FY21 Sustainability Report

Focused on emissions & energy metrics

Board of Trustees - Administration & Finance Committee
April 6, 2022
Highlights

- Fifth year of reporting under the Board adopted Sustainability Policy
- Established key metrics for annual reporting and ongoing effort to refine the methodologies utilized and appropriate data sources
- In light of Executive Order 594, utilizing metrics from the Commonwealth reporting requirements to better streamline and ensure transparency among campus reporting through the Leading By Example program
- All five UMass campuses are undergoing energy and decarbonization planning with Amherst, Dartmouth, and Lowell having completed decarbonization plans. Boston and UMass Chan Medical are currently beginning the planning process
- Even as campus square footage has grown over time emissions have decreased demonstrating the success of energy efficiency projects and adoption of renewable energy across the campuses
- The University is nationally recognized as a leader in sustainability efforts including for individual campus rated by the Association for the Advancement of Sustainability in Higher Education (AASHE)
Executive Order 594
Executive Order 594 – Partnership in Decarbonization

UMass has been a partner to DOER in emissions reduction efforts and the largest state entity impacted by the new order

<table>
<thead>
<tr>
<th>Objective</th>
<th>2025</th>
<th>2030</th>
<th>2040</th>
<th>2050</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reduce emissions from onsite fossil fuels*</td>
<td>-20%</td>
<td>-35%</td>
<td>-60%</td>
<td>-95%</td>
</tr>
<tr>
<td>Zero emission vehicles (ZEVs) in state fleet</td>
<td>5% of fleet (~325 vehicles)</td>
<td>20% of fleet (~1,625 vehicles)</td>
<td>75% of fleet (~3,250 vehicles)</td>
<td>100% of fleet (~6,500 vehicles)</td>
</tr>
<tr>
<td>Reduce fuel oil use*</td>
<td>-90%</td>
<td>-95%</td>
<td>TBD</td>
<td>TBD</td>
</tr>
<tr>
<td>Energy use intensity (site EUI) reduction*</td>
<td>-20%</td>
<td>-25%</td>
<td>TBD</td>
<td>TBD</td>
</tr>
<tr>
<td>EV charging stations at state facilities</td>
<td>350 stations</td>
<td>500 stations</td>
<td>TBD</td>
<td>TBD</td>
</tr>
</tbody>
</table>

*over 2004 baseline

Executive Order 594 replaces Executive Order 484 issued in 2007 which created targets for energy and emissions reductions as well as a reporting framework across all state agencies

- Governor Baker signed Executive Order 594 in April 2021; directing state agencies to take more aggressive steps to reduce greenhouse gas emissions and improve energy efficiency:
  - Establishes new emission reduction targets for 2025, 2030, 2040 towards a net zero greenhouse gas emissions goal by 2050
  - Focus on decarbonizing existing state buildings by reducing onsite fossil fuel consumption and optimizing building performance through efficient operations

New light- and medium duty vehicles: Starting in fiscal year 2023, all acquisitions of vehicles with a Gross Vehicle Weight Rating (GVWR) of 8,500 pounds or less must be ZEVs. New heavy-duty vehicles: Starting in fiscal year 2030, all acquisitions of vehicles with a GVWR of more than 14,000 must be ZEVs.
Campuses engaged in energy & sustainability master planning efforts informing compliance with the new executive order; coordinating with DOER to collaborate on strategies:

- **Funding**: will require state investment to enable the University to decarbonize campus energy infrastructure at the pace required to meet DOER’s updated goals
  - For example, electrifying campus heating and cooling systems to meet emission goals requires investments in new utility infrastructure on all 5 campuses – estimated cost $1 billion+

- **Infrastructure**: concerns on the ability of the ISO New England Grid to keep pace with demand while ensuring the reliability and resiliency for business continuity

- **Deferred Maintenance Needs**: significant backlog impacts energy efficiency; requires a partnership with DCAMM for funding to address building envelope and energy efficiency projects to reduce energy demand and address long-standing capital needs
University Metrics
UMass Emissions Progress

Even as campus square footage has grown, emissions has decreased as a result of energy efficiency projects and adoption of renewable energy.

- Overall emissions have declined by more than 100,000 metric tonnes of CO2e annually, since FY04 baseline, equivalent to a 28% reduction.

- FY20 and FY21 emissions significantly lower than pre-COVID FY19 emissions, thus reductions may increase in near term years.

Sourced to MA Leading by Example data and analysis. *Both FY20 and FY21 data include impacts from COVID-19 closures and operations, which may contribute to progress values in these years.
UMass partnership is essential to achieve EO 594 Targets

- 4 of the 5 UMass campuses fall within the top 10 onsite fossil fuel emitters in the LBE portfolio
  - UMA and UMCMS contribute 20% and 16%, respectively
  - The 5 UMass campuses together contribute 43% of total portfolio onsite fossil fuel emissions, meaning these campuses play a significant factor in overall portfolio progress

Sourced to MA Leading by Example data and analysis. *FY21 portfolio progress still being calculated. Both FY20 and FY21 data include impacts from COVID-19 closures and operations, which may contribute to progress values in these years. MTCO2e = metric tonnes of CO2e
As of FY21, the UMass system has reduced onsite fossil fuel emissions by roughly 1%. To meet FY25 targets, UMass will need to reduce onsite fossil fuel emissions by ~43,000 MTCO2e over FY21 values.

