OP 22: Waste Minimization

5 points available

A. Credit Rationale
This credit recognizes institutions that are minimizing their production of waste. While other credits recognize the benefits of recycling and composting, this credit acknowledges the importance of preventative measures. Decreasing the total amount of materials that are used and discarded offers significant environmental benefits.

B. Criteria
Part 1
Institution has implemented source reduction strategies to reduce the total amount of waste generated (materials diverted + materials disposed) per weighted campus user compared to a baseline.

Part 2
Institution’s total annual waste generation (materials diverted and disposed) is less than the minimum performance threshold of 0.45 tons (0.41 tonnes) per weighted campus user.

This credit includes on-campus dining services operated by the institution or the institution’s primary on-site contractor.

Total waste generation includes all materials that the institution discards, intends to discard or is required to discard (e.g. materials recycled, composted, donated, re-sold and disposed of as trash) except construction, demolition, electronic, hazardous, special (e.g. coal ash), universal and non-regulated chemical waste, which are covered in OP 24: Construction and Demolition Waste Diversion and OP 25: Hazardous Waste Management.

C. Applicability
This credit applies to all institutions.

D. Scoring
Each part is scored independently. Points earned are calculated according to the formulas below. Please note that users do not have to calculate the number of points earned themselves; points earned will be calculated automatically when the data listed under Section E: Reporting Fields is entered in the online Reporting Tool.

Part 1
Institutions earn maximum points of 2.5 points available for Part 1 by reducing their total waste generation by 50 percent or more compared to a baseline. Incremental points are awarded based on the percentage reduction achieved. For example, an institution that
reduced the total amount of waste generated by 25 percent would earn 1.25 points (half of the points available for Part 1).

STARS only awards positive points; points will not be deducted if the total amount of waste generated increases rather than decreases during the time period.

Points Earned = 5 × \{ \left[ \frac{A}{B} \right] - \left[ \frac{C}{D} \right] \} / \left( \frac{A}{B} \right)

A = Total waste generated (diverted + disposed), baseline year (short tons/tonnes)
B = Weighted campus users, baseline year
C = Total waste generated (diverted + disposed), performance year (short tons/tonnes)
D = Weighted campus users, performance year

Part 2
An institution earns the maximum of 2.5 points available for Part 2 of this credit when its total annual waste generation per weighted campus user is 90 percent less than the minimum performance threshold of 0.45 short tons (0.41 tonnes). Incremental points are awarded based on the institution’s performance between the threshold and the 90 percent target. For example, an institution that generates 0.25 tons of waste per weighted campus user (45 percent less than the threshold) would earn 1.25 points (half of the points available for Part 2).

Points Earned = 2.78 × \{ \left[ \frac{C - \left( \frac{A}{B} \right)}{C} \right] \}

A = Total waste generated (diverted + disposed), performance year (short tons/tonnes)
B = Weighted campus users, performance year
C = Minimum performance threshold (0.45 short tons or 0.41 tonnes)

E. Reporting Fields

Required

- Materials recycled, performance year (short tons/tonnes)
- Materials composted, performance year (short tons/tonnes)
- Materials reused, donated or re-sold, performance year (short tons/tonnes)
- Materials disposed in a solid waste landfill or incinerator, performance year (short tons/tonnes)
- Figures needed to determine the number of “Weighted Campus Users” during the performance year:
  - Number of residential students, performance year (annualized headcount)
  - Number of residential employees, performance year (annualized headcount)
  - Number of in-patient hospital beds, performance year
- Full-time equivalent enrollment, performance year (annualized FTE)
- Full-time equivalent of employees, performance year (annualized FTE)
- Full-time equivalent of distance education students, performance year (annualized FTE)
- Start date, performance year or 3-year period
- End date, performance year or 3-year period
- Materials recycled, baseline year (short tons/tonnes)
- Materials composted, baseline year (short tons/tonnes)
- Materials reused, donated or re-sold, baseline year (short tons/tonnes)
- Materials disposed in a solid waste landfill or incinerator, baseline year (short tons/tonnes)
- Figures needed to determine the number of “Weighted Campus Users” during the baseline year:
  - Number of residential students, baseline year (annualized headcount)
  - Number of residential employees, baseline year (annualized headcount)
  - Number of in-patient hospital beds, baseline year
  - Full-time equivalent enrollment, baseline year (annualized FTE)
  - Full-time equivalent of employees, baseline year (annualized FTE)
  - Full-time equivalent of distance education students, baseline year (annualized FTE)
- Start date, baseline year or 3-year period
- End date, baseline year or 3-year period
- An affirmation that the submitted information is accurate to the best of a responsible party's knowledge and contact information for the responsible party. The responsible party should be a staff member, faculty member, or administrator who can respond to questions regarding the data once submitted and available to the public.

