

Evaluation of the WasteWise Program



Promoting Environmental Results



Through Evaluation

Acknowledgements

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EXECUTIVE SUMMARY

In January 1994, EPA launched WasteWise—a partnership program designed to help businesses, government and non-profit organizations find practical methods for reducing municipal solid waste (MSW). WasteWise currently has over 2,000 partners representing over 50 sectors, who commit to reduce and recycle MSW and select industrial and commercial wastes. Partners include large corporations, small and medium-sized businesses, schools, colleges, universities, hospitals, state and local governments, tribes, and other institutions. WasteWise uses a broad range of approaches to encourage prevention, recycling, and reuse of waste. WasteWise program activities include various forms of technical assistance and recognition.

EPA's Office of Resource Conservation and Recovery (ORCR) and the Office of Policy's Evaluation Support Division (ESD) sponsored this program evaluation to: assess the value that WasteWise provides to its partners, assess changes in waste management behavior at partner organizations, and explore how to improve performance measurement moving forward. Industrial Economics, Incorporated (IEc) conducted the evaluation under contract to EPA.

The evaluation was guided by four key questions:

1. WasteWise uses a variety of approaches to influence the behavior of partners. Which approaches—for example technical assistance, information, awards and recognition—are most effective for which types of partners?
2. In addition to participation in WasteWise, what other factors may influence a partner organization's decisions to improve management of MSW (e.g., cost savings, consumer pressure, other voluntary program opportunities)?
3. What can be determined about how WasteWise participation contributes to partner behavior regarding MSW management (e.g., by effecting waste management improvements sooner, better incorporating waste management as a permanent feature of corporate culture, facilitating non-participant changes by providing information)?
4. What can EPA do to encourage WasteWise partners to submit sufficient environmental data for performance measurement and evaluation purposes?

As discussed in Chapter 2 of this report, IEc used several research methods to answer the evaluation questions, including review of existing program data, and collection of new data through a focus group, survey, and interviews. We surveyed the United States Postal Service (USPS) WasteWise partners, and studied differences in facilities that joined WasteWise early on versus those that joined later, hypothesizing that earlier joiners would demonstrate greener waste management behaviors given longer exposure to

WasteWise services. We also conducted a review of best practices for data collection and quality control to address evaluation question 4. Exhibit ES-1 provides an overview of methods used to answer each evaluation question.

EXHIBIT ES-1: CROSSWALK OF EVALUATION QUESTIONS AND PRIMARY AND SECONDARY DATA COLLECTION METHODS

EVALUATION QUESTION	PRIMARY METHOD(S)	SECONDARY METHOD(S)
1. WasteWise uses a variety of approaches to influence the behavior of partners. Which approaches—for example technical assistance, information, awards and recognition—are most effective for which types of partners?	<ul style="list-style-type: none"> • Focus Group • Review of existing program data including website statistics, ward program data, conference attendance data 	<ul style="list-style-type: none"> • USPS Survey
2. In addition to participation in WasteWise, what other factors may influence a partner organization’s decisions to improve management of MSW (e.g., cost savings, consumer pressure, other voluntary program opportunities)?	<ul style="list-style-type: none"> • Literature Review 	<ul style="list-style-type: none"> • USPS Survey • USPS Interviews
3. What can be determined about how WasteWise participation contributes to partner behavior regarding MSW management (e.g., by effecting waste management improvements sooner, better incorporating waste management as a permanent feature of corporate culture, facilitating non-participant changes by providing information)?	<ul style="list-style-type: none"> • USPS Survey • Focus Group 	<ul style="list-style-type: none"> • USPS Interviews • Literature Review
4. What can EPA do to encourage WasteWise partners to submit sufficient environmental data for performance measurement and evaluation purposes?	<ul style="list-style-type: none"> • Best Practices Review 	(None)

The report organizes findings by evaluation question in Chapter 3; we provide a short summary below:

Evaluation Question 1: WasteWise uses a variety of approaches to influence the behavior of partners. Which approaches—for example technical assistance, information, awards and recognition—are most effective for which types of partners?

Findings:

- The focus group was the most helpful method to address this question.
- The WasteWise awards program reaches many participants and receives very positive feedback.
- The WasteWise conference received generally positive feedback from focus group participants, but conference data and survey data call the value of conferences into question.

- WasteWise receives consistently positive feedback on technical tools offered to partners, including greenhouse gas calculations, the Re-TRAC waste reporting system, program website, and helpline.
- WasteWise partners are hungry for more communication from the program.

Evaluation Question 2: In addition to participation in WasteWise, what other factors may influence a partner organization's decisions to improve management of MSW (e.g., cost savings, consumer pressure, other voluntary program opportunities)?

The literature review identified several factors that influence environmental decision-making. IEC grouped these factors as follows:

- External market forces, including production levels/market trends and firm size. These factors can obscure the role of WasteWise in driving behavior change.
- Potentially complementary factors to WasteWise, including customer/supply chain pressure, community pressure/public image, corporate environmental ethic, and cost savings. These factors can be synergistic with WasteWise influence in some contexts.
- Pre-existing requirements, which include regulatory and legally-binding agreements. Where present, these factors take precedence over WasteWise influence.
- Uncertain impacts, including public disclosure laws, threat of future regulation, pressure from environmental groups, industry pressure, and internal industry codes. The impact of these factors is context-specific.

Under Evaluation Questions 3 and 4, we refer to these literature review findings to interpret data collected about WasteWise impacts and best practices for data collection and quality control, respectively.

Evaluation Question 3: What can be determined about how WasteWise participation contributes to partner behavior regarding MSW management (e.g., by effecting waste management improvements sooner, better incorporating waste management as a permanent feature of corporate culture, facilitating non-participant changes by providing information)?

Findings:

- The survey results provide clear evidence that WasteWise contributes to better waste management practices among USPS facilities. Early USPS WasteWise joiners conduct more recycling activities than later joiners, and have higher recycling frequencies for every material and a higher recycling frequency across materials. Also, early USPS joiners have been recycling for a longer time than later joiners, and are more aware of their recycling rates.
- Survey respondents cite several reasons for initiating recycling that are potential proxies for WasteWise influence, or complementary to WasteWise factors.

- Self-selection bias is unlikely to explain the extent of difference found in the survey between early and later WasteWise joiners.
- Focus group results and USPS interviews validate survey findings that WasteWise contributes to changes in waste management.
- The inability to conduct the USPS district survey originally planned hindered learning about some potential areas of WasteWise influence on USPS.

Evaluation Question 4. What can EPA do to encourage WasteWise partners to submit sufficient environmental data for performance measurement and evaluation purposes?

Findings:

- WasteWise is now collecting data necessary to establish a credible baseline.
- WasteWise has created a powerful incentive for program participation and reporting by offering free access to Re-TRAC.
- WasteWise has taken steps to encourage participant adherence to the program's reporting standards, although EPA could do more to improve the first-time quality of data submitted by partners.
- EPA takes steps to validate waste data reported to WasteWise, but could adopt additional measures to bolster confidence in self-reported data.
- While many EPA partnership programs encourage or require partners to submit normalized data, OMB has precluded WasteWise from doing so.
- WasteWise emulates other data quality best practices identified across partnership programs.

The report provides recommendations for the WasteWise program moving forward in Chapter 4; in summary, they include:

- Increase communications from EPA to WasteWise partners.
- Promote communications among WasteWise partners by providing an online venue for networking.
- In absence of additional program funding, consider recasting the conference as an awards ceremony.
- Keep a focus on offering high-value technical tool to partners.
- Invest in enhancement to annual reporting to improve the efficiency of the reporting review process, and collect information the potential benefits of WasteWise through the annual reporting process.
- As resources allow, conduct research into spillover effects.
- Develop high-level communications around the interplay of factors that encourage

CHAPTER 1 | INTRODUCTION AND PURPOSE

The U.S. generates approximately 2.4 million tons of municipal solid waste (MSW) annually. Preventing and recycling these wastes conserves resources, reduces greenhouse gas emissions, and improves human and ecological health. In January 1994, EPA launched WasteWise—a partnership program designed to help businesses, government and non-profit organizations find practical methods for reducing municipal solid waste.

The WasteWise program has over 2,000 partners representing over 50 sectors, who commit to reduce and recycle MSW and select industrial and commercial wastes. Partners include large corporations, small and medium-sized businesses, schools, colleges, universities, hospitals, state and local governments, tribes, and other institutions. In addition, WasteWise has approximately 200 endorsers, mainly membership-based organizations, who recruit other organizations to become WasteWise partners and provide partners with ongoing information about WasteWise tools and events.

WasteWise uses a broad range of approaches to encourage prevention, recycling, and reuse of waste materials. WasteWise program activities include various forms of technical assistance, public recognition and awards, and annual conferences.

EPA's Office of Resource Conservation and Recovery (ORCR) and the Office of Policy's Evaluation Support Division (ESD) sponsored this program evaluation to assess several areas of WasteWise program outcomes. The evaluation serves the following purposes:

- Identify WasteWise activities that are most useful for improving waste management activities undertaken, and identify any differences among categories of program partners. This information will help EPA direct program resources toward activities with the greatest utility for different industry sectors.
- Better understand the extent to which partner behavior regarding MSW management can be attributed to WasteWise participation. This involves first identifying factors outside of WasteWise that influence partner's waste management behavior, and then identifying and assessing changes in organizational behavior that can be linked to utilization of WasteWise approaches.
- Identify potential methods for encouraging WasteWise partners to submit robust and consistent waste management tracking data. EPA instituted a new data collection protocol for WasteWise in 2009 that greatly improves the program's data collection system. As part of this evaluation, we document these changes and identify potential additional enhancements.

- Explore EPA’s ability to meet OMB expectations for program evaluation for the WasteWise program using the full suite of research methods readily available to the Agency, barring an additional Information Collection Request submittal; and assess the feasibility and appropriateness of applying a randomized controlled trial (RCT) or similar evaluation approach to the WasteWise program and similar programs.

REPORT ORGANIZATION

The report is organized as follows:

- The remainder of Chapter 1 presents the WasteWise logic model and the evaluation questions that guided this project.
- Chapter 2 presents the methodology used in this evaluation. IEC used several methods to assess WasteWise outcomes, including: analysis of existing program data; literature review; focus group; survey of USPS members; and a review of data collection and quality control best practices across EPA partnership programs. We also discuss the strengths and weaknesses of this combination of methods to assess program outcomes.
- Chapter 3 presents the evaluation findings, organized by the four evaluation questions.
- Chapter 4 presents recommendations for improving the WasteWise program, including broader recommendations for improving EPA’s communications on the appropriate use, contributions, and limitations of partnership programs.

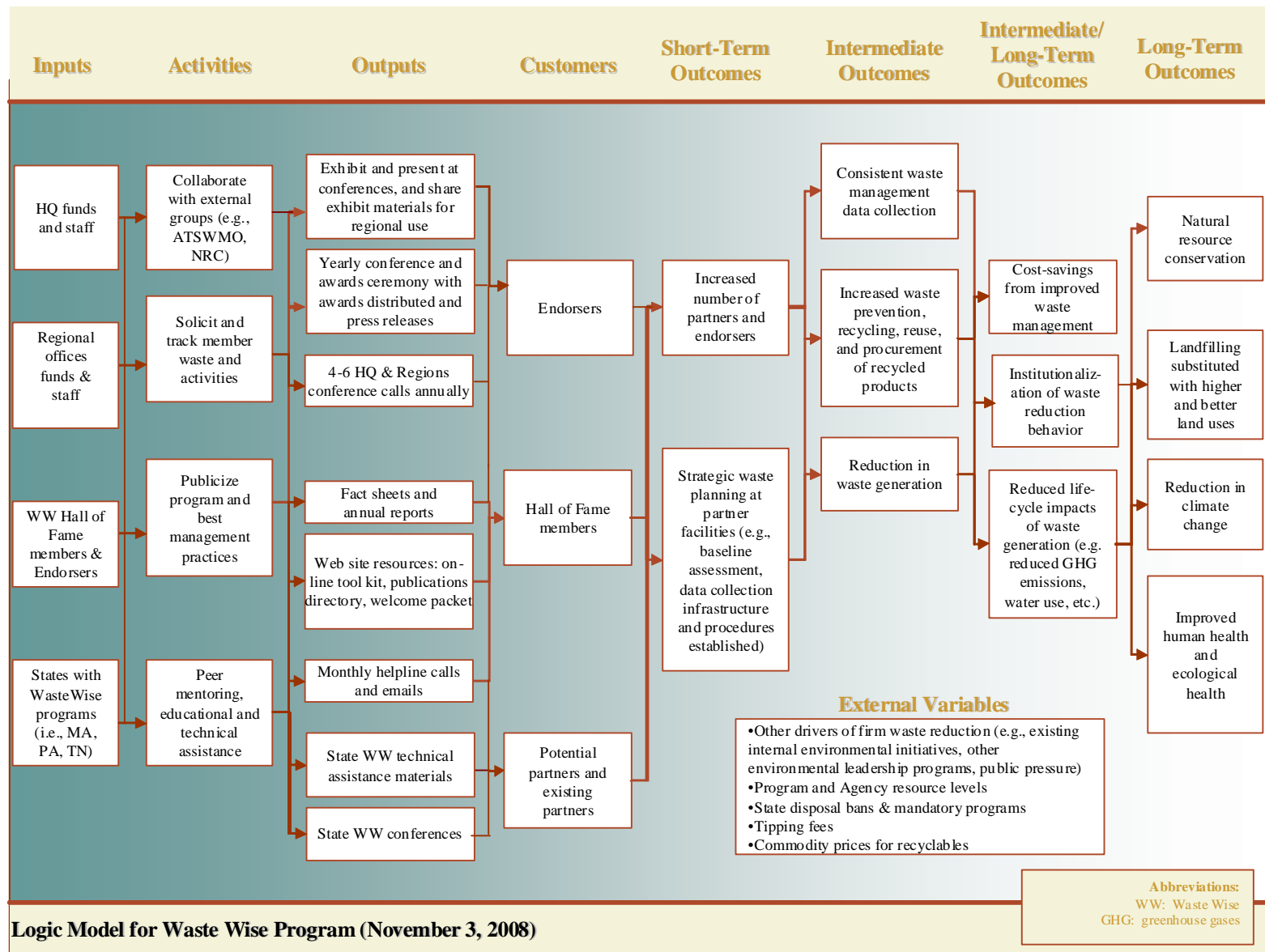
We include all major program evaluation deliverables, including memos with interim results from individual methods, in a series of appendices in a separate file. See the Table of Contents for the list of appendices.

