FY2013 Carbon Emissions Analysis

The Maine System
Collected carbon emissions at the Maine System

Analyzing utility-related emissions as MTCDE (Metric Tons of Carbon Dioxide Equivalent)

Scope 1 – Direct GHGs
- On-Campus Stationary (Natural Gas; Fuel Oil)

Scope 2 – Upstream GHGs
- Purchased Electricity

Scope 3 – Indirect GHGs
- Transmission & Distribution Losses

Sources required by the ACUPCC not included in this analysis:

Scope 1:
- Fleet Fuel
- Refrigerants
- Agriculture

Scope 3:
- Employee & Student Commuting
- Air Travel
- Solid Waste & Wastewater
Carbon intensity of commonly used fuels

Natural Gas is the least carbon-intense fossil fuel

<table>
<thead>
<tr>
<th>Fuel</th>
<th>UMaine &amp; USM</th>
<th>Regional Campuses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coal</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Residual Oil</td>
<td>10%</td>
<td>0%</td>
</tr>
<tr>
<td>Distillate Oil</td>
<td>2%</td>
<td>89%</td>
</tr>
<tr>
<td>Propane</td>
<td>1%</td>
<td>5%</td>
</tr>
<tr>
<td>Natural Gas</td>
<td>87%</td>
<td>5%</td>
</tr>
<tr>
<td>Biomass</td>
<td>0%</td>
<td>1%</td>
</tr>
</tbody>
</table>

MTCDE = Metric Tons of Carbon Dioxide Equivalent
UMS switching to less carbon intense fuels

UMaine and USM

Change in Fuel Type FY2012 to FY2013

<table>
<thead>
<tr>
<th>Fuel Type</th>
<th>UMaine FY12</th>
<th>UMaine FY13</th>
<th>USM FY12</th>
<th>USM FY13</th>
</tr>
</thead>
<tbody>
<tr>
<td>Propane</td>
<td>1%</td>
<td>1%</td>
<td>7%</td>
<td>10%</td>
</tr>
<tr>
<td>Natural Gas</td>
<td>86%</td>
<td>87%</td>
<td>93%</td>
<td>90%</td>
</tr>
<tr>
<td>Distillate Oil (#1-4)</td>
<td>13%</td>
<td>12%</td>
<td>7%</td>
<td>10%</td>
</tr>
<tr>
<td>Residual Oil (#5-6)</td>
<td>1%</td>
<td>1%</td>
<td>7%</td>
<td>10%</td>
</tr>
<tr>
<td>Wood Pellets</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
</tbody>
</table>
UMS switching to less carbon intense fuels

Regional Campuses

Change in Fuel Type FY2012 to FY2013

% of Total MMBTU

- Residual Oil (#5-6)
- Distillate Oil (#1-4)
- Propane
- Natural Gas
- Wood Pellets

UMA FY12: 69%
UMA FY13: 54%
UMF FY12: 98%
UMF FY13: 98%
UMFK FY12: 98%
UMFK FY13: 90%
UMM FY12: 89%
UMM FY13: 91%
UMPI FY12: 94%
UMPI FY13: 96%
Comparing Maine’s Grid to other US regions

New England has one of the cleanest eGrids in the country

Carbon Intensity by Grid Region

MTCDE = Metric Tons of Carbon Dioxide Equivalent
Maine’s Grid getting greener since 2007

Carbon Intensity by Grid Region

MTCDE = Metric Tons of Carbon Dioxide Equivalent

- eGRID 2007
- eGRID 2010
- eGRID 2012
FY2013 utility emissions – state university detail

FY2013 Gross Utility Emissions

UMaine: 30,000 MTCDE (Scope 1: 25,000, Scope 2: 5,000)
USM: 5,000 MTCDE (Scope 1: 4,000, Scope 2: 1,000)

Maine System Average: 10,820 MTCDE

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MTCDE = Metric Tons of Carbon Dioxide Equivalent

Scope 1  Scope 2  Scope 3

UMA  UMF  UMFK  UMM  UMPI
Two different ways to benchmark GHG emissions

**GHG Emissions per 1,000 GSF**
Stresses intensity of operations.

\[
\frac{\text{Gross GHG Emissions}}{\text{Total GSF in Footprint}} \times 1,000
\]

**GHG Emissions per Student**
Stresses efficient use of space.

\[
\frac{\text{Gross GHG Emissions}}{\text{Total Student FTE}}
\]
## Climate Zone 1 peers

<table>
<thead>
<tr>
<th>Institution</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carleton College</td>
<td>Northfield, MN</td>
</tr>
<tr>
<td>Champlain College</td>
<td>Burlington, VT</td>
</tr>
<tr>
<td>Hamilton College</td>
<td>Hamilton, NY</td>
</tr>
<tr>
<td>Hamline University</td>
<td>St. Paul, MN</td>
</tr>
<tr>
<td>Le Moyne College</td>
<td>Syracuse, NY</td>
</tr>
<tr>
<td>Michigan State University</td>
<td>East Lansing, MI</td>
</tr>
<tr>
<td>Montana State University</td>
<td>Bozeman, MT</td>
</tr>
<tr>
<td>Rensselaer Polytechnic Institute</td>
<td>Troy, NY</td>
</tr>
<tr>
<td>Siena College</td>
<td>Loudonville, NY</td>
</tr>
<tr>
<td>University of Denver</td>
<td>Denver, CO</td>
</tr>
<tr>
<td>University of Vermont</td>
<td>Burlington, VT</td>
</tr>
</tbody>
</table>
Maine System FY2013 utility emissions

