Approaches to Managing EHS & Sustainability Data

February 2013

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NAEM is pleased to present the *Approaches to EHS & Sustainability Data* report, which examines the primary tools environment, health and safety (EHS), and sustainability leaders use to ensure regulatory compliance, increase efficiency and support public disclosure of sustainability achievements. Putting these systems in place requires a great deal of collaboration, time and effort.

NAEM first began tracking the question of how companies manage EHS data at its early workshops about management information systems in the late 1990s. Beginning in 2001, NAEM expanded its efforts to also include a formal biennial benchmarking survey that looks at how companies are managing EHS and sustainability data as well as the capabilities of available software tools.

Over the years, the survey has continued to evolve to reflect changes in usage and the maturation of the software marketplace. This year's report is a snapshot of how companies are using management information systems to track progress, improve performance and facilitate external communication. NAEM is providing this free of charge with the primary goal of advancing the collective understanding of this important issue.

As a non-profit association focused on increasing the success of all EHS and sustainability managers, NAEM does not recommend any one approach or vendor, but rather aims to illuminate common data management practices. We hope the report will contain valuable insights for anyone working on EHS and sustainability data management, whether it is with the purpose of implementing a new system, benchmarking a current system, or expanding the offerings of a commercial solution.

We would like to gratefully acknowledge the support of our advisory committee, who helped shape the questionnaire as well as our financial supporters whose contributions made the research possible.

Sincerely,

Carol Singer Neuvelt
Executive Director
NAEM

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About NAEM

The National Association for Environmental Management (NAEM) empowers corporate leaders to advance environmental stewardship, create safe and healthy workplaces, and promote global sustainability. As the largest professional community for EHS and sustainability decision-makers, we provide peer-led educational conferences and an active network for sharing solutions to today's corporate EHS and sustainability management challenges. Visit NAEM online at www.naem.org.

Glossary of Terms

Approaches: Respondents were asked to indicate which approach their company primarily uses to manage its EHS and sustainability data. They were given the option of:

- **Commonly available tools:** This option was used to indicate when a company primarily uses programs such as Microsoft Excel, Microsoft Access, Microsoft SharePoint, Microsoft Outlook, etc. to manage its EHS and sustainability data.

- **Internally developed system:** This option was used to indicate when a company primarily uses a system that was built by the company itself rather than an off-the-shelf solution or a commonly available tool.

- **Off-the-shelf solution:** This option was used to indicate when a company buys a commercially available software system. This does not include tools such as Microsoft Excel, Microsoft Access, Microsoft Share Point, Microsoft Outlook, etc.

- **Combination:** This option was used to indicate when a company does not have a primary data management system, but instead uses a relatively equal combination of internally developed systems, commonly available tools and/or off-the-shelf solutions.

Business Objectives: This term is used to refer to the goals a company hoped to achieve with the implementation of its current data management system. For respondents who indicated they are in the market for a new system, they were asked to rank the goals they hoped to achieve with the implementation of a new system.

Capabilities: The data points that information management system allows a company to track.

Data management: This term is used to denote the business management process associated with collecting, tracking and reporting data.

EHS: Environment, health and safety

Facility: This term includes manufacturing sites, office buildings and other physical locations where business operations take place.

Implementation: This includes all activities until the date the system goes live. Implementation costs are therefore those incurred until the system goes live, excluding licensing or subscription fees.

Maintenance: This refers to all activities that keep the system updated and functioning properly on an ongoing basis. Maintenance costs may include licensing or subscription fees.

Sustainability: The survey did not define this term for respondents.

System: This term refers to the type of software, database or tool a company uses to manage its data.

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Executive Summary

Companies use a variety of approaches to meet all their EHS and sustainability data management needs

Among respondents, 34 percent use a combination of approaches to meet all of their data management needs. The remaining two-thirds of respondents said their companies have a 'primary' approach, which consists of either commonly available tools, an internally developed system or an off-the shelf-solution. Even those that have a primary approach, however, use alternative approaches at least some of the time, according to the results.

Data Management Approach
Figure ES1

Approach	Percentage
Commonly-Available Tools	25%
Internally-Developed System	18%
Off-the-Shelf Solution	24%
Combination	34%

N = 106
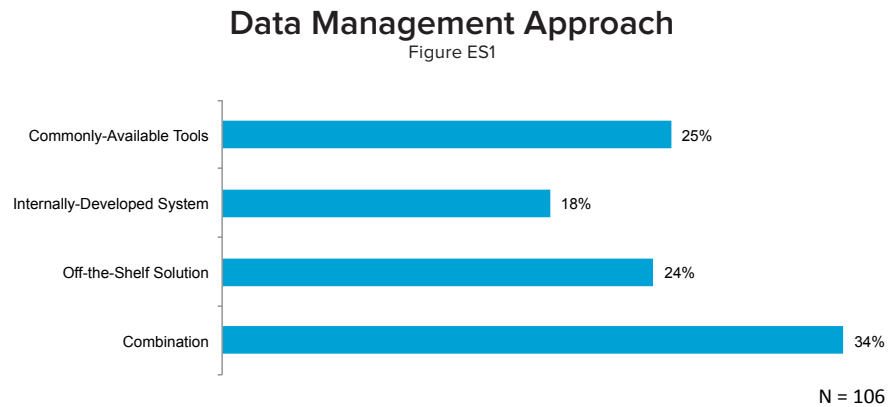
A company's approach to data management strongly correlates to its size and level of EHS risk

Companies with a high level of EHS risk are much more likely to use an off-the-shelf solution to manage their EHS and sustainability data. Size also seems to play a role in determining a company's approach to data management: Larger companies tend to use internally developed systems more often than other approaches.

Off-the-shelf solutions are the newest systems

While the average age of an EHS and sustainability data management system is about eight years, the average age of an off-the-shelf solution is about four years old, according to respondents. Internally developed systems and commonly available tools are about nine or ten years in age.

Respondents use different approaches for different needs

When respondents were asked to indicate which approach they use for each of 41 different types of data, a portrait of the relative strengths of each approach begins to emerge. Commonly available tools seem to be most often used for keeping track of permits, risk assessments and inspections, while internally developed systems tend to be used more comprehensively. Off-the-shelf solutions seem to dominate specialty areas, such as MSDS tracking, regulation tracking, and monitoring and document tracking. These newer software systems also seem to be most often used to manage core EHS tasks. It's important to note that companies with a high degree of risk tend to use off-the-shelf solutions more so than other approaches.

The following chart shows the top ten capabilities most frequently managed by each approach.

Top 10 Capabilities Most Frequently Managed by Each Approach
Figure ES2

Commonly Available Tools	Percent of Respondents Using this Approach
SARA Title III reporting (Tier II, TRI)	35%
Wastewater permit management	31%
Environmental reporting	30%
Hazard identification and assessment	30%
Stakeholder communications (internal/external)	30%
Waste management	29%
Environmental auditing/inspections	29%
Job hazard/Risk assessment (JHA)	29%
Safety auditing/inspections	29%
Responding to external requests for information (CDP, DJSI, etc.)	28%

Internally Developed System	Percent of Respondents Using this Approach
Accident/Incident management	47%
Incident reporting, investigation and tracking	47%
Job hazard/Risk assessment (JHA)	45%
Injury/Illness reporting	43%
Hazard identification and assessment	43%
Compliance reporting, investigation and tracking	42%
Environmental auditing/inspections	41%
GHG inventory and reporting	40%
Performance metrics/dashboards/scorecards	39%
Safety auditing/inspections	37%

Off-the-Shelf Solution	Percent of Respondents Using this Approach
Chemical/MSDS management	62%
Accident/Incident management	37%
Injury/Illness reporting	37%
Regulation tracking and monitoring	36%
Employee health and wellness	35%
Incident reporting, investigation and tracking	34%
Equipment tracking	32%
Document management	30%
Training (EHS)	30%
Corrective action tracking	28%

N = 80

Executive Summary

Supply chain monitoring and product footprinting are the greatest unmet needs

Respondents seem to be satisfied with the core EHS capabilities of their chosen approach, particularly in the areas of injury and illness reporting, incident management and auditing. Emerging issues such as supply chain monitoring, product footprinting, on the other hand, remain unmet needs. Managing lifecycle data, for example, is an unmet need for 38 percent of respondents; 30 percent of respondents reported that material traceability and supply chain transparency is also data they would like to collect but currently cannot.

Top Five Unmet Needs
Figure ES3

Unmet Need
1. Life-cycle assessment (LCA)/product footprinting
2. Material traceability and supply chain transparency
3. Product liability/REACH/RoHS/TSCA
4. Stakeholder communications (internal/external)
5. Responding to external requests for information (CDP, DJSI, etc.)

N = 73

Companies using a combination of approaches are more likely to be shopping for a new system

Half of all respondents indicated that they are in the market for some type of off-the-shelf solution. Among prospective buyers, those using a combination approach or an internally developed system are most likely to be shopping for a new system.

In the Market by Data Management Approach
Figure ES4

Approach	Yes	No	Don't Know
Commonly-Available Tools	50%	42%	8%
Internally-Developed System	53%	42%	5%
Off-the-Shelf Solution	32%	64%	4%
Combination	61%	36%	

N = 106

Executive Summary

Continuous improvement seems to drive prospective buyers of off-the-shelf solutions

Those who are in the market for off-the-shelf software seem to seek a solution that will help them advance their programs. For those who currently use commonly available tools, these objectives include risk and injury reduction. Respondents that use internally developed systems seem to seek a system that will save time, standardize processes and improve productivity. Those who already have an off-the-shelf solution seem most ambitious in their goals, seeking a transition to tracking leading indicators, as well as improving visibility and communication about their EHS and sustainability activities. For the majority of buyers, who are using a combination of approaches, the purchase drivers are a mix of the aforementioned goals, ranging from process improvements and injury reduction to facilitating communications.

Top Five Business Objectives for Potential Purchasers of an Off-the-Shelf Solution by Current Data Management Approach
Figure ES4

Rank	Commonly Available Tools	Internally Developed System	Off-the-Shelf Solution	Combination
1	Improve EHS and sustainability performance	Save time	Transition to tracking leading indicators	Improve EHS and sustainability performance
2	Improve communication about EHS and sustainability activities	Improve EHS and sustainability performance	Improve communication about EHS and sustainability activities	Standardize processes
3	Reduce injuries and illnesses	Standardize processes	Improve corporate-level visibility on EHS and sustainability performance	Reduce injuries and illnesses
4	Reduce risks	Improve communication about EHS and sustainability activities	Save time	Reduce risks
5	Improve corporate-level visibility on EHS and sustainability performance	Increase productivity	Improve facility-level visibility on EHS and sustainability performance	Improve communication about EHS and sustainability activities

N = 75

Larger companies have higher implementation and maintenance costs

Data management systems cost more for larger companies in both the implementation and maintenance stages. Implementation costs range from less than $20,000 for companies with fewer than 1,000 employees to more than $175,000 for companies with more than 80,000 employees. The median for all respondents was $100,000. Large companies also spend more on annual maintenance; the median cost for companies that employ more than 80,000 employees was $75,000 per year.

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Methodology & Demographics

Methodology & Demographics

Objectives

Since 2001, NAEM has conducted an EHS and sustainability data management survey in conjunction with the biennial EHS and sustainability software conference. The purpose of this benchmark study is to understand:

- How companies manage EHS and sustainability data
- What types of systems companies use to manage data and the shelf life of those systems
- The business objectives that affect how a company approaches data management
- The level of integration between the EHS and sustainability data management systems and other business information systems
- The most valued capabilities and unmet needs of data management systems
- How long it takes and how much it costs to implement a system

Survey Design

This study reprises core concepts from NAEM's previous research on EHS and sustainability management information systems and incorporates input from an advisory committee composed of senior EHS and sustainability leaders. The committee helped to shape the project and additionally served as beta-testers, completing an initial draft of the questionnaire.

The resulting online survey consisted of 31 questions, which were broken into sections similar to those in this report.

Respondents and Timing

The respondents were drawn from primarily U.S.-based EHS and sustainability professionals. Only respondents in full-time, "in-house" EHS or sustainability roles were eligible to complete the survey; consultants and service providers were excluded. This report reflects the inputs from the 116 respondents who met the eligibility criteria.