**Conditional**

Required if end date of the baseline year/period is 2004 or earlier:

- A brief description of when and why the waste generation baseline was adopted (e.g. in sustainability plans and policies or in the context of other reporting obligations)

**Optional**

- A brief description of any of the following materials management and waste minimization strategies employed by the institution:
  - Waste audits (non-food)
  - Institutional procurement policies designed to prevent waste (e.g. by minimizing packaging and purchasing in bulk)
o A surplus department or formal office supplies exchange program that facilitates reuse of materials

o Limits on paper and ink consumption (e.g. restricting free printing and/or mandating doubled-sided printing in libraries and computer labs)

o Making materials (e.g. course catalogs, course schedules, and directories) available online by default rather than printing them

o Program to reduce residence hall move-in/move-out waste

o Other (non-food) waste minimization strategies

□ A brief description of any of the following food waste minimization strategies that are employed by the institution:

  o Food waste audits

  o Programs and/or practices to track and reduce pre-consumer food waste in the form of kitchen food waste, prep waste and spoilage

  o Programs and/or practices to track and reduce post-consumer food waste, e.g. by modifying menus/portions and/or implementing trayless dining (in which trays are removed from or not available in dining halls)

  o Providing reusable and/or third party certified compostable to-go containers for to-go food and beverage items (in conjunction with a composting program)

  o Utilizing reusable service ware for “dine in” meals and reusable and/or third party certified compostable service ware for to-go meals (in conjunction with a composting program)

  o Offering discounts to customers who use reusable containers (e.g. mugs) instead of disposable or compostable containers in to-go food service operations

  o Other dining services waste minimization programs and initiatives

□ The website URL where information about the institution’s waste minimization initiatives is available

□ Notes about the submission
Scoring Example: Waste Minimization

The following data describe Example University:

A. Waste Generation, Baseline Year:
   • Tons of materials recycled = 1,000
   • Tons of materials composted = 350
   • Tons of materials reused, donated or re-sold = 0
   • Tons of materials disposed as garbage = 650
   Total Waste Generation = 1,000 + 350 + 650 = **2,000** tons

B. Weighted Campus Users, Baseline Year:
   a. Number of residential students = 2,000
   b. Number of residential employees = 0
   c. Number of in-patient hospital beds = 0
   d. Full-time equivalent enrollment = 2,500
   e. Full-time equivalent of employees = 750
   f. Full-time equivalent of distance education students = 0

   Baseline Weighted Campus Users = (a + b + c) + 0.75 [ (d - a) + (e - b) – f ]

   \[
   = (2,000 + 0 + 0) + 0.75 \left[ (2,500 - 2,000) + (750 - 0) – (0) \right] \\
   = 2,000 + 0.75 (500 + 750) \\
   = 2,000 + 0.75 (1,250) \\
   = **2,937.5**
   \]

C. Waste Generation, Performance Year:
   • Tons of materials recycled = 790
   • Tons of materials composted = 350
   • Tons of materials reused, donated or re-sold = 10
   • Tons of materials disposed as garbage = 400
   Total Waste Generation = 790 + 350 + 10 + 400 = **1,550** tons

D. Weighted Campus Users, Performance Year:
   a. Number of residential students = 2,500
   b. Number of residential employees = 50
   c. Number of in-patient hospital beds = 0
   d. Full-time equivalent enrollment = 3,000
   e. Full-time equivalent of employees = 800
   f. Full-time equivalent of distance education students = 0
Performance Year Weighted Campus Users = \((a + b + c) + 0.75 \left( (d - a) + (e - b) - f \right)\)

\[
\begin{align*}
&= (2,500 + 50 + 0) + 0.75 \left( (3,000 - 2,500) + (800 - 50) - (0) \right) \\
&= 2,550 + 0.75 (500 + 750 - 0) \\
&= 2,550 + 0.75 (1,250) \\
&= 3,487.5
\end{align*}
\]

