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Sustainability in the plastics industry: concerns, issues, and strategies

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Summary

An increased corporate emphasis on sustainability can be seen in such areas as: annual reports with published sustainability goals, sustainability management systems with balanced scorecards and dashboards, websites using increased screen area and space for sustainability communications, internal and external stakeholder opinion gathering, development of sustainable supply chain plans, and marketing strategies focusing on *green* or *sustainable* consumers. To address this ever increasing attention to sustainability, a research project to understand sustainability in the plastics industry was initiated with the membership of the Society of Plastics Engineers (SPE). This paper focuses on the results of the research (global survey) and the implications of sustainability to the plastics industry.

KEY WORDS:

plastic industry
sustainability
sustainable business

KLJUČNE RIJEČI:

održivost
održivo poslovanje
plastičarska industrija

Održivost u plastičarskoj industriji: problemi, pitanja i strategije

Sažetak

Sve se veći naglasak na održivosti u tvrtkama može zapaziti i u područjima kao što su: godišnja izvješća s objavljenim ciljevima održivosti, sustavi upravljanja održivošću s usklađenim ciljevima i *dashboard* izvještajima, mrežne stranice koje sve veći prostor koriste za komuniciranje o održivosti, sakupljanje mišljenja zainteresiranih u tvrtkama i izvan njih, razvoj održivoga opskrbnog lanca i tržišnih strategija koje su fokusirane na *ekološke* ili *održive* kupce. Kako bi se kvantificiralo sve veće značenje održivosti u plastičarskoj industriji, započet je istraživački projekt među članovima *Društva inženjera plastičara* (e. *Society of Plastics Engineers, SPE*). Ovaj rad obrađuje rezultate istraživanja (globalna anketa) i posljedice održivosti za plastičarsku industriju.

Introduction

In the past, green business evolution among corporate organizations has gone through *three waves of change*.^{1a} In the 1960s, the first wave of change started with being *green* and the notion *Do no harm*. This change was about minimizing environmental impacts.^{1a} Also in the 1960s, companies focused on pollution control that included stopping illegal activities such as *spewing smokestacks and drainpipes*.^{1a} In the 1970s, the *U.S. Environmental Protection Agency* and similar agencies were

formed in the United States and in other countries for the purpose of standardizing laws and regulations for water and air pollution.¹ The second wave occurred in the 1980s and emphasized *Doing well by doing good* as companies realized that taking a few proactive steps could reduce costs and enhance a company's image.^{1a} Later, companies started being concerned about issues such as pollution prevention, waste reduction, and energy efficiency. Then, in the 1990s, came the third wave: *Green is green*.^{1a} During the third wave companies paid even more attention to the environmental issues. As stated by Makeower, *Companies recognized that environmental thinking can do much more than improving the bottom line i.e., it can help grow the top line through innovation, new markets, and new business opportunities*.¹

In September 1996, the *ISO 14001* environmental management system was issued and applied, establishing a *baseline set of rules for how companies should be organized environmentally*.^{1b} According to Makeower, *as companies scrutinized their operations, they understood how much of their environmental impacts were affected by their external stakeholders hence Supply-chain Environmental Management became the watchword after that the concepts of industrial ecology, zero waste, and carbon-neutrality emerged*.^{1b} Today companies are finally concerned about the *S-word, sustainability* that incorporates the 3 P's - i.e., people, profit and planet.^{1b}

Definitions of Sustainability

If one googles the word sustainability, a myriad of definitions amassed over decades can be found. Let's explore some of these concepts.

Sustainability, from a general point of view, means the capacity to endure or support and includes continuous biological system diversity and productivity. Sustainability has also been defined as the long-term maintenance of environmental, economic, and social well-being.

