of company-specific metrics by CEO and senior staff	21.5%	21.4%	18.5%
Regular monitoring and review of company-specific metrics by CEO and senior staff and transparency and clarity throughout the organization	12.7%	13.3%	19.3%

[14] "Regular monitoring and review of company-specific metrics by CEO and senior staff" or "Regular monitoring and review of company-specific metrics by CEO and senior staff and transparency and clarity throughout the organization."

Process Improvement Results

Four out of five manufacturers (82%) indicate that 90% ore more of deliveries reach customers in perfect order (*Figure 44*), and 93% describe their customers' satisfaction as favorable ("preference for our products" or "strong loyalty") (*Figure 45*).[15] Manufacturers with less than 90% perfect delivery rates are more likely to describe their customers' satisfaction as "threatens to pull business" or "indifferent."

Figure 44. What percentage of deliveries reach customers in perfect order (on time, high quality, to all customer specifications)?

	2013
<80%	3.5%
80 – 89%	14.7%
90 – 99%	77.9%
100%	3.8%

Figure 45. Describe your customers' satisfaction with your overall performance:

	2009	2011	2013
Threatens to pull business because we don't match the competition	1.8%	1.9%	1.9%
Indifferent to buying our product or competitors	4.7%	5.4%	5.5%
Preference for our products by virtue of price, quality, and delivery performance	45.7%	44.0%	45.1%
Strong loyalty to our products due to ongoing trust in our organization's people and capabilities	47.7%	48.8%	47.5%

[15] "Preference for our products by virtue of price, quality, and delivery performance" or "Strong loyalty to our products due to ongoing trust in our organization's people and capabilities."

From a productivity and cost-reduction perspective:

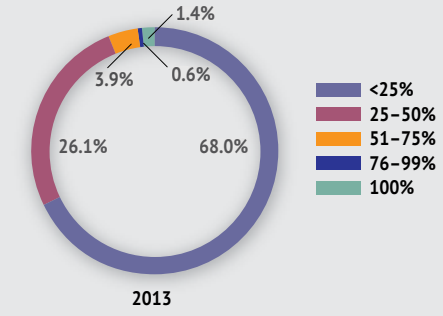
- 46% of manufacturers have been able to reduce costs over the past three years (*Figure 46*).

- 32% of manufacturers have improved productivity (sales per employee) by more than 25% over the past three years (*Figure 47*).

Figure 46. How have your per-unit manufacturing costs (excluding purchased materials) changed over the past three years?

	2013
Decreased >10%	9.3%
Decreased 6 – 10%	12.3%
Decreased 1 – 5%	24.9%
No change	11.8%
Increased 1 – 5%	23.0%
Increased 6 – 10%	14.2%
Increased >10%	4.6%

Figure 47. By what percentage has sales per employee improved over the past three years (current year figure vs. three-years ago)?



World-Class Supply-Chain Management & Collaboration

Develop and manage supply chains and partnerships that provide flexibility, response time, and delivery performance that exceed the competition.

Supply-Chain Strategy and Practices

Three-fourths of manufacturers (72%) recognize the importance of supply-chain management and collaboration (*Figure 48*),[16] but only 31% of manufacturers report that they are near or at world-class status in supply-chain management and collaboration;[17] 9% of firms report no progress toward world-class status (*Figure 49*).

Figure 48. Rate the importance of supply-chain management and collaboration to your organization's success over the next five years:

	2009	2011	2013
1=Not important	3.6%	3.0%	1.9%
2	8.8%	8.3%	7.4%
3	19.4%	16.5%	18.5%
4	30.6%	32.3%	34.4%
5=Highly important	37.6%	39.9%	37.7%

Figure 49. Rate your organization's progress toward world-class processes and supply-chain management and collaboration:

	2009	2011	2013
1=No progress	9.1%	9.2%	9.0%
2	24.5%	25.9%	23.2%
3	38.8%	35.6%	36.3%
4	22.1%	23.9%	26.5%
5=World-class	5.5%	5.5%	4.9%

The three critical elements necessary for world-class supply-chain management and collaboration are:

- S*trategy:* More than half of manufacturers (59%) have a company-specific strategy for supply-chain management and collaboration, but only 16% define that company-specific strategy as having full functional involvement and buy-in. Approximately 10% have no strategy. (*Figure 50*).