The online survey was fielded between Dec. 20, 2012 and Jan. 18, 2013.

Company Demographics

The survey asked respondents a number of identifying questions to facilitate effective benchmarking. The following charts provide a profile of responding companies:

- The respondents represented companies with revenues ranging from less than $250 million to more than $50 billion. The largest group (49 percent) reflected the perspective of companies with revenues of between $1 billion and $10 billion.

Annual Revenue
Figure 1

N = 105
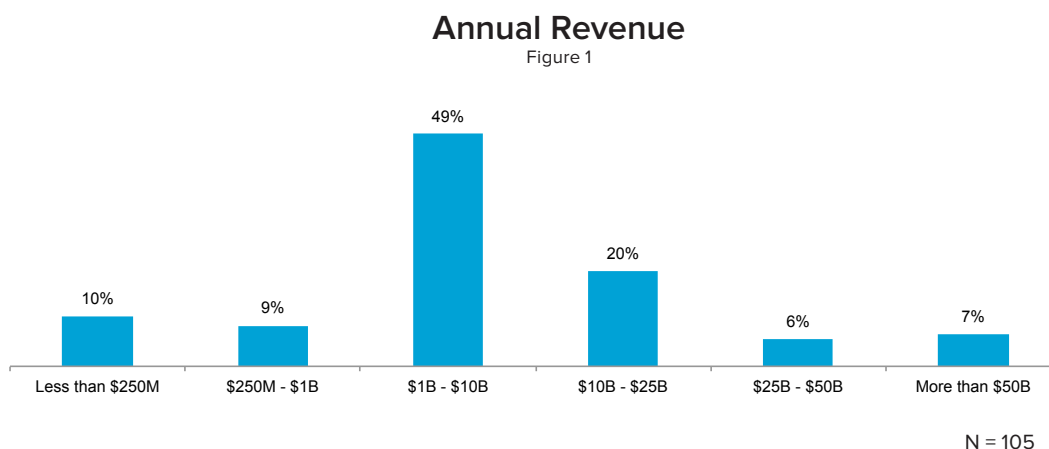
- Respondents represented large companies with high headcounts.

Total Number of Employees
Figure 2

Less than 1,000	1,000 - 10,000	10,000 - 20,000	20,000 - 80,000	More than 80,000
16%	25%	24%	25%	11%

N = 106
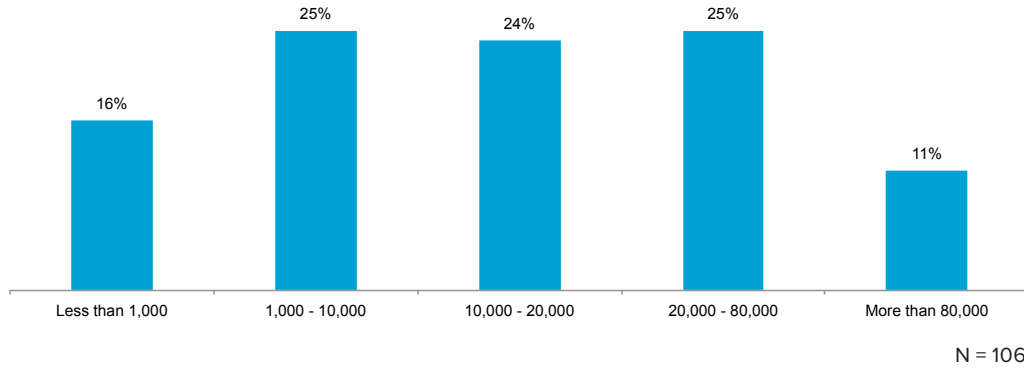
- Responding companies have a broad geographic reach, covering all of the world's major economies and regions.

Geographic Presence of Operations
Figure 3

Region	Percentage
United States	99%
European Union	68%
Asia Pacific	66%
Canada	62%
Mexico & Central America	56%
South America	53%
Other Europe & Russia	47%
Middle East & Africa	47%

N = 107
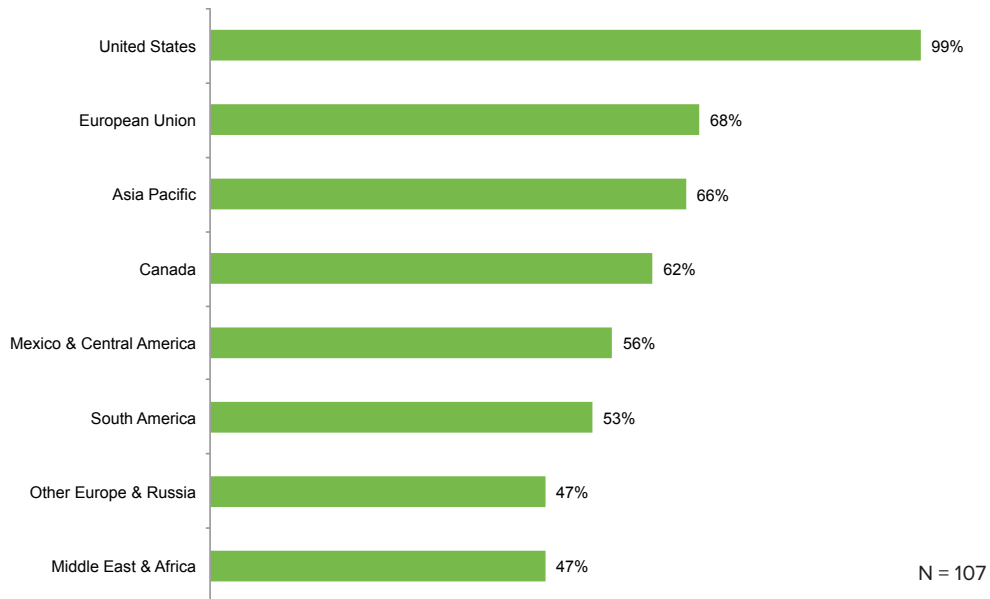
Methodology & Demographics

- Responding companies operate in a wide variety of industries, with the strongest representation from manufacturing (42 percent).

Industry
Figure 4

Industry	Percentage
Manufacturing	42%
Retail and Services	16%
Utilities	15%
Chemicals	11%
Pharma and Biotech	8%
Consumer Products	8%

N = 106
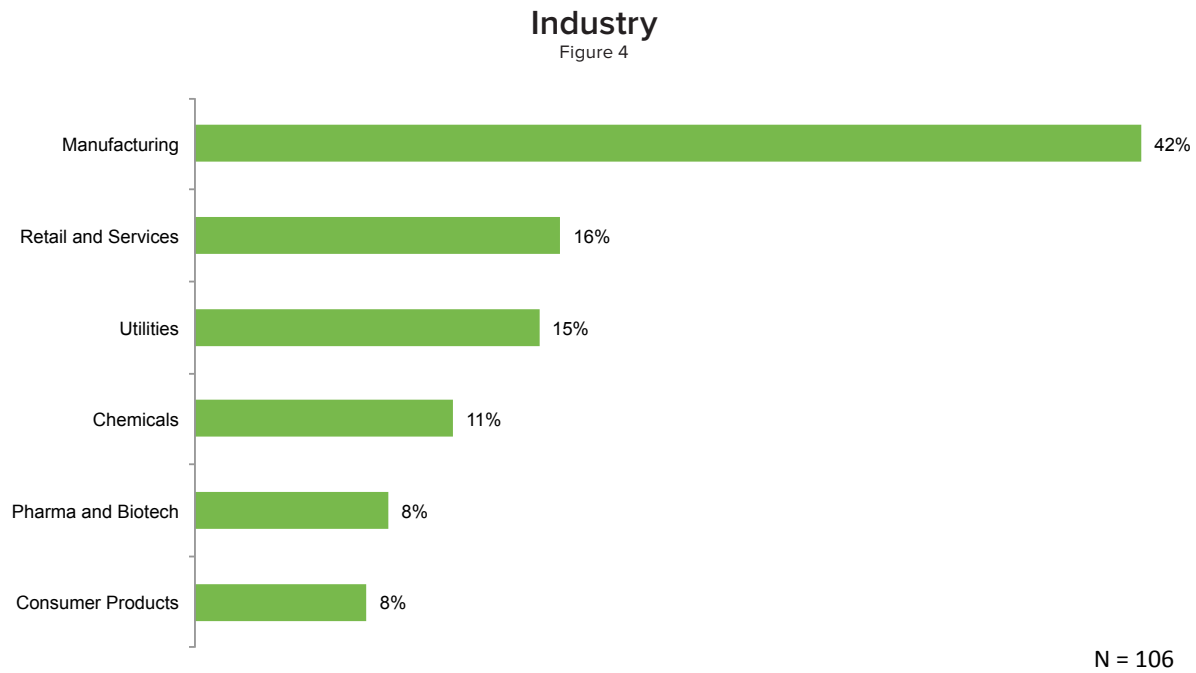
- Most respondents self-identified as operating with a medium level of EHS risk relative to companies operating in other industries.

EHS Risk Profile
Figure 5

- Low degree of EHS risk — 14%
- Medium degree of EHS risk — 65%
- High degree of EHS risk — 21%

N = 107
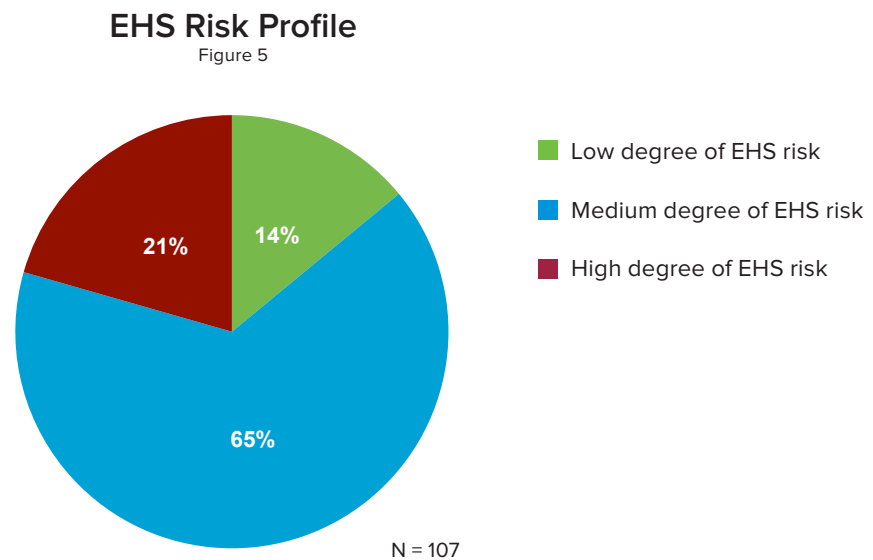
Data Management Approaches

Data Management Approaches

This section addresses how respondents currently approach their data management needs. The information is segmented by risk, revenue, headcount and industry to facilitate benchmarking.

There is no one-size-fits-all approach to data management

According to respondents, companies are using a variety of systems to manage EHS and sustainability data. These include internally developed systems (those created in house); off the shelf systems (software developed by, and purchased from, an external firm); and commonly available tools, such as Microsoft Excel or Microsoft SharePoint. While many respondents indicated that they primarily use one of the above approaches, about a third reported that their company relies on a combination of these different approaches to meet all of their data management needs.

Results from later questions on how specific needs are met by different types of systems reveal that even the two-thirds of respondents who reported having a primary approach use different types of systems to meet all of their EHS and sustainability data management needs. A company that primarily uses an internally-developed system, for example, may turn to an off-the-shelf solution for a specific set of capabilities. The 'System Capabilities and Effectiveness' section of this report provides more granularity and further explores how companies diversify their data management portfolios to meet the multitude of EHS and sustainability needs.