Sustainability and sustainable development, defined in 1987 by the World Commission on Environment and Development, have come to be generally accepted as *development that meets the needs of the present without compromising the ability of future generations to meet their own needs*.² The author of *Natural Capital* and *The Ecology of Commerce*, Paul Hawken states, *Sustainability is leaving the world better than you found it, taking no more than you need, trying not to harm life or the environment, and making amends if you do*.^{3a} Sustainability is broader than environmentalism because it includes social aspects and is based on the *triple bottom line* approach: planet, people, and prosperity.⁴

Yet another definition of sustainability includes the following: *the goal of sustaining economic growth while maintaining natural ecosystems and assuring the equitable distribution of goods and services*.^{5a} Lowitt & Hoffman stated, *Sustainability aims for two things: first, an ongoing and stable resource base that does not deplete, and, second, an ongoing and stable social system that creates or preserves just standards of living and security of all*.^{5b} Sustainability has been defined in many different ways by a diverse set of scholars, practitioners, and experts.³

Sustainability has become the catchphrase and increasingly popular in today's business world. It has impacted almost every

industry, has been in legislative agendas of most governments, and a hot topic for media coverage.⁶ *The sustainability arena offers an unprecedented opportunity for the plastics industry, if approached with creative and forward thinking*, said Seetha Coleman-Kammula of *Simply Sustain LLC* as cited in Blanco.⁷ Bob MacDonald, *Procter & Gamble* chairman, president, and CEO, said, *what is important is that we don't treat environmental sustainability as different from our base business when we operate sustainably, we earn gratitude, admiration and trust that lead to opportunity, partnerships and growth*.⁸ Sustainability is not only a way to satisfy stakeholders, but it is also a key to competitive advantage.^{6a} Most companies today agree that sustainability has a capability to ensure profitability, enhance goodwill, and encourage innovation.⁹

Numerous studies have concluded that the definition of the term sustainability varies, but none of those have discussed the reasons why. Also, there are no studies that talk about the definitions of the term sustainability specific to a select industry. There are, however, numerous studies that deal with the organizational impact of sustainability, but there has been little to no research conducted on how much impact sustainability issues have on a specific industry.

Sustainability has become the focal point to deliver evidence of a firm's commitment to the triple bottom line (economic, social, and environmental responsibilities). This has not been an easy transition and required a different way to evaluate and communicate corporate responsibility. Some of the motivations underlying the corporate sustainability concept include competitive advantage, profitability, increasing stakeholder pressure, legal requirements, reputation concerns, environmental performance, and internal organization improvements. Many of these can be linked to innovation or competitive advantages. It has long been recognized that sustainability is an innovative and potentially transformational force that generates new products and processes that challenge existing practice.

Methodology

This study was designed to understand the importance of sustainability on the corporate agenda of different companies and organizations. An online survey was created with a set of twenty seven (27) questions including demographics. The survey was distributed to the *Society of Plastics Engineers (SPE)* membership via an email blast. The survey was created, distributed, and analyzed using Qualtrics a web based surveying software application.

The first phase of the sustainability research at *Missouri University of Science & Technology* was the qualitative research tool: interviewing. Although interviewing can be used to obtain answers and test hypotheses, the deeper value comes from understanding the experience of other people and the meaning they derive from that experience. The results of this research effort were reported at *ANTEC 2011*.¹⁰

The second phase of this study expanded the inquiry from solely a packaging viewpoint to include the plastics industry at large and is the focus of this paper. An e-mail survey was conducted using Qualtrics with more than 230 responses collected.

The questions for this survey were taken primarily from the *Sustainability Initiative* project which is a joint collaboration of the *MIT Sloan Management Review* and knowledge partner *The Boston Consulting Group*.¹¹ Questions are listed in the Appendix 1 of this paper.

Demographics

This section highlights the demographics of the respondents. Pertinent figures (Figures 1-4) and tables (Tables 1-4) are provided with a description following the last table.