Figure 50. What best describes your supply-chain strategy?

	2011	2013
No strategy	13.3%	10.1%
Generic strategy with little or no functional involvement and buy-in	28.7%	30.9%
Company-specific strategy with some functional involvement and buy-in	43.4%	43.2%
Company-specific strategy with full functional involvement and buy-in	14.7%	15.9%

[16] Rated 4 or 5 on a scale of 1–5, where 5 equals "highly important."

[17] Rated 4 or 5 on a scale of 1–5, where 5 equals "world-class."

- *Talent and development programs:* More than half of manufacturers (56%) report sufficient talent for world-class supply-chain management, but only 28% have talent-development programs in place to drive the strategy (*Figure 51*). Approximately 26% of manufacturers have both talent and development programs, but 42% have neither talent nor development programs.

- *Business systems and equipment:* Approximately 11% of manufacturers report that their business systems and equipment are state-of-the-art and can support supply-chain management long-term (same as in 2011), and another 67% report that systems and equipment meet current requirements (much higher than in 2011). Approximately 22% of firms have either inadequate systems and equipment or none at all to support world-class supply-chain management (*Figure 52*).

Most manufacturers (70%) have at least moderate ability to monitor goods moving through their supply chains and the behaviors of suppliers. But 5% of firms have no ability to monitor goods and behaviors, which exposes them to risk (e.g., product compliance issues) (*Figure 53*).

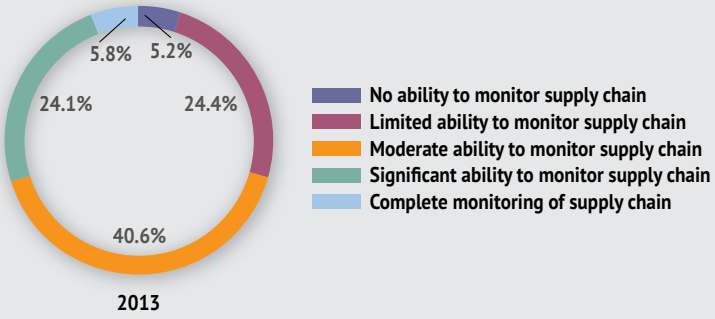
Figure 51. Does your organization have the skilled supply-chain management leadership and talent (e.g., logistics engineers) and talent-development programs to drive world-class supply-chain management into the next generation?

	2013
Leadership and talent	
Yes	56.4%
No	43.6%
Talent-development programs	
Yes	27.5%
No	72.5%

Figure 52. What best describes the quality of your business systems and equipment to support world-class supply-chain management?

	2011	2013
None	9.2%	5.5%
Inadequate for current requirements	22.1%	16.7%
Adequate but limited to current requirements	57.9%	66.9%
State-of-the-art and able to provide long-term support	10.9%	10.9%

Figure 53. What best describes your ability to monitor supplier goods and behaviors throughout your entire supply chain?



One-quarter of manufacturers (24%) spend more than 25% of staff time and resources expediting, firefighting, resolving conflicts with customers and suppliers, etc., rather than strategic procurement and supply-chain planning and partnering. Approximately 29% of manufacturers spend less than 5% of their time expediting, firefighting, and resolving conflicts (*Figure 54*).

Approximately 29% of manufacturers report regular senior-level monitoring and reviews in place to measure return on investment from supply-chain management, an increase from 2011.[18] One-third (32%) have ad hoc monitoring and ad hoc reviews, and 17% have no measurement systems or reviews (*Figure 55*).

Figure 54. What percentage of staff time and resources is spent expediting, firefighting, resolving conflicts with customers and suppliers, etc., rather than strategic procurement and supply-chain planning and partnering?

	2011	2013
<5%	23.3%	28.7%
5 – 25%	50.3%	47.1%
26 – 50%	19.4%	15.4%
>50%	7.1%	8.8%

Figure 55. What best describes your measurement system for reviewing return from supply-chain management and collaboration?