Data Management Approach
Figure 6

Approach	Percentage
Commonly-Available Tools	25%
Internally-Developed System	18%
Off-the-Shelf Solution	24%
Combination	34%
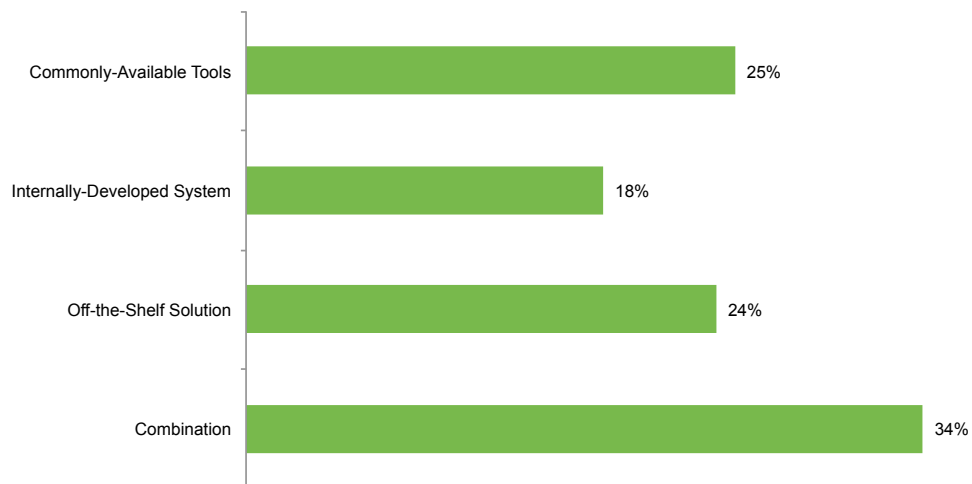
N = 106

High risk companies rely more on off-the-shelf systems

The results in Figure 7 illustrate that a company's chosen approach to data management strongly correlates with its level of EHS risk. High-risk companies tend to manage EHS and sustainability data using an off-the-shelf solution (45 percent) while low-risk companies typically use an internally developed system (40 percent).

Data Management Approach by EHS Risk Profile
Figure 7

N = 104

Reasons for Current Approach

In an open-ended question to all respondents about why their company chooses to manage its EHS and sustainability data the way it does, most respondents cited cost and resources as key considerations.
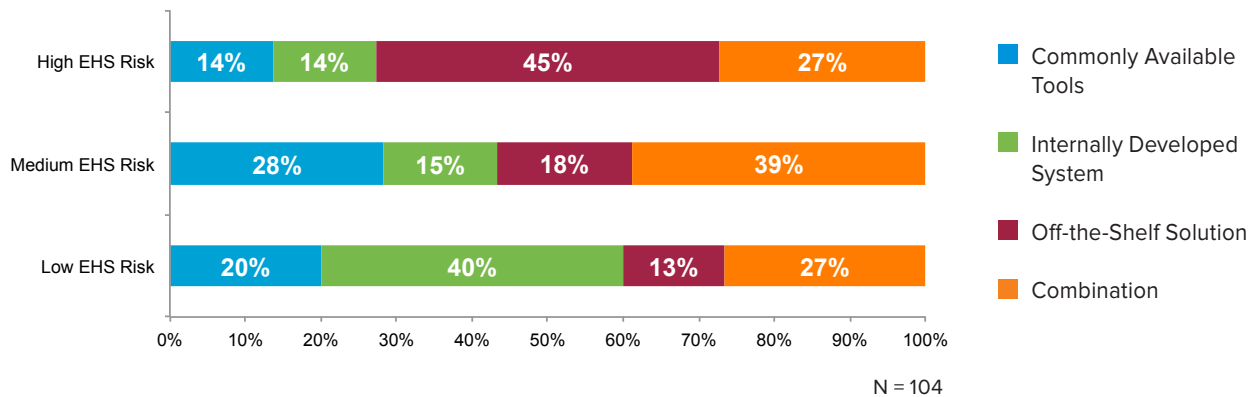
In order to justify the expense, companies tend to weigh cost against avoidance of risk. According to one respondent that primarily uses commonly available tools, the biggest driver for choosing this approach was, "perceived level of risk based on rate of return for off-the-shelf solution or time spent developing an internal system." Another respondent echoed with, "Cost has been a limiting factor. The present system works, so justifying the cost is justifying avoidance of risk. The perception of risk is low."

Companies that primarily use an off-the-shelf solution tended to cite 'ease of use' as the primary driver behind their decision to purchase software. Other reasons included the ability to customize the solution, along with increased efficiency, consistency and transparency. Most companies that have chosen to manage data using an internally developed system also cited customization as a primary driver.

For those who are using a relatively equal combination of systems, a decentralized EHS structure was often cited as the deciding factor behind adopting this combination approach. As one respondent explained, "We are a siloed company and each business unit determines what technologies are needed to best manage data and maintain compliance." Another deciding factor for a combination approach was the lack of a coherent data management strategy, according to respondents. "Systems were developed at different times," one respondent said. "Various components were selected to meet the needs at that point in time." Another significant driver for companies to adopt a combination approach was the fact that they couldn't find a single solution that met all of their needs.

While lack of funding seems to be keeping companies reliant on commonly available tools, some respondents advocate for these tools. As one respondent explained, "familiarity, portability, ease-of-use/training, remote access and cost," were the biggest drivers behind their company's decision to use commonly available tools.

Data Management Approaches

Consumer-facing industries tend to use commonly available tools or a combination of systems

Respondents from companies in the consumer products industry tend to manage EHS and sustainability data using a combination of approaches, while retail and services companies stick with commonly available tools. Utilities, along with companies in the pharmaceuticals and biotech industries, are the most likely to employ off-the-shelf solutions for their EHS and sustainability data management needs.

Data Management Approach by Industry
Figure 8
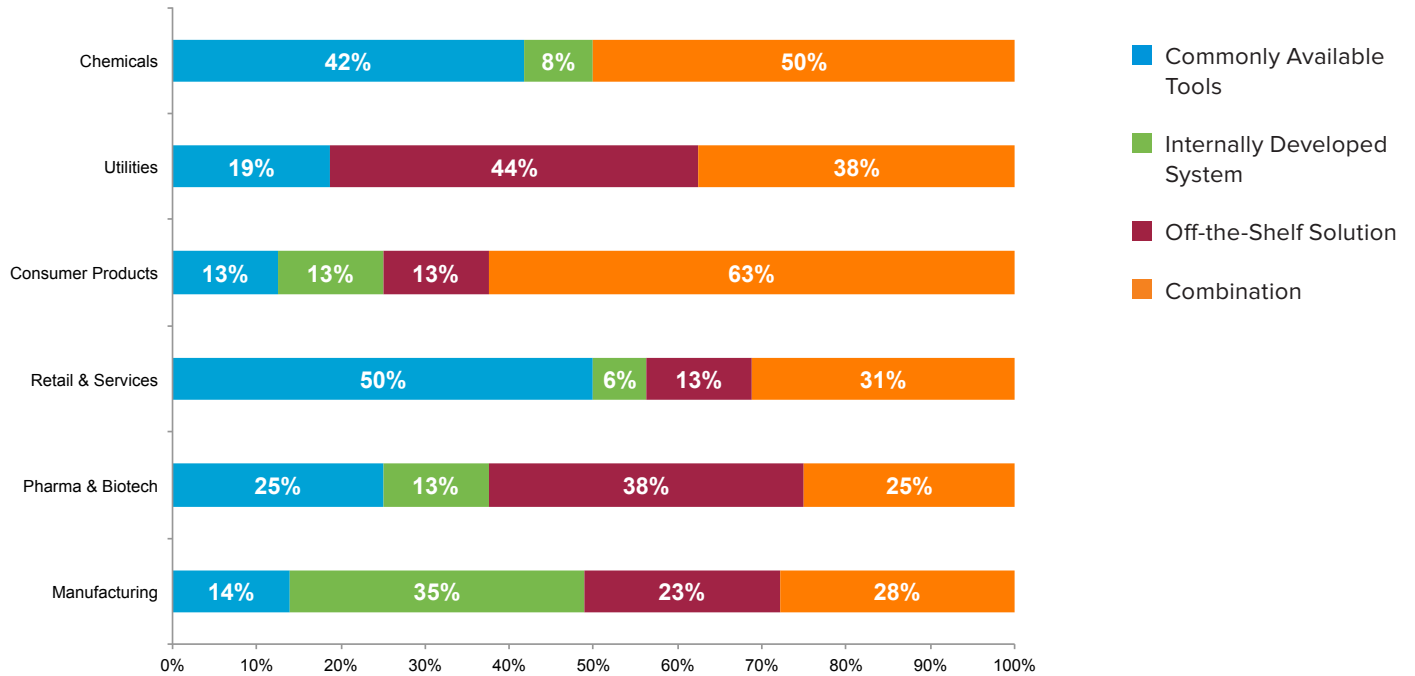
N = 104

Larger companies use internally developed systems or a combination approach

Whether you measure a company's size by number of employees or number of facilities, larger companies are more likely to use internally developed systems (42 percent) or a combination of approaches to manage their data. Companies with fewer than 1,000 employees are more apt to use commonly available tools (41 percent).

The number of facilities a company has may also suggest a decentralized structure[1], which is another potential driver for using a combination of systems. Indeed, in response to an open-ended question about the primary driver for using a combination of systems, one respondent wrote, that it was "primarily the result of the decentralized operation structure of the company."

Data Management Approach by Number of Employees
Figure 9

	Commonly Available Tools	Internally Developed System	Off-the-Shelf Solution	Combination
More than 80,000	8%	42%	17%	33%
20,000 - 80,000	8%	21%	21%	50%
10,000 - 20,000	28%	12%	24%	36%
1,000 - 10,000	32%	4%	32%	32%
Less than 1,000	41%	24%	18%	18%

N = 103
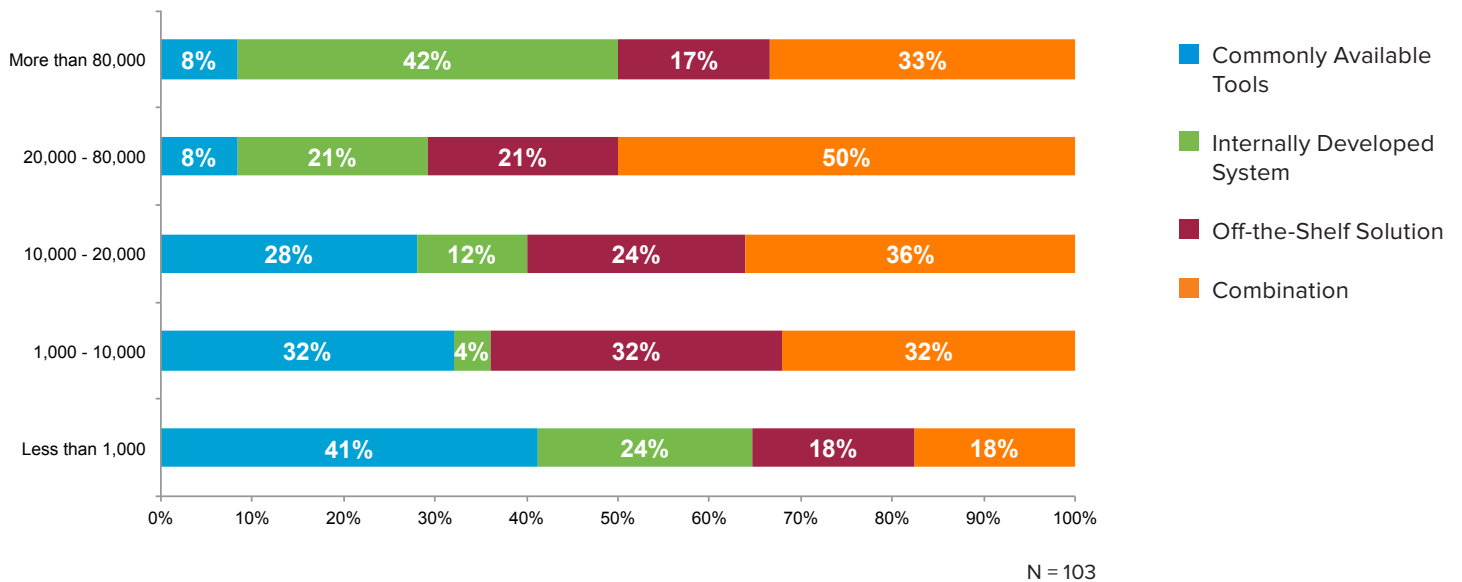
Data Management Approach by Number of Facilities
Figure 10

