



**ILLINOIS WATER ENVIRONMENT ASSOCIATION**  
**Sustainability Management Surveys 2019**





## FOREWARD

The Illinois Water Environment Association's Sustainability Committee developed sustainability management surveys to measure progress towards sustainability for industrial and water resource recovery facilities (WRRFs) across Illinois. The committee recognizes that evaluation through measurable metrics is one of the best ways to support sustainability programs such as resource recovery, energy neutrality, water conservation, or the beneficial reuse of residuals and biosolids.

Two online surveys with tailored questions for either industrial facilities or WRRFs were distributed to capture as many facilities as possible. The surveys were developed with the intention of gathering basic facility operational information and sustainability outlooks and practices being used. The word cloud on the previous page was created by combining words from both surveys.

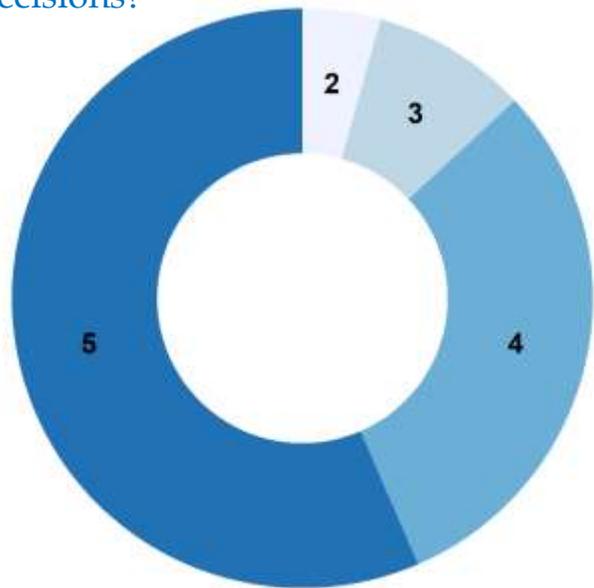




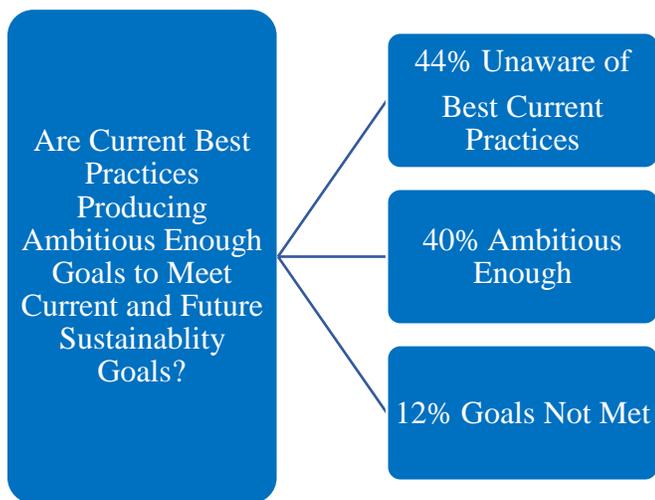
## SUSTAINABILITY MANAGEMENT FOR INDUSTRIES

Eighty-eight percent of respondents believe there is value in resource recovery and reuse. Ninety-two percent of respondent industries report that social responsibility and environmental impacts are somewhat to very often considered when their organization makes decisions. Eighty percent report that sustainability management practices are part of their organization's strategic business plan.

How often are social responsibility and environmental impacts considered with cost when your organization is making decisions?



**Very Often: 5 | Not Often: 1**



The three main goals of sustainability management for respondents are to reduce waste, energy, and water consumption. Other goals include reducing greenhouse gas emissions and protecting water resources. Several respondent industries are interested in improving practices through resource conservation, recycling and reduction or elimination of unnecessary processes.