	2009	2011	2013
No measurement system per se or reviews	26.2%	21.5%	16.9%
Ad hoc monitoring of basic measures and ad hoc reviews	30.9%	31.1%	32.0%
Company-specific metrics monitored regularly by operations staff	18.5%	22.9%	21.9%
Regular monitoring and review of company-specific metrics by CEO and senior staff	17.5%	15.6%	23.0%
Regular monitoring and review of company-specific metrics by CEO and senior staff and transparency and clarity throughout the organization	6.9%	8.9%	6.3%

[18] "Regular monitoring and review of company-specific metrics by CEO and senior staff" or "Regular monitoring and review of company-specific metrics by CEO and senior staff and transparency and clarity throughout the organization."

Supply-Chain Results

A lower percentage of manufacturers (36%) recorded supply-chain inventory reductions of 10% or more than in 2011 or 2009 (51% and 47%, respectively), which may indicate that improved economic conditions have led to larger inventories (*Figure 56*).

Two-thirds of manufacturers (67%) indicate that 90% or more of their supplier deliveries arrive precisely to specifications, but 10% of firms have issues with one-fifth or more of their supplier deliveries (*Figure 57*).

Supplier relationships vary considerably, with 26% at one end of the relationship spectrum ("buy and sell") and 13% at the other ("partnership") (*Figure 58*).

Figure 56. By approximately what percentage has total value of inventory throughout the supply chain for your primary product (furthest supplier to end customer) been reduced over the last three years?

	2009	2011	2013
<10%	52.8%	49.4%	64.1%
10 – 25%	33.0%	35.0%	28.8%
26 – 50%	10.9%	12.0%	5.4%
>50%	3.3%	3.6%	1.7%

Figure 57. What percentage of supplier materials and components are delivered precisely to your specifications (e.g., quality, quantity, timing, labeling, packaging, etc.)?

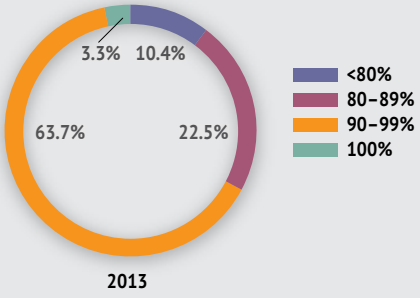


Figure 58. Which of the following best describes your organization's relationship with its suppliers?

	2013
Buy and sell (e.g., cost and quality focus)	25.5%
Certification (e.g., broad qualifications established)	23.3%
Cooperation (e.g., sharing product ideas, best practices)	38.1%
Partnership (e.g., sharing resources, intellectual property, cost savings)	13.2%

World-Class Sustainability

Design and implement waste and energy-use reductions at a level that provides superior cost performance and recognizable customer value.

Sustainability Strategies and Practices

Fifty-five percent of manufacturers recognize the importance of sustainability (*Figure 59*).[19] Approximately 29% of manufacturers report that they are near or at world-class status in sustainability; about 13% of firms report no progress toward world-class status (*Figure 60*).[20]

Figure 59. Rate the importance of sustainability to your organization's success over the next five years:

	2009	2011	2013
1=Not important	15.6%	5.8%	6.4%
2	22.6%	12.9%	14.4%
3	26.7%	22.1%	24.3%
4	19.4%	27.7%	22.9%
5=Highly important	15.7%	31.5%	32.0%

Figure 60. Rate your organization's progress toward world-class processes and sustainability:

	2009	2011	2013
1=No progress	20.8%	11.3%	12.7%
2	32.0%	27.1%	26.5%
3	27.2%	34.2%	31.7%
4	14.7%	22.2%	23.4%
5=World-class	5.4%	5.3%	5.8%

The three critical elements necessary for world-class process improvement are:

- *Strategy:* Approximately 45% of manufacturers have a company-specific sustainability strategy, but only 13% define that company-specific strategy as having full functional involvement and buy-in. Approximately 29% have a generic strategy with little or no functional involvement or buy-in, and 26% have no strategy (*Figure 61*).

Figure 61. What best describes your sustainability strategy?

	2011	2013
No strategy	24.5%	25.8%
Generic strategy with little or no functional involvement and buy-in	28.3%	29.1%
Company-specific strategy with some functional involvement and buy-in	35.3%	31.9%
Company-specific strategy with full functional involvement and buy-in	11.9%	13.2%

[19] Rated 4 or 5 on a scale of 1–5, where 5 equals "highly important."
[20] Rated 4 or 5 on a scale of 1–5, where 5 equals "world-class."