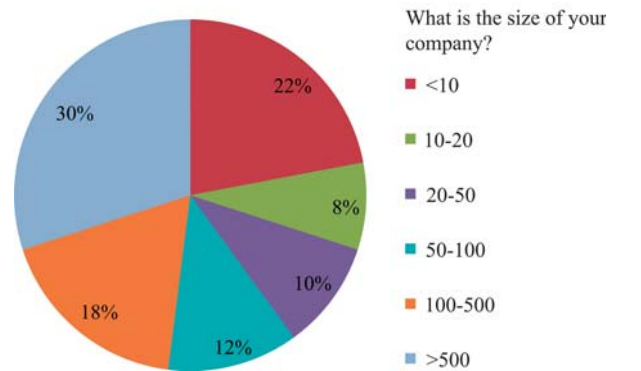


FIGURE 1 – Size of Company

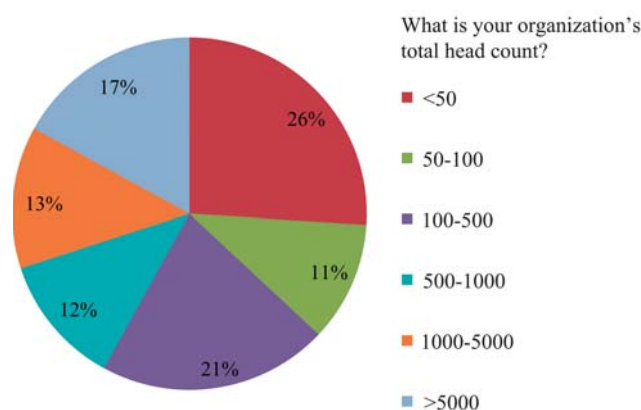


FIGURE 2 – Organization's Total Headcount

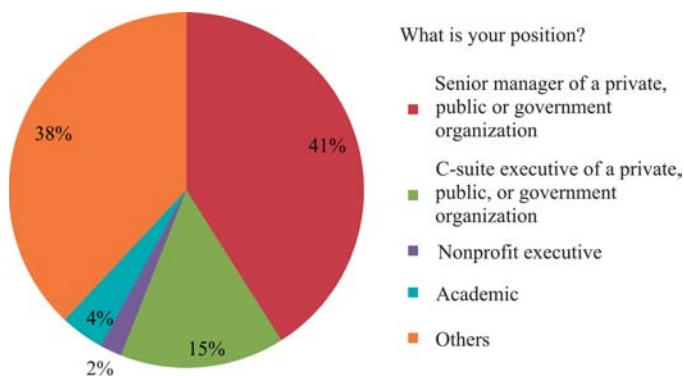


FIGURE 3 – Position with the Organization

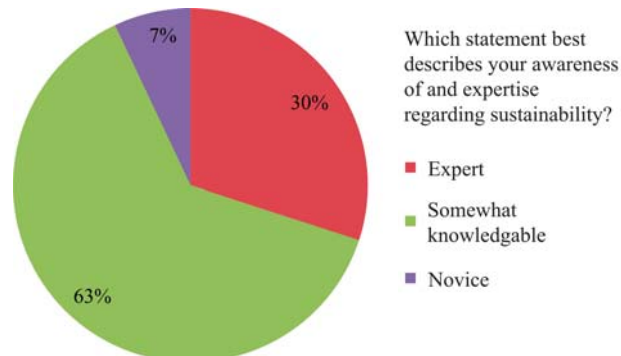


FIGURE 4 – Expertise Level

What is your area of responsibility?

TABLE 1 – Area of Responsibility

	Answer	Percent, %
1	Accounting/Finance	1
2	Administration	4
3	Education/Training	2
4	Engineering	18
5	Environment, Health and Safety	1
6	Human Resources	0
7	Information Technology	0
8	Management	19
9	Marketing/Sales	14
10	Production	1
11	Research and Design	31
12	Development	9
	TOTAL	100

In what industry does your organization participate?

TABLE 2 – Industry in Which the Organization Participates

	Answer	Percent, %
1	Academics	2
2	Manufacturing-Raw materials	22
3	Manufacturing-Equipment	7
4	Manufacturing- Added Value	33
5	Manufacturing- Other	18
6	Non Profit	0
7	OEM - Capacity	2
8	OEM - Subcontract	0
9	Public Sector/Government	0
10	Service Provided-Consultant	8
11	Service Provided - Fabricator	1
12	Service Provided - Other	3
13	Other	3
	TOTAL	100

In what primary market does your organization serve?

TABLE 3 – Primary Market

	Answer	Percent, %
1	Automotive	13
2	Building/Construction	9
3	Consumer Products	15
4	Electrical/Electronic	6
5	Fiber/Textile	1
6	Industrial	15
7	Medical/Healthcare	8
8	Packaging	22
9	Other	11
	TOTAL	100

In which region does your organization primarily conduct business?

