MIT completed a greenhouse gas inventory to understand and manage our Institutional climate change impact.

Who should use the inventory?

How will it be used?
The inventory will be used as a tool for meeting MIT’s carbon reduction goal, and as tool for learning and engaging with real-time carbon footprint assessment.

MIT is committed to becoming a test-bed for climate innovation; staff, students, and faculty can use the inventory to identify ways to reduce the Institute’s footprint, understand energy and emission trends, and improve methodology in data collection.

Why Complete a GHG Inventory?

MIT completed a greenhouse gas inventory to understand and manage our Institutional climate change impact.

A greenhouse gas (GHG) inventory measures the amount and source of an organization’s “carbon footprint” – that is, how institutional activities contribute to climate change.

The process looks at the impact from burning fossil fuels and using other resources, and assesses the greenhouse gases which contribute to climate change from their use into a single metric: metric tons of carbon dioxide equivalent (MTCO2e).
The Greenhouse Gas Protocol, developed by World Resources Institute (WRI) and World Business Council on Sustainable Development (WBCSD), sets the global standard for how to measure, manage, and report greenhouse gas emissions.

The Campus Carbon Calculator (formerly the Clean-Air Cool Planet calculator) is used to calculate emissions based on the GHG Protocol.

The Campus Carbon Calculator is the standard tool used for American campus greenhouse gas (GHG) data collection and inventory reporting.

Six greenhouse gases are measured and converted to metric tons of CO2 equivalent:

- Carbon dioxide (CO2)
- Methane (CH4)
- Nitrous oxide (N2O)
- Hydrofluorocarbons (HFCs)
- Sulfur hexafluoride (SF6)
- Perfluorocarbons (PFCs)

MIT uses the “operational control” method for inventory boundaries.
The GHG Protocol categorizes emissions into three broad scopes:

1: All direct GHG emissions.
2: Indirect GHG emissions from consumption of purchased electricity, heat or steam.
3: Other indirect emissions, such as the extraction and production of purchased materials and fuels, transport-related activities in vehicles not owned or controlled by the reporting entity, electricity-related activities (e.g. T&D losses) not covered in Scope 2, outsourced activities, waste disposal, etc.

MIT measures the areas indicated on the graph, which is in line with industry best practice for higher education.
MIT measures all direct emissions in Scope 1 and all indirect emissions in Scope 2. MIT also currently measures T&D losses and space leased for academic purposes on the Cambridge campus in Scope 3.

Because “scopes” are not an easily recognizable set of categories for the general public, MIT, like most of our institutional peers, categorizes emissions into more familiar categories. Which emissions from each scope are included in these categories is shown in the diagram to the left.

The three categories used by MIT are Buildings, Fugitive Gases, and Campus Vehicles.
Self-Reporting

MIT publishes the inventory on our website – makes the information accessible where we want, how we want

Why: Transparency & accountability to our community, campus as a test bed for learning, standard best practice among our peers

Mandated Reporting

MIT is required by law to report certain institutional emissions to a central reporting agency, for public / state and federal dissemination, publish, or use.

GHG Inventory Different Reporting Boundaries

The MIT GHG inventory represents a full accounting according to industry best practice of the Institute’s carbon footprint.

MIT also reports a portion of it’s institutional emissions through mandated reporting to the EPA.

MIT GHG Inventory (Full Accounting)

Uses the WRI GHG Protocol is voluntary and includes:
- Scope 1
- Scope 2
- Scope 3
- Boundary flexibility, defined by operational control

MIT Federal / State Reporting (Mandated Only):

The EPA and DEP reporting is regulated and includes:
- Scope 1 Only
- No Scope 2 (purchased electricity)
- No Scope 3
- Boundary defined by source
The MIT FY2014-FY2018 inventories include buildings owned and leased for the Cambridge campus. The inventories do not currently include real estate investment holdings managed by MITIMCO, off-campus space, Lincoln Laboratory, Endicott House, Haystack Observatory, Bates Linear Accelerator Center, or the MA Green High Performance Computing Center. The map indicates buildings included in our baseline year 2014.

MIT OWNED BUILDINGS (FOR ACADEMIC USE)
MIT LEASED BUILDINGS (FOR ACADEMIC USE)
### MIT GREENHOUSE GAS EMISSIONS INVENTORY