- *Talent and development programs:* About 44% of manufacturers report sufficient talent for world-class sustainability, but only 21% have talent-development programs in place to drive the strategy (*Figure 62*). Just 21% of manufacturers have both talent and development programs, and 55% have neither talent nor development programs.

- *Business systems and equipment:* Only 9% of manufacturers report that their business systems and equipment are state-of-the-art and can support world-class sustainability long-term. Another 53% report that systems and equipment meet current requirements. About 38% of manufacturers have either inadequate systems and equipment or none at all to support world-class sustainability (*Figure 63*).

Figure 62. Does your organization have the skilled sustainability leadership and talent (e.g., environmental engineers) and talent-development programs to drive world-class sustainability into the next generation?

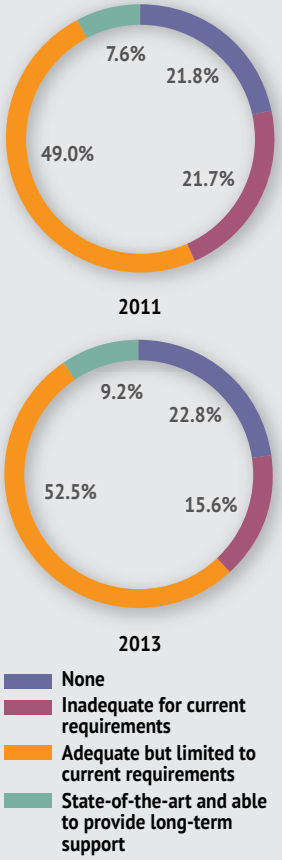
	2013
Leadership and talent	
Yes	43.7%
No	56.3%
Talent-development programs	
Yes	21.3%
No	78.7%

Fully one-fifth of manufacturers report regular senior-level monitoring and reviews in place to measure return on investment from sustainability efforts,[21] a steady increase from 2009 and 2011 findings. Many manufacturers, though, still have ad hoc monitoring and ad hoc reviews (31%) or no measurement systems or reviews (33%) (*Figure 64*).

Figure 64. What best describes your measurement system for reviewing return from sustainability efforts?

	2009	2011	2013
No measurement system per se or reviews	53.4%	37.0%	32.5%
Ad hoc monitoring of basic measures and ad hoc reviews	25.0%	30.3%	31.4%
Company-specific metrics monitored regularly by operations staff	8.4%	15.5%	16.1%
Regular monitoring and review of company-specific metrics by CEO and senior staff	8.8%	11.7%	14.5%
Regular monitoring and review of company-specific metrics by CEO and senior staff and transparency and clarity throughout the organization	4.5%	5.6%	5.5%

Figure 63. What best describes the quality of your business systems and equipment to support world-class sustainability?



[21] "Regular monitoring and review of company-specific metrics by CEO and senior staff" or "Regular monitoring and review of company-specific metrics by CEO and senior staff and transparency and clarity throughout the organization."

Sustainability Results

Sustainability performances are comparable across the three years of the NGM Study:

- *Energy reduction:* Just 3% of manufacturers have reduced energy by more than 25%. Approximately (83%) report annual energy reductions (per unit of product output) of less than 10% (*Figure 65*).

- *Recycled materials:* Just 5% of manufacturers have reduced their use of non-recycled material by more than 25%. Four out of five manufacturers (79%) report annual reductions in the usage of non-recycled material (per unit of product output) of less than 10% (*Figure 66*).

- *Recyclable/reusable products:* Approximately 25% of manufacturers report that 90% or more of their products are completely recyclable/reusable — the biggest improvement in sustainability metrics compared to 2009 and 2011. Fifty-eight percent of firms report that less than half of their products (by sales volumes) are completely recyclable/reusable (*Figure 67*).

Approximately 11% of manufacturers have calculated a carbon footprint for half or more of their products. Four percent have a carbon footprint for all products (*Figure 68*).

Figure 68. For what percentage of your SKUs have you calculated a carbon footprint?