## Has Your Company Been Able to Meet These Goals?

In Process

56%

Yes

16%

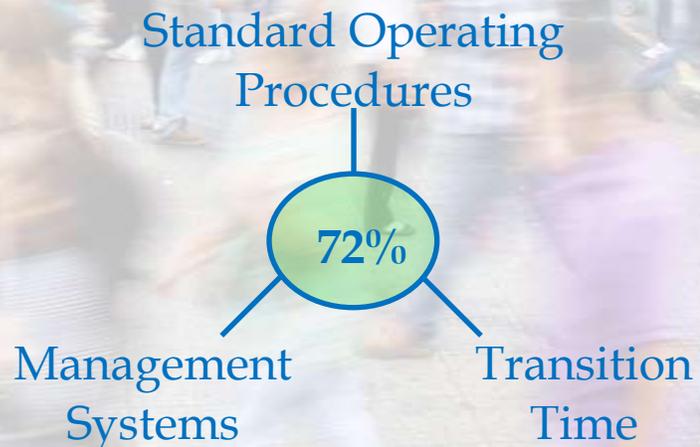
Unknown/  
No Response

28%

Fifty-five percent of respondents indicated that sustainability management goals are clearly defined and over 70% of respondents indicated they either meet stated sustainability goals or are in the process of meeting them. This indicates that many industries across many sectors are working towards achieving more sustainable practices.

## HUMAN CAPITAL

Retaining institutional knowledge that would otherwise be lost as personnel retire or leave an organization is a key element of human capital. Nearly three-quarters of the industries surveyed have a method for retaining knowledge from experienced personnel. While use of written standard operating procedures is the most common, management systems and transition time are also used.





## WATER, WASTE, AND ENERGY

Thirty-two percent of industrial respondents report using less than 50,000 gallons of water per day and 12% report using greater than 500,000 gallons per day. Another 32% are in the middle of this range and the remainder are uncertain.

### Average Daily Water Use

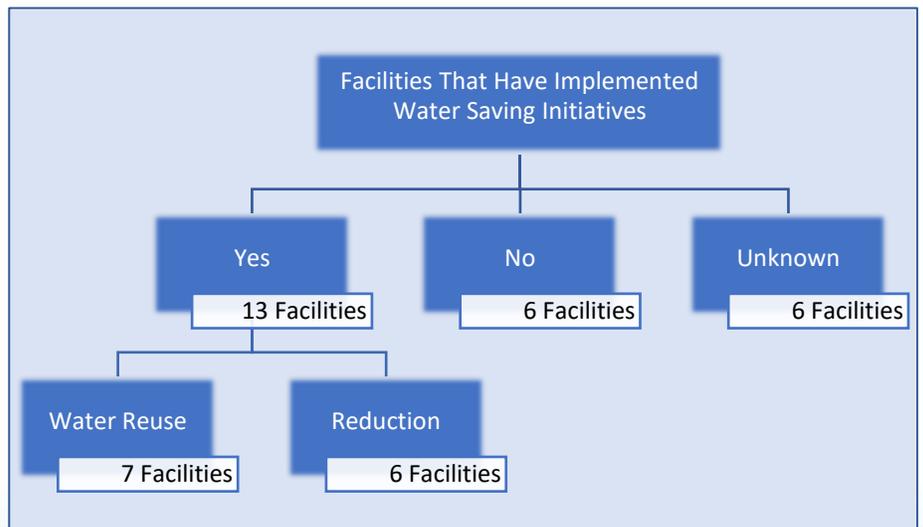
Gallons Per Day	No. Facilities
<50,000	8
50,000-100,000	4
100,000-500,000	4
>500,000	3
Unknown/Unreported	6

### PERCENTAGE OF WATER USAGE DISCHARGED TO A WRRF (NO. OF FACILITIES)



Forty-eight percent of the respondent industrial facilities report discharging more than 75% of their wastewater to water resource recovery facilities (WRRFs), 20% discharge 50-75% of their wastewater to WRRFs, 4% discharge between 20-50%, and 8% discharge under 20%. The remaining facilities are uncertain how much of the facility's water usage is discharged to a WRRF.

Only 4% report discharging a significant amount of their wastewater directly to a waterway. Sixty percent of the respondent facilities report having implemented water saving initiatives. The initiatives include water reuse strategies, reduction strategies, or unspecified approaches.