	Commonly Available Tools	Internally Developed System	Off-the-Shelf Solution	Combination
More than 200	13%	13%	19%	56%
100-200	8%	32%	24%	36%
50-100	25%	13%	38%	25%
20-50	29%	13%	17%	42%
Less than 20	43%	17%	22%	17%

N = 104

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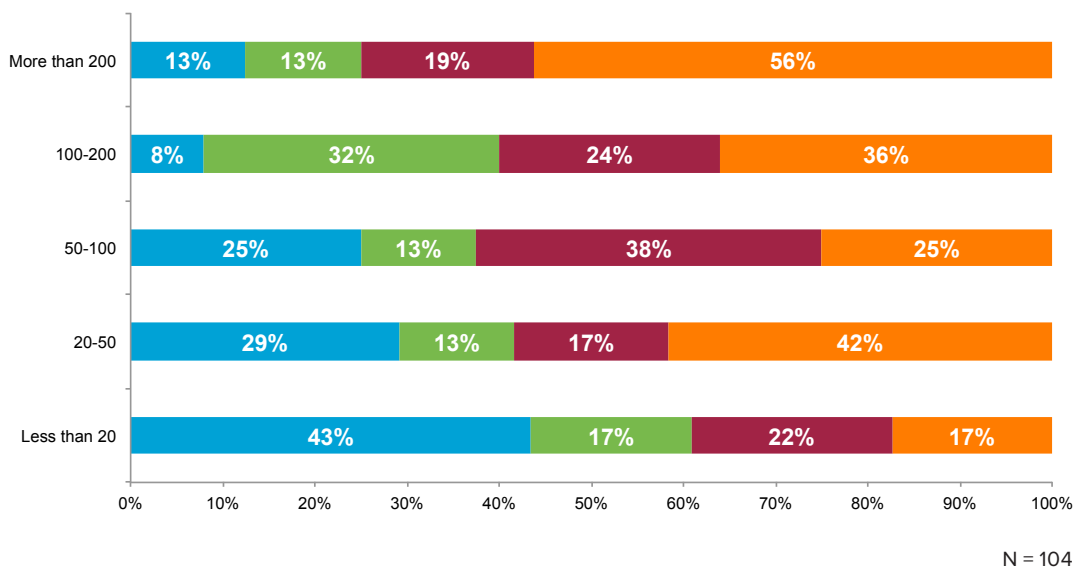
1. *NAEM's December 2012 benchmark on EHS & Sustainability Staffing and Structure revealed that companies with a large number of facilities tend to be decentralized.*

Data Management Approaches

Off-the-shelf solutions are the newest systems

The average age of an EHS and sustainability data management system is a little more than eight years. Off-the-shelf solutions, however, tend to be newer, with an average age of four years. The age of other data management approaches averaged nine or ten years.

Average Age of System by Approach
Figure 11

Approach	Average Age
Commonly-Available Tools	8.9
Internally-Developed System	10.1
Off-the-Shelf Solution	4.4
Combination	9.7

N = 98

Integration with Other Business Information Systems

Integration with Other Business Information Systems

Integration is rare

On average, about 50 percent of companies expect to integrate, or have already integrated, their data management system with other business information systems. Companies that have plans to integrate, however, do not seem to know when the integration will occur, and very few expect it to happen in the next year.

Integration
Figure 12

Category	Already integrated	Expected to be integrated by the end of 2013	Plans to integrate, but a date is not yet set	No plans to integrate
Third party data	12%	7%	28%	53%
Risk Management	20%	5%	27%	48%
Manufacturing	16%	5%	24%	54%
Maintenance	18%	8%	25%	49%
Supply Chain/Inventory/Purchasing	14%	5%	31%	50%
Human Resources	24%	9%	15%	51%
Accounting and ERP	13%	5%	28%	54%
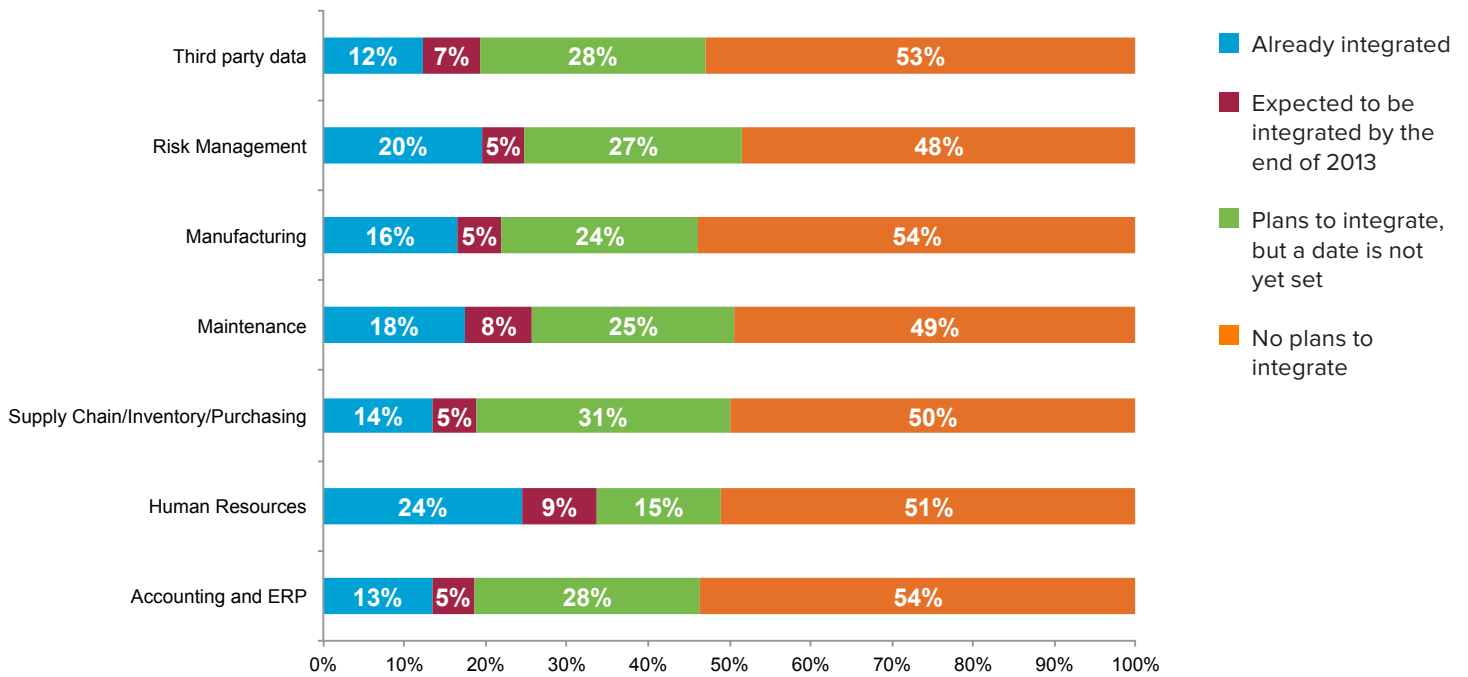
N = 98

Integration is much more common for high-risk companies

Integration with other business information systems was much more common among high-risk companies. Among low-risk companies, for example, only 36 percent report integration with risk management systems compared to 71 percent of high-risk companies. Risk plays a much smaller role when it comes to integration with accounting and enterprise resource planning (ERP) systems. Regardless of the EHS risk level, about 45 percent of companies integrate their EHS and sustainability data management system with accounting and ERP systems.

Integration by Risk
Figure 13

Category	High EHS Risk	Medium EHS Risk	Low EHS Risk
Third party data	62%	43%	36%
Risk Management	71%	47%	36%
Manufacturing	65%	41%	40%
Maintenance	62%	45%	55%
Supply Chain/Inventory/Purchasing	57%	47%	55%
Human Resources	57%	46%	55%
Accounting and ERP	48%	46%	45%
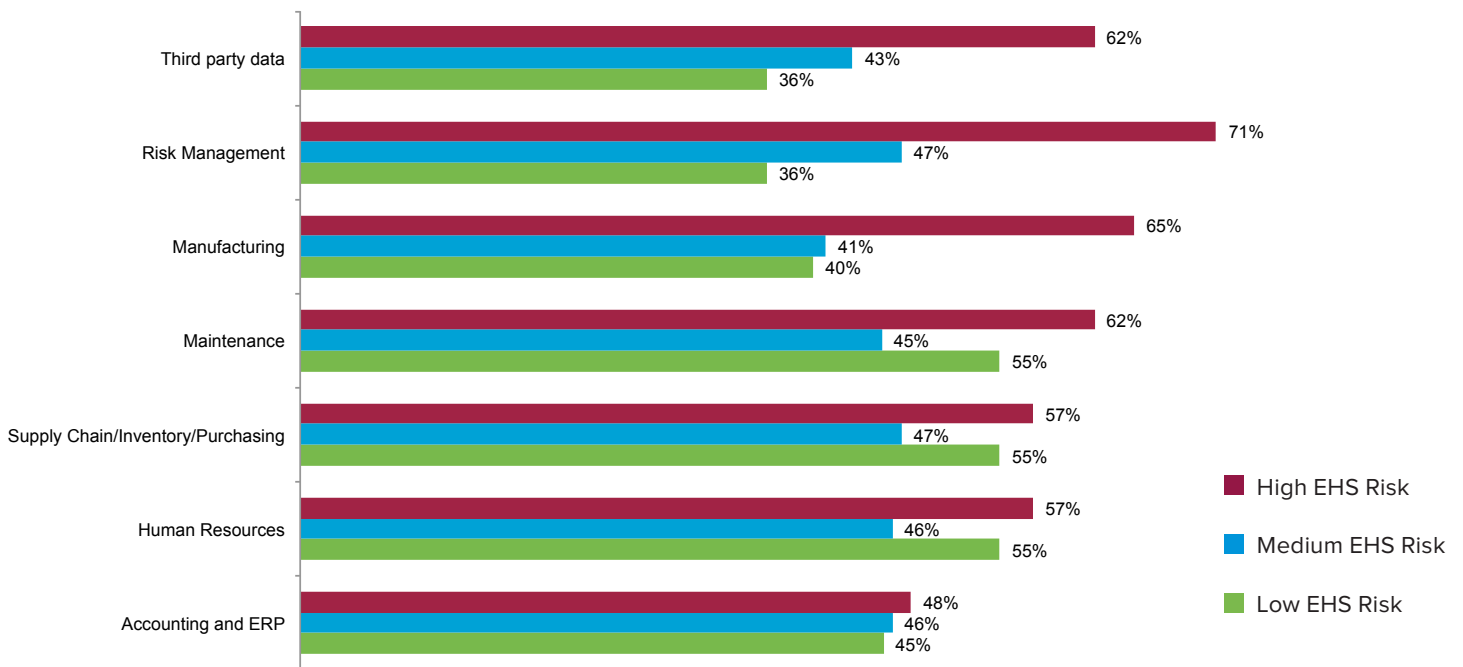
N = 97

Integration with Other Business Information Systems

On average, about 20 percent of employees access EHS and sustainability data systems

The level of access to a company's data management system varies according to approach. On average, 20 percent of employees have access to a company's system. Those that use a combination of systems give access to 27 percent of employees; those with internally developed systems only provide access to 10 percent of employees.

When it comes to compiling, analyzing and reporting data, the results show that only about three percent of employees access the data for this purpose. Companies using commonly available tools provide the greatest level of access to employees for data analysis and reporting (4 percent), while companies using internally developed systems provide the least (2 percent).