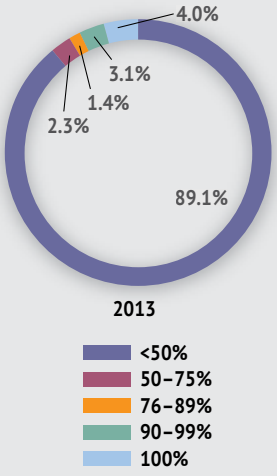


Figure 65. What is your annual reduction in energy per unit of product output?

	2009	2011	2013
<10%	83.4%	81.2%	82.6%
10 – 25%	14.0%	17.4%	14.6%
26 – 50%	2.1%	1.3%	2.3%
>50%	0.5%	0.1%	0.6%

Figure 66. What is your annual reduction in usage of non-recycled material per unit of product output?

	2009	2011	2013
<10%	77.6%	76.3%	79.0%
10 – 25%	16.6%	18.3%	16.2%
26 – 50%	3.3%	3.8%	2.0%
>50%	2.6%	1.5%	2.8%

Figure 67. What percentage of your products (by sales volume) are completely recyclable/reusable?

	2009	2011	2013
<50%	59.9%	60.9%	57.5%
51 – 75%	8.7%	10.0%	8.1%
76 – 89%	9.5%	8.1%	9.5%
90 – 99%	13.8%	12.2%	15.9%
100%	8.2%	8.8%	8.9%

World-Class Global Engagement

Secure business advantages by having people, partnerships, and systems in place capable of engaging global markets and talents better than the competition.

Global Engagement Strategies and Practices

Nearly half of manufacturers (49%) recognize the importance of global engagement (*Figure 69*).[22] Approximately 24% of manufacturers report they are near or at world-class status in global engagement;[23] 25% of firms report no progress toward world-class status (*Figure 70*).

Manufacturing executives with less than 10% of their firms' sales outside the United States are far more likely to believe global engagement is not important (51%)[24] and to report their organizations as furthest from world-class status in global engagement (63%).[25]

Figure 69. Rate the importance of global engagement to your organization's success over the next five years:

	2009	2011	2013
1=Not important	18.1%	11.8%	18.0%
2	18.1%	17.5%	15.8%
3	17.5%	20.3%	16.9%
4	18.6%	19.1%	23.3%
5=Highly important	27.7%	31.3%	26.0%

Figure 70. Rate your organization's progress toward becoming a world-class global player:

	2009	2011	2013
1=No progress	25.8%	22.6%	24.7%
2	28.0%	25.8%	22.7%
3	21.5%	26.4%	28.5%
4	18.1%	19.3%	18.6%
5=World-class	6.5%	6.0%	5.5%

The three critical elements necessary for world-class global engagement are:

- *Strategy:* Approximately 44% of manufacturers have a company-specific global strategy, but only 15% define that company-specific strategy as having full functional involvement and buy-in. One-third of firms (33%) have no strategy (*Figure 71*).

[22] Rated 4 or 5 on a scale of 1–5, where 5 equals "highly important."
[23] Rated 4 or 5 on a scale of 1–5, where 5 equals "world-class."
[24] Rated 1 or 2 on a scale of 1-5, where 1 equals "not important."
[25] Rated 1 or 2 on a scale of 1-5, where 1 equals "no progress."

Figure 71. What best describes your global strategy?		
	2011	**2013**
No strategy	32.3%	33.2%
Generic strategy with little or no functional involvement and buy-in	22.9%	23.0%
Company-specific strategy with some functional involvement and buy-in	29.5%	28.8%
Company-specific strategy with full functional involvement and buy-in	15.2%	15.1%

- *Talent and development programs:* About 39% of manufacturers report sufficient talent for world-class global engagement, but only 18% have talent-development programs in place to drive the strategy (*Figure 72*). Just 17% of manufacturers have *both* talent and development programs — 60% have *neither* talent nor development programs. From a talent and development-program perspective, global engagement is the least supported strategy.

- *Business systems and equipment:* Only 9% of manufacturers report that their business systems and equipment are state-of-the-art and can support world-class global engagement long-term. Another 48% report that systems and equipment meet current requirements. Approximately 43% of manufacturers have either inadequate systems and equipment or none at all to support world-class global engagement (*Figure 73*).