TABLE 4 – Regional Business Location

	Answer	Percent, %
1	Africa/Middle East	2
2	Asia Pacific	4
3	Australia/New Zealand	1
4	Europe	7
5	Latin America	3
6	USA	41
7	Canada	1
8	Business spread across three or more regions	41
	TOTAL	100

Most respondents were distributed in the following three classes according to the size of their firm (percentage is shown in parenthesis): \$500MM+ (30%), <10 MM (22%), and 100-500 MM (18%) (Figure 1). The wide distribution in company size is strikingly representative of SPE’s overall membership and illustrates the extent of diversity in the respondents.

In terms of headcount, most respondents were from the following three groups: <50 people (26%), 100-500 (21%), and 5000+ (17%) (Figure2). This demographic also represents a broad distribution of respondents.

Figure 3 displays position type or level with 41% of the respondents identifying themselves as senior managers of a private, public, or government organization. The *other* category had 38% and finally, 15% came from academia.

Overwhelmingly, sixty-three (63%) per cent of the respondents classified themselves as “somewhat knowledgeable”. Experts followed with 30%, and novice as 7% (Figure 4).

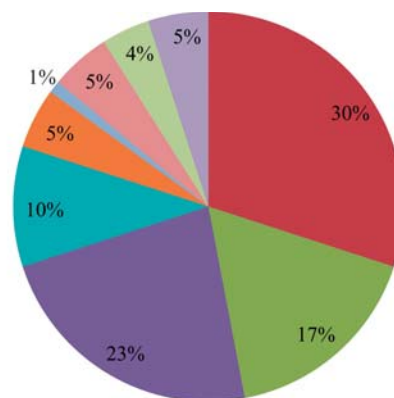
Table 1 shows the area of responsibility with the three most prevalent categories as follows: Research & Design (31%), Management (19%), and Engineering (18%).

The vast majority of respondents (73%) identified themselves as employed in the manufacturing sector with the following breakdown: manufacturing-added value (33%), manufacturing-raw materials (22%), and manufacturing-other (18%) (Table 2).

Packaging (22%), industrial and consumer products (each with 15%), and automotive (13%) were the largest responding primary marketing segments (Table 3).

The final demographic discussed in this paper concerns the geographic region in which the organization primarily conducts business (Table 4). Both USA and business spread across three or more regions had 41% of the respondents.

Selected Survey Questions and Responses



Which external challenges present the most significant roadblocks to addressing sustainability issues in your organization?

- Insufficient customer demand or needs
- Inufficient economic incentives
- Absence of clear industry standards
- Limited availability of financial capital
- Lack of clear regulatory policy for externalities (e.g. carbon pricing)
- Lack of shareholder support
- Potential source of competitive disadvantage
- Risk of economic incentives being reduced or eliminated due to changing policies
- Other