Access to System

Figure 14

Access the system in any way	18.7%
Access the system to compile, analyze and report data	3.0%

N = 95

Business Objectives for Selecting a Data Management Approach
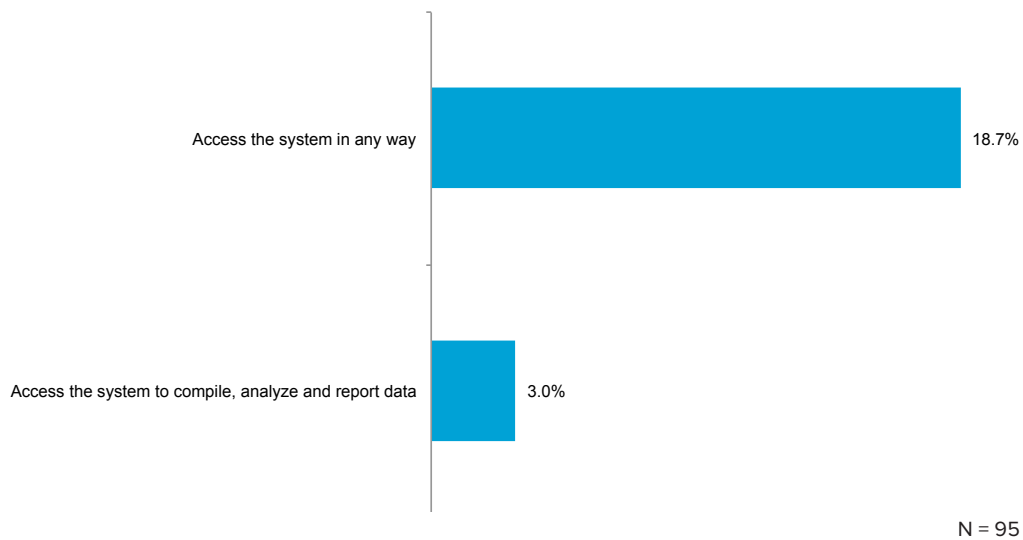
Business Objectives for Selecting a Data Management Approach

Better data management is expected to improve performance, communication

Respondents were asked to rank a set of 14 business objectives in terms of how important they were to their company when considering the implementation of a new EHS and sustainability data management system. Improving performance rose to the top, as did improving communication about EHS and sustainability activities.

Top Five Business Objectives for Implementing a Data Management System
Figure 15

Business Objective
1. Improve EHS and sustainability performance
2.   Improve communication about EHS and sustainability activities
3. Improve corporate-level visibility on EHS and sustainability performance
4. Standardize processes
5. Improve facility-level visibility on EHS and sustainability performance

N = 75

Business Objectives for Implementing a Data Management System
Figure 16

- Reduce injuries and illnesses
- Improve EHS and sustainability performance
- Improve communication about EHS and sustainability activities
- Improve corporate-level visibility on company EHS and sustainability performance
- Improve facility-level visibility on company EHS and sustainability performance
- Save time
- Change culture
- Reduce risks
- Reduce costs
- Increase productivity
- Standardize processes
- Improve quality
- Increase accountability
- Transition to tracking leading indicators

Risk affects business objectives for implementing a data management system

The most important business objectives for implementing a system change depending on the EHS risk under which a company operates. High-risk companies also rank objectives such as 'transitioning to tracking leading indicators' and 'increasing productivity' higher than low-risk companies. On average, companies with a high degree of EHS risk are least concerned about saving time, changing culture and reducing costs when it comes to implementing a data management system.

Top 5 Business Objectives by EHS Risk Profile
Figure 17

Rank	Low EHS Risk	Medium EHS Risk	Low EHS Risk
1	Improve communication about EHS and sustainability activities	Improve EHS and sustainability performance	Improve EHS and sustainability performance
2	Save time	Standardize processes	Improve communication about EHS and sustainability activities
3	Improve EHS and sustainability performance	Improve corporate-level visibility on EHS and sustainability performance	Reduce risks
4	Improve corporate-level visibility on EHS and sustainability performance	Improve facility-level visibility on EHS and sustainability performance	Improve corporate-level visibility on EHS and sustainability performance
5	Reduce injuries and illnesses	Improve communication about EHS and sustainability activities	Standardize processes

N = 74

Half of respondents are shopping for off-the-shelf solutions

Half of all responding companies indicated they are in the market for some type of off-the-shelf solution. Among prospective buyers, the largest segment (41 percent) is composed of those with a combination of systems. It's not clear, however, whether these potential purchasers are looking for a comprehensive solution to replace their primary system or are seeking another addition to their diverse portfolio of data management software.

Percent of Respondents Who Are Shopping for an Off-the-Shelf Solution?
Figure 18

- Yes
- No
- Don't Know

5%
45%
50%

N = 106
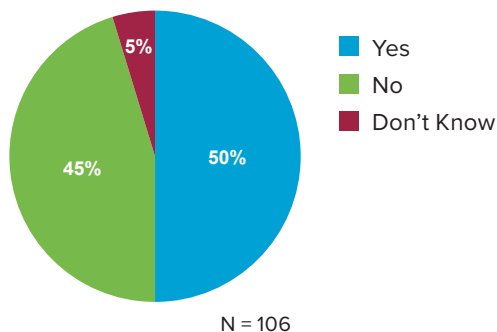
Prospective Buyers by Approach
Figure 19

- Commonly Available Tools
- Internally Developed System
- Off-the-Shelf Solution
- Combination

25%
41%
19%
15%

N = 106
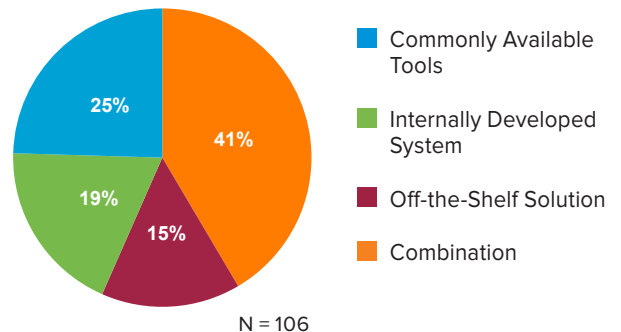
Business Objectives for Selecting a Data Management Approach

Continuous improvement seems to drive prospective buyers of off-the-shelf solutions

Those who are in the market for off-the-shelf software seem to seek a solution that will help them advance their programs. For those who currently use commonly available tools, these objectives include risk and injury reduction. Respondents that use internally developed systems seem to seek a system that will save time, standardize processes and improve productivity. Those who already have an off-the-shelf solution seem most ambitious in their goals, seeking a transition to tracking leading indicators, as well as improving visibility and communication about their EHS and sustainability activities. For the majority of buyers, who are using a combination of approaches, the purchase drivers are a mix of the aforementioned goals, ranging from process improvements and injury reduction to facilitating communications.

Top Five Business Objectives for Prospective Buyers of Software
Figure 20

Rank	Commonly Available Tools	Internally Developed System	Off-the-Shelf Solution	Combination
1	Improve EHS and sustainability performance	Save time	Transition to tracking leading indicators	Improve EHS and sustainability performance
2	Improve communication about EHS and sustainability activities	Improve EHS and sustainability performance	Improve communication about EHS and sustainability activities	Standardize processes
3	Reduce injuries and illnesses	Standardize processes	Improve corporate-level visibility on EHS and sustainability performance	Reduce injuries and illnesses
4	Reduce risks	Improve communication about EHS and sustainability activities	Save time	Reduce risks
5	Improve corporate-level visibility on EHS and sustainability performance	Increase productivity	Improve facility-level visibility on EHS and sustainability performance	Improve communication about EHS and sustainability activities

N = 75

System Capabilities and Effectiveness

System Capabilities and Effectiveness

In this section, respondents were no longer asked questions about their primary approach. Instead, they were asked to indicate which type of system they use to collect data among a list of 41 different capabilities. Because the results represent the perspective of all respondents, regardless of primary approach, they offer a more detailed look at how companies use different EHS and sustainability data management systems to meet different needs.

## Even companies with a primary approach may use different systems for different needs

While two-thirds of the survey respondents reported having a primary approach to managing data, the results from this section demonstrate that few companies depend on a single system to meet all of their EHS and sustainability data management needs. A company that primarily uses an internally developed system, for example, may turn to an off-the-shelf solution for a specific set of capabilities.

It's important to note that while the following charts weigh each capability equally (i.e. injury/illness reporting is weighed the same as carbon tracking), some of the capabilities are much more important to the EHS function and companies spend much more time on some than on others. Therefore, even though respondents who *primarily* use commonly available tools only use those tools for 32 percent of the 41 capabilities listed below, that small percentage could be the handful of that consumes 90 percent of their time and energy.

Alternative Approaches to Primary Systems:

Commonly Available Tools
Figure 21

32% | 20% | 47%
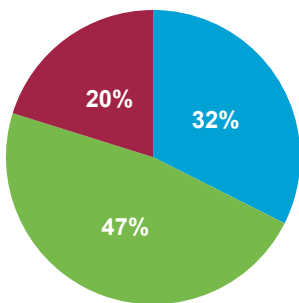
N = 19

Internally Developed Systems
Figure 22

30% | 18% | 52%
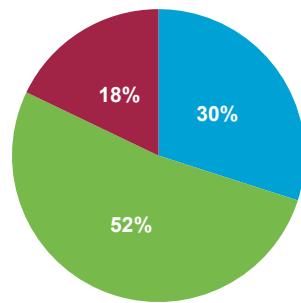
N = 17

Off-the-Shelf Solutions
Figure 23

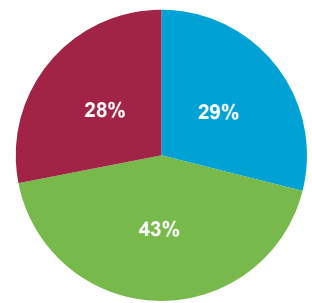
22% | 61% | 17%
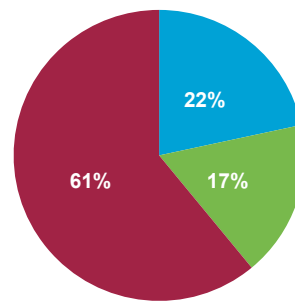
N = 19

Breakdown for Combination Users
Figure 24

29% | 28% | 43%

N = 29

- ■ Commonly Available Tools
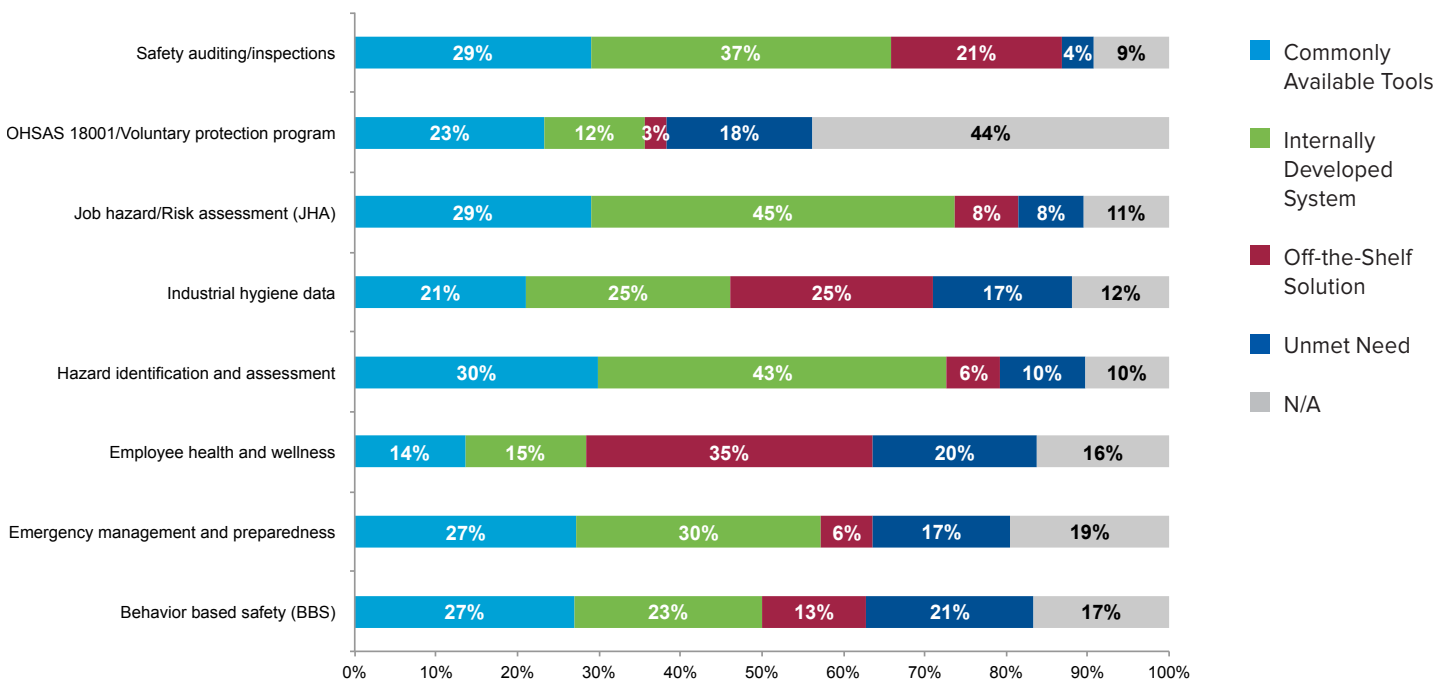- ■ Internally Developed System
- ■ Off-the-Shelf Solution

Companies still rely on internally developed systems for many core health and safety capabilities

Internally developed systems are most often used for 'risk assessment', 'hazard identification and assessment', and 'safety auditing and inspections'. Commonly available tools are also frequently used for managing this type of data. Off-the-shelf solutions were most often used for 'employee health and wellness' data management (35 percent) and 'industrial hygiene' data management (25 percent).