Figure 72. Does your organization have the skilled overseas leadership and talent (e.g., environmental engineers) and talent-development programs overseas to drive world-class global engagement into the next generation?	
	2013
Leadership and talent	
Yes	39.1%
No	60.9%
Talent-development programs	
Yes	18.2%
No	81.8%

Figure 73. What best describes the quality of your business systems and equipment to support world-class global engagement?		
	2011	**2013**
None	29.6%	27.7%
Inadequate for current requirements	17.8%	15.5%
Adequate but limited to current requirements	44.3%	47.7%
State-of-the-art and able to provide long-term support	8.3%	9.1%

A majority of manufacturers (61%) have no direct workforce located overseas and/or located domestically and responsible for global business activities; 7% of manufacturers have more than one-quarter of their workforces engaged in global business activities (*Figure 74*).

Only 22% of manufacturers report regular senior-level monitoring and reviews in place to measure return on investment from global engagement.[26] One in five manufacturers (22%) have ad hoc monitoring and ad hoc reviews, and 47% have no measurement systems or reviews (*Figure 75*).

Figure 74. What percentage of your total direct workforce is located overseas and/or located domestically and responsible for global business activities?

	2009	2011	2013
0%	53.7%	57.0%	60.7%
1 – 25%	38.5%	35.0%	32.3%
26 – 50%	4.8%	4.6%	3.3%
>50%	3.0%	3.4%	3.6%

Figure 75. What best describes your measurement system for reviewing return from global engagement?

	2009	2011	2013
No measurement system per se or reviews	53.9%	51.4%	46.8%
Ad hoc monitoring of basic measures and ad hoc reviews	17.6%	21.2%	21.6%
Company-specific metrics monitored regularly by operations staff	9.2%	9.0%	10.0%
Regular monitoring and review of company-specific metrics by CEO and senior staff	14.4%	13.1%	15.0%
Regular monitoring and review of company-specific metrics by CEO and senior staff and transparency and clarity throughout the organization	4.8%	5.4%	6.7%

[26] "Regular monitoring and review of company-specific metrics by CEO and senior staff" or "Regular monitoring and review of company-specific metrics by CEO and senior staff and transparency and clarity throughout the organization."

Global Engagement Results

Approximately 40% of manufacturers generate 10% or more of their sales dollars from outside the United States (*Figure 76*). Other global performance measures include:

- *Sales change:* One-quarter of manufacturers (23%) report that sales outside the United States have increased by more than 25% in the last three years (*Figure 77*).
- *Production facilities:* Fully 45% of manufacturers operate or partner in one or more production facilities outside of the United States (*Figure 78*).
- *Sales and/or distribution facilities:* Approximately 42% of manufacturers have one or more sales and/or distribution facilities outside of the United States (*Figure 79*).

Figure 76. What percentage of sales dollar volume comes from outside the United States?

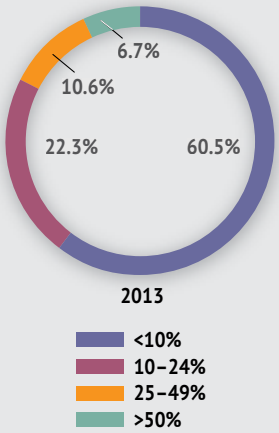


Figure 77. By what percentage has dollar volume of sales outside the United States changed over the past three years?

	2009	2011	2013
<25%	74.6%	73.0%	76.9%
26–50%	17.4%	19.6%	17.8%
51–100%	5.3%	5.9%	3.9%
>100%	2.7%	1.5%	1.4%

Figure 78. In how many countries outside of the United States does your organization operate or partner in production facilities?

	2009	2011	2013
0	55.5%	54.4%	55.0%
1–5	32.4%	31.6%	31.9%
6–10	5.5%	5.3%	3.9%
>10	6.7%	8.8%	9.2%

Figure 79. In how many countries outside of the United States does your organization have sales and/or distribution facilities?