FIGURE 5 – External Challenges

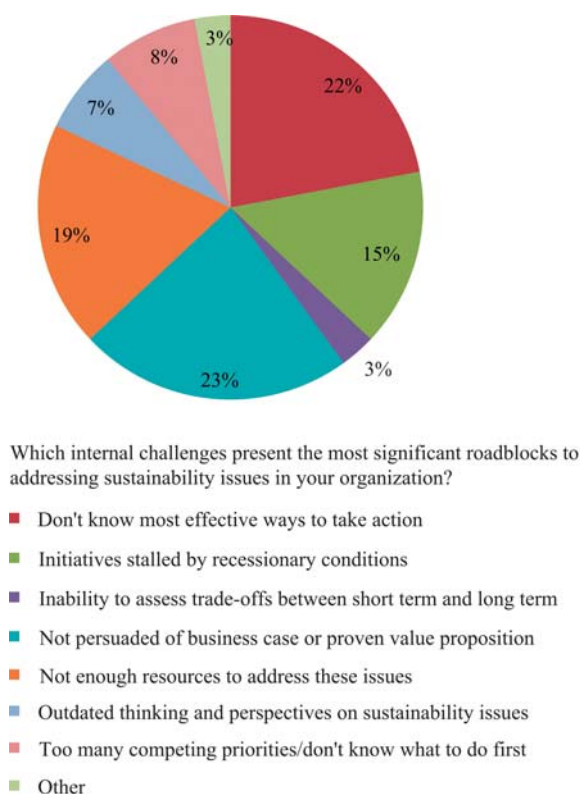


FIGURE 6 – Internal Challenges



FIGURE 8 – Financial Logic underlying organization's investments

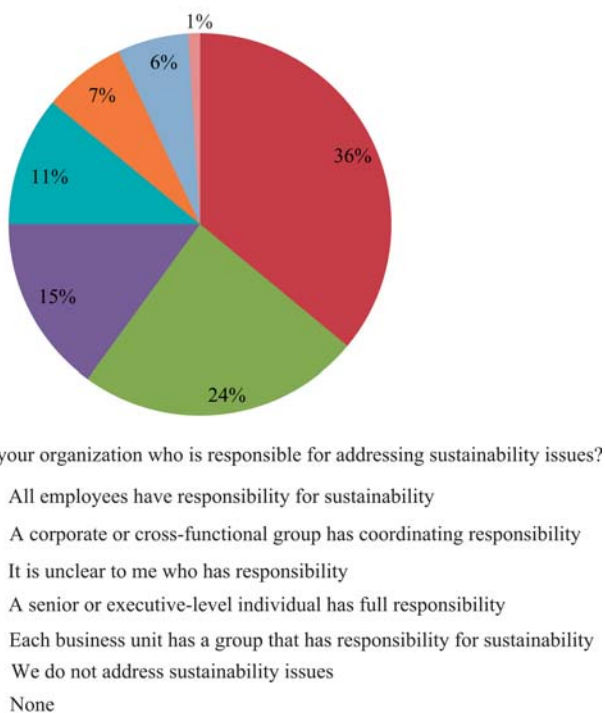


FIGURE 7 – Responsible for addressing sustainability

TABLE 5 – How does your organization define sustainability?

	Answer	Responses	Mean
1	Sustainability refers to other environmental issues	213	3.57
2	Sustainability refers to climate change issues	212	2.94
3	Sustainability refers to corporate social responsibility issues	212	3.87
4	Sustainability refers to maintaining the viability of our business	214	3.90
5	Sustainability incorporates climate change, environmental, social, and economic issues	215	3.92
6	Sustainability refers to meeting the needs of the current generation without compromising the ability of future generations to meet their needs	213	3.94
7	Sustainability refers to addressing issues from a long-term perspective	213	4.20
8	Other	24	3.88

Concerns

When asked about the organization-wide definition of sustainability, 45% of the senior managers believed sustainability refers to addressing issues from a long term perspective. About 40% of the respondents who consider themselves an expert in the area indicated that sustainability incorporates climate change, environmental, social, and economic issues. About 47% of the company's based in the USA believed sustainability refers to addressing issues from a long term perspective and 46% of the companies operating in three or more regions believe sustainability incorporates climate change, environmental, social, and economic issues.

Results and Findings

Although many industries today recognize the importance of sustainability, it is not easy to address it effectively. This study focused on understanding the importance of sustainability as part of the corporate agenda in different plastics-related industries and the strategies these companies are implementing to address sustainability. This paper presents highlights of the survey based on the responses of the SPE membership.

These responses reflect the earlier discussion regarding the definition of sustainability: varied and multiple areas of emphasis.

Likert scales, with scales of *pertinent* (5) to *not pertinent* (1), were used to understand the definition of sustainability (Table 5). More respondents reported that sustainability refers to addressing issues from a long term perspective (mean 4.2) and very few believed sustainability refers to climate change issues (mean 2.94).

The most significant external challenges faced by the respondents was insufficient customer demand or need (30%) and was followed by an absence of clear industry standards (23%) (Figure 5).

On the whole, not persuaded of a business case or proven value proposition was the most significant internal challenge noted in the survey (22%) (Figure 6). This is of interest since respondents were almost equally split when asked if their organization had developed a clear business case or proven value proposition for sustainability. Other important internal challenges noted were a lack of understanding regarding the most effective ways to take action and not enough resources to address sustainability issues.