There are very few unmet needs in this category of health and safety capabilities, but 44 percent of the respondents reported that voluntary protection programs do not apply to their company.

Approaches Used for Health and Safety Capabilities
Figure 25

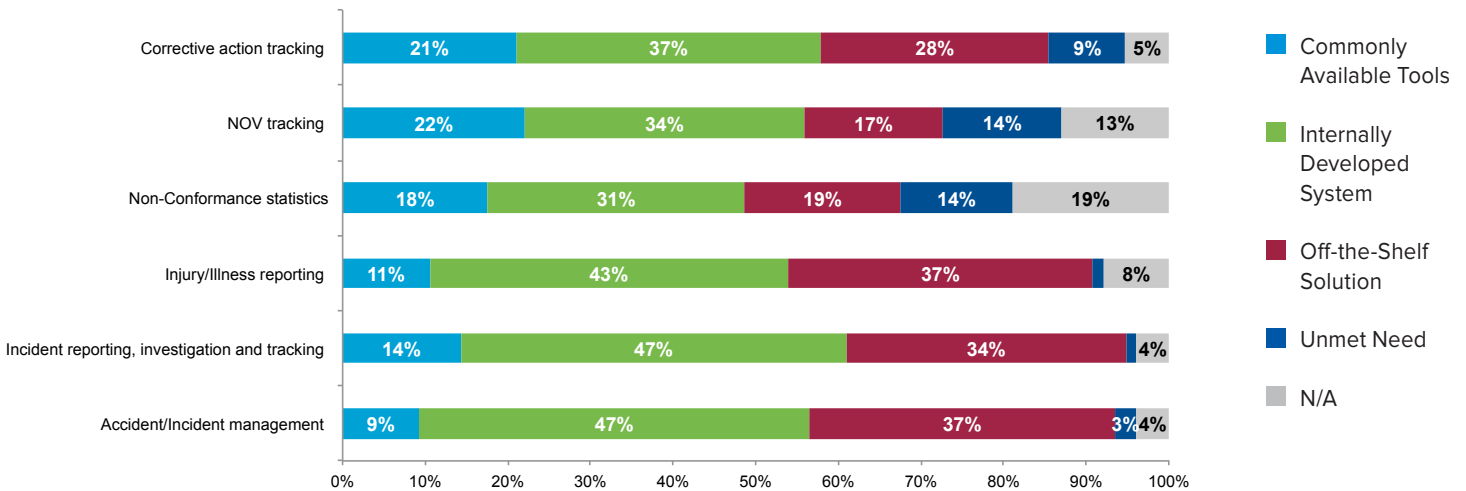| Capability	Commonly Available Tools	Internally Developed System	Off-the-Shelf Solution	Unmet Need	N/A
Safety auditing/inspections	29%	37%	21%	4%	9%
OHSAS 18001/Voluntary protection program	23%	12%	3%	18%	44%
Job hazard/Risk assessment (JHA)	29%	45%	8%	8%	11%
Industrial hygiene data	21%	25%	25%	17%	12%
Hazard identification and assessment	30%	43%	6%	10%	10%
Employee health and wellness	14%	15%	35%	20%	16%
Emergency management and preparedness	27%	30%	6%	17%	19%
Behavior based safety (BBS)	27%	23%	13%	21%	17%

N = 80

System Capabilities and Effectiveness

Internally developed systems and off-the-shelf solutions often used for incident data

Internally developed systems, followed closely by off-the-shelf solutions, are the primary ways companies manage data related to 'injury and illness reporting', 'incident management', and 'corrective action tracking'. Very few respondents reported using commonly available tools for these types of capabilities.

This category of capabilities also has the lowest rate of respondents with unmet needs. In most cases, less than 10 percent of respondents are struggling to meet these needs.

Approaches Used for Incident Tracking and Management Capabilities
Figure 26

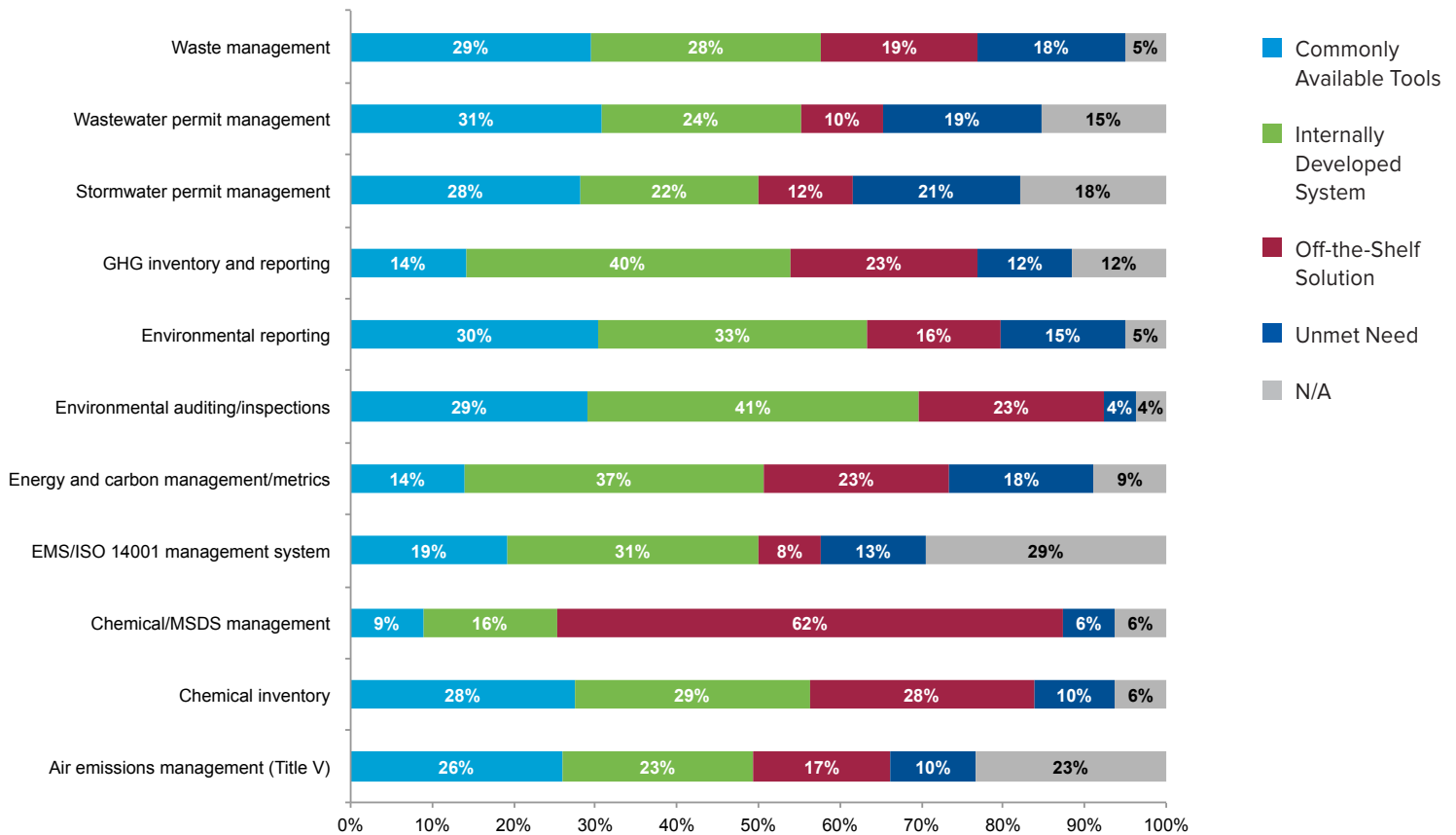| Capability	Commonly Available Tools	Internally Developed System	Off-the-Shelf Solution	Unmet Need	N/A
Corrective action tracking	21%	37%	28%	9%	5%
NOV tracking	22%	34%	17%	14%	13%
Non-Conformance statistics	18%	31%	19%	14%	19%
Injury/Illness reporting	11%	43%	37%		8%
Incident reporting, investigation and tracking	14%	47%	34%		4%
Accident/Incident management	9%	47%	37%	3%	4%

N = 80

Greenhouse gas and environmental auditing are most commonly tracked by internally developed systems

According to respondents, environmental data is most often tracked using internally developed systems. This is particularly true for greenhouse gas reporting, in which 40 percent of respondents turn to internally developed systems. To a lesser extent, companies also tend to rely on internally developed systems for their energy and carbon data management needs. A notable exception is in the area of chemical/MSDS management, in which 62 percent of respondents reported using an off-the-shelf software system. Results from this category of capabilities suggest that unmet needs are not much of an issue.

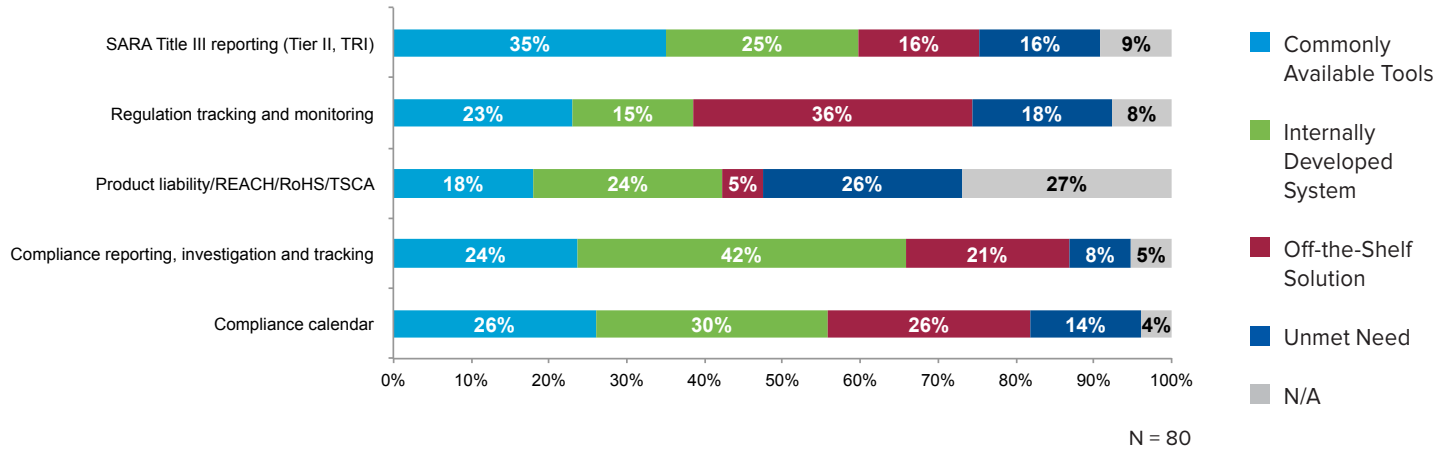## Approaches Used for Environmental Capabilities
Figure 27

Capability	Commonly Available Tools	Internally Developed System	Off-the-Shelf Solution	Unmet Need	N/A
Waste management	29%	28%	19%	18%	5%
Wastewater permit management	31%	24%	10%	19%	15%
Stormwater permit management	28%	22%	12%	21%	18%
GHG inventory and reporting	14%	40%	23%	12%	12%
Environmental reporting	30%	33%	16%	15%	5%
Environmental auditing/inspections	29%	41%	23%	4%	4%
Energy and carbon management/metrics	14%	37%	23%	18%	9%
EMS/ISO 14001 management system	19%	31%	8%	13%	29%
Chemical/MSDS management	9%	16%	62%	6%	6%
Chemical inventory	28%	29%	28%	10%	6%
Air emissions management (Title V)	26%	23%	17%	10%	23%