Fifty-two percent of facilities began implementing water saving initiatives in the last five years. One facility reduced water use by more than 40% compared to water use prior to implementing the initiatives. Twelve percent report water use reductions between 10 to 40% of their prior water use, while 8% report a reduction of less than 5% of their water use.

Twenty-four percent of respondents tracking solid waste report 3,400 tons going to landfills and twelve companies report minimizing or diverting 7,900 tons per year away from landfills. Another 28% report the beneficial reuse of sludge waste, which includes energy recovery, metal recovery, land application as a fertilizer, and animal feed.



Seventy-six percent of respondents have energy savings initiatives. The respondent industrial facilities were diverse; however, there were commonalities to the energy-saving initiatives implemented including:



- ◆ LED light fixtures
- ◆ Lighting sensors
- ◆ Energy efficiency upgrades to equipment, such as compressors
- ◆ Better controls of systems, such as head pressures on refrigeration systems
- ◆ Wind turbines
- ◆ Solar trees
- ◆ Variable frequency drives on pumps
- ◆ Smaller, more appropriately sized pumps



## WATER RESOURCE RECOVERY FACILITIES

### AT A GLANCE

There were responses from 21 water resource recovery facilities (WRRFs) from across Illinois. The size of the WRRFs varied from 1.23 to 450 million gallons per day (MGD), with most facilities having design average flows of 50 MGD or less.

### WRRF Respondents



### Design Average Flow

1.23 - 450 Million Gallons Per Day

MGD	No. Facilities
1-10	8
10-50	12
>50	1

### TREATMENT PROCESSES

Primary clarification and the activated sludge process are the predominate primary and secondary treatment processes for the 21 facilities. The two facilities without activated sludge utilize attached growth processes for secondary treatment. Over 80% of the facilities have anaerobic digestion and 67% have tertiary treatment.





## SUSTAINABILITY MANAGEMENT

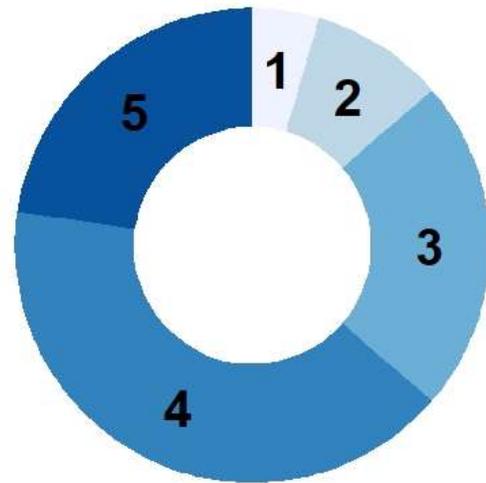
Although 90% of respondents believe there is value in resource recovery and reuse and 86% of respondents report that social responsibility and environmental impacts are somewhat to very often considered when their organization makes decisions, just 62% report that sustainability management practices are part of their organization's strategic business plan. Another 19%, however, report it was unknown if these practices were part of a strategic plan.

For two of the four facilities that did not report sustainability management practices as part of their organization's strategic business plan, economic incentives and cost are the primary drivers. Other reasons for no or unknown responses include the absence of regulatory drivers and need to have clearer understandings of the outcomes of such practices.

For one facility, it was further noted that although their plan does not specifically mention sustainability, it is recognized that sustainability concepts are intrinsic to good environmental engineering and design. Minimizing a facility's waste, energy usage, and carbon footprint and building new infrastructure for the long-term are examples given of engineering principles that intersect with sustainability.

### SUSTAINABILITY MANAGEMENT

How often are social responsibility and environmental impacts considered with cost when your organization is making decisions?



Very Often: 5 | Not Often: 1



## HUMAN CAPITAL

Retaining institutional knowledge that would otherwise be lost as personnel retire or leave the organization is a key element of human capital. Over 70% of the WRRF facilities surveyed have a method for retaining knowledge from experienced personnel. Standard operating procedures, management systems, and transition time are methods most often used.