PROGRAM LOGIC MODEL

To illustrate the various components of the WasteWise Program and to inform development of specific evaluation questions, EPA has developed a logic model (i.e., a graphical representation of the relationships between program inputs, outputs, and intended outcomes). As shown in Exhibit 1, the key components of the model include:

- **Resources** — the basic inputs of funds, staffing, and knowledge dedicated to the program.
- **Activities** — the specific procedures or processes used to achieve program goals. For example, WasteWise Program activities include technical assistance, collaboration with external groups, and publicity efforts.
- **Outputs** — the immediate products that result from activities and are often used to measure short-term progress. For example, EPA outputs include yearly conferences, fact sheets and reports, and WasteWise website resources.

EXHIBIT 1: WASTE WISE PROGRAM LOGIC MODEL



- **Customers** — groups and individuals targeted by WasteWise Program activities and outputs. For example, EPA provides technical assistance and recognition to WasteWise partners and endorsers.
- **Short-Term Outcomes** — changes in awareness, attitudes, understanding, knowledge, and skills resulting from program outputs that are causally linked to the WasteWise Program. For example, EPA’s outreach and publicity efforts result in recruitment of new partners and endorsers for the WasteWise program.
- **Intermediate Outcomes** — changes in behavior that are broader in scope than short-term outcomes. Intermediate outcomes often build upon the progress achieved in the short-term. For example, increased numbers of WasteWise partners and endorsers results in increased waste prevention, reuse, recycling, and procurement of recycled products.
- **Long-Term Outcomes** — the overarching goals of the program, which in this case include natural resource conservation, better uses of land than as landfills, reduction in climate change, and improvements in human and ecological health.

BACKGROUND INFORMATION ON WASTEWISE DATA COLLECTION EFFORTS

IEc reviewed historic waste data reported by WasteWise partners to determine if they were of sufficient completeness and quality to use as a data source for this evaluation. This section summarizes our findings.

To estimate the proportion of partners reporting waste data to the WasteWise program, IEC first looked at the historic program partner universe. As of the end of 2008, WasteWise had 2,197 partners, as communicated on the program website. However, the WasteWise database had records for 11,835 current and former partners; if accurate, this would mean that WasteWise has 9,638 former partners. This number seems very high, and is likely a result of record keeping problems; however, it represents an upper bound of the number of total WasteWise partners.

IEc then assessed the number of partners that reported waste data to WasteWise. EPA made significant changes to WasteWise program rules in 2010 to require partners to submit both baseline and annual waste data as a condition of membership. From 2004 through 2009, waste reporting was requested, but not required. Prior to 2004, EPA did not collect these data from partners. As shown in Exhibit 2, partners reported limited waste data to WasteWise from 2004-2008 compared to the program’s membership levels.

IEc reviewed these data in aggregate to determine if they were of sufficient completeness to analyze as part of the evaluation process. A total of 663 partners, current and past, had reported data to WasteWise through 2008, generating the 1,219 records noted above. The number of records exceeds the number of partners because many of the same partners reported annually in multiple years. Of those 663 partners, 267 partners provided only baseline data, and 234 provided only annual data. It is not clear if these are partners are all current partners, or if some of these may have been partners that left the program.

EXHIBIT 2: WASTEWISE TOTAL REPORTING BY YEAR— BASELINE AND ANNUAL REPORTING RECORDS

YEAR	BASELINE AND ANNUAL DATA RECORDS
2000	1
2003	1
2004	170
2005	249
2006	217
2007	443
2008	138
Total	1,219

Given that we do not have complete information on the number of former WasteWise members, or the current membership status of those who have reported, IEc estimated a range of the proportion of partners that reported waste data, based on the number of current partners and the total number current and past partners. Results are presented in Exhibit 3. Only 162 partners reported both baseline and annual data necessary for trend analysis, which we estimate as between one and seven percent of the partner universe. Even the high end of this range, seven percent, is too low to enable extrapolation of these data to the entire WasteWise universe.

EXHIBIT 3: PROPORTION OF WASTEWISE PARTNERS REPORTING

REPORTING TYPE	NUMBER OF PARTNERS REPORTING	% OF 11,835 PAST AND PRESENT PARTNERS — LOW ESTIMATE	% OF 2,197 CURRENT PARTNERS - HIGH ESTIMATE
Baseline Only	267	2%	12%
Annual Only	234	2%	11%
Both	162	1%	7%
Total	663	N/A	N/A

Thus, analysis of historical WasteWise waste data is precluded by a low frequency of reporting. As such, this program evaluation does not consider changes in quantified environmental outcomes of WasteWise members. Alternatively, this evaluation examines changes in behavior among WasteWise partners, and the program’s role in those changes. This evaluation also explores changes that EPA could undertake to improve WasteWise data collection and quality control to support future performance measurement.

EVALUATION QUESTIONS

To develop and refine evaluation questions, IEC conducted an initial data and document review, and engaged in several discussions with EPA regarding the implications of our findings for scope of this evaluation. Subsequently, IEC and EPA finalized the evaluation questions that EPA seeks to answer through this project:

1. WasteWise uses a variety of approaches to influence the behavior of partners. Which approaches—for example technical assistance, information, awards and recognition—are most effective for which types of partners?
2. In addition to participation in WasteWise, what other factors may influence a partner organization's decisions to improve management of MSW (e.g., cost savings, consumer pressure, other voluntary program opportunities)?
3. What can be determined about how WasteWise participation contributes to partner behavior regarding MSW management (e.g., by effecting waste management improvements sooner, better incorporating waste management as a permanent feature of corporate culture, facilitating non-participant changes by providing information)?
4. What can EPA do to encourage WasteWise partners to submit sufficient environmental data for performance measurement and evaluation purposes?

CHAPTER 2 | METHODS

This chapter summarizes the evaluation methodology employed to assess EPA’s WasteWise program. First, we discuss methods for collecting and analyzing existing data. We then review efforts to collect new data, including the literature review, focus groups, surveys, and interviews. The chapter concludes with a discussion of the strengths and weaknesses of the evaluation approach and quality assurance procedures. For complete information on methods, refer to the evaluation methodology document in Appendix A.

EVALUATION DESIGN

IEc employed a mixed-methods approach to collecting information for this evaluation. Key sources of data include:

Existing information:

- Existing data and documentation on the WasteWise program, including data and documents related to partners’ use of WasteWise program activities and services, such as the WasteWise website, helpline, annual conference, and awards program.
- Peer-reviewed literature on impacts and attribution issues associated with voluntary programs.
- Company websites and publications, including FedEx, UPS, DHL, and USPS.
- Websites of select EPA partnership programs and non-EPA voluntary programs, and government websites.

Original research:

- Focus group with representatives from a sector participating in WasteWise
- Survey of USPS facility staff
- Post-survey interviews with select USPS HQ and District staff

ANALYSIS OF EXISTING DATA

EPA provided IEC with a variety of documents and data related to partners’ use of WasteWise program activities and services, such as the WasteWise website, helpline, annual conference, and awards program. IEC reviewed these documents for relevance to Evaluation Question 1 (i.e., which program activities are most effective for which types of partners?). IEC evaluated each data source for evidence of utility to WasteWise partners, as well as information on who (i.e., which sectors) are looking for information provided by the resource.

Website Data

EPA tracks a variety of statistics, or “webstats” from the WasteWise website. EPA provided IEC with webstats from September 2007 through August 2008. One of the key statistics tracked in webstats is the number of times various files are download from the website. IEC identified the ten most commonly downloaded files during one year (September 2007 through August 2008) as indicators of the most relevant content for WasteWise website users.

Another useful statistic tracked by the WasteWise website is the most commonly used search phrases. By summing data on the number of times users of the WasteWise website entered a search phrase between September 2007 and August 2008, IEC identified popular phrases to serve as an indicator of what users are looking for on the website and more generally, what topics are of concern/interest to them.

One key limitation of the WasteWise webstats is that they do not provide information on who is using the various features of the WasteWise website. Thus, we cannot derive the type of user (e.g., WasteWise partner, non-member, or individual citizen), or, for professional users, the sector of the user.

WasteWise Conference Data

EPA provided IEC with a list of the 2007 WasteWise Annual Conference attendees, including sector information. The purpose of WasteWise conferences is to provide networking opportunities, information sharing, and recognition of participants who have excelled in their waste management efforts. The most recent conference included a discussion regarding zero waste, the use of climate profiles provided to participants by WasteWise, and a general program update.

Using the conference attendance data, IEC identified the ten most represented industries at the 2007 conference. EPA also provided IEC with the 2007 conference evaluations, submitted by conference participants, as well as the minutes from the conference. IEC reviewed these documents for information on the types of WasteWise materials and activities that conference participants find useful.

EPA later provided IEC with data for the 2008 WasteWise Annual Conference attendees. Thus, IEC expanded our original analysis of 2007 conference attendees and analyzed attendee breakdown by sector for 2008.

Helpline Data

EPA provided monthly correspondence logs in Excel format for May 2007 through August 2008. The monthly correspondence logs track the name and affiliation of the contact, the date of the inquiry, and the nature of the inquiry and response or action taken (for technical assistance inquiries only). All inquiries are coded based on the following categories: program implementation question from a WasteWise member, data verification, program information request, technical assistance, request from WasteWise regional contacts, or a general waste/recycling inquiry. At EPA’s recommendation, IEC focused on assessing the technical assistance inquiries, and limited consideration to the past year (September 2007 to August 2008). The technical inquiry log categorizes each

inquiry by keyword. IEC grouped these keywords into categories to determine the subjects of the most frequent inquiries.

Awards and Recognition

EPA provided IEC with data on all WasteWise award winners from 1997 to 2005. The data included each participant who has won a WasteWise award, and the specific award that they won and year of the award.

As an initial analysis, IEC tallied the number of award winners by industry in 2007 to determine the sectors that most actively participated in the awards program that year. To discern trends in award recipients, IEC analyzed award recipients by sector and by company, from 1998 through 2008, using the WasteWise Award Winner spreadsheet. IEC performed several analyses to determine the presence of trends among award recipients, including analyzing awards won by each participant and tallying the number of participants for each category. The 2007 WasteWise Conference evaluations also provided additional information about the WasteWise awards program.

NEW DATA COLLECTION EFFORTS

In addition to using existing files and data sources, IEC undertook new data collection efforts to support this evaluation. These efforts included:

- Literature reviews related to Evaluation Questions 2 and 3
- Focus group related to Evaluation Questions 1 and 3
- Survey of USPS facility staff related to Evaluation Question 3
- Interviews with USPS HQ and district staff related to Evaluation Question 3
- Review of data collection and quality control practices related to Evaluation Question 4

Literature Review

IEC used literature review as the primary method for addressing Evaluation Question 2:

In addition to participation in WasteWise, what other factors influence a partner organization's decisions to improve management of MSW (e.g., cost savings, consumer pressure, other voluntary program opportunities)?

Evaluation Question 2 represents an initial step in the attribution of WasteWise benefits, or identifying beneficial impacts specifically resulting from WasteWise. It is important to identify and correct for external factors that are unrelated to WasteWise program design but may drive participation in WasteWise and overall program performance. These factors include, for example:

- Regulatory requirements in other markets (e.g., European Union directives or some State regulations);
- Participation in other voluntary programs;
- Changes in technical requirements by significant customers or suppliers; and

- Market volatility that changes production levels.

A significant body of literature exists on the reasons that companies join partnership programs and the impact of external factors (e.g., threat of regulation) on program performance. As part of a previous project addressing attribution methodology, IEC developed a *Draft Literature Review of Approaches to Estimating Attribution of Voluntary Program Benefits* (Memorandum submitted to EPA Office of Solid Waste, February 25, 2008). To address Evaluation Question 2, IEC updated this literature search with information published in 2008, and used the body of information to develop an inventory of the main external factors that influence organizational behavior related to MSW management. To identify recent publications pertinent to the evaluation, IEC employed the following search engines: Dialog, EconLit, EPA, Environmental Valuation Reference Inventory (EVRI), Social Sciences Research Network (SSRN), National Bureau of Economic Research (NBER), EBSCOhost, and a targeted search for authors. The complete literature review deliverable is included in Appendix B.

Once the key external factors (e.g., other than WasteWise) that may influence behavior were identified in Question 2, Question 3 was designed to consider the leverage points specific to WasteWise, and identify key questions for assessing the impacts specifically associated with WasteWise participation:

What can be determined about how WasteWise participation contributes to partner behavior regarding MSW management (e.g., by effecting waste management improvements sooner, better incorporating waste management as a permanent feature of corporate culture, facilitating non-participant changes by providing information)?