	2009	2011	2013
0	53.6%	53.3%	57.5%
1–5	29.3%	27.2%	24.3%
6–10	6.3%	7.3%	5.8%
>10	10.8%	12.2%	12.4%

Going Forward

Manufacturers are most likely to seek outside support for their firms on an ongoing or as-needed basis for:

- Regulatory/compliance issues (72% of manufacturers),
- Operations improvements (70% of manufacturers),
- Workforce skills development (69% of manufacturers),
- Strategic planning (56% of manufacturers),
- Business development (54% of manufacturers), and
- Innovation/R&D (52% of manufacturers).

Manufacturers regular use — ongoing or as needed — of outside support increased or remained the same for all of the activities in 2013 vs. 2011, with the exception of supply-chain development and global sales/procurement (*Figure 80*).

Figure 80. To what extent does your company get support from outside resources for the following activities?*

		Never	Rarely	As needed	Ongoing guidance and support
Regulatory/compliance issues	2011	8.9%	24.2%	51.9%	15.0%
	2013	9.1%	19.3%	52.6%	19.0%
Operations improvement (e.g., lean)	2011	9.0%	26.8%	45.5%	18.7%
	2013	10.9%	19.6%	52.3%	17.2%
Workforce skills development	2011	8.9%	27.2%	49.6%	14.3%
	2013	9.0%	21.6%	53.4%	15.9%
Strategic planning	2011	17.3%	30.9%	39.5%	12.4%
	2013	17.5%	26.6%	40.3%	15.6%
Business development	2011	13.1%	34.7%	40.4%	11.8%
	2013	14.8%	30.9%	42.1%	12.3%
Innovation/R&D	2011	14.9%	33.3%	43.2%	8.6%
	2013	18.6%	29.6%	43.6%	8.2%
Supply-chain development	2011	27.7%	35.0%	30.7%	6.6%
	2013	29.5%	33.6%	33.3%	3.6%
Global sales and/or procurement	2011	34.7%	29.8%	29.6%	5.9%
	2013	35.9%	30.4%	28.5%	5.2%
Sustainability initiatives	2011	34.5%	31.8%	27.2%	6.5%
	2013	40.7%	32.0%	22.4%	4.9%
Government credits/ grants	2011	24.9%	31.8%	35.0%	8.4%
	2013	25.6%	30.5%	34.9%	9.1%

* ranked by 2013 combined "as needed" and "ongoing guidance and support"

A majority of manufacturers report that their organizations have been positively impacted by industry associations (55% of manufacturers), state manufacturing associations including Manufacturing Extension Partnerships (55%), and consulting firms (54%) (*Figure 81*).

Manufacturing leaders are most likely to be involved outside of their own firms for:

- Leadership or board position(s) with civic or charitable organization (57% of manufacturing executives),
- Leadership or board position(s) with industry association (38%),
- Leadership or board position(s) with local manufacturing association (23%), and
- For-profit board of directors position(s) (19%) (*Figure 82*).

Figure 81. If you have used outside resources, which of the following have positively impacted your company?

	2011	2013
Industry associations	57.8%	55.2%
State manufacturing associations (including MEPs)	56.1%	54.6%
Consulting firms	54.3%	53.8%
Universities/colleges	41.2%	43.4%
National manufacturing associations	24.2%	25.2%
Local/municipal manufacturing associations	24.1%	20.7%
Other	10.0%	7.6%
No positive impact	5.0%	3.6%

Figure 82. How is senior leadership involved outside of your company?

	2011	2013
Leadership or board position with civic or charitable organization	46.7%	57.0%
Leadership or board position with industry association	37.4%	37.5%
Leadership or board position with local manufacturing association	18.5%	22.7%
For-profit board of directors position	18.3%	18.9%
Leadership or board position with state manufacturing association or MEP	13.8%	16.2%
Leadership, board, or teaching position with university/college	13.0%	15.6%
Leadership or board position with national manufacturing association	11.5%	14.3%
No outside involvement	28.5%	24.7%

Profile of NGM Study Companies

The majority of manufacturers participating in the 2013 NGM Study (88%) are privately held, and 84% of participating organizations were identified as a "company" (*Figures 83* and *84*).

NGM Study manufacturers report annual revenues of $13.35 million (median) and approximately $250.8 million (average), and full-time employees of 60 (median) and 744 (average). These firms have been in operation for 38 years (median) and 45 years (average) (*Figures 85-87*).