N = 80

System Capabilities and Effectiveness

Managing product regulations a key unmet need for respondents

Although particular types of systems are commonly used to track particular compliance and regulatory data, no one approach seems to dominate this area for most respondents. The key unmet need for this category is data management for product regulations such as REACH, RoHS and TSCA (26 percent).[2] A nearly equal number of respondents, however, said this issue does not apply to their company.
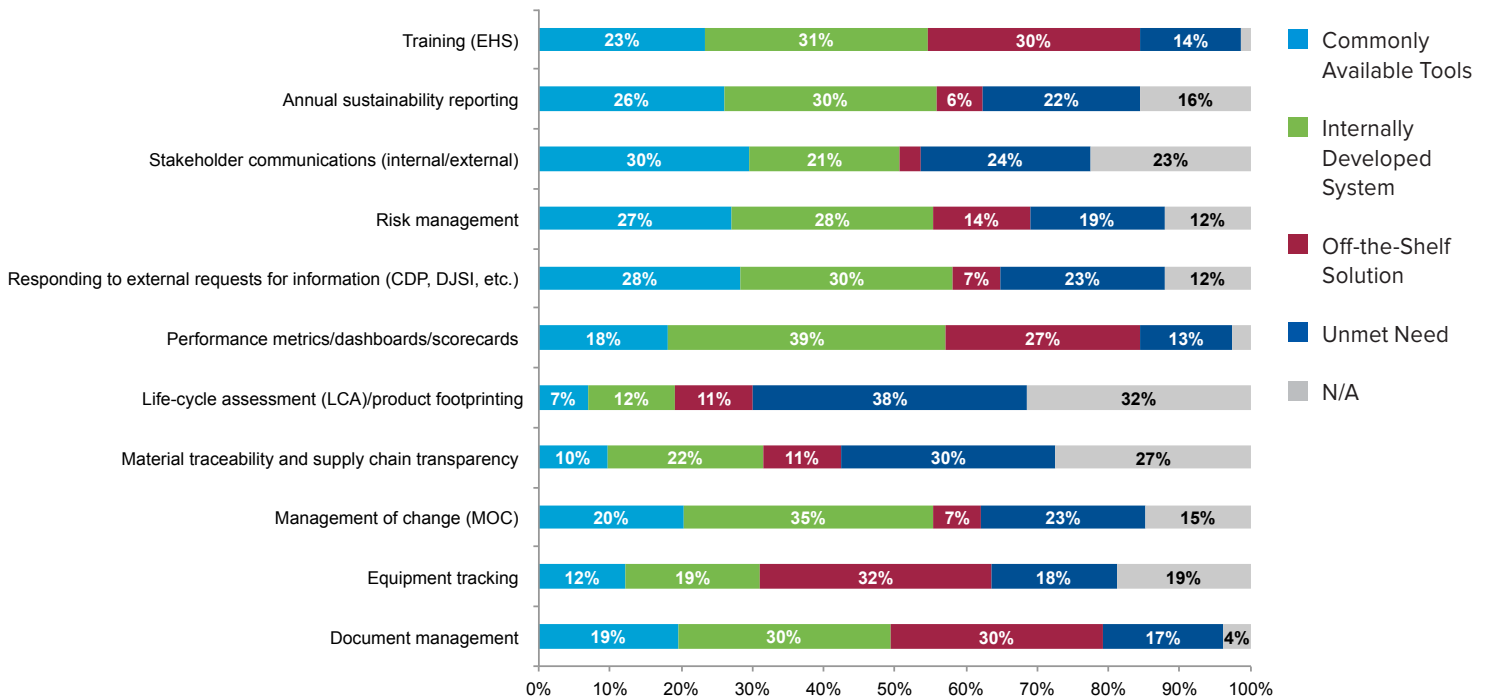
Approaches Used for Compliance Regulations
Figure 28

Category	Commonly Available Tools	Internally Developed System	Off-the-Shelf Solution	Unmet Need	N/A
SARA Title III reporting (Tier II, TRI)	35%	25%	16%	16%	9%
Regulation tracking and monitoring	23%	15%	36%	18%	8%
Product liability/REACH/RoHS/TSCA	18%	24%	5%	26%	27%
Compliance reporting, investigation and tracking	24%	42%	21%	8%	5%
Compliance calendar	26%	30%	26%	14%	4%

N = 80

2. *Registration, Evaluation, Authorization and Restriction of Chemicals (REACH), Restriction of Hazardous Substances Directive (RoHS), and the Toxic Substance Control Act (TSCA).*

No single data management approach dominates training, document management and performance metrics

The final category of capabilities includes everything from sustainability reporting and stakeholder communications, to training and management of change. A relatively equal number of respondents use each approach to manage data on EHS training, performance metrics and document management. Off-the-shelf solutions, however, do seem to be most often used for equipment tracking, while internally developed systems tend to handle performance metrics and scorecards. Commonly available tools very rarely rise to the top except in the area of stakeholder communications.

Approaches Used for Other Capabilities
Figure 29

Capability	Commonly Available Tools	Internally Developed System	Off-the-Shelf Solution	Unmet Need	N/A
Training (EHS)	23%	31%	30%	14%	
Annual sustainability reporting	26%	30%	6%	22%	16%
Stakeholder communications (internal/external)	30%	21%		24%	23%
Risk management	27%	28%	14%	19%	12%
Responding to external requests for information (CDP, DJSI, etc.)	28%	30%	7%	23%	12%
Performance metrics/dashboards/scorecards	18%	39%	27%	13%	
Life-cycle assessment (LCA)/product footprinting	7%	12%	11%	38%	32%
Material traceability and supply chain transparency	10%	22%	11%	30%	27%
Management of change (MOC)	20%	35%	7%	23%	15%
Equipment tracking	12%	19%	32%	18%	19%
Document management	19%	30%	30%	17%	4%

N = 80

System Capabilities and Effectiveness

Supply chain monitoring and product footprinting issues are the largest unmet needs

The largest unmet needs, according to the results, are in the areas of 'life-cycle assessments/product footprinting', 'material traceability' and 'supply chain transparency'. This may be due to the fact that product stewardship is still emerging area of focus for many companies. It's important to note, however, that almost the same number of respondents indicated that these data management issues do not apply to their company.

Top Five Unmet Needs
Figure 30

Unmet Need
1. Life-cycle assessment (LCA)/product footprinting
2. Material traceability and supply chain transparency
3. Product liability/REACH/RoHS/TSCA
4. Stakeholder communications (internal/external)
5. Responding to external requests for information (CDP, DJSI, etc.)

N = 73

Respondents seem most satisfied with how their systems manage health and safety data

On average, respondents rate their systems that manage data related to accident and incident management as most effective. Other areas where respondents are most satisfied include 'chemical and MSDS management', 'air emissions management' and 'environmental reporting'.

Respondents are less satisfied with their data management systems when it comes to issues related to 'material traceability', 'supply chain transparency', 'product footprinting' and 'product liability'. This explains why companies see these areas as the biggest unmet needs (Figure 30).

Top Five Most and Least Effective Capabilities
Figure 31

Rank	Most Effective	Least Effective
1	Accident/Incident management	Material traceability and supply chain transparency
2	Incident reporting, investigation and tracking	Life-cycle assessment (LCA) product footprinting
3	Injury/Illness reporting	Product liability REACH/RoHS/TSCA
4	Chemical/MSDS management	Responding to external requests for information (CDP, DJSI, etc.)
5	Air emissions management (Title V)	Equipment tracking

N = 73

Off-the-shelf solutions are considered more effective than other systems

On average, respondents rated off-the-shelf solutions as more effective than internally developed systems or commonly available tools. Thus said, this doesn't apply to each and every capability. Internally developed systems are rated higher for capabilities such as 'internal and external stakeholder communications' and commonly available tools are rated highest for 'supply chain and product footprinting' capabilities as well as 'equipment tracking'.

Top Five Most and Least Effective Capabilities by Approach
Figure 32

Rank	Commonly Available Tools	Internally Developed System	Off-the-Shelf
	Most Effective		
1	Equipment tracking	Incident reporting, investigation and tracking	Wastewater permit management
2	Accident/Incident management	Accident/Incident management	EMS/ISO 14001 management system
3	Injury/Illness reporting	OHSAS 18001/Voluntary protection program	Air emissions management (Title V)
4	Material traceability and supply chain transparency	Injury/Illness reporting	Accident/Incident management
5	NOV tracking	Air emissions management (Title V)	Stormwater permit management
	Least Effective		
1	Management of change (MOC)	Life-cycle assessment (LCA)/product footprinting	Stakeholder communications (internal/external)
2	Responding to external requests for information (CDP, DJSI, etc.)	Material traceability and supply chain transparency	Emergency management and preparedness
3	Annual sustainability reporting	Regulation tracking and monitoring	Equipment tracking
4	Industrial hygiene data	Equipment tracking	Risk management
5	Regulation tracking and monitoring	Job hazard/Risk assessment (JHA)	Annual sustainability reporting

N = 73

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# Implementation and Maintenance

Implementation and Maintenance

Implementing a data management system takes about 20 months

The average implementation time for a data management system is about 20 months, a rule of thumb that is shaped by a company's chosen data management approach. For those companies using internally developed systems or an off-the-shelf solution, the average implementation time is about a year. A company that uses commonly available tools or a combination of systems should expect implementation to last about twice as long.

The longer implementation times for companies using a combination of systems may be due to the fact that these companies tend to integrate their EHS and sustainability data management systems with other business information systems. Respondents may also report longer implementation times with a combination of systems because all of the systems are not developed at the same time.

Implementation Time
Figure 33

Category	Value
Commonly-Available Tools	23
Internally-Developed System	12
Off-the-Shelf Solution	13
Combination	26
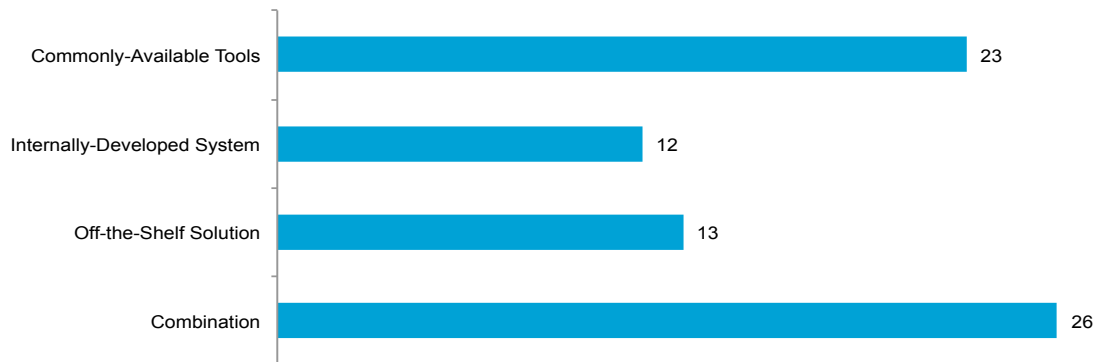
N = 80

Who builds internally developed systems?

When a company decides to build a data management system internally or use a set of commonly available tools to meet their needs, the EHS function is most often responsible for the project (52 percent). Another approach is for EHS to team up with IT to build the system (27 percent). Very rarely does IT build the system for EHS or independently of EHS.