IEC reviewed literature on materials and waste management in the air delivery and freight services sector, the private sector of most relevance to USPS, to inform the development of the USPS survey. We used the following data sources to identify relevant literature for this review:

- Company websites and publications, including FedEx, UPS, DHL, and USPS;
- Government websites, including EPA (e.g., the Smartway program); NTIS, and State transportation agencies;
- Trade associations, including Express Delivery and Logistics Association and Global Trade and Logistics; and
- Research organizations, including the Transportation Research Board, University Transportation Centers, and the Transit Cooperative Research Program

Focus Groups

On September 29, 2009, IEC conducted a focus group addressing the potential benefits of WasteWise membership. The purpose of the focus group was to address Evaluation Questions 1 and 3 as proposed in the evaluation methodology. Question 1 addresses the relative effectiveness of WasteWise tools for influencing partners' waste management practices. Question 3 explores the contributions of WasteWise to partners' waste management practices. We explored both questions throughout the focus group and obtained information regarding members' opinions and views of the WasteWise Program.

Below, we first discuss the criteria used to select sectors for the focus group, followed by the criteria used to recommend specific companies from each sector for participation in the focus group. Finally, we describe the focus group procedures and analysis of results.

Selection of Focus Group Members

IEc recommended a set of eleven sectors for inclusion in the focus groups, with one company or organization to represent each sector, for a total of eleven participants. We made this recommendation because the Paperwork Reduction Act limited us to a total of nine non-federal participants (2 of the participants recommended are federal, resulting in a total of eleven participants). Moreover, larger focus groups can be unwieldy and are less likely to capture perspectives from all members.

We selected sectors using a series of criteria. The primary criterion for selecting the sectors was a high level of participation in WasteWise. To determine the highest participating sectors, we queried the online WasteWise Membership Listing to obtain a count of the number of WasteWise partners by sector.¹ We defined a high-participation sector as one with a minimum of 40 partners in the program. Of the 18 sectors that had 40 or more partners, we selected the top five for inclusion in the focus groups:

- Local Government
- Colleges & Universities
- Consulting & Employment Services
- Waste Management Services
- U.S. Postal Service²

We selected the remaining six sectors for inclusion in the focus groups using a blend of two additional criteria: sector type and average quantity of waste generated by facilities in each sector. We characterized each sector as belonging to one of the following types: government, institutional (e.g., schools and NGOs), services, or production/manufacturing. In addition, we obtained data from the WasteWise database on the quantity of waste generated by each sector in 2007.³ We then chose sectors reporting the highest average waste generation per facility (calculated as the total waste quantity per sector divided by the number of partners generating that waste).⁴ Finally, we aimed to ensure adequate representation of all sector types. For example, if two sectors had roughly equal waste generation quantities but different sector types, we selected the sector type with less representation in the final set. In addition, we tried to achieve some diversity across sector types (e.g., if two production/manufacturing sectors made products in the same general category, such as automotive/vehicle parts, we selected only one of those sectors).

¹ Accessed at: <http://WasteWise.tms.icfi.com/wisearch/search.asp> on January 15, 2009.

² One sector, the Federal Government, contains a total of 146 partners; we divided this sector into the USPS (86 partners) and other Federal Government partners (60 partners).

³ We analyzed data only for WasteWise partners that are flagged as currently active in the database.

⁴ For each sector, we looked at average waste generation per facility instead of total waste generation by sector to normalize the reported waste generation data. Not all partners reported waste generation in 2007, so straight sector totals would not have been easily comparable. By dividing sector waste totals by the number of reporting partners, we account for the variability between sectors in the number of partners reporting waste generation.

Exhibit 4 presents the eleven sectors selected for inclusion in the focus groups, the associated data for each sector, and a summary of the rationale for selection.

Recommended Focus Group Participants

From the eleven sectors selected for the focus groups, IEC used the following criteria for selecting specific companies/facilities to participate in the focus groups:

1. High-quantity of waste generation.
2. A diversity of recent and long-time WasteWise members.
3. Diversity in awards and recognition (e.g., some companies that have received one or more awards and others that have not).
4. Diversity in reporting behavior (e.g., some companies/facilities that regularly report to WasteWise and some that do not).

Participant Selection

EPA selected two organizations within each sector as top choices, and IEC ranked these choices to ensure diversity. Of the eleven sectors identified, nine sectors participated; Participants from the Motor Vehicle and Parts and the Federal Government sectors did not attend the focus group. Details about the organizations representing each sector in the focus group are presented in Exhibit 5.

EXHIBIT 4: SECTORS RECOMMENDED FOR INCLUSION IN FOCUS GROUPS

SECTOR	NO. OF PARTNERS	SECTOR TYPE	AVG MSW QUANTITY PER PARTNER (LBS)	RATIONALE FOR SELECTION
Local Government	174	Government	3,680,658	Very high participation in WasteWise
Colleges & Universities	131	Institution	1,117,365	Very high participation in WasteWise; provides an example of the institution sector type
Consulting & Employment Services	126	Service Sector	36,060	Very high participation in WasteWise
Waste Management Services	94	Service Sector	10,819,119	Very high participation in WasteWise
US Postal Service	86	Service Sector*	41,945,333	Very high participation in WasteWise
Electronics & Electrical Equipment	67	Production/ Manufacturing	1,084,962	Provides another example of a private production/ manufacturing sector type; provides diversity within production/ manufacturing sector type
Printing & Publishing	64	Production/ Manufacturing	10,559,959	Large quantity of waste generated; provides diversity within production/manufacturing sector type
Federal Government (Other)**	60	Government	4,766,288	Provides another example of government sector type
Utilities	53	Production/ Manufacturing	16,247,978	Very Large quantity of waste generated; provides diversity within production/manufacturing sector type
Entertainment	45	Service Sector	46,848,591	Large quantity of waste generated; provides another example of a private service sector type
Motor Vehicle & Parts	42	Production/ Manufacturing	69,513,940	Very large quantity waste generator; provides diversity within production/ manufacturing sector type
<p><u>Source:</u> EPA, "WasteWise Membership Listing," accessed at: http://WasteWise.tms.icfi.com/wisearch/search.asp</p> <p><u>Notes:</u> *More closely represents a service sector than government sector **Excludes the U.S. Postal Service</p>				

EXHIBIT 5: FOCUS GROUP PARTICIPANTS

SECTOR	ORGANIZATION	LENGTH OF MEMBERSHIP	EVER REPORTED?	REPORTED MSW GENERATED 2007 (TONS)	TOTAL AWARDS RECEIVED
Local Government	King County, Washington	12	Yes	Not Reported	5
Colleges and Universities	University of Colorado at Boulder	15	No	Not Reported	0
Consulting and Employment Services	CDM	2	Yes	152,418	0
Waste Management Services	Inland Empire Regional Composting Authority	2	Yes	15,041	0
US Postal Service	USPS Northeast Area	12	Yes	14,932,913	7
Electronics and Electrical Equipment	General Dynamics - Lincoln Operations	2	Yes	156,850	0
Printing and Publishing	FedEx Kinkos	12	Yes	52,543,958	1
Utilities	PSEG	15	Yes	17,975,048	9
Entertainment	The Walt Disney Company	15	Yes	321,619,163	14

EPA and IEC worked together to select the focus group date. IEC prepared the draft focus group protocol and information sheet for participants (attached here as Appendix C). The focus group was held at the IEC office in Cambridge, Massachusetts; Andy Schwarz, a Principal at IEC, moderated the focus group. IEC took notes to assist in the summarizing findings from the focus group. After the focus group, IEC synthesized responses to each question and developed a focus group summary that identified the key findings, available in Appendix D.

USPS Survey

Due to constraints under the Paperwork Reduction Act, EPA could not survey most program participants without undertaking an ICR process. However, EPA can conduct surveys within the federal family. Because USPS is a very active partner in the WasteWise program, with all of its facilities enrolled in WasteWise, IEC conducted a

survey of USPS facilities. We surveyed USPS processing and distribution centers (P&DCs) and bulk mail centers (BMCs) to investigate the effects of WasteWise membership on waste management behavior within USPS, by looking for differences in facilities that joined WasteWise many years ago and facilities that joined WasteWise relatively recently.

Characterization of the USPS Universe in WasteWise

USPS entities began joining WasteWise in 1997. Initially, USPS entities joined at many different levels within the organization. The range of partners initially included entities as diverse as individual post offices and processing facilities, as well as whole USPS districts and even larger USPS areas. Now, most partners join WasteWise and report at the district level, and all USPS districts are enrolled in WasteWise. As of late 2008, USPS WasteWise membership was organized into 86 USPS individual partners. Of those 86 individual USPS partners, 75 partners reported at the district level, 6 partners reported at the area level, and 6 partners reported at the individual facility level.

Survey Approach

After discussing the goals and intent of this survey with USPS, IEC determined that district staff members and managers at P&DCs and BMCs represented the most appropriate target universe. District staff members play a key role in organizing waste management activities and therefore are likely to have direct experience implementing WasteWise-related activities and other waste management strategies, and P&DCs and BMCs generate and manage large quantities of non-hazardous waste and are therefore able to identify the effectiveness of USPS efforts at a facility level.

The USPS organization includes nine areas, 80 districts, and 460 P&DCs and BMCs. The Northeast area (which includes eight individual districts) and four districts (Alabama, Dallas, Sacramento, and South Florida) joined WasteWise several years before the other areas and districts. Together, these 12 districts contain a total of 55 P&DCs and BMCs; we defined this group of early joiners as “Group A” and surveyed the entire Group A universe. The majority of USPS WasteWise partners, however, joined in 2007 and 2008. This universe, labeled “Group B,” contains 405 P&DCs and BMCs. Instead of surveying the entire Group B universe, IEC developed a statistically valid sampling strategy to survey 200 facilities.⁵ The sample plan is summarized in Exhibit 6.

Thus, to discern the effects of WasteWise participation, we surveyed all facilities that were early joiners, as well as a statistically valid sample of facilities that joined later. We hypothesized that due to their longer tenure participating in WasteWise, USPS facilities and districts that joined the program earlier than others would report higher utilization of “greener” waste management approaches.

IEC also developed a survey for district staff and planned to survey one staff member from each district. However, due to the USPS reorganization and consolidation of districts, IEC was not able to administer this survey.

⁵ See WasteWise evaluation methodology in Appendix A for detailed information about the survey approach.

EXHIBIT 6: SAMPLE PLAN SUMMARY

FACILITY LEVEL GROUPS	POPULATION SIZE	EXPECTED RESPONSE RATE	INITIAL SAMPLE SIZE	EFFECTIVE SAMPLE SIZE
Group A (early joiners)	55	75%	55	41
Group B (later joiners)	405	50%	200	100

To ensure that the sample reflected a variety of geographic locations, we developed a plan to stratify the sampling of P&DCs based on the area in which the center is located. The USPS organization contains nine areas. The entire Northeast Area joined early on; therefore all P&DCs and BMCs in the Northeast were surveyed. We applied stratification across the remaining eight areas. See Exhibit 7 for the stratification of Group B.

EXHIBIT 7: LATER JOINERS (GROUP B) STRATIFICATION

STRATUM	DESCRIPTION	POPULATION SIZE (N)	STRATUM RELATIVE PROPORTION	SQUARE OF STRATUM RELATIVE PROPORTION	INITIAL SAMPLE SIZE	EXPECTED RESPONSE RATE	EFFECTIVE SAMPLE SIZE (N)	ESTIMATED STRATUM PROPORTION	VARIANCE FOR ESTIMATED PROPORTION
1	BMCs	28	0.07	0.005	14	50%	7	0.5	0.032
2	Capital Metro	26	0.06	0.004	13	50%	6	0.5	0.035
3	Eastern	59	0.15	0.021	29	50%	15	0.5	0.014
4	Great Lakes	45	0.11	0.012	22	50%	11	0.5	0.019
5	New York Metro	18	0.04	0.002	9	50%	4	0.5	0.055
6	Pacific	23	0.06	0.003	11	50%	6	0.5	0.040
7	Southeast	42	0.10	0.011	21	50%	10	0.5	0.020
8	Southwest	53	0.13	0.017	26	50%	13	0.5	0.016
9	Western	111	0.27	0.075	55	50%	27	0.5	0.007
Total		405	1.00		200		100		

ASSUMPTIONS:

0.50	Estimated population proportion
0.0021	Variance of estimated population proportion
0.0019	Standard deviation of SRS (for comparison)

Stratified sampling has the added benefit of guaranteeing a geographic spread for the sample. The sampling plan assumes "proportional allocation." That is, the sample size for each stratum is proportional to the size of the stratum. IEC chose a sample size of 200 for Group B in consideration of both the need for statistical validity as well the need to minimize survey burden on USPS staff. See the Evaluation Methodology for more information on the sampling process.

Survey Instruments

The final survey instruments for facility staff members and is available in Appendix E. The survey was designed to investigate:

- Waste management activities at the facility-level, including recycling of specific materials, and source reduction;
- Knowledge of waste management outcomes;
- Influences on waste management attitudes and behaviors (including WasteWise membership); and
- Use of WasteWise tools, and assessment of those tools.

IEc shared the facility and district surveys with Charlie Vidich of USPS Headquarters to ensure that the survey questions were clear and understandable. IEC received feedback for the facility survey and then revised the survey to use language that was more consistent with USPS operations.

Survey Mode

Based on conversations with USPS, IEC confirmed that USPS staff have ready Internet access and a familiarity with online surveys. As such, IEC conducted the survey by Internet using ESurveysPro Basic online survey service.

Overview of Respondents

Of the 255 facilities contacted about the survey, 132, or 52%, responded. Thirty of 55 long-term partners responded to the survey, for a response rate of 54.5% from Group A. Similarly, Group B had a response rate of 51 %, with 102 of 200 facilities responding.⁶ See Exhibit 8 for a summary of facility surveys and the number of responses by group.

EXHIBIT 8: RESPONSES BY GROUP A AND GROUP B

GROUP	FACILITIES SURVEYED	RESPONDED	DID NOT RESPOND
Group A	55	30	25
Group B	200	102	98
Total	255	132	123

⁶ Two respondents left significant sections of the survey blank.

