Decentralized Cooling Systems with Steam Heating

Typology at a Glance

The statistics below reflect this typology’s fraction of citywide office building floor area, and the resulting energy use and greenhouse gas (GHG) emissions of all large office buildings, citywide.

- Gross SF: 40.5M SF
- # of NYC buildings: 460+
- GHG Emissions: 275,000 tCO2e
- Site Energy Use: 3.1B kBtu

Cooling Systems

- Ductless Mini Split
- Multi-Split
- PTAC
- Single Split
- Split System Central Air
- Through Wall A/C
- Window A/C

Heating System

- Steam Boiler

Heating Fuel

- District Steam
- Dual Fuel
- Electric
- Natural Gas
- Oil
- Propane

Whole-building GHG distribution

This pie chart depicts the breakdown of GHG emissions by end-use system, as well as the split between base building and tenant usage for each system.

owner / tenant collaboration

While LL97 places the responsibility to meet emissions limits on building owners, close collaboration between tenants and owners is critical to achieving the required GHG reductions. As part of tenant lease negotiations and tenant improvement projects, energy efficiency and GHG reduction will be an important element to reduce both base building and tenant emissions. Achieving LL97 compliance will require thoughtful owner-tenant engagement, to inform choices and behaviors that result in greater energy efficiency and emissions reductions.

calculate your carbon emissions

Compare your current calculated GHG emissions with Local Law 97 (LL97) limits and determine the percent reduction required for compliance.

compare to LL97 GHG limits

Choose a pathway below to decarbonization measures that can help you achieve your GHG reduction target.

choose a pathway to meet your reduction target

select one of the following options:

- Moderate existing tenant measures
- Moderate base building measures

select one of the following options:

- Moderate base building + Moderate existing tenant measures
- Deep base building measures
- Deep tenant fitout measures

select the following:

- Deep base building + Deep tenant fitout measures

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### Decentralized Cooling Systems with Steam Heating

This shows the breakdown of GHG emissions by end-use system, as well as bar charts depicting building vs. tenant usage for each system.

<table>
<thead>
<tr>
<th>System</th>
<th>Base Building</th>
<th>Tenant</th>
<th>Whole Building</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heating</td>
<td>37%</td>
<td>12%</td>
<td>10–12%</td>
</tr>
<tr>
<td>Cooling</td>
<td>12%</td>
<td>&lt;0.5%</td>
<td>0.5%</td>
</tr>
<tr>
<td>Ventilation</td>
<td>1%</td>
<td>0%</td>
<td>0–2%</td>
</tr>
<tr>
<td>Hot Water</td>
<td>3%</td>
<td>0.5%</td>
<td>0.5%</td>
</tr>
<tr>
<td>Lighting</td>
<td>11%</td>
<td>&lt;0.5%</td>
<td>0–3%</td>
</tr>
<tr>
<td>Plug Loads &amp; Conve.</td>
<td>24%</td>
<td>0.5%</td>
<td>0.5%</td>
</tr>
<tr>
<td>Process / Other</td>
<td>12%</td>
<td>&lt;0.5%</td>
<td>0.5%</td>
</tr>
</tbody>
</table>

### Retrofit Packages

#### Moderate Decarbonization

The potential GHG savings percentages listed below reflect estimated building and/or tenant space emissions savings from baseline whole-building emissions. The total savings range for moderate decarbonization measures includes the combined savings from both base building measures and existing tenant measures.

<table>
<thead>
<tr>
<th>Base Building</th>
<th>Existing Tenant</th>
<th>Whole Building</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>GHG savings from base building measures</strong></td>
<td><strong>GHG savings from existing tenant measures</strong></td>
<td><strong>Total savings from moderate decarbonization measures</strong></td>
</tr>
<tr>
<td>10–12%</td>
<td>4–6%</td>
<td>14–18%</td>
</tr>
</tbody>
</table>

#### Deep Decarbonization

Achieving deeper GHG savings for buildings more than 25% over emissions limits will require significant investment, often including electrification solutions (●) for heating, cooling, and hot water. A detailed engineering analysis is needed to determine the best measures for each building. *GHG savings listed below are from baseline whole-building emissions.*

<table>
<thead>
<tr>
<th>Base Building</th>
<th>Tenant Fitout</th>
<th>Whole Building</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>GHG savings from base building measures</strong></td>
<td><strong>GHG savings from new tenant measures</strong></td>
<td><strong>Total savings from deep decarbonization measures</strong></td>
</tr>
<tr>
<td>12–14%</td>
<td>15–17%</td>
<td>27–31%</td>
</tr>
</tbody>
</table>

---

*For real uses where there are measures listed but no savings shown, the whole building GHG savings is counted in the baseline building column for the real use. The transition to all-electric equipment will shift some energy usage between building and tenant systems, which is not estimated in this table.*

*Emissions reductions are shown using the electricity carbon coefficient specified in Local Law 97 for the 2019-2020 compliance period. It is likely that the final electricity coefficient for 2030-2034 will be lower, resulting in larger GHG reductions.*