Calculating Points Earned for Part 1
Points Earned = \(5 \times \left\{ \frac{(A/B) - (C/D)}{(A/B)} \right\} \)

\[
\begin{align*}
&= 5 \times \left\{ \frac{(2,000/2,937.5) - (1,550/3,487.5)}{(2,000/2,937.5)} \right\} \\
&= 5 \times \left\{ \frac{0.681 - 0.444}{0.681} \right\} \\
&= 5 \times \{ 0.2366 / 0.6809 \} \\
&= 5 \times 0.347 \\
&= 1.74 \text{ points}
\end{align*}
\]

Calculating Points Earned for Part 2
Points Earned = \(2.78 \times \left\{ \frac{0.45 - (C/D)}{0.45} \right\} \)

\[
\begin{align*}
&= 2.78 \times \left\{ \frac{0.45 - (1,550/3,487.5)}{0.45} \right\} \\
&= 2.78 \times \left\{ \frac{0.45 - 0.4444}{0.45} \right\} \\
&= 2.78 \times \{ 0.006 / 0.45 \} \\
&= 2.78 \times 0.0123 \\
&= 0.034 \text{ points}
\end{align*}
\]

Total Points Earned = 1.74 + 0.034 = 1.77 points

F. Measurement

Timeframe

**Performance Year**
Report the most recent data available from the three years prior to the anticipated date of submission. Institutions may use the most recent single year for which data is available or an average from throughout the period. Institutions may choose the annual start and end dates that work best with the data they have (e.g. fiscal or calendar year), as long as data are reported from a consecutive 12-month (or 3-year) period.

Report annualized population figures from the same time period as that from which waste generation data are drawn (e.g. the consecutive 12-month or 3-year period that most closely overlaps with the waste generation performance period).

**Baseline Year**
Report data from the baseline year, which may be:
Any year from 2005 to the present
A baseline year, 1990 to 2004, that the institution has adopted as part of its sustainability plans or policies or in the context of other reporting obligations

Recommended best practices for defining a baseline include:
- Using the average of three consecutive years to reduce the impact of outliers.
- Using the same baseline year for multiple credits to reduce reporting requirements. For example, institutions using 2005 for all STARS credits that are baseline-based would only have to calculate baseline weighted campus user data once.
- Ensuring that baseline and performance year data are valid and reliable (e.g. that the data were gathered in the same manner)

Institutions without valid and reliable historical data should use performance year data for both the baseline and performance year. Following this approach, an institution would not be able to claim points during its first STARS submission, but would be able to use its newly established baseline for subsequent submissions.

Institutions may choose the start and end dates that work best with the data they have (e.g. fiscal or calendar year), as long as data are reported from a consecutive 12-month (or 3-year) period. Report annualized population figures from the same period as that from which waste generation data are drawn (e.g. the consecutive 12-month or 3-year period that most closely overlaps with the waste generation baseline period).

**Sampling and Data Standards**
Waste figures measured in volume may be converted to weight using the conversion factors provided by the [U.S. Environmental Protection Agency](https://www.epa.gov) and the College and University Recycling Council (used for the U.S. [RecycleMania competition](https://recylemania.org)) or the conversion factors provided by the [United Nations Environment Programme](https://unep.org).

To the extent possible, include all waste (diverted + disposed) that was generated by the institution and the institution’s primary on-site dining services contractor (if applicable) when reporting for this credit. Construction, demolition, electronic, hazardous, special (e.g. coal ash), universal and non-regulated chemical waste, which are covered in [OP 25: Construction and Demolition Waste Diversion](https://www.ahec.org) and [OP 26: Hazardous Waste Management](https://www.ahec.org), are excluded. Agricultural waste may be excluded, provided it is excluded from both the volume of materials diverted and the volume of materials disposed.

If data for the entire campus and/or entire year are not available, institutions may use a representative sample. When taking a sample, strive for consistency between the baseline and performance year.