IEc and USPS undertook several activities to increase the response rate, including:

- USPS Headquarters verbally notified managers of upcoming survey in August 2009.
- IEc sent a survey invitation to subjects with an explanation of the purpose of the survey on August 31, 2009.
- IEc sent a follow-up invitation and reminder on September 14, 2009.
- USPS contacts conducted outreach among facilities to increase the response rate.
- IEc sent a second round of follow-up invitations in November 2009.

Exhibit 9 presents a breakdown of respondents by facility type. IEc worked with USPS staff to develop the list of current P&DCs and BMCs. It is important to note, however, that some of the facilities labeled as P&DCs were post offices that contain or previously contained some processing equipment, and perform(ed) some P&DC functions. Fifteen respondents selected “other,” indicating that their facility is not a BMC, or P&DC. A comparison of these “other” facilities to respondent positions indicated that six “other” facilities appeared to be post offices with some P&DC functions, and the remaining nine facilities appeared to be sorting or processing centers (and thus, may have been miscategorized by respondents).

EXHIBIT 9: USPS TYPES OF FACILITIES RESPONDED

WHAT TYPE OF FACILITY DO YOU WORK AT?	TOTAL
Processing and Distribution Center (P&DC)	108
Bulk Mail Center (BMC)	9
Other	15
Total	132

As seen in Exhibit 10, about half of the respondents (73) indicated that they determine waste management methods at their facilities, either independently or in conjunction with others. However, many respondents indicated that someone else determined waste management methods, typically District or Area staff. Twenty-six facilities checked the “other” box, sometimes indicating specific positions from a list of choices presented on the survey form; most of the positions listed under “other” are facility-level positions (as opposed to positions at the district or area level).

EXHIBIT 10: DECISION-MAKING ON WASTE MANAGEMENT

WHO DETERMINES WASTE MANAGEMENT METHODS? (CHECK ALL THAT APPLY)	COUNT
I do	73
District Staff	55
Area Staff	33
Headquarters Staff	17
Other	26

The survey asked respondents about their tenure at USPS. Despite recent changes at USPS, most of the respondents have been in their positions for at least a year, and nearly half have been in their positions for over five years. See Exhibit 11.

EXHIBIT 11: TENURE OF RESPONDENT POSITIONS

HOW LONG HAVE YOU BEEN IN YOUR POSITION?	TOTAL
5+ years	63
3 - 5 years	23
1 - 3 years	34
6 - 12 months	9
0 - 6 months	3
Total	132

Based on the above responses, we are confident that respondents were staff members who were knowledgeable about waste management practices at their facilities. Survey results are discussed at length in the Findings chapter; IEc’s survey results memo with complete results is included in Appendix F.

USPS Interviews

IEc identified three USPS interview participants at the area and district level. IEc used the interviews to follow up on survey results, and specifically to clarify and expand upon key survey findings, including differences among early and later joiners (these survey findings are discussed at length in Chapter 3). See Exhibit 12 for the interview guide. IEc provided a synthesis of the interviews to ESD and ORCR staff.

EXHIBIT 12: USPS SURVEY FOLLOW UP INTERVIEW GUIDE

1. General Interviewee Information
 - a) Name?
 - b) Title?
 - c) How long have you been in your position?
2. What is your role in determining waste prevention methods at facilities?
3. What types of communications occur among HQ, Area, and District staff when considering or implementing waste prevention methods?
 - a) How does WasteWise figure into these communications?
4. Do you believe that WasteWise participation influenced and/or supported changes in waste management practices at the facility, district, or area level?
 - a) If yes, provide some examples (e.g., initializing or retaining recycling of specific materials?)
 - b) Has this influence changed over time? If so, how?
5. The survey indicates that district or area encouragement, and sometimes requirements, are a key influence on facility waste management practices. In your opinion, how much influence did WasteWise membership have on district/area encouragement/requirements for greener waste management at the facility level?
 - a) Has this influence changed over time? If so, how?
6. The survey results indicate that, in general, partners that joined WasteWise a long time ago (Group A) reported greener waste prevention activities (e.g., recycling frequency, number of recycling activities) when compared to newer partners that joined over the last couple of years (Group B). Why do you think older partners report greener waste prevention activities?
7. Older WasteWise partners also indicated that they are more aware of their recycling rates. Can you think of any reasons why older partners might be more aware of recycling rates?
8. Do you think that WasteWise, or Area/District use of WasteWise materials, has influenced personnel attitudes about waste management at the facility level? If so, how?
9. Is there any other information that you could provide that would assist us in our analysis?

Best Practices Review for Data Collection and Quality Control Practices

Early in the process of developing a program evaluation methodology for the WasteWise program, IEC determined that partner environmental data previously collected by EPA for WasteWise are not robust enough to support performance measurement and program evaluation. As such, EPA developed Evaluation Question 4 to include as part of this evaluation:

- What can EPA do to encourage WasteWise partners to submit sufficient environmental data for performance measurement and evaluation purposes?

To address this evaluation question, IEC conducted a review of data collection and QA/QC best practices across select EPA partnership programs and voluntary programs outside of EPA. The focus of the best practices review was to identify practices that encourage program partners to submit robust and consistent environmental data, and could be utilized for ongoing performance measurement as well as future program evaluation. We also compared best practices identified to current WasteWise practices, and determine where WasteWise has implemented these practices, and whether there are areas where WasteWise goes beyond best practices used by other partnership programs.

IEC conducted a review of data collection best practices across select EPA partnership programs and non-EPA voluntary programs, focusing on methods to increase data quality. To identify programs to review, we applied the following criteria:

- Voluntary participation (non-mandatory)
- Facility or firm-based (not product based)
- Program data collection and reporting responsibilities exist at the facility or firm level
- Some programs should have a follow-up component, for quality control
- Some programs included should have a waste reporting component
- Some programs should use electronic reporting

As discussed in the WasteWise Evaluation Methodology, IEC identified seven EPA partnership programs to include in the review. Below, we list each program, and describe the rationale for including them.

- *Hospitals for a Healthy Environment (H2E)*: A previous EPA evaluation of the H2E program suggested that EPA collect data for normalization purposes and require baseline and annual reporting for new partners, as well as annual reporting for existing partners. H2E implemented the suggestions and now partners are required to submit annual reports. In addition, the H2E toolbox (cms.h2e-online.org/partners/toolbox/) contains useful guidance for current and prospective partners, including steps for getting started, sample partner goals, data collection practices, and normalizing guidance to account for changes in activities across different types of facilities (e.g., # of patients seen, # of patient beds occupied).
- *Laboratories for the 21st Century (Labs 21)*: Labs21 differs from WasteWise and many other EPA voluntary programs in that the partnership is project-based and

partners do not submit annual reports until after project is complete. However, Labs21 is included in this review as the program provides useful materials on topics relevant to WasteWise such as best practices, case studies, and benchmarking.

- *National Environmental Performance Track*: Performance Track required all members to submit baseline data and annual data, and aggregated and published performance measurement results. Performance Track had a strong focus on QA/QC. The program reviewed all data submitted, followed up with members to ensure accuracy in reporting, and conducted site visits at 5 – 10% of member facilities each year.
- *Natural Gas Star*: The Natural Gas Star program provides many sector-specific resources to partners, such as emission quantification guidance and information on cost-effective technologies. Natural Gas Star has also been able to aggregate and publish results.
- *National Partnership for Environmental Priorities (NPEP)*: NPEP is a project-based program; partners report their baseline quantities and associated achievements to EPA. Since 2006, NPEP has inquired about QA/QC for data associated with partner success stories.
- *SmartWay*: The SmartWay program has also developed sector-specific resources, including models and standards for reporting baseline and performance measurement data.
- *Energy Star Buildings and Plants*: At the request of EPA, IEc added this program to the original list. Many of the "Plants & Buildings" partners match WasteWise partner sectors. In addition, the program maintains a reporting database for partners that can also be used for benchmarking.

IEc found that the following non-EPA programs and initiatives contained reporting guidance or tools that could inform WasteWise data quality and increase reporting; as such, we included them in this review:

- *Australia's Greenhouse Challenge Plus*: This program is mandatory for a small number of companies, but the majority of partners join voluntarily. The program provides resources to help partners calculate their greenhouse gas emissions, and reporting is completed through a universal reporting system. To minimize reporting burden and data duplication, the reporting system shares data with various agencies and programs.
- *Stewardship Ontario's Blue Box*: This mandatory program offers a variety of calculators and guidance documents for waste/recycling reporting.

Synthesis of Data Collection and Quality Control Efforts

For each of the above programs (EPA and non-EPA), IEc conducted a comprehensive review the following materials to identify and compare practices across programs:

- Environmental reporting forms

- Environmental reporting instructions
- Reporting follow up and quality control procedures
- Reporting requirements and/or incentives for reporting
- Program data aggregation
- Program evaluations

IEC asked the following data collection and QA/QC questions of each program reviewed. We answered these questions by reviewing program documents and, when needed, by following up with program staff.

- **Baseline:** How does the program establish a credible baseline?
- **Reporting standards:** What reporting standards does the program use to ensure consistent and accurate data collection? (Examples could include: standard reporting frequency, mandating absolute data, mandating facility-wide reporting, providing definitions of program indicators, and asking for text descriptions to provide context on reported data.)
- **Reporting materials:** How does the program use reporting materials to encourage adherence to reporting standards? (Examples could include: providing clear reporting instructions; using standard reporting forms; using advanced forms such as Excel, PDF, or online forms to minimize reporting confusion or mistakes; using innovative reporting methods or materials to assist program participants in providing quality information.)
- **Reporting compliance:** How does the program encourage or require compliance with reporting standards? (e.g., by making reporting a condition of program participation, or by providing incentives for reporting?)
- **Reporting quality control:** How does the program ensure the quality of reported data? (Examples could include: using a standard guide to review all submissions, comparing data to previously submitted data, comparing data to other data sets like TRI, following up with members on questionable numbers, site visits, reference checks)
- **Data normalization:** Does the program encourage or require members to normalize environmental data to account for external factors, such as economic conditions?
- **Data aggregation:** If the program aggregates data, how does the program ensure that data are suitable for aggregation? Does the program systematically exclude data that should not be aggregated?
- **Double counting:** How does the program address potential double counting within its own reporting, and across programs?
- **Transparency:** How does the program ensure transparency of data limitations in its communication of program results? (Examples could be noting existence or

potential effects of: external conditions, double counting, missing data, excluded data, or other quality control issues.)

- **Benchmarking:** Does the program's data collection facilitate benchmarking of performance among participants and/or between participants and non-participants, and if so, how?

We answered these questions by reviewing program documents, and when needed, by following up with program staff. We discuss the outcome of the best practices review in Chapter 3 under Evaluation Question 4.

In summary, Exhibit 13 maps each evaluation question to methods used to answer it.

EXHIBIT 13: CROSSWALK OF EVALUATION QUESTIONS AND PRIMARY AND SECONDARY DATA COLLECTION METHODS

EVALUATION QUESTION	PRIMARY METHOD(S)	SECONDARY METHOD(S)
1. WasteWise uses a variety of approaches to influence the behavior of partners. Which approaches—for example technical assistance, information, awards and recognition—are most effective for which types of partners?	<ul style="list-style-type: none"> • Focus Group • Review of existing program data including website statistics, ward program data, conference attendance data 	<ul style="list-style-type: none"> • USPS Survey
2. In addition to participation in WasteWise, what other factors may influence a partner organization's decisions to improve management of MSW (e.g., cost savings, consumer pressure, other voluntary program opportunities)?	<ul style="list-style-type: none"> • Literature Review 	<ul style="list-style-type: none"> • USPS Survey • USPS Interviews
3. What can be determined about how WasteWise participation contributes to partner behavior regarding MSW management (e.g., by effecting waste management improvements sooner, better incorporating waste management as a permanent feature of corporate culture, facilitating non-participant changes by providing information)?	<ul style="list-style-type: none"> • USPS Survey • Focus Group 	<ul style="list-style-type: none"> • USPS Interviews • Literature Review
4. What can EPA do to encourage WasteWise partners to submit sufficient environmental data for performance measurement and evaluation purposes?	<ul style="list-style-type: none"> • Best Practices Review 	(None)

Quality Assurance Procedures

In conducting the evaluation, IEC, ESD, and ORCR agreed on a set of three key quality assurances:

- IEC and EPA agreed on the key data sources to inform the evaluation, including:
 - Existing data and documentation on the WasteWise program, including data and documents related to partners' use of WasteWise program activities and services, such as the WasteWise website, helpline, annual conference, and awards program
 - Previous literature review: *Draft Literature Review of Approaches to Estimating Attribution of Voluntary Program.*
 - Company websites and publications, including FedEx, UPS, DHL, and USPS; and government websites, including EPA (e.g., the Smartway program); NTIS, and state transportation agencies
 - Focus group with representatives from sectors participating in WasteWise
 - Survey of USPS facility staff
 - Interviews with select USPS HQ and District staff
 - Review of data collection best practices across select EPA partnership programs and non-EPA voluntary programs
- IEC designed its analyses in the context of the project's overarching evaluation questions and the program logic model, and used statistical techniques to describe the significance of analytical findings where possible and appropriate.
- EPA staff from ESD and ORCR reviewed IEC's outputs, including:
 - Program Evaluation Methodology
 - Summary of Award Data
 - Summary of Conference Data
 - Literature Review
 - Focus Group Summary
 - USPS Survey Results
 - Summary of USPS Interviews
 - Best Practices Review

Appendix H contains the Quality Assurance Plan that IEC delivered to EPA in July 2009.