## RESOURCE RECOVERY

### Reuse of Final Effluent

Portion Reused	No. Facilities
<5%	12
5-20%	8
20-50%	1
>50%	0

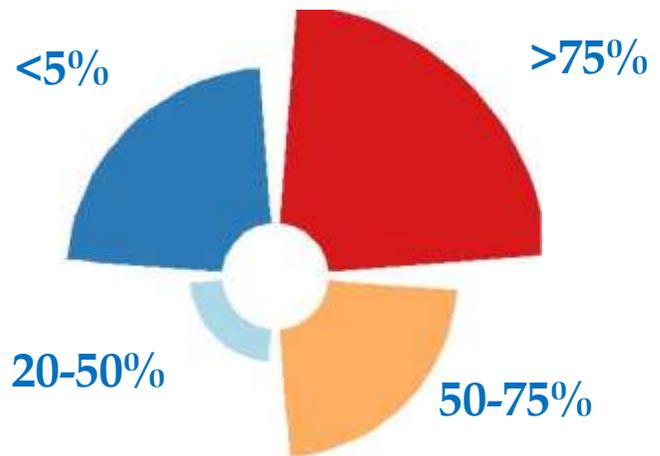
Less than half the respondent facilities reuse more than 5% of their final effluent and only one facility is using more than 20%. One facility innovatively reuses final effluent for watering a golf course. Those facilities reusing less than 20% of final effluent report use for internal processes only.



All respondent facilities beneficially utilize their biosolids, and 90% report beneficially using more than 75%. A small fraction of what cannot be beneficially utilized is sent to landfill, and no facilities incinerate biosolids.

Nearly a quarter of respondent facilities - 24% - accept high-strength waste for co-digestion, and 33% use more than 75% of their biogas. Another 14% utilize 50-75% of their biogas.

### Biogas Utilization\*



\*Pie piece size proportional to number of respondent facilities.

### Energy Management Annual Megawatt Hours

MWh	No. Facilities
<100	2
100-1,000	1
1,000-10,000	9
>10,000	1
Unreported	8

### Implemented Energy Savings Initiatives

Yes	No	Unknown
<b>Prior to 2010</b>		
7	9	5
<b>After 2010</b>		
16	2	3

Of the 21 respondent facilities, most use between 1,000 and 10,000 megawatt hours (MWh) annually. Many facilities installed energy saving initiatives prior to 2010 and even more after. Thirty-three percent of facilities implemented energy saving initiatives prior to 2010; after 2010 the number increased to over 75%. Several respondents tracked energy usage savings in the year after the most beneficial initiatives were implemented. These organizations realized a savings of more than 3,900 MWh - enough to power more than 400 homes for 1 year.



The energy savings initiatives implemented include a diverse array of technologies ranging from installation of more efficient equipment to utilization of wastewater resources on-site and revamping aeration control strategies. The initiatives employed by the respondents include:

- ◆ LED light fixtures
- ◆ Motion sensors
- ◆ High efficiency motors
- ◆ Variable frequency drives
- ◆ Water source heat pumps
- ◆ Non-potable water system upgrades
- ◆ High efficiency turbo blowers
- ◆ Dissolved oxygen control
- ◆ Fine bubble diffusers
- ◆ Biogas reuse
- ◆ Combined heat and power systems

Electric utility companies such as ComEd and Ameren Illinois offer incentives, such as rebates and grants, that can help organizations offset the capital costs associated with many different types of energy savings initiatives.

Lighting was the most popular improvement, implemented by more than 50% of respondents

Just under 50% of respondents improved aeration to reduce energy usage

33% of respondent facilities utilize biogas on-site via a combined heat and power or co-generation system

## CONCLUSION

Nearly all industrial facilities and WRRFs surveyed see value in sustainability management and have implemented sustainability management practices to conserve water and energy and limit waste being sent to landfills. Some noted their use of such practices for many decades. Although most WRRFs and industries recognize the importance of sustainability management, there is a wide range in reporting metrics. Nearly half of WRRFs and industries expressed an interest in learning more about rating systems to further measure progress towards sustainability. IWEA will continue to provide information to interested organizations on rating systems, including the Institute for Sustainable Infrastructure's Envision program, and continue to help organizations work towards better sustainability management.