Function Responsible for Building Internally Developed Systems
Figure 34

Category	Value
EHS	52%
IT	9%
EHS and IT	27%
Consultant(s)	7%
Other	5%
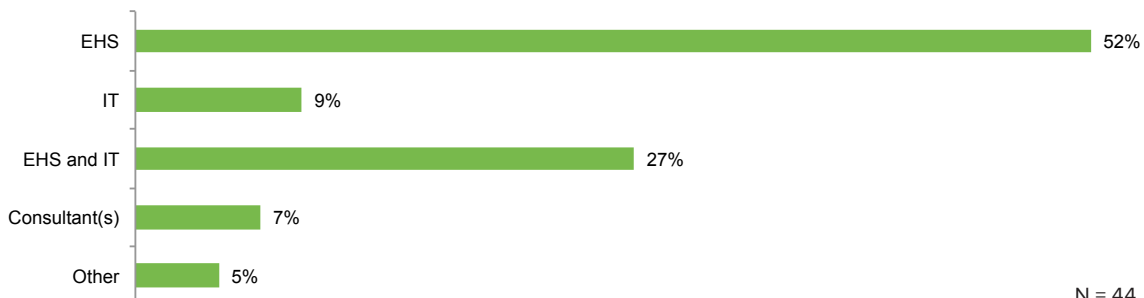
N = 44

The larger the company, the longer the implementation

Company size also affects the length of the implementation process for EHS and sustainability data management systems. For companies with fewer than 20,000 employees, the average implementation time is about 14 months. Those with more than 20,000 employees report implementation times of two years or more, on average. Finally, companies with more than 80,000 employees reported an average of 41 months for implementation of their EHS and sustainability data management systems.

Implementation Time by Number of Employees
Figure 35
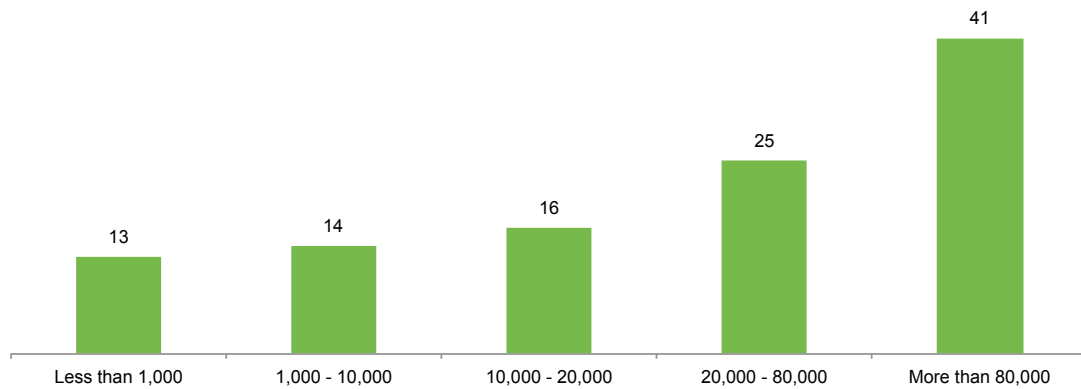
N = 80

A system implementation typically costs $100,000

Although the median cost of an implementation is $100,000[3], a company's chosen data management approach is also an important determinant of implementation cost. Companies that are using commonly available tools reported a median implementation cost of only $1,000. At the other end of the spectrum, companies that employ an off-the-shelf solution typically spend more than $130,000 during the implementation process. The median implementation cost for internally developed systems is $125,000.

Median Implementation Cost by Approach
Figure 36

N = 56

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3. It is important to note that respondents were asked not to include licensing or subscription fees when calculating implementation costs. These types of costs were included in the annual maintenance costs, which are discussed on pages 45 and 46.

Implementation and Maintenance

Implementation costs are driven by company size

As previously mentioned, the number of employees affects implementation time more so than a company's current approach to data management. Companies that employ fewer than 1,000 people tend to experience the lowest implementation costs ($20,000), which makes sense, since smaller companies most frequently use commonly available tools (Figure 9). Companies with more than 80,000 employees typically have the highest implementation costs ($175,000).

The same is true of implementation costs. In Figure 36, the data shows that implementation costs are typically the same for all approaches other than commonly available tools. The results in Figure 37, however, show a very strong relationship between company size and implementation costs.

Implementation Cost by Number of Employees
Figure 37
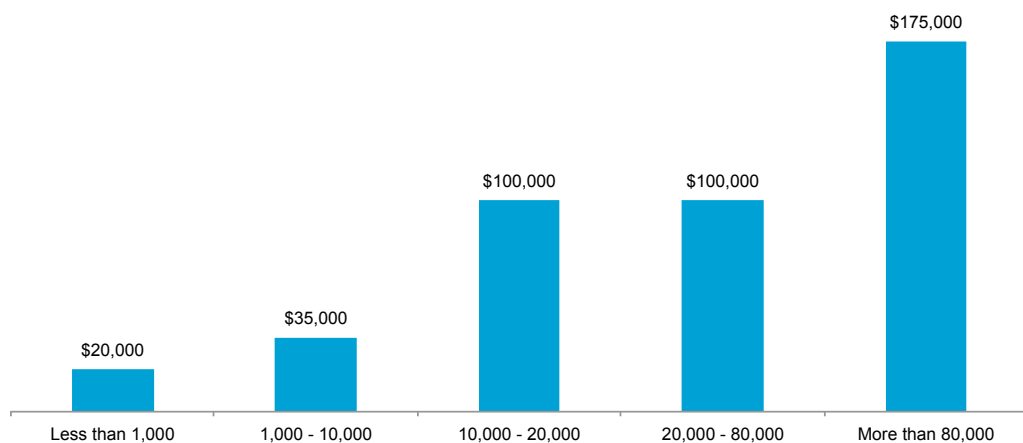
N = 56

Training is among the most important—yet overlooked—aspects of implementation

When asked about the lessons they learned from the implementation process, most respondents said they wish they had focused more on training. "Provide initial training and then follow up training within six months," one respondent suggested. Similarly, respondents advocated for the use of pilot sites and recommended getting more users involved early on.

Another lesson that respondents said they learned about the implementation process was the value of working with a non-biased third party to help with software selection, developing a detailed requirements document and ensuring "full backing of business leadership." Respondents also reported underestimating how much time and resources were necessary for the implementation of their data management system.

The EHS function takes the lead in system maintenance

Consistent with how internally developed systems are built, the results in Figure 38 show that the EHS function is primarily responsible maintaining the company's EHS and sustainability data management systems. The second most common approach to system maintenance is through a collaboration between EHS and the Information Technology (IT) function. Again, few companies have an IT department that does this for them, and even fewer use external consultants to maintain their systems.

Function Responsible for System Maintenance
Figure 38

Function	Percentage
EHS	59%
IT	15%
EHS and IT	18%
Consultant(s)	2%
Other	6%

N = 97
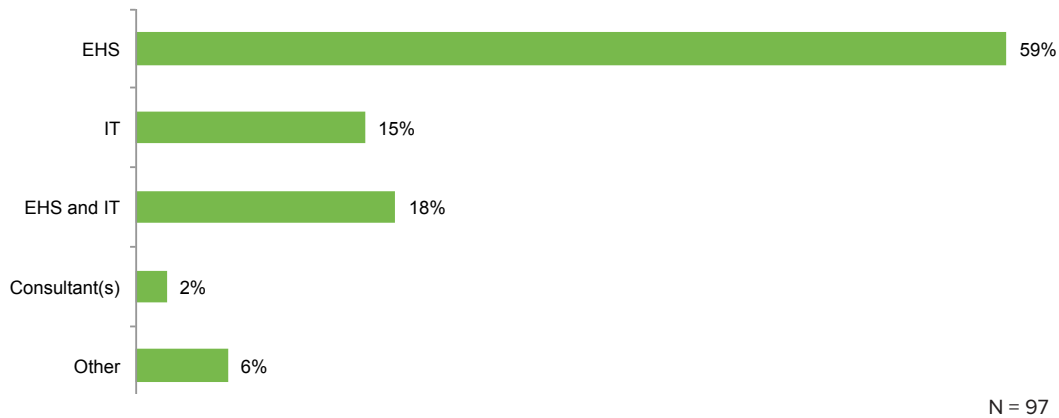
Off-the-shelf systems and combination approaches cost more to maintain

Annual maintenance costs, which include licensing or subscription fees, are highly dependent on a company's data management approach. Those respondents using an off-the-shelf solution or a combination of systems spend the most on annual maintenance ($48,000 and $50,000, respectively). Companies using commonly available tools reported the lowest annual maintenance costs at only $500.

Figure 36 shows very little difference in implementation costs between the different types of data management approaches (except for commonly available tools). Maintenance costs tend to be much lower for companies using internally developed systems ($11,000); the other three have very similar implementation costs (Figure 39).

Maintenance Cost by Approach
Figure 39

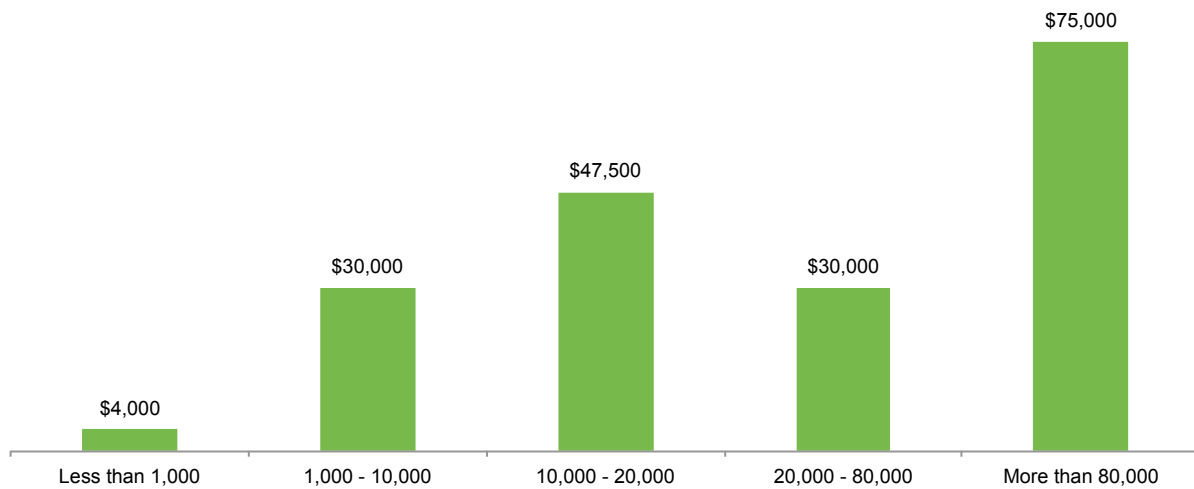| Approach	Cost
Commonly-Available Tools	$500
Internally-Developed System	$11,000
Off-the-Shelf Solution	$48,000
Combination	$50,000

N = 61
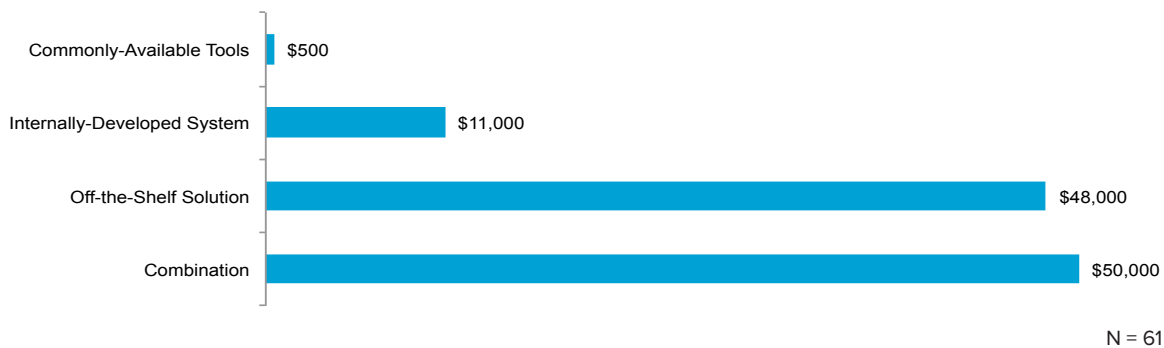
Larger companies spend more on annual maintenance

Maintenance costs, like implementation costs (Figure 37), are higher for larger companies. Although larger companies tend to rely on internally developed systems (which have lower annual maintenance costs), companies employing more than 80,000 people reported annual maintenance costs of $75,000. This suggests that the size of a company, not its approach to data management, is a better determinant of annual maintenance costs.

On the opposite end of the spectrum, companies with fewer than 1,000 employees typically experience annual maintenance costs of only $4,000. This is most likely due to the fact that smaller companies tend to primarily use commonly available tools to meet their EHS and sustainability data management needs (Figure 9).

Maintenance Cost by Number of Employees
Figure 40

N = 61

Acknowledgements