Strengths and Weaknesses of the Methodology

There are significant strengths of this project that make it unique. The evaluation methodology is well designed for understanding how and why a partnership program is effective, which can provide useful information for program managers of WasteWise and other partnership programs

The greatest strength is that this evaluation relied on a multitude of data collection and analytical methods, including a literature review, a focus group, a survey, interviews, a best practices review, and analyses of existing data. Using multiple sources of information to address the same question provides the opportunity for findings from one source to validate or contradict findings from another source. When findings are validated by more than one information source, it results in increased confidence in the research findings. As discussed in Chapter 4, several of the evaluation findings are bolstered by validation from more than one source.

In addition, the USPS survey was designed to discern statistically significant differences between long-term WasteWise partners and recent joiners regarding waste management attitudes and behaviors, a good indicator of WasteWise impacts. IEC designed the survey in conformance with best practices for evaluation research. In particular, IEC:

- Utilized the expertise of a survey expert and statistician to develop the survey and review survey questions;
- Selected a sample large enough to support statistical analysis;
- Used random stratified sampling to ensure geographic representation.
- Set a clear boundary between the two groups to be studied; Group A joined from 1997 to 2004 whereas Group B primarily joined later, with the majority of districts joining in 2007 and 2008.

A limitation of the survey is that it includes only USPS facilities as opposed to a broader sample of WasteWise members. As discussed above, EPA would have had to file for an ICR to conduct a broader survey. Filing an ICR with OMB for this kind of survey is a time consuming process and based on the program's ICR history, it is unclear if OMB would have approved such an ICR. Moreover, an ICR process was beyond the resources of this evaluation. Although there may be limits to the transferability of USPS findings to the broader WasteWise universe, IEC used the focus group to compensate for this survey weakness. In addition, it should be noted that if anything, USPS behavior is a conservative proxy for behavior of the larger WasteWise universe. USPS has extreme cost pressures, and is unlikely to sustain a long-term involvement with any voluntary program that does not offer clear and compelling value to the organization.

A general limitation of this methodology is that although it finds significant evidence of WasteWise impacts on participant behavior (as discussed in Chapter 4), it cannot quantify the contribution of WasteWise to changes in waste management attitudes and behavior. As discussed in the OMB White Paper in Appendix I, methodologies for mathematically attributing impacts to partnership programs are elusive given the complex ways in which these programs share information and influence behavior among their memberships as

well as in broader markets, and the variety of factors that influence firm-level decision-making around environmental issues.

CHAPTER 3 | FINDINGS

In this chapter, we present findings from the WasteWise evaluation, organized by the four evaluation questions. As discussed in the previous chapter, IEC used multiple methods to address the first three Evaluation Questions; as such, we synthesize findings across methods for these evaluation questions. We include key data and exhibits from interim deliverables to explain and illustrate findings, but do not replicate the full detail of interim deliverables here. We have included a number of project deliverables in the Appendices for reference; the literature review is included in Appendix B; the focus group summary is included in Appendix D; the survey results deliverable is included in Appendix F; and the Best Practices Review for Data Collection and Quality Control is included in Appendix G.

EVALUATION QUESTION 1: WasteWise uses a variety of approaches to influence the behavior of partners. Which approaches—for example technical assistance, information, awards and recognition—are most effective for which types of partners?

Findings:

The focus group was the most helpful method to address this question. During the focus group, IEC was able to collect direct feedback on WasteWise technical tools and the program’s general approach to interfacing with partners. In the case of conferences and awards, IEC also had good existing data on their use that served to supplement focus group findings. The survey was not particularly helpful in addressing Evaluation Question 1 because materials are often not branded as WasteWise materials at the facility level in USPS. Hence, facility-level staff may not be aware that technical assistance materials provided by USPS management integrated the WasteWise framework and WasteWise content.

The WasteWise awards program reaches many participants and receives very positive feedback. Focus group participants noted that WasteWise awards resonate with executives, and many participants find them helpful in promoting their participation in the WasteWise program, and for communicating their environmental programs to the public. One participant stated that if his organization had not received a WasteWise award, they would have stopped recycling marginal commodities three to four years ago. Because the organization received an award for its recycling program, however, recycling of the material became standard operating procedure and is now perceived as mandatory throughout the organization.

The award program reaches many WasteWise partners. As shown in Exhibit 14, a large number of program participants have been involved in the awards program, with 171 different participants having won one or more awards over the course of the program.

EXHIBIT 14: SUMMARY OF AWARD WINNERS BY NUMBER OF AWARDS WON 1998-2008

NUMBER OF AWARDS	NUMBER OF PARTICIPANTS	PERCENT OF ALL AWARD WINNERS	TOTAL NUMBER OF AWARDS	PERCENT OF ALL AWARDS WON
1	78	45.61%	78	15.82%
2-5	65	38.01%	184	37.32%
6-9	21	12.28%	157	31.85%
10-12	7	4.09%	74	15.01%
Total	171	100%	493	100%

To investigate the representation of award winners by sector, IEc identified the top ten award winners by sector. This is shown in Exhibit 15.

EXHIBIT 15: TOP TEN AWARD WINNERS BY SECTOR 1998-2008

SECTOR	NUMBER OF AWARDS	PERCENT OF TOTAL AWARDS
Local Government	47	9.53%
Federal Government	45	9.13%
Utilities	40	8.11%
Furniture Manufacturing	34	6.90%
Colleges and Universities	30	6.09%
State Government	29	5.88%
Electronics & Electrical Equipment	26	5.27%
Motor Vehicles & Part	24	4.87%
Scientific, Photographic, & Control Equipment	22	4.46%
Entertainment	17	3.45%
Total	314	66.69%

As shown in Exhibit 15, local and federal government agencies won a combined total of almost 20% of all awards given between 1998 and 2008, with state government agencies winning an additional 6%. Utilities, furniture manufacturing, and colleges and universities are also well represented among award winners, accounting for slightly more than 20% of the total.

The WasteWise conference received generally positive feedback from focus group participants, but conference data and survey data call the value of conferences into question. The annual conference received generally positive reviews from focus group participants. One participant who has participated since the mid-90's and whose organization is involved in many other voluntary programs, finds the WasteWise

conference to be the overall best-run conference of its type. However, another participant thought the conference was too small and is of limited value because it is focused on the awards ceremony. The networking opportunities provided by the conference were commended by most focus group participants, and many of them expressed an interest in expanding the networking opportunities available through WasteWise.

The conference attendance data are not as positive as the focus group feedback. IEC analyzed 2007 and 2008 conference attendance data by participant and sector. There were 210 conference attendees in 2007 and 170 attendees in 2008, a drop of 40 participants. The data revealed that both the 2007 and 2008 WasteWise Conferences were attended by federal government participants more than any other WasteWise participant sector, as shown in Exhibit 16. Federal agencies represent approximately 25% of all participants by sector that attended in 2007 and 37% in 2008.

EXHIBIT 16: WASTEWISE CONFERENCE ATTENDEES BY SECTOR

SECTOR	NUMBER OF ATTENDEES 2008	NUMBER OF ATTENDEES 2007
Federal Government	51	63
Electronics and Electrical Equipment	15	6
Utilities	11	14
Waste Management Services	11	5
Local Government	10	27
Fossil Fuel Production	10	2
Consulting and Employment Services ⁷	6	3
Colleges and Universities	5	9
Food Manufacturing	3	1
Furniture Manufacturing	3	2
Medical Services	3	2
Motor Vehicles and Parts	3	9
Non-Profit Organization	3	3
Pharmaceuticals	3	3
Schools - K - 12	3	3
State Government	3	7
Building Materials	2	0
Chemicals	2	0
Communication	2	4
Forest and Paper Products	2	4
Retail and Mail Order	2	1
Rubber and Plastic Products	2	2
Wholesale Distribution	2	0
Airlines	1	1
Banking, Finance and Savings	1	0

⁷ WasteWise Contractor ICF (5 attendees 2008, 9 attendees 2007) were excluded from the total.

SECTOR	NUMBER OF ATTENDEES 2008	NUMBER OF ATTENDEES 2007
Beverages	1	1
Computer and Office Equipment	1	1
Construction and Engineering	1	1
Entertainment	1	1
Food, Drug and Convenience Stores	1	0
Hotels, Resorts and Lodging	1	0
Scientific, Photographic and Control Equipment	1	1
Printing and Publishing	0	2
Property Management and Real Estate	0	2
Industrial and Farm Equipment	0	1
Restaurant and Food Services	0	1
Other/Unknown	4	17
Total	170	210

Within the federal government agencies, US EPA represents an overwhelming proportion of federal government participation, not surprisingly. Exhibit 17 shows the breakdown of WasteWise conference attendees from federal government agencies in 2007 and 2008.

EXHIBIT 17: FEDERAL AGENCY 2007 AND 2008 WASTEWISE CONFERENCE ATTENDANCE

FEDERAL GOVERNMENT AGENCY	2008 CONFERENCE ATTENDANCE	2007 CONFERENCE ATTENDANCE
US Environmental Protection Agency	36	41
US Postal Service	9	8
US Department of Agriculture	1	0
US Air Force	1	0
National Partnership for Environmental Priorities	1	0
National Institute of Health	1	4
Naval Facility Engineering Command - Atlantic	1	0
Naval Institute for Dental and Biomedical Research	1	0
US Army, Fort Hood	0	1
Department of Homeland Security	0	1
Pentagon	0	2
Sandia National Labs	0	1
Federal Aviation Administration	0	3
Oak Ridge Lab	0	2

EPA represents approximately 65% of all attendees at the 2007 WasteWise Conference, and approximately 70% in 2008. The next largest representation of federal agencies for both years was the US Postal Service (USPS), however, the USPS represented less than 20% of federal attendees in 2007 and 2008. The National Institute of Health is the only other group that attended both the 2007 and 2008 WasteWise Conference, with all other federal agencies attending only one of the two Conferences. Sandia National Labs, which is historically one of the highest WasteWise award winners, having won ten awards between 1998 and 2008, sent one representative to the 2007 Conference and had no representatives at the 2008 Conference. This high degree of variability in federal agency attendance could be interpreted in different ways. On one hand, it is a positive sign that different agencies are interested in the WasteWise program. On the other hand, it is curious that many agencies that attended in 2007 did not attend in 2008.

Examining the remaining top five sectors for attendance, we found a similar variability among participation rates. Exhibit 18 shows the number of partners in each of these sectors that were represented at both the 2007 and 2008 WasteWise conferences. The totals reflect the number of partners and not total participation, as several partners sent more than one representative.

EXHIBIT 18: CONFERENCE REPEAT ATTENDEES BY SECTOR

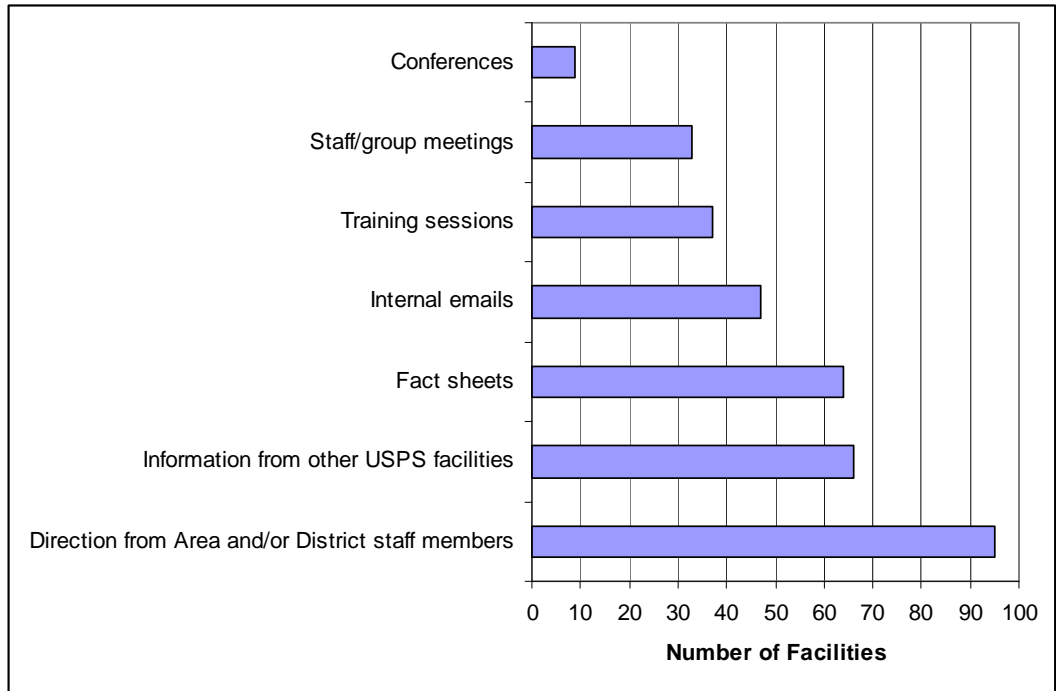
SECTOR	2008 CONFERENCE: # OF PARTNERS REPRESENTED	2007 CONFERENCE: # OF PARTNERS REPRESENTED	# OF PARTNERS WITH REPEAT ATTENDANCE IN 2007 AND 2008
Electronics and Electrical Equipment	5	3	2
Utilities	6	8	2
Waste Management Services	8	5	1
Local Government	8	25	4

As seen in Exhibit 18, three of the sectors had similar participation numbers at both conferences. There is little repeat attendance among any of the four sectors in 2007 and 2008. Local government representation varied greatly between 2007 and 2008, which may be an effect of the economic downturn. Although repeat attendance for this sector is the highest, the rate of repeat attendance is still low. While we would have to look at a longer time period to analyze trends in conference attendance confidence, the low level of repeat attendance from 2007 to 2008 is not a positive indicator for the WasteWise conference. However, partners that attended both conferences sent a similar number of representatives, if not more, to the 2008 conference. For example, Raytheon sent four representatives to the 2007 conference and 10 in 2008.