When asked who is responsible for addressing sustainability issues, most of the senior managers of private, public, or government organizations believed that each business unit in their company has responsibility. A majority of the academic professionals responded that all employees have a responsibility for sustainability. Most of the C-suite executives of private, public, or government organization said they do not address sustainability issues at all in their company. Of those that do address it, each business unit had a group responsible for sustainability, but no corporate wide coordination exists. This last response from the C-suite executives did not reflect the majority of those completing the survey. This last response from the C-suite executives did not reflect the majority of those completing the survey.

Overall, only 6% indicated their organizations did not address sustainability issues and 15% were not clear on who has responsibility. Thirty-six percent (36%) indicated all employees have a responsibility with 11% reporting a senior or executive-level individual has full responsibility (Figure 7).

One of the questions in the survey asked the respondents for specific examples of firms that were considered world-class in addressing sustainability. Eighty companies representing differing industry segments, sizes, types, and geographic locations were named. Topping the list with the highest number of votes was *Procter & Gamble* with 8.6% and *Wal-Mart* with 6.8%. Both *DuPont* and *Dow Chemical* received 3.7%. *Toyota* rounded out the field with 3.1% of the votes. Although a clear leader did not emerge, the large number of firms selected as world-class may indicate an increased awareness of sustainability across many industries.

Issues

When asked about the most pertinent impacts of sustainability issues, the majority of the experts in the area said non-renewal resource depletion (e.g., oil) has the most pertinent impact on their organization. Most of the respondents who consider themselves to be an expert in the area and who are parts of USA based organizations indicate that global political security has the least pertinent impact on their businesses. Significant numbers of experts mentioned consumer concerns on sustainability had impacted their organization as well.

Likert scales, with scales of *major impact* (5) to *no impact* (1), were used to understand the impact of sustainability related issues to respondent’s organization (Table 6). Most of the respondents reported that non-renewable resource depletion (mean 3.97) has the major impact on their

business. Similarly, respondents reported that global health inequalities have no impact (mean 2.48) in their business.

TABLE 6 – How much impact will the following sustainability related issues have on your organization?

	Answer	Responses	Mean
1	Air, water, or other environmental pollution	217	3.48
2	Biodiversity reduction and habitat destruction	214	2.53
3	Climate change	215	2.73
4	Food supply or safety issues	215	2.93
5	Global health inequalities	214	2.48
6	Global political security	213	2.73
7	Government legislation in regards to sustainability	213	3.92
8	Increasing consumer concern for sustainability issues	212	3.88
9	Increasing employee interest in sustainability	214	3.44
10	Non-renewable resource depletion (e.g., oil)	213	3.97
11	Population growth	213	3.09
12	Poverty and income differentials	213	2.53
13	Societal pressures—social license to operate your business	212	2.85
14	Urbanization as populations migrate to cities	214	2.59
15	Water supply or access issues	210	3.15
16	Other	19	2.74

Overall, the greatest benefit to the organization as a result of addressing sustainability issues was competitive advantage (40%). This was followed by product, service, or market innovation (36%) and cost savings (34%).

Strategy

From the survey, a majority of the companies in the size range of 500 MM+ are focusing on improving efficiency on energy consumption, whereas a majority of the companies in the <10 MM range are focusing on reducing waste. Results also indicate that majority of the medium sized companies are trying to design products or process for reuse or recycle. They also focus on sustainable packaging and efficient energy consumption.

From all the responses received, the lowest priority strategy was proactively influencing government policies/regulations on sustainability (e.g., carbon pricing, etc.) followed by reducing or eliminating carbon or greenhouse gas emissions and highlighting sustainability in the recruitment of employees.

Likert scales, with scales of *considerable focus* (5) to *no focus* (1), were used to find out the most important sustainability strategies that these companies are addressing (Table 7). Most of the respondents reported that their company is considerably focusing on improving efficiency by reducing waste (mean 4.29). Similarly, most respondents reported that no focus has been given to proactively influencing government policies/regulations on sustainability (mean 2.8).

