Experiences from Tokyo on energy efficiency actions at the city level

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Tokyo’s GHG/Energy Consumption Targets

2006
GHG emissions <10 year Plan>
25% reduction by 2020 from 2000 level

Fukushima nuclear accident

2014
Energy consumption < TMG Long-term Vision>
20% reduction by 2020, 30% by 2030

New target setting

2016 March
<TMG Environment Master Plan 2016>
GHG emission 30% reduction by 2030
Energy consumption 38% reduction by 2030

2016 Dec.
<Action Plan for 2020>
TOKYO’s Green Building Policy Framework

Tokyo’s Policy Framework

- District Plan for Energy Efficiency
- Green Building Program
- Cap & Trade Program
- Carbon Reduction Reporting for SME

Planning/Operation Stage
- Planning
- Design
- Construction
- Operation
- Tuning
- Retrofit

New buildings

Larger

Developments w. incentive bonus

Smaller

Existing buildings
TOKYO’s Policy development

Tokyo’s Policy Targets

- **2002**
  - **Start**
  - **Green Building Program**
  - **2002**

- **2005**
  - **Revise**
  - **Carbon Reduction Reporting (for Large)**
  - **2005**

- **2008**
  - **Enact**
  - **Tokyo Cap & Trade**
  - **2008**

- **2010**
  - **Start**
  - **Carbon Reduction Reporting for SMEs**
  - **2010**

- **New builds**
  - **2002**
    - **Start**
  - **2005**
    - **Revise**
  - **2010**
    - **Revise**

- **Existing buildings**
  - **2002**
    - **Start**
  - **2005**
    - **Revise**
  - **2008**
    - **Enact**

- **Green Labeling Program for Residential Buildings**
  - **2010**

- **District Plan for Energy Efficiency**
  - **2010**
What is Tokyo Cap-and-Trade Program?

1. Tokyo Cap-and-Trade Program


- **Building Sector**
- **Existing Buildings**
- **Energy consumption including power**
- **5 years for Compliance**
- **Emission Trading Scheme**
Tokyo Cap-and-Trade Program

Program Outline
Cap, Covered Facilities, Cap Settings

Cap (Total emissions allowed for the covered sector) was designed to enable Tokyo to achieve "-25% by 2020" emission target.

Setting cap on emissions from 1,300 facilities (Mainly commercial bldgs.), accounting for 20% of Tokyo’s total emissions.

Under the cap, each building is obligated to reduce emissions by 6-8% (first period) and 15-17% in the second period.
Program Outline
Trading and Offsetting

Emission Trading:
Trade scheme can be utilized by owners to fulfill their obligations
Tradable allowances are limited to the excess reductions over compliance obligations

MRV: Monitoring and annual reporting are required
Verification system established for the program

Offset systems:
Renewables, emission reductions in small facilities, etc.

Linkage:
Link with the C&T of an adjacent prefecture
Tokyo Cap-and-Trade Program

CO2 Emission Reduction

- Base-year emission: 1,650
- 2010: 1,400
- 2011: 1,300
- 2012: 1,200
- 2013: 1,100
- 2014: 1,000
- 2015: 1,227

Reduction percentages:
- 2010: 13%
- 2011: 22%
- 2012: 22%
- 2013: 23%
- 2014: 25%

Total reduction: 26%
Comparison with the national trend

Tokyo Cap-and-Trade Program

National final energy consumption
Tokyo’s final energy consumption
CO2 emission from C&T covered facilities (fixed emission factor)

Fiscal Year

 FY 2005=100

Huge jump in LED installation

-500,000
-300,000
-100,000
100,000
300,000
500,000
700,000
900,000
1,100,000
1,300,000
1,500,000

-500,000
-300,000
-100,000
100,000
300,000
500,000
700,000
900,000
1,100,000
1,300,000
1,500,000

Efficient
Conventional
LED
Other efficient lightings
Conventional lightings
2. Carbon Reduction Reporting for SMEs