Finally, although the USPS survey is generally of limited value in assessing WasteWise approaches because of the lack of WasteWise branding at the USPS facility level, it is worth noting that conferences in general (not just WasteWise conferences) were the tools least cited as influencing waste management in the USPS survey, as shown in Exhibit 19.

Furthermore, the majority of survey respondents were not familiar with the WasteWise conference in particular.

EXHIBIT 19: TOOLS THAT INFLUENCE WASTE MANAGEMENT ACTIVITIES AT FACILITIES



WasteWise receives consistently positive feedback on technical tools offered to partners, including Greenhouse Gas Calculations, Re-TRAC, program website, and helpline: Greenhouse gas calculations were cited by participants in the focus group as one of the WasteWise tools used extensively. Participants noted that the fact that the calculations come from EPA gave them credibility within their organizations. One participant went as far as to say that the use of the calculations were a key component of their continued involvement in the program. Although survey respondents were not familiar with WasteWise tools in general, of facilities that were familiar with these tools, WARM Greenhouse Gas calculations received the most positive reviews.

Similarly, focus group participants indicated that the Re-TRAC system is extremely helpful, and were very enthusiastic about the system’s ability to assist with waste management and reporting. The ability to select different commodities was a popular component of Re-TRAC. (As discussed under Evaluation Question 4, Re-TRAC has also been critical for facilitating robust data collection and management for performance measurement.) USPS interviewees noted that Re-TRAC is a key benefit for assisting new partners in particular with waste tracking.

Some focus group members raised questions about how up-to-date the greenhouse gas calculators are. One participant expressed concern that portions of the website have not been updated in several years and that the WARM model, in particular, was not reflective of current advancements in GHG calculations. Also, many participants expressed interest in syncing their internal greenhouse gas calculators with the calculators offered through the WasteWise program, to streamline GHG monitoring and reporting.

Focus group participants largely agreed about the overall helpfulness of the website, due in particular to the availability of useful resources, calculators, and methodologies. WasteWise partners who are aware of the helpline report that they find it extremely helpful, especially with regard to seeking out information about annual reporting and award applications. However, some participants were completely unaware of the helpline, or unaware of the breadth of service that it provides.

Despite overall enthusiasm for WasteWise technical tools, some WasteWise partners perceive that EPA's communication on the availability of these tools is lacking. Participants who did not utilize specific tools often cited their lack of knowledge about them. One participant suggested that EPA provide training sessions aimed at new members that would involve using the website, annual reporting, and the applicability of WasteWise tools.

WasteWise partners are hungry for more communication from the program.

During the focus group, the discussion of WasteWise tools led to a broader discussion on the dissemination of information throughout the WasteWise program. There was a clear divide between perceptions of long-term members and more recent joiners. Several newer members had not used the helpline and were not aware of the services provided by it. One new joiner indicated that his involvement was minimal due to a lack of information and training. A long-term member indicated that, in the past, WasteWise information was much more prevalent and available, but over the past year, the level of information he received from WasteWise had dropped drastically. However, not all long-term members agreed with this sentiment. Participants did share general agreement that the WasteWise contact information is out of date and that information distribution is not reaching all members.

Partners are looking for several ways to become more informed about WasteWise and take better advantage of program offerings, including;

- Training for using the WasteWise tools, annual reporting, and award applications.
- More frequent contact from WasteWise about annual reporting, award applications and other program announcements.
- An updated, browsable, online directory of WasteWise to replace the current system, which only allows for searching but not browsing.
- Opportunities for newer members to network with older members who have won awards and who are more knowledgeable regarding annual reporting and other aspects of WasteWise.

Finally, focus group participants indicated that EPA should work harder to champion the importance of WasteWise to increase its potential as a means of establishing closer strategic relationships with other members (who may be suppliers).

Sector-based differences in perceptions of WasteWise approaches are minimal. The focus group participants did not express divisions in perceptions of WasteWise approaches among sectors, with the one exception of the waste management sector, whose representative expressed concern that many WasteWise approaches were not generally applicable to the sector. From IEC's review of existing data, it appears that a diversity of sectors participate in and benefit from the awards program. Although certain sectors attend the conferences more than others (USPS, local government partners, electronics/electrical equipment manufacturers, utilities), these attendance numbers appear to correlate with the sectors' overall facility participation rates in WasteWise. It is interesting that USPS is highly represented at conferences, given the low marks that facility-level staff gave to conferences in general. However, it is quite possible that USPS District and Area staff attend WasteWise conferences, as opposed to the facility-level staff that participated in the survey.

EVALUATION QUESTION 2: In addition to participation in WasteWise, what other factors may influence a partner organization's decisions to improve management of MSW (e.g., cost savings, consumer pressure, other voluntary program opportunities)?

Findings:

IEC used the literature review as the main method to address this evaluation question; the complete literature review is included in Appendix B. The literature review is comprised of a targeted review and analysis of recent literature related to partnership programs, focusing on the identification of the key external factors (i.e., factors not part of program design) that may influence decisions to participate in the WasteWise program and to change management practices. Below, we summarize findings of the literature review. Under Evaluation Questions 3 and 4, we refer back to literature review findings in the discussion of WasteWise impacts and the discussion of best practices for data collection and quality control.

The literature review identified 12 general factors that influence environmental decision-making. IEC grouped these factors into the following categories: external market forces, potentially complementary factors, pre-existing requirements, and factors with uncertain impacts vis-à-vis WasteWise.

External market forces includes two factors, production levels/market trends and firm size. Decreases in waste generation may be the direct result of a decrease in production levels to respond to broader market forces. Broader market or sector trends can have a direct effect on the changes in waste generation and waste management reported by existing partners. Thus, production levels could result in overstatement or understatement of WasteWise impacts. (In consideration of this dynamic, IEC addresses the issue of normalizing for economic conditions within the Best Practices Review and Evaluation Question 4). The firm size factor indicates that different sizes may have different motivations for joining partnership programs. For example, larger firms that are more

likely to have sophisticated waste management approaches may focus on recognition, while smaller companies may find technical assistance more important.

Potentially complementary factors to WasteWise include four factors: customer/supply chain pressure, community pressure/public image, environmental ethic, and cost savings. EPA has traditionally addressed these factors as “alternative” motivations to WasteWise, and has discounted the role of WasteWise and other voluntary programs in partner outcomes when these factors are clearly present. The literature, however, suggests that these factors can work in complementary ways with WasteWise and similar programs by assisting firms in obtaining and sharing information, and in adopting practices that confer cost savings, demonstrate responsiveness to suppliers/public, and demonstrate adherence to the firm’s environmental ethic. For example, a firm may join WasteWise to demonstrate an environmental ethic, and may also, as a result of WasteWise, implement a waste management plan earlier or on a broader scale, and thus enjoy greater cost savings. Therefore, WasteWise may provide specific program resource or activities that represent real program achievement, even in the context of other motivations. To evaluate the impact of these factors on a particular firm, one would need to understand the role of WasteWise and the extent to which the program’s tools, resources, and activities contributed to the waste reduction or management outcomes.

Pre-existing requirements: The literature review found that in situations where partners have separate, pre-existing requirements associated with other regulatory or legally-binding agreements, these requirements are likely to drive documented waste management changes, and WasteWise participation would have little or no impact. The literature review indicates that changes in waste generation at companies that, for example, are subject to state-level waste bans for certain wastes, should not be considered the result of WasteWise activities. As discussed under Evaluation Question 3, information that IEc collected from interviews with USPS conflicts to a certain degree with this finding.

Uncertain impacts: The remaining five factors fall under the category of **uncertain impacts** because it is not clear in general whether they complement WasteWise’s structure, or indicate a motive that precludes a significant impact by WasteWise. These factors include public disclosure laws, threat of future regulation, pressure from environmental groups, and industry pressure or internal industry codes. The impact of each of these factors is context-specific, and a complete evaluation of WasteWise impacts requires firm-specific information to determine how these factors intersect with WasteWise activities. The fifth uncertain impact, participation in other voluntary programs, raises uncertainty because of potential double counting (this factor is addressed in best practices review under Evaluation Question 4).

EVALUATION QUESTION 3: What can be determined about how WasteWise participation contributes to partner behavior regarding MSW management (e.g., by effecting waste management improvements sooner, better incorporating waste management as a permanent feature of corporate culture, facilitating non-participant changes by providing information)?

Findings:

The survey results provide clear evidence that WasteWise contributes to better waste management practices among USPS facilities. Early WasteWise joiners (Group A) reported greener approaches to waste management overall compared to later joiners (Group B), and many results were statistically significant. Specifically:

- *Early USPS WasteWise joiners (Group A) conduct more recycling activities than later joiners (Group B).*

The survey asked respondents about recycling activities that are undertaken at their facility. As shown in Exhibit 20, on average, participants in Group A reported 2.77 recycling activities per facility, versus 2.00 activities for participants in Group B. This difference is statistically significant at the 1% level ($t = 3.13$).

EXHIBIT 20: RECYCLING ACTIVITIES AT USPS FACILITIES

RECYCLING ACTIVITY	GROUP A (N=30)	GROUP B (N=102)	TOTAL
Reverse hauling of undeliverable mail	19	48	67
Separate collection/contracts with recyclers in addition to waste haulers	19	61	80
Participate in specific recycling approach identified by local government	6	15	21
Work with post offices to collect waste materials from customers (e.g., unwanted mail from customer PO Boxes)	21	31	52
Reuse of recycled materials in-house	14	30	44
Other	4	19	23
Total number of recycling activities	83	204	287
Average number of recycling activities per facility	2.77	2.00	2.17

- *Early USPS WasteWise joiners (Group A) have higher recycling frequencies for every material, and a higher recycling frequency across materials, compared to later joiners (Group B).*

The survey asked a series of questions about the frequency of recycling for a variety of materials (undeliverable mail, plastic pallets, wooden pallets, corrugated cardboard, mixed paper, office supplies, and plastic). For each material, the survey asked facilities if the material is recycled:

- Always or almost always (90-100% of the time)
- Usually (50-90% of the time)

- Occasionally (10-50% of the time)
- Rarely or never (0-10% of the time)

For communication purposes, IEC color-coded results of the recycling frequency question using King County’s Environmental Behavior Index (EBI)⁸, presented in Exhibit 21.

EXHIBIT 21: ENVIRONMENTAL BEHAVIOR INDEX CLASSIFICATION

FINDING ON RECYCLING FREQUENCY	COLOR CODING
Always/Almost Always: 90 - 100% of the time	Green
Usually: 50 - 90% of the time	Light Green
Occasionally: 10 - 50% of the time	Yellow
Rarely/Never: 0 - 10% of the time	Brown
Other	White
Not Applicable: this facility does not use/receive the material	White

IEC analyzed material specific results, and rolled up results across materials. Exhibit 22 presents a rollup of recycling frequency across all materials. As shown in Exhibit 22, Group A more frequently indicated that materials are always or almost always recycled, and Group B more frequently indicated that materials are rarely or never recycled. Material-specific results can be found in the WasteWise Survey Results memo in Appendix F.

EXHIBIT 22: RECYCLING FREQUENCY ACROSS ALL MATERIALS (ROLL UP ANALYSIS)

RECYCLING FREQUENCY	GROUP A	GROUP B	DIFFERENCE
Always/Almost Always: 90 - 100% of the time	69.31%	55.46%	13.85%
Usually: 50 - 90% of the time	15.84%	11.93%	3.91%
Occasionally: 10 - 50% of the time	1.98%	4.74%	-2.76%
Rarely/Never: 0 - 10% of the time	6.44%	19.97%	-13.53%
Other	5.45%	6.75%	-1.30%
Not Applicable	0.99%	1.15%	-0.16%
Total	100.00%	100.00%	

We conducted a statistical analysis of the difference in recycling frequency of Group A and Group B for always/almost always recycle and rarely/never recycle. On average, participants in Group A reported always/almost always recycling 4.7 materials, versus 3.8 materials for participants in Group B. This difference is statistically significant at the 5% level ($t = 2.52$). Participants in Group A rarely/never recycle an average of 0.4 materials, while Group B reported rarely/never recycling and average of 1.4 materials, as presented in Exhibit 23. This difference is statistically significant at the 1% level ($t = 3.24$). We

⁸ The EBI approach involves coding responses to communicate the environmental soundness of different actions (e.g., green indicates most environmentally sound action, brown indicates least environmentally sound). King County, Washington, used the EBI approach to communicate survey results on the adoption of environmentally preferable behaviors among County residents.

did not conduct statistical analyses for the “usually” and “occasionally” frequencies, as those two categories were very broad, accounting for frequencies ranging from 10 to 90%.

EXHIBIT 23: STATISTICAL ANALYSES OF RECYCLING FREQUENCIES ACROSS ALL MATERIALS (ROLL UP ANALYSIS)

RECYCLING FREQUENCY	AVERAGE # MATERIALS GROUP A	AVERAGE # MATERIALS GROUP B	TEST STATISTIC ⁹
Always/Almost Always: 90 - 100% of the time	4.8	3.8	2.5214**
Rarely/Never: 0 - 10% of the time	0.4	1.4	3.1846***

As shown in Exhibit 24, recycling frequency varied by material. Cardboard was the material most frequently cited as being recycled always or almost always, with 97 % of respondents from Group A reporting that cardboard always or almost always recycled. Cardboard was also the most frequently reported material for Group B, with 81% of respondents indicating that cardboard is always or almost always recycled. Undeliverable mail was second most recycled material for both groups.

Group A reported higher recycling rates than Group B for every individual material. Differences in recycling rates between Group A and Group B ranged from a small difference, such as 3% for office supplies, to a larger difference of 20 % for recycling plastic pallets. In general, the difference in responses ranged from 10 – 15 %. The survey results memo in Appendix F provides details on recycling rates by material for Group A and Group B.