Earlier, it was mentioned that the one of the external challenges facing the plastics industry was an absence of clear industry standards, yet the respondents’ least active strategy was proactively influencing governmental policies/regulations.

TABLE 7 – Which of the following sustainability strategies is your organization addressing?

	Answer	Responses	Mean
1	Building awareness of sustainability in the organization	213	3.68
2	Developing new sustainability-related business opportunities (e.g., clean energy solutions)	211	3.72
3	Designing products or processes for reuse or recycling	212	3.92
4	Highlighting sustainability in company or product branding	211	3.69
5	Highlighting sustainability in the recruitment of employees	208	2.82
6	Highlighting or promoting sustainability in supplier and customer relationships	212	3.64
7	Including sustainability in scenario planning or strategic analysis	208	3.53
8	Improving efficiency in packaging	212	3.64
9	Improving efficiency in energy consumption	212	4.08
10	Improving efficiency by reducing waste	211	4.29
11	Proactively influencing government policies/regulations on sustainability (e.g., carbon prices, etc.)	210	2.80
12	Reacting to emerging government policies/regulations on sustainability (e.g., carbon prices, etc.)	210	3.02
13	Reducing or eliminating carbon or greenhouse gas emissions	210	3.19
14	Reducing or eliminating toxicity or harmful chemicals	211	3.72
15	Other	17	2.94

When asked if there was a financial logic underlying the organization's investment in sustainability, 25% responded that financial logic was not a driver (Figure 8). Seeking incremental financial returns was the logic identified by 24% of the survey participants.

Conclusions

Companies are rapidly and actively including sustainability into their businesses and the plastic industry is no exception.

In general, the respondents report a clear understanding of sustainability although it still remains complex by definition. A difference of opinion concerning who has responsibility was discovered between the C-suite executives and the remaining identified positions.

Companies are met with internal challenges when searching for the most effective means of addressing sustainability issues and defining who should have responsibility within the organizational structure. Additionally, firms are struggling with the business case for sustainability and clearly presenting a value proposition. From an external point of view, the lack of demand or need was cited as a significant challenge.

Multiple paths have been highlighted by the respondents concerning sustainability strategies and are size dependent.

The research undertaken with SPE will become part of longitudinal study of the plastics industry and sustainability.

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Appendix 1: Survey Questions

1. What is the size of your company?
2. What is your organization's total headcount?
3. What is your position?
4. What is your area of responsibility?
5. Which statement best describes your awareness of and expertise regarding sustainability?
6. In what industry does your organization participate?
7. In what primary market does your organization serve?
8. In which region does your organization primarily conduct business?
9. How does your organization define sustainability?
10. How much impact will the following sustainability related issues have on your organization?
11. Which of the following sustainability strategies is your organization addressing?
12. In your organization, who is responsible for addressing sustainability issues?
13. Has your organization developed a clear *business case* or *proven value proposition* for addressing sustainability?
14. Which external challenges present the most significant roadblocks to addressing sustainability issues in your organization?
15. Which internal challenges within your organization present the most significant roadblocks to addressing sustainability issues?
16. How has the recent economic downturn affected your organization's commitment to addressing sustainability issues?
17. What are the greatest benefits to your organization in addressing sustainability issues?
18. What is the financial logic underlying your organization's investments (or lack thereof) in sustainability initiatives?
19. Which stakeholder groups most drive embracing of sustainability issues for your organization? Please rank the options in order of significance where 1 is the most significant.
20. Improving sustainability-related communications with which stakeholder group would deliver the greatest benefit to your organization?
21. Which statement best describes the challenges your organization faces in communicating effectively with stakeholders regarding sustainability?
22. How does your organization engage suppliers regarding sustainability?
23. Name the organizations that you look to as world-class in addressing sustainability. What differentiates those organizations in addressing sustainability?
24. How would you benchmark your organization against this world-class standard?
25. How important are the following organizational capabilities in terms of addressing sustainability?
26. What tool would be most valuable to your organization in better addressing sustainability?
27. What important topics have we missed in defining how sustainability impacts management and strategy?
28. Can you suggest any way the SPE or SPI can help nurture sustainability principles in the plastics industry?

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