**FY2014 BASELINE BUILDINGS INCLUDED**

<table>
<thead>
<tr>
<th>Owned Academic Spaces</th>
<th>Leased Academic Spaces</th>
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<tbody>
<tr>
<td><strong>Owned Academic Spaces</strong></td>
<td><strong>Leased Academic Spaces</strong></td>
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<td>Building</td>
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<td>1</td>
<td>Pierce Laboratory</td>
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<td>2</td>
<td>Building 2</td>
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<tr>
<td>3</td>
<td>Maclaurin Buildings (3)</td>
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<tr>
<td>4</td>
<td>Maclaurin Buildings (4)</td>
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<td>5</td>
<td>Pratt School</td>
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<td>6</td>
<td>Eastman Laboratories</td>
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<td>7</td>
<td>Solvent Storage</td>
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<td>8</td>
<td>Building 6C</td>
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<td>9</td>
<td>William Barton Rogers Building</td>
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<td>10</td>
<td>Walker Memorial</td>
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<td>11</td>
<td>Brain and Cognitive Sciences Center</td>
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<td>Cyclotron</td>
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<td>Holtzman</td>
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<td>Hayden Memorial Library</td>
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<td>Dorrance Building</td>
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<td>Wright Brothers Wind Tunnel</td>
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<td>Buch Building</td>
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<td>18</td>
<td>Dreyfus Building</td>
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<td>Compton Laboratories</td>
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<td>Sloan Laboratories</td>
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<td>Statia Center</td>
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<td>Guggenheim Laboratory</td>
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<td>23</td>
<td>EG&amp;G Education Center</td>
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<td>24</td>
<td>Sloan Laboratory</td>
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<td>25</td>
<td>Faucheur Building</td>
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<td>26</td>
<td>Mcnair Building</td>
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<tr>
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<td>29</td>
<td>Brown Building</td>
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<td>30</td>
<td>Building 41</td>
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<tr>
<td>31</td>
<td>Copernican Plant</td>
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<td>32</td>
<td>Power Plant Annex</td>
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<td>Cyclotron</td>
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<td>Brain and Cognitive Sciences Center</td>
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<td>35</td>
<td>Parsons Laboratory</td>
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<td>Walker Memorial</td>
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<td>37</td>
<td>Wood Sailing Pavilion</td>
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<td>38</td>
<td>Green Building</td>
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<td>39</td>
<td>Whitaker Building</td>
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<td>40</td>
<td>MIT Alumini Pool</td>
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<td>41</td>
<td>Alumni House: Monroe Hayden Wood</td>
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<td>42</td>
<td>East Campus: Walter Mitt Bevis Goodale</td>
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<tr>
<td>43</td>
<td>Landau Building</td>
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</table>

The MIT FY2014-FY2017 inventories include MIT-owned buildings on the Cambridge campus and leased academic space. The inventories do not yet include off-campus, MITMCO, Lincoln Laboratory, Bates Linear Accelerator Center, Endicott House, MGHPCC, or Haystack Observatory.
2014 is the baseline year for MIT emissions reduction. It is the year from which MIT will begin accounting as the Institute works to achieve its GHG reduction goal and represents the first year of comprehensive and streamlined data collection.

Fugitive gas emissions and fleet vehicle use comprise <3% of emissions, while 98% of emissions stem from operation of labs, offices, and facilities across campus.
The 2015 inventory was audited by the MIT Office of Treasury and represents the second year of comprehensive inventory assessment for the Institute.

The total change in emissions from 2014 was a reduction of 12,408 MTCO2e, or 6%.

* This data is based on the calendar year, where MIT building data is fiscal year.

### BUILDINGS
- **Fugitive Gases**: 4,000 MTCO2e (2%)
- **Vehicles**: 1,151 MTCO2e (1%)
- **Total**: 195,869 MTCO2e (97%)

### BUILDING FUEL SOURCE DETAIL
- **Leased Buildings (All Sources)**: 4,101 MTCO2e
- **Transmission & Distribution Losses**: 3,609
- **#2 Fuel Oil**: 6,892
- **#6 Fuel Oil**: 14,746
- **Electricity**: 36,494
- **Natural Gas**: 130,027

*Estimated. The GHG inventory will be updated in early 2016 when final data for these categories become available.*
The 2016 inventory was audited by the MIT Office of Treasury and represents the third year of comprehensive inventory assessment for the Institute.

The total change in emissions from 2015 was a reduction of 2,982 MTCO2e, or 1.5%.

The total change in emissions from 2014 was a reduction of 15,390 MTCO2e, or 7%.
The 2017 inventory was audited by the MIT Office of Treasury and represents the third year of comprehensive inventory assessment for the Institute.

The total change in on-campus emissions from 2016 was a reduction of 356 MTCO2e, or 0.18% of 1515,856, not accounting for MIT's solar power purchase in 2017.

The total change in emissions from 2014 was a reduction of 15,034 MTCO2e, or 7%.

Role of Solar Power Purchase

Fiscal year 2017 marked the first year MIT began to account for the impact of their large Summit Farm solar energy purchase. Since the solar-generated electricity is considered to be carbon-free, the net impact is a reduction of greenhouse gas emissions associated with MIT's greenhouse gas inventory. The solar power purchase had a net impact of reducing our total emissions by 19,308 metric tons of CO2 equivalents.
The 2018 inventory was audited by the MIT Office of Treasury and represents the third year of comprehensive inventory assessment for the Institute.

The total change in on-campus emissions from 2017 was an increase of 5,606 MTCO2e, or 3%, not accounting for MIT’s solar power purchase in 2018.

The total change in emissions from 2014 was a reduction of 9,428 MTCO2e, or 4.4%.

Role of Solar Power Purchase

Fiscal year 2018 marked the first complete year of production for MIT to account for from their large Summit Farm solar energy purchase.

Since the solar-generated electricity is considered to be carbon-free, the net impact is a reduction of greenhouse gas emissions associated with MIT’s greenhouse gas inventory. The solar power purchase had a net impact of reducing our total emissions by 33,040 metric tons of CO2 equivalents.
MIT has non-audited greenhouse gas data for buildings dating back to 1990. From this data, emissions can be roughly categorized into four phases of development from 1990 to the present: Pre-Cogeneration, Cogeneration, Campus Growth, and Efficiency. The next phase of MIT’s greenhouse gas management is Climate Leadership, beginning with the first Institutional GHG reduction goal of at least 32% by 2030 below 2014 levels being set in 2015, and the release of the first comprehensive and audited institutional GHG inventories for 2014-2018.

Note that this graphic shows trends only for emissions from MIT owned academic buildings, and does not include MIT’s solar power purchase in 2017-2018. Beginning in 2014, MIT also measures emissions from fugitive gases and campus vehicle use which are omitted from this figure.