EXHIBIT 24: FREQUENCY OF ALWAYS/ALMOST ALWAYS RECYCLING RESPONSES BY MATERIAL

MATERIAL	GROUP A	GROUP B	DIFFERENCE
Corrugated Cardboard	96.55%	81.00%	15.55%
Undeliverable Mail	89.66%	71.43%	18.23%
Mixed Paper	75.00%	58.59%	16.41%
Office Supplies	68.97%	66.00%	2.97%
Wooden Pallets	62.07%	48.51%	13.55%
Plastic Pallets	58.62%	38.38%	20.24%
Plastics	34.48%	24.24%	10.24%
Average	69.33%	55.45%	13.88%

Note: Percentages cannot be aggregated because this table presents only the frequency of selecting always/almost always recycles; Appendix F contains detailed results for the response options provided for this question.

- ***Early USPS WasteWise joiners (Group A) have been recycling for a longer time than later joiners (Group B).***

⁹ *** denotes 99% significance level, ** denotes 95% significance level, and * denotes 90% significance level.

The survey asked USPS facilities about the tenure of recycling activities. IEC analyzed material specific results (presented in the survey results memo in Appendix F) and rolled up results across materials. As shown in Exhibit 25, respondents most frequently indicated a recycling tenure of more than five years, across all materials. However, 53 % of respondents from group A reported first recycling materials more than five years ago, compared to 40 % in group B. In addition, Group A reported that facilities started recycling an average of 3.7 materials more than five years ago. Group B reported first recycling an average of 2.7 materials more than five years ago. This difference is statistically significant at the 5% level ($t = 2.13$).

EXHIBIT 25: TENURE OF RECYCLING ACROSS ALL MATERIALS (ROLL UP ANALYSIS)

TENURE OF RECYCLING	GROUP A	GROUP B	DIFFERENCE
More than 5 years ago	52.74%	40.18%	12.56%
3 - 5 years ago	10.95%	11.09%	-0.14%
2 - 3 years ago	3.48%	7.50%	-4.02%
1 - 2 years ago	9.95%	6.60%	3.35%
6 - 12 months ago	2.49%	2.40%	0.09%
In the past 6 months	1.00%	1.50%	-0.50%
I do not know	12.94%	10.49%	2.45%
Question was not asked (material is rarely/never recycled)	6.47%	20.24%	-13.77%
Total	100.00%	100.00%	

- *Early USPS WasteWise joiners (Group A) are more aware of their recycling rates than later joiners (Group B).*

The survey asked about awareness of the facility’s recycling rate across materials. As shown in Exhibit 26, over 70% of respondents from Group A indicated that they either know their recycling rate, or could research it for all or some materials it, while just over 50 % from Group B reported the same. This difference is statistically significant at the 10% level ($z = 1.92$). Very few facilities in either group knew their overall recycling rate off-hand.

EXHIBIT 26: AWARENESS OF RECYCLING RATE ACROSS ALL MATERIALS

DO YOU KNOW THE APPROXIMATE RECYCLING RATE FOR THE MATERIALS YOUR FACILITY RECYCLED IN 2008?	GROUP A	GROUP B	DIFFERENCE
No, this metric is not tracked.	28.57%	48.98%	-20.41%
I know or could research recycling rates for some of the materials we recycle, but not all.	32.14%	24.49%	7.65%
Yes, but I would need to research it.	32.14%	18.37%	13.77%
Yes, I roughly know the %age of materials that were recycled.	7.14%	8.16%	-1.02%
Total	100.00%	100.00%	

For two survey questions, results indicated that Group A has greener practices than Group B, but results were not statistically significant. These include:

- Frequency of changes to operations or to the facility's organization resulting from recycling and waste prevention.
- Number of waste prevention activities.

Differences between Group A and Group B on the following survey questions were mixed and/or marginal:

- Changes in attitudes of facility personnel about waste prevention.
- Waste prevention/recycling leading to other environmental initiatives.

Additional information on the above survey questions and responses can be found in the survey results memo in Appendix F.

Survey respondents cite several reasons for initiating recycling that are potentially proxies for WasteWise influence, or complementary to WasteWise factors.

The survey asked USPS staff why they started to recycle various materials; results are presented in Exhibit 27. Cost savings opportunity was the most common response, being cited 527 times reason across all materials. As discussed under Evaluation Question 2, despite conventional wisdom, the cost savings in motivating behavior is not necessarily a detractor to the role of WasteWise, as WasteWise is designed to help facilities enjoy cost savings from waste prevention and recycling. In fact, focus group participants and USPS interviewers indicate that WasteWise provided cost savings opportunities, as discussed later in this section.

Encouragement from District/Area representatives was the second most common response, with 312 responses across the two groups. Requirement of District/Area representatives was the fourth most frequently cited reason for first recycling materials, with 188 responses across the two groups. Given that District and Area representatives use WasteWise as the organizing framework for USPS waste management approaches, and these representatives are a conduit for WasteWise information to USPS facilities, we view these responses as potential proxy indicators for WasteWise influence at the facility level. EPA voluntary program participation, another proxy for WasteWise, was cited 57 times across the two groups.

Survey respondents cited local initiatives 90 times across Groups A and B, and cited state or local requirements 36 times. These factors are more likely to discount the role of WasteWise in firm behavior, but they are also far less common than potential proxies for WasteWise, and potential complementary factors to WasteWise. Also, the effect of state and local requirements in this context are non-linear and difficult to decipher; see further discussion of WasteWise's role in USPS response to waste bans within the discussion of WasteWise interview findings below.

EXHIBIT 27: REASONS CITED FOR WHY FACILITIES STARTED RECYCLING (ACROSS MATERIALS)

REASON FOR RECYCLING (CHECK ALL THAT APPLY)	TIMES CITED BY GROUP A (N=30)	TIMES CITED BY GROUP B (N=102)	TOTAL	GROUP A RESULTS NORMALIZED BY FACILITY COUNT	GROUP B RESULTS NORMALIZED BY FACILITY COUNT
Cost savings opportunity	133	394	527	4.4	3.9
District/Area representatives encouraged it	98	214	312	2.5	2.1
District/Area representatives required it	76	112	188	0.9	1.1
Local initiatives	26	64	90	0.6	0.6
EPA voluntary program participation	19	38	57	0.2	0.4
Other	7	46	53	0.5	0.5
Required by local or state law	15	21	36	.5	0.2

Self-selection bias is unlikely to explain the extent of differences found in the survey between early and later WasteWise joiners. Early USPS WasteWise joiners may have benefited from Area and District management that were generally more proactive on environmental issues than Group B. Thus, one could argue that Group A has a self-selection bias, and may have undertaken improvements to waste management seen in the survey results in absence of WasteWise. Thus, we looked for evidence, beyond differences in Group A and Group B, that WasteWise contributed or did not contribute to waste management practices. We found some indications of WasteWise’s direct influence from survey responses, which counter the notion that proactive Area and District management can explain differences in Group A and Group B:

- ***The timing of when facilities started to recycle is generally consistent with when facilities joined WasteWise.*** Group A joined from 1997 to 2004 whereas Group B primarily joined later, with the majority of districts joining in 2007 and 2008. As discussed above, the survey found a statistically significant difference in the number of facilities that started recycling or improved waste management over five years ago between Group A and Group B, with many more facilities in Group A starting recycling more than five years ago. Moreover, given that Group B joined WasteWise mostly in the 2007-2008 timeframe, we would expect to see more Group B recycling activity starting during this time if the activity was tied to joining WasteWise. Across all materials, the proportion of respondents in Group B that started recycling 2-3 years ago is 4% more than Group A respondents. However, this difference is larger for individual materials, including a 9% difference for undeliverable mail recycling, and a 6% difference in plastic pallet

and cardboard recycling. To the extent that WasteWise efforts have been directed at these materials over the last few years, this would be further evidence of causality.

- Although we did not expect respondents at the facility level to be familiar with WasteWise by name, *some facilities directly cited WasteWise as a reason for originating recycling activities*, including 27% of respondents in Group A and 14% from Group B. Moreover, the higher proportion of respondents in Group A citing WasteWise as a factor in originating recycling activities does not support the notion that self-selection bias accounts for differences seen in Group A and Group B.
- *Many survey respondents from both Group A and Group B indicated that District and Area representatives either encouraged or (less frequently) required recycling of various materials, as shown in Exhibit 27.* Given that District and Area representatives are a conduit for WasteWise information to USPS facilities, these are potential proxy indicators for WasteWise influence, as discussed above. As shown in Exhibit 27, the number of times that influence of District and Area representatives was cited is similar in Group A and Group B, which does not support the notion that District and Area staff are generally more proactive in Group A. In addition, if being independently environmentally proactive was the main reason that Group A started recycling earlier, we would not expect to see cost savings cited more by Group A (on a normalized basis) as a factor motivating behavior.

Focus group results and USPS interviews validate survey findings that WasteWise contributes to changes in waste management.

- *Several focus group participants identified tangible waste prevention or recycling achievements that WasteWise contributed to.* Specific benefits of WasteWise cited by focus group participants include:
 - Initiating waste management initiatives that led to environmental benefits and cost savings, and which would not have occurred outside of WasteWise, or would have occurred later in the absence of WasteWise.
 - Continuing greener waste management practices that were environmentally preferable but not justified on a cost basis, because the firm had communicated the improved practices to stakeholders.
 - Using WasteWise data and framework to support broader sustainability goals such as carbon neutrality and green building operations.
 - Communicating waste management achievements to stakeholders. Specifically, focus group members stated that communications to the public about waste management were more credible when mentoring WasteWise, and that these communications contributed to the practices becoming standard, permanent procedures.

- *USPS staff interviewed reported that early joiners have tangibly benefited from cumulative knowledge gained from being a WasteWise partner, which has led to better results seen in the survey.* This assessment was provided by all three of the USPS interviewees, including an interviewee from a district that joined later. Interviewees underscored that WasteWise gave USPS a framework and a game plan to implement the organization’s general waste management goals. One interviewer stressed that WasteWise assistance in identifying recycling markets was quite valuable and led to recycling of additional waste streams.

One USPS interviewee indicated that the organization used WasteWise as a framework to respond to a patchwork of different state waste bans in a coherent, efficient way. Without the framework and tools offered by WasteWise, the interviewee stated that USPS would have taken longer to come into compliance with the waste bans, and compliance costs would have been higher. The literature review underscores that WasteWise cannot take “credit” for mandated environmental improvements. However, if data were available, WasteWise could conceivably take credit in this case for “early adoption” – the mandated improvements that occurred prior to the compliance deadline. Moreover, the program could take credit for compliance cost savings associated with the new regulation.

The inability to conduct the district survey hindered learning about some potential areas of WasteWise influence on USPS, including personnel attitudes on waste management; and changes in relationships with regulators, suppliers, competitors, and the public. The facility survey indicated little difference between Group A and B on personnel attitudes; interviewees noted that WasteWise influence on attitudes is mostly seen at the district level. Given IEC’s understanding of USPS structure, we did not ask questions about changes in relationships at the facility-level questionnaire, as these questions are likely not applicable to facility-level staff. If we found transmission of WasteWise principles and activities through partner organizations, and/or to external organizations (i.e., spillover effect) that would be a significant area of program benefit. We discuss this “OMB White Paper in Appendix I.

EVALUATION QUESTION 4: What can EPA do to encourage WasteWise partners to submit sufficient environmental data for performance measurement and evaluation purposes?

Findings:

We discuss the findings of the best practices review below; the complete best practices review is included in Appendix G.

It should be noted that since IEC commenced this evaluation in late 2008, EPA instituted new data reporting requirements for WasteWise. For example, WasteWise now requires partners to sign a Partnership Agreement when registering, and the program has developed a Partnership Assurance Protocol requiring partners to report baseline and annual data in order to remain in active status. In addition, WasteWise has transitioned to a fully online reporting system in July 2009. The best practices review took these recent program changes into account.

Also, it would be unrealistic to expect WasteWise or any other EPA partnership program to implement all of the data collection and QA/QC best practices identified by IEC in the best practice review. Some of the best practices are resource intensive, and cannot be implemented in the absence of staff able to dedicate much of their time to performance measurement. In addition, some of the best practices and specific data recommendations identified in this report may fall outside of the current ICR and approved data collection forms.

WasteWise is now collecting data necessary to establish a credible baseline.

WasteWise has requested baseline data from new partners since 2005, although most partners did not provide baseline data on a voluntary basis. As noted above, WasteWise recently developed a Partnership Agreement that requires partners to register in the program and submit baseline and annual data. Upon registering for WasteWise, the “Welcome to WasteWise” email generated by Re-TRAC communicates that prospective partners need to report baseline information within 60 days of joining the program. Partnership is activated by submitting baseline data; for example, EPA lists the entity as a partner and distributes an electronic logo once the data are submitted. If EPA does not receive data within 60 days, the Re-TRAC account is deactivated, and partnership is never established. WasteWise staff may grant extensions to this reporting schedule on a case-by-case basis depending on partner circumstances.

Now that WasteWise is collecting baseline and annual data (see below) for all partners, it will develop a data set that could be mined for performance measurement purposes in the future. Although this evaluation takes an in-depth look at changes in partner behavior associated with WasteWise membership, the program will be in a better position to analyze program environmental outcomes in a few years, when it has accrued enough baseline and annual data to support trend analysis.