Target: "Small and medium-sized facilities“

Non-residential facilities
Not covered by the Tokyo Cap-and-Trade scheme
Own or Use

Mandatory and Voluntary

Carbon Reduction Reporting for SMEs

Reporting Process

TMG
- Consultation, Help desk (Cool net Tokyo)
- Disclosure at TMG web site at company
- Advice, guidance, admonition

SMEs
- Report XX Company
- Aggregate at the headquarter

Feeding back
- Info. (benchmark etc.) Support programs
- CO2 emissions data
- BEE measures

Disclosure at TMG web site at company
- Advice, guidance, admonition

Report Submission
- Feeding back
- CO2 emissions data
- BEE measures
## Carbon Reduction Reporting for SMEs

### Feeding back – Low Carbon Benchmark

#### (1) Benchmark (7 grade, 15 ranges)

<table>
<thead>
<tr>
<th>Range</th>
<th>Range of CO₂ emission intensity (kg-CO₂/m²)</th>
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<tbody>
<tr>
<td>A4</td>
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<tr>
<td>A3</td>
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<tr>
<td>A3−</td>
<td>A3−</td>
</tr>
<tr>
<td>A2</td>
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</tr>
<tr>
<td>A2+</td>
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<tr>
<td>C</td>
<td>C</td>
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</tbody>
</table>

#### (2) Ratio of facility

- A4: 6%
- A3−: 10%
- A2+−: 17%
- A1−: 23%
- B2+: 19%
- B1: 16%
- C: 9%

**Benchmark category: Tenant building (office type: medium-sized)**
Carbon Reduction Reporting for SMEs Reporting Contents

255 types of **Carbon reduction/energy efficiency improvement measures**

Each measure is explained in the guideline

- Used as a manual for measures
- Used to check if any appropriate measure is overlooked
Carbon Reduction Reporting for SMEs

Continuous Reductions

CO$_2$ emissions of small and medium-sized facilities

(Ten thousand tons)

10.0% decrease from FY2009
12.1% decrease from FY2010
Tokyo Green Building Program
Rating and disclosure system for sustainable design

Coverage:
40% of new buildings
Newly planned large buildings (over 5,000 sq. meters)

Requirement:
Mandatory reporting
Submit sustainable design plan with its ratings

Rating & Disclosure:
12 items in 4 categories
Energy, Greenery, Water/Material, and Heat Island
Rated results are disclosed on the TMG website

Labeling and Energy Efficient Certificate Programs have been developed based on this GB program
Tokyo Green Building Program
Rating and disclosure system for sustainable design

Assessment items: 12 Items

<table>
<thead>
<tr>
<th>Category</th>
<th>Items</th>
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<tbody>
<tr>
<td>Energy</td>
<td>Heat load resistance of the building envelope</td>
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<tr>
<td></td>
<td>Renewable energy installation</td>
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<td></td>
<td>Energy efficiency in building equipment</td>
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<td></td>
<td>Building energy management system</td>
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<tr>
<td>Resources Material</td>
<td>Usage of eco-materials</td>
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<td></td>
<td>Protection of ozone Layers</td>
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<td>Longer building life-expectancy</td>
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<tr>
<td>Natural environment</td>
<td>Water re-cycle, rainwater use</td>
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<tr>
<td></td>
<td>Greening (vegetation, landscape, etc.), bio-diversity</td>
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<tr>
<td>Heat-Island subject</td>
<td>Heat waste discharge</td>
</tr>
<tr>
<td></td>
<td>Surface of ground and buildings (greenery, water retaining pavement, etc.)</td>
</tr>
<tr>
<td></td>
<td>Wind environment</td>
</tr>
</tbody>
</table>

Disclosure @ TMG website
--Plan with ratings are displayed

● Charts display the rated results in 3 grades

● Find buildings from a location map

Conclusion

Tokyo’s Experiences on Energy Efficiency Actions