Sourced to MA Leading by Example data and analysis. *FY21 portfolio progress still being calculated. Both FY20 and FY21 data include impacts from COVID-19 closures and operations, which may contribute to progress values in these years. MTCO2e =metric tonnes of CO2e
UMass Energy Use Intensity Progress

The University's commitment to energy efficiency efforts is vital, with data highlighting the success achieved to date.

- Overall energy use intensity (kBtu/SF) for the 5 campuses has declined roughly 27% over FY04 baseline.
- Building square footage has grown 46% since the FY04 baseline, demonstrating the impact of efficiency projects and new construction driving this measure.

Energy Use Intensity (EUI): an indicator of the energy efficiency of a building's design and/or operations based on energy used per square foot per year.

Sourced to MA Leading by Example data and analysis. *Both FY20 and FY21 data include impacts from COVID-19 closures and operations, which may contribute to progress values in these years.
As of FY21, the UMass system has reduced energy use intensity by roughly 27%. FY19, the last pre-COVID year, shows a 16% reduction over the FY04 baseline.

Sourced to MA Leading by Example data and analysis. *Both FY20 and FY21 data include impacts from COVID-19 closures and operations, which may contribute to progress values in these years.
UMass Zero-Emission Vehicles Progress & Targets

As of FY21, zero-emission vehicles (ZEVs) make up roughly 7% of the UMass system fleet. ZEVs include both on road and utility vehicles that are either battery electric or plug-in hybrid electric.

A zero-emission vehicle does not emit exhaust gas or other pollutants from the onboard source of power.
UMass has 35% of EV charging stations at state facilities

- UMass system comprises 85 out of 288 (35%) of total EV charging stations deployed at state facilities, currently providing 157 charging ports.

- UMass Chan comprises roughly 50% of total UMass system active ports.

Current EV Charging Ports by Entity (Top 20)

<table>
<thead>
<tr>
<th>Entity</th>
<th># of ports</th>
</tr>
</thead>
<tbody>
<tr>
<td>MassPort</td>
<td>103</td>
</tr>
<tr>
<td>UMass Chan Medical School</td>
<td>76</td>
</tr>
<tr>
<td>MassDOT</td>
<td>57</td>
</tr>
<tr>
<td>UMass Amherst</td>
<td>35</td>
</tr>
<tr>
<td>MBTA</td>
<td>29</td>
</tr>
<tr>
<td>UMass Lowell</td>
<td>28</td>
</tr>
<tr>
<td>Cape Cod Regional Transit Authority</td>
<td>22</td>
</tr>
<tr>
<td>Salem State University</td>
<td>19</td>
</tr>
<tr>
<td>Worcester State University</td>
<td>16</td>
</tr>
<tr>
<td>MWRA</td>
<td>13</td>
</tr>
<tr>
<td>UMass Boston</td>
<td>11</td>
</tr>
<tr>
<td>Department of Conservation and Recreation</td>
<td>10</td>
</tr>
<tr>
<td>UMass Dartmouth</td>
<td>7</td>
</tr>
<tr>
<td>Tewksbury Hospital</td>
<td>6</td>
</tr>
<tr>
<td>Roxbury Community College</td>
<td>6</td>
</tr>
<tr>
<td>McCormack Building</td>
<td>6</td>
</tr>
<tr>
<td>MassDEP</td>
<td>6</td>
</tr>
<tr>
<td>Mass College of Art &amp; Design</td>
<td>6</td>
</tr>
<tr>
<td>Quinsigamond Community College</td>
<td>4</td>
</tr>
<tr>
<td>Mass Convention Center Authority</td>
<td>4</td>
</tr>
</tbody>
</table>

Sourced to MA Leading by Example data and analysis.
Look Ahead
Coordination on reporting across the System

- Alignment to LBE reporting metrics under EO 594
  - Streamline reporting to focus on new priorities of EO 594 and data collection by Leading by Example Program
  - Provide consistent metrics with defined baselines, targets, and campus boundaries

- Review and updated to sustainability policy reporting standards to align with new executive order
  - Shift in focus towards reduction in fossil fuel consumption, decarbonizations planning, campus electrification, and ultra-low energy intense new construction

- STARS reporting – effort for consistent reporting to STARS across all campuses
  - Provide in-depth evaluation of campus sustainability program, including academics, engagement, operations, planning and administration, and innovation
  - Supported peer benchmarking and best practices in higher education sustainability programs

- Re-state commitment to new EO and partnership with Commonwealth to address the unmet need to reach targets
  - Campus commitments to decarbonization planning
  - Inclusion of DOER/Leading by Example in UMass Sustainability Council to foster collaborative partnership
Helpful Resources to Learn More

- MA Department of Energy Resources – Leading By Example Program
  - [https://www.mass.gov/orgs/leading-by-example](https://www.mass.gov/orgs/leading-by-example)
- Association for the Advancement of Sustainability in Higher Education (AASHE)
  - [https://stars.aashe.org/](https://stars.aashe.org/)
- Campus Sustainability Efforts
  - Amherst: [https://www.umass.edu/sustainability/](https://www.umass.edu/sustainability/)
  - Boston: [https://www.umb.edu/in_the_community/sustainability](https://www.umb.edu/in_the_community/sustainability)
  - Dartmouth: [https://www.umassd.edu/campussustainability/](https://www.umassd.edu/campussustainability/)
  - Lowell: [https://www.uml.edu/sustainability/](https://www.uml.edu/sustainability/)
  - Chan Medical School: [https://www.umassmed.edu/growinggreen/](https://www.umassmed.edu/growinggreen/)