WasteWise has created a powerful incentive for program participation and reporting by offering free access to Re-TRAC. Re-TRAC is popular, proprietary online software that assists organizations in tracking waste prevention, disposal, and recycling at the commodity level. In absence of WasteWise, organizations pay a subscription fee to use Re-TRAC. Offering Re-TRAC for free to WasteWise participants is a key program benefit. Focus group participants and USPS interviews indicated that Re-TRAC is very helpful for tracking waste minimization and recycling efforts. WasteWise also provides a GHG report on waste and recycling data reported, which focus group members identified as a valuable service. Independent of this evaluation, EPA has received positive feedback on Re-TRAC from its partnership.¹⁰

WasteWise has taken steps to encourage participant adherence to the program’s reporting standards, although EPA could do more to improve the first-time quality of data submitted by partners. The new WasteWise Partnership Assurance Protocol requires annual reporting by March 31st for the previous calendar year. Re-TRAC facilitates incremental reporting, so facilities can enter data weekly or monthly, or at intervals customized by a partner, as an alternative to entering annual quantities. (Re-TRAC automatically sums data reported across time at the end of the year to develop

¹⁰ WasteWise Re-TRAC factsheet, available at: <http://www.epa.gov/osw/partnerships/WasteWise/pubs/retrac.pdf>

annual quantities.) EPA deactivates WasteWise partnership for partners who do not submit annual data within 60 days of the March 31st deadline, unless EPA staff grants an extension for extenuating circumstances.

Re-TRAC provides instructions to participants for reporting waste data. Re-TRAC also provides guidance on data collection practices, and provides links to FAQs and other resources. In addition, WasteWise advertises on its reporting page that the program hotline can provide assistance with data reporting; hotlines can be very effective tools for ensuring partner understanding of program requirements and compliance with them. Finally, WasteWise maintains a library of on-line documents to assist partners with reporting-related activities including: setting up recycling programs, conducting waste audits, monitoring program effectiveness, and communicating program results.

Other programs reviewed have taken additional steps to encourage adherence to reporting standards, including:

- Providing model baseline and annual reports.
- Providing direct links from the online reporting form to a list of common conversions, to avoid conversion errors.
- Specifying data fields that participants are required to complete before submitting an annual report. IEC was able to submit a blank test annual report through the Re-TRAC system. Although all annual reports submitted via Re-TRAC are reviewed and approved before being formally entered into the WasteWise, database, requiring fields would help to clarify reporting rules, improve first time quality, and reduce resources necessary for reviewing reported data.
- Collecting supplemental information on *how* partners measure or estimate reported quantities. For example, recycling data are typically of high quality because recyclers have an incentive to calculate the exact quantity of materials collected from suppliers. However, data on waste disposed can be subject to some errors from conversions, or from questionable methods of estimating tonnage disposed (as some waste hauling contracts, especially those that are based on a waste hauling schedule for emptying a set number of dumpsters, do not generate invoices that specify tonnage disposed). Also, data on waste prevention typically needs to be estimated, often involving a series of assumptions and calculations that can introduce error and/or uncertainty. Obtaining this supplemental information may require revisions to existing WasteWise forms currently approved by OMB.

EPA takes steps to validate waste data reported to WasteWise, but could adopt additional measures to bolster confidence in self-reported data. WasteWise staff review waste data before it is published, using ad-hoc logic tests to assess the plausibility of data reported. For example, if a partner reports a waste quantity that appears to conflict with previous reporting, or be out of step with the type and scale of operations, WasteWise staff note the issue and follow up with the partner. EPA will not finalize the data for aggregation until staff are satisfied with the quality of the data.

While logic tests are helpful, other programs have developed guidance for reviewing data submitted. Guides typically cover appropriate responses to each data field on the reporting form. Guides also call out common quality problems, such as pitfalls in estimating waste disposal and prevention (discussed above), and in assessing changes in quantities from year to year. Guides also sometimes include information on the range of impacts (in this case, waste) typical for various industries and scale of operations.

EPA does not conduct site visits or require third-party certification to verify WasteWise data. It should be noted that conducting site-visits to verify data would be very resource intensive for EPA, while requiring third-party certification would be similarly resource intensive for WasteWise partners. As such, most EPA partnership programs do not utilize site visits or require third- party data certification.

While many EPA partnership programs encourage or require partners to submit normalized data, OMB has precluded WasteWise from collecting normalized data. Many programs reviewed encourage or require partners to provide normalized data, to factor out external factors when reviewing progress. External factors include changes in economic conditions (or other measure of an organization's activity). Absolute data do not indicate if reductions or increases in waste are due to economic conditions as opposed to partner environmental initiatives, which is important context for understanding individual facility progress.

However, in the process of EPA coordinating with OMB on ICR approval for the WasteWise program in 2007, OMB raised background economic conditions as a factor that WasteWise should account for when they are attributing partner improvements to the program. Thus, OMB included background economic conditions among the list including cost savings, state and local laws, and customer expectations that are commonly cited as other factors that influence firm behavior.¹¹ Given OMB's inclusion of economic conditions as an attribution factor, EPA has not pursued collection of normalized data from WasteWise partners. EPA is awaiting the results of this evaluation to engage in a comprehensive discussion of WasteWise attribution issues with OMB. It is not clear why OMB did not raise similar concerns within the ICRs for the other EPA partnership programs that collect data normalized for economic conditions.

WasteWise emulates other data quality best practices identified across partnership programs. WasteWise has taken proactive steps to ensure data quality by adopting best practices including:

- Ensuring internal consistency by using the WARM model, ORCR's official model, to generate greenhouse gas reports for members.
- Using automated data aggregation tools in Re-TRAC to eliminate the possibility of human error in aggregating program results.
- Taking steps to avoid double-counting of waste reductions reported to WasteWise with waste reductions reported to other programs.

¹¹ See the previous literature review conducted for this evaluation for a discussion of influences on firms that join partnership programs, dated December 14, 2009.

- Including a disclaimer on reported aggregate results that WasteWise does not take credit for all improvements reported by partners, given the constellation of factors that influence partners' waste management decisions.

CHAPTER 4 | RECOMMENDATIONS

In this chapter, IEC draws on lessons learned from this program evaluation to provide recommendations to EPA on future directions for WasteWise. As seen in the previous chapter, findings from this evaluation are largely positive; they reflect that WasteWise provides real value to its partners, and drives positive changes in waste management within partner organizations.

The findings from this evaluation are particularly positive considering the clear resource strain on the program. From 2003 through 2008, WasteWise lost half of its staff, going from five FTEs to 2.5 FTEs over the course of five years. The program did not increase contractor spending to substitute for the loss of FTEs. Furthermore, WasteWise received significant program funding from OAR through 2006, but since 2006, OAR has not contributed to WasteWise, resulting in a 60% reduction in WasteWise funding. Since 2006, OSWER has funded the entire program out of its budget. As a result of budget cutbacks, WasteWise eliminated several partner services over the past five years, including a campaign to promote state-level WasteWise programs, WasteWise bulletins and other regular partner communications, exhibits at conferences and trade shows, and regional recruiting events.

In light of the generally positive assessment of the program, IEC does not recommend making sweeping changes to the program, especially any that would result in further reductions of resources. Moreover, given the resource constraints faced by the program, we focus on recommendations that would: strengthen program design in a low cost manner, respond to the stated needs of WasteWise partners, and help EPA measure and demonstrate the benefits of the program moving forward.

Increase communications from EPA to WasteWise partners. WasteWise staff reduced communications to partners over the past five years as a result of budget cutbacks. Focus group participants and USPS interviewees noticed this change, and expressed a desire for more regular communications from the program. EPA should explore if it is possible to augment communications in a low-cost manner. Some specific ideas to consider include:

- Develop an electronic welcome packet to distribute to new WasteWise partners, and to be stored on the partners-only portion of the WasteWise website. The welcome packet should provide cursory information on all WasteWise services, and include links to those services and/or applicable contract information.
- Develop standard email communications to distribute to members regarding annual reporting, awards applications, and other regularly occurring program happenings. Distribute these email communications on a standard cycle.

- Use social networking platforms such as Twitter and LinkedIn to communicate to the WasteWise partnership at a low cost, and through media that members may be actively using already. Several EPA programs as well as the Administrator's office use Twitter and LinkedIn to communicate to various audiences.
- To address existing confusion among the WasteWise partnership, work with colleagues in ORCR to develop a one-pager that clarifies the relationship between WasteWise and ORCR's Resource Conservation Challenge (RCC), including differences in benefits. Post the one-pager on the WasteWise and RCC websites, and distribute it to respective email lists.
- Update the WasteWise contacts database, and ensure that it is kept up-to-date by including a line on each email communication from the program that asks recipients if WasteWise is reaching the right people, and provide clear instructions for partners to update contact information.

Promote communications among WasteWise partners by providing an online venue for networking. In addition to desiring more communication from EPA, WasteWise partners are eager to network more among themselves, both to share information and lessons learned on environmental strategies, and to form strategic business relationships. However, it is unlikely that EPA can sponsor additional in-person networking events for WasteWise partners with current resources available to the program. Alternatively, EPA should explore virtual networking models available to the Agency. LinkedIn is a possible solution for fostering networking among WasteWise partners, as well as facilitating regular communication from EPA staff to the WasteWise membership. In addition, EPA could explore other existing commercial networking sites that are designed to organize and promote information sharing among groups, and facilitate ongoing discussion. Multiple free or low-cost online applications have features that cater to common organizational needs such as discussion threads, blogs/wikis, the ability to post documents and links, and event calendars and notifications. Two such sites known to IEC are www.huddle.net and www.ning.com.

Also, to allow partners to find one another more easily, EPA should use contact information from Re-TRAC or the program's existing contacts database to develop a web-view of contact information that is browsable by sector, and available on the partners-only area of the WasteWise website. If categorizing partners by sector is currently cost-prohibitive due to the need to research sectors, EPA could add a question to the WasteWise application form and annual reporting form that asks partners to select a sector from a drop-down list. It is unclear if this change would be covered by the current WasteWise ICR, or if EPA would need to seek approval from OMB to make this change.

In absence of additional program funding, consider recasting the conference as an awards ceremony. In the past, WasteWise held conferences over a two day period that included working sessions, forums, and partner networking. This format was well-liked and well-attended by partners. However, IEC's review of WasteWise conference attendance data from 2007 and 2008 suggests that the current conference format may not be delivering as much value as participants expect. Overall conference attendance

declined from 2007 to 2008, repeat attendance is low, and the conference appears dominated by EPA attendees. During the focus group, IEc heard from one participant that the conference feels more like an awards ceremony than a broader networking event. If EPA lacks the resources to expand the focus of the conference to include broader sessions and networking events, the Agency should consider rebranding it as an awards ceremony only.

Keep a focus on offering high-value technical tools to partners. Partners clearly value WasteWise’s technical tools, including Re-TRAC and GHG calculations from waste reporting. EPA should bolster the value of current tools by ensuring that underlying data are up-to-date; and by developing frequently asked questions for the WARM model and GHG reports tailored to the WasteWise audience. If WasteWise is looking for an incentives area to invest in, developing additional technical tools would be a good area to explore. Previously, WasteWise had considered developing a series of technical issue papers in conjunction with Hall of Fame companies; this may be one strategy for providing additional technical resources to partners. Also, WasteWise could foster communications about technical issues and desired tools on an online networking platform (discussed above). For example, during the focus group, participants discussed their interest in assistance in integrating various GHG reporting tools. Even if WasteWise cannot address this need with resources available, through online networking, it could foster dialogues among partners about technical solutions to integration that partners are experimenting with or have had success with.

Invest in enhancements to annual reporting to improve the efficiency of the reporting review process, and collect information on potential benefits of WasteWise. The best practice review identified several potential enhancements to the WasteWise annual reporting process that are utilized by other partnership programs, including:

- Additional training materials for annual reporting, such as model reports, which would clarify reporting rules and likely increase first-time quality of data submitted (thereby reducing staff or contractor hours needed to review reports).
- Adding questions to baseline and annual reporting forms to inquire about how partners estimate reported data on waste disposal and waste prevention in particular. Having this information will often provide confidence in data reported; in some cases, it will highlight potential problems for EPA to follow up on.
- Combining new member registration with baseline reporting, to establish a one-step process for new members. This change also has the potential to reduce transaction costs for both members and WasteWise staff.
- As part of ongoing Re-TRAC enhancements, EPA should require that partners complete non-optional fields in the reporting form, to make sure that sufficient data are included in annual reports. As with other proposed enhancements, adding required fields will reduce review time.

- Develop internal guidance for WasteWise staff and contractors for systematically reviewing WasteWise partner data, to replace current use of ad-hoc logic tests.

In addition, EPA should add questions to the annual reporting form that inquire about potential WasteWise contributions to partner operational decision-making on waste prevention and management initiatives, as well as any other business decisions that relate to waste prevention and management (i.e., supply chain alterations). Again, some of these recommendations would increase data collected by WasteWise, and may require OMB approval and ICR modification.

As resources allow, conduct research into spillover effects. Communication of information on environmental best practices from the WasteWise program and its partners to non-partners (i.e., spillover effects) is a potentially important area of program benefits, and one that we have not been able to assess in this evaluation. If funding is available for additional research, we recommend that EPA examine WasteWise spillover effects in sectors with high representation in WasteWise. EPA could add questions to the annual reporting form to gauge whether (and how) WasteWise has improved relationships with competitors, suppliers, and/or customers. If EPA could obtain ICR clearance for a survey, it could also investigate potential spillover effects by surveying partners and non-partners in selected sectors.

Develop high-level communications around the interplay of factors that encourage firms to make decisions on waste management and other environmental issues. It is clear from the literature, focus groups, and interviews that significant changes in environmental practices are driven by a constellation of motivations and organizational structures. WasteWise clearly caveats its reporting to communicate that the program does not take credit for all of the results reported by members. But more broadly, confusion about the role of partnership programs in motivating change is widespread. As such, we recommend that based on this evaluation and related work, EPA develop communication pieces for various audiences (internal management, political, academic, partnership program members and stakeholders, and the general public) on all of the factors that encourage firms to make voluntary environmental investments, and on how partnership programs intersect with some of these factors to spur positive changes in behavior. We also suggest that EPA develop a companion set of communications around the new white paper that ESD is developing on how partnership programs can demonstrate their value.