MTCDE/1,000 GSF

Maine System Average: 8.65/1,000 GSF
Climate Zone 1 Average: 9.85/1,000 GSF

MTCDE/Student FTE

Maine System Average: 3.29/Student FTE
Climate Zone 1 Average: 4.82/Student FTE

MTCDE = Metric Tons of Carbon Dioxide Equivalent
Maine System Emissions by Institution
FY2006 - FY2013
The University of Maine

FY2006 – FY2013 emissions at The University of Maine (MTCDE)

MTCDE/1,000 GSF

MTCDE/Student FTE

MTCDE = Metric Tons of Carbon Dioxide Equivalent

Scope 1  Scope 2  Scope 3
University of Southern Maine

FY2006 – FY2013 emissions at University of Southern Maine (MTCDE)

MTCDE/1,000 GSF

MTCDE/Student FTE

MTCDE = Metric Tons of Carbon Dioxide Equivalent

Scope 1  Scope 2  Scope 3
University of Maine at Augusta

FY2006 – FY2013 emissions at University of Maine at Augusta (MTCDE)

MTCDE/1,000 GSF

MTCDE/Student FTE

MTCDE = Metric Tons of Carbon Dioxide Equivalent

Scope 1  Scope 2  Scope 3
University of Maine at Farmington

FY2006 – FY2013 emissions at University of Maine at Farmington (MTCDE)

MTCDE/1,000 GSF

MTCDE/Student FTE

MTCDE = Metric Tons of Carbon Dioxide Equivalent
University of Maine at Fort Kent

FY2006 – FY2013 emissions at University of Maine at Fort Kent (MTCDE)

MTCDE = Metric Tons of Carbon Dioxide Equivalent

Scope 1  Scope 2  Scope 3
University of Maine at Machias

FY2006 – FY2013 emissions at University of Maine at Machias (MTCDE)

MTCDE = Metric Tons of Carbon Dioxide Equivalent

Scope 1  Scope 2  Scope 3
University of Maine at Presque Isle

FY2006 – FY2013 emissions at University of Maine at Presque Isle (MTCDE)

MTCDE/1,000 GSF

MTCDE/Student FTE

MTCDE = Metric Tons of Carbon Dioxide Equivalent

Scope 1
Scope 2
Scope 3
Maine System Total Utility Emissions

FY2006 - FY2013
Maine System emissions summary

MTCDE/1,000 GSF

2006-2013 Average: 8.14/1,000 GSF

MTCDE/Student FTE

2006-2013 Average: 2.96/Student FTE

MTCDE = Metric Tons of Carbon Dioxide Equivalent

Scope 1  Scope 2  Scope 3
Total gross utility emissions FY2006 - FY2013

Total gross emissions have decreased 22% since FY2006

Maine System Total Gross Emissions

(FY2006-FY2013)

MTCDE = Metric Tons of Carbon Dioxide Equivalent

Scope 1  Scope 2  Scope 3

MTCDE (Thousands)

2006  2007  2008  2009  2010  2011  2012  2013

-22%
# Total GHG emissions by institution

% change is from FY2006 to FY2013

## FY2013 Gross emissions by institution (MTCDE)

<table>
<thead>
<tr>
<th>Institution Name</th>
<th>Scope 1</th>
<th>Scope 2</th>
<th>Scope 3</th>
<th>% change FY06-FY13</th>
</tr>
</thead>
<tbody>
<tr>
<td>The University of Maine</td>
<td>31,403</td>
<td>13,705</td>
<td>1,233</td>
<td>-22%</td>
</tr>
<tr>
<td>University of Southern Maine</td>
<td>7,557</td>
<td>5,812</td>
<td>523</td>
<td>-22%</td>
</tr>
<tr>
<td>University of Maine at Augusta</td>
<td>1,288</td>
<td>1,099</td>
<td>99</td>
<td>-34%</td>
</tr>
<tr>
<td>University of Maine at Farmington</td>
<td>4,082</td>
<td>1,689</td>
<td>152</td>
<td>-15%</td>
</tr>
<tr>
<td>University of Maine at Fort Kent</td>
<td>1,225</td>
<td>480</td>
<td>43</td>
<td>-27%</td>
</tr>
<tr>
<td>University of Maine at Machias</td>
<td>1,378</td>
<td>536</td>
<td>48</td>
<td>-27%</td>
</tr>
<tr>
<td>University of Maine at Presque Isle</td>
<td>2,294</td>
<td>977</td>
<td>88</td>
<td>-13%</td>
</tr>
</tbody>
</table>

**Total Maine System FY2013** 49,257 24,297 2,187

MTCDE = Metric Tons of Carbon Dioxide Equivalent
Concluding comments

Overall, University of Maine System emissions are down 22% since FY2006.

The increase in emissions from FY2012 to FY2013 is due to the increase in fossil consumption, driven by additional heating degrees for the year.

Many institutions are switching to less carbon intense fossil fuels by using more natural gas and propane and decreasing the use of oil on campus.

In addition, four of the seven institutions are using fuel alternatives – geothermal and biomass – which significantly reduces the amount of emissions.