All product-category manufacturers — as identified by three-digit North American Industrial Classification System (NAICS) codes — were represented within the NGM Study sample; industries with the highest percentage of respondents were fabricated metal product manufacturing (18%) and machinery manufacturing (15%) (*Figure 88*).

Figure 83. Is your company public or privately held?

	2011	2013
Public	12.9%	11.9%
Private	87.1%	88.1%

Figure 84. Which of the following describes your organization?

	2009	2011	2013
Company	79.8%	78.8%	84.0%
Division/Unit of a larger company	20.2%	21.2%	16.0%

Figure 85. What are your approximate annual revenues?

	2009	2011	2013
Median	$10,000,000	$12,000,000	$13,350,000
Average	$159,603,620	$196,493,091	$250,796,240
75th Percentile	$30,000,000	$40,000,000	$38,500,000
25th Percentile	$3,000,000	$4,000,000	$5,000,000

Figure 86. How many full-time employees (and equivalents)?

	2009	2011	2013
Median	55	60	60
Average	445	595	744
75th Percentile	140	150	166
25th Percentile	21	25	30

Figure 87. How many years has your organization been in operation?

	2009	2011	2013
Median	32	36	38
Average	41	44	45
75th Percentile	55	58	60
25th Percentile	19	22	24

Figure 88. Product Category

	2009	2011	2013
Fabricated Metal Product Mfg.	16.2%	18.0%	18.4%
Machinery Mfg.	16.2%	16.3%	14.9%
Computer and Electronic Product Mfg.	10.0%	11.0%	10.7%
Chemical Mfg.	7.3%	6.9%	8.5%
Transportation Equipment Mfg.	6.5%	6.7%	4.0%
Miscellaneous Mfg.	4.3%	5.8%	6.1%
Plastics and Rubber Products Mfg.	6.6%	5.0%	5.3%
Primary Metal Mfg.	8.3%	5.0%	5.9%
Electrical Equipment, Appliance, and Component Mfg.	2.8%	3.9%	6.4%
Food Mfg.	3.9%	3.9%	2.4%
Furniture and Related Product Mfg.	2.6%	2.9%	3.2%
Paper Mfg.	2.5%	2.4%	2.1%
Nonmetallic Mineral Product Mfg.	2.3%	2.2%	2.7%
Printing and Related Support Activities	2.4%	1.7%	0.8%
Wood Product Mfg.	2.8%	1.3%	2.4%
Textile Mills	1.1%	1.3%	0.5%
Apparel Mfg.	0.9%	1.0%	0.3%
Beverage and Tobacco Product Mfg.	0.3%	0.7%	0.5%
Textile Product Mills	0.7%	0.5%	1.6%
Petroleum and Coal Products Mfg.	0.5%	0.4%	0.3%
Leather and Allied Product Mfg.	0.6%	0.4%	0.0%
Other	1.3%	2.8%	2.9%

NGM Study Methodology

The Next Generation Manufacturing Study was conducted using an online questionnaire. Participants also had access to a PDF version of the questionnaire, which could be completed and mailed. A total of 375 manufacturers participated in the study in August and September 2013. The American Small Manufacturers Coalition (ASMC), Manufacturing Extension Partnerships (MEPs) across the United States, the Association for Manufacturing Excellence (AME), and The Manufacturing Performance Institute (MPI) promoted the study. Responses to the NGM Study were received by The Manufacturing Performance Institute, then entered into a database, edited, and cleansed to ensure answers were plausible, where necessary.

All respondent answers to the survey are confidential. As incentives, respondents who provided contact information were offered a copy of an NGM Performance Report, which shows their individual responses next to categories of respondents with organizational profiles comparable to their own.

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P.O. Box 201610
Shaker Heights, OH 44120
Phone: 216-991-8390
Fax: 216-991-8205
www.mpi-group.net

American Small Manufacturers Coalition

The American Small Manufacturers Coalition (ASMC) is a trade association of manufacturing extension agents who work to improve the innovation and productivity of America's manufacturing community. ASMC advocates for legislative and programmatic resources that allow its small manufacturing clients to better compete in the global marketplace.

P.O. Box 15289
Washington, DC 20003
Phone: 202-341-7066
Fax: 202-315-3906
www.smallmanufacturers.org

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