

# CITY CLIMATE LEADERSHIP AWARDS

## Tokyo Climate Close-Up

### Fast Facts

- Japan's population of 127 million makes it the 10th most populated country in the world.
  - Japan's population decreased by 0.1% in 2013. Japan's National Institute of Population and Social Security Research estimates that the country's population could decrease by 20 million by 2040.
  - The elderly now outnumber children in Japan. In 2013, the number of people over 65 years of age surpassed 30 million (24% of the population), in contrast to the population under 14 years, which fell to a record low of 13% of the population.
  - The Climate Change Vulnerability Index ranks Japan as the 86th most vulnerable country in the world. It is considered a country at high risk of climate change impacts.
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- Tokyo's GDP was \$893 billion in 2008, almost 20% of Japan's GDP. GDP for the wider metropolitan area was \$1.5 trillion, or 33% of national GDP.
  - In 2010, Tokyo's population was 13.2 million. By 2020, it is estimated to rise to 13.4 million.
  - Tokyo's elderly population (>65 years of age) was 2.7 million (20% of the population) in 2010, and is expected to reach 3.2 million in 2020 (24%).
  - Tokyo emits 62 million tons of greenhouse gas (GHG) emissions annually.

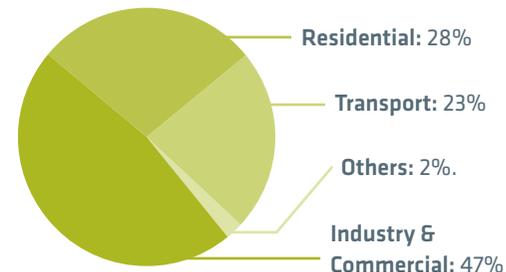
### Population statistics



	2010	2030	2060
City	12.9 million	12.9 million	10.4 million
Metropolitan Area	35.2 million	36.0 million	

Sources: Demographia, <http://www.demographia.com/db-wuaproject.pdf>; Japanese Journal of Population (2011), [http://www.ipss.go.jp/webj-ad/webjournal.files/population/2011\\_Vol.9/Web%20Journal\\_Vol.9\\_01.pdf](http://www.ipss.go.jp/webj-ad/webjournal.files/population/2011_Vol.9/Web%20Journal_Vol.9_01.pdf), [http://ajw.asahi.com/article/behind\\_news/social\\_affairs/AJ201311110006](http://ajw.asahi.com/article/behind_news/social_affairs/AJ201311110006)

### Sources of CO<sub>2</sub> (eq.) emissions



Source: IETA, [http://www.ieta.org/assets/Reports/EmissionsTradingAroundTheWorld/edf\\_ieta\\_tokyo\\_case\\_study\\_september\\_2013.pdf](http://www.ieta.org/assets/Reports/EmissionsTradingAroundTheWorld/edf_ieta_tokyo_case_study_september_2013.pdf); Siemens-C40 Climate Leadership Awards, [http://issuu.com/siemens\\_the\\_crystal/docs/tokyo?e=3714297/4955837](http://issuu.com/siemens_the_crystal/docs/tokyo?e=3714297/4955837)

### CO<sub>2</sub> (eq.) emissions



**Annual CO<sub>2</sub> (eq.) emissions:**  
62 million tons

**Emissions reduction target:**  
25% reduction by 2020 (compared to 2000 levels)

Source: Siemens-C40 Climate Leadership Awards, [http://issuu.com/siemens\\_the\\_crystal/docs/tokyo?e=3714297/4955837](http://issuu.com/siemens_the_crystal/docs/tokyo?e=3714297/4955837)

## Finance & Economic Development winner 2013: Cap-and-trade program

### Summary

Tokyo won the C40 & Siemens Climate Leadership Awards' Finance & Economic Development category for its cap-and-trade program, which became the world's first urban emissions trading scheme when it was launched in April 2011. In its first year, more than 1,100 participating facilities, large commercial and industrial buildings, reduced CO<sub>2</sub> emissions by 13%. The following year, an additional 10% reduction was achieved, bringing total emissions reductions to more than 7 million tons of CO<sub>2</sub>.

### Challenges

As Japan's largest economic centre, Tokyo accounts for 62 million tons of greenhouse gas (GHG) emissions per year. Energy-related CO<sub>2</sub> emissions represent about 95% of Tokyo's GHG emissions. Tokyo's new and existing building stock is a particularly high emitter of CO<sub>2</sub>, for example, CO<sub>2</sub> emissions in the commercial building sector accounted for approximately 40% of GHG emissions in 2010.

### Actions

In 2006 Tokyo announced its aim to cut emissions by 25% from 2000 levels by 2020. The Tokyo Climate Change Strategy, released in June 2007, stemmed from this announcement, and included a number of measures to fight global warming. As part of the Strategy, the Tokyo Metropolitan Government (TMG) targeted emissions from the city's new and existing building stock, implementing a cap-and-trade program for existing large commercial, government, and industrial buildings, in addition to launching design policies and information campaigns for new green buildings. Launched on April 1, 2010, the Tokyo cap-and-trade

program was the most comprehensive of these green building measures, and is the world's first urban cap-and-trade program.

### Projected Outcomes

Under the cap-and-trade system, TMG requires buildings over a certain size to take action to reduce emissions. It set the cap for reducing GHG emissions at 6% for the first compliance period (FY2010-FY2014) and 15% for the second compliance period (FY2015-FY2019). Buildings that reduce emissions beyond the cap are eligible to sell their "credits" to buildings unable to match those targets. Thus, a market for GHG emissions is established, which produces the market-allocated distribution of a government-set level of emissions.

In its first year, the participating 1,159 facilities exceeded program expectations, reducing emissions by 13% in total. Reports submitted at the end of November 2012 bring the second-year total to an overall 23% emission reduction below the base-year emissions. Of the required facilities, 93% have now met the first compliance factor, and more than 70% have already surpassed the target for 2019.

The success of Tokyo's cap-and-trade program provides a compelling example for other cities to follow. Through the market mechanism the program provides, buildings more readily able to reduce emissions are able to sell credits to buildings more costly to retrofit. This drives greater emissions reductions at a reduced cost to all participants. In addition, energy efficiency efforts are now taken jointly by tenants and building owners, which has led to an increased public awareness of climate change issues.



## In detail

### Building on experience and engaging stakeholders

The Cap and Trade Program has made a significant impact on Tokyo's CO<sub>2</sub> emissions and electricity consumption. Peak power demand has been reduced by 10 gigawatts from Tokyo's previous peak demand of 60 gigawatts.

The Tokyo Cap and Trade Program was not implemented overnight. It was designed based on experiences from a previous program, the CO<sub>2</sub> emission reporting program, started in 2002. The prior program required large facilities to report their yearly data of energy consumption and CO<sub>2</sub> emissions as well as their reduction plans. Whilst the reporting was mandatory, emission reductions were voluntary. As the scheme was voluntary, the reduction-level stayed relatively low. However, the program allowed the City government to gather real data from buildings in Tokyo and understand what was feasible when designing the Cap and Trade program.

After announcing the proposal to introduce the Program, the TMG held public meetings to engage stakeholders, give more details about the Program and ensure that it could be delivered effectively. Meetings were held three times between July 2007 to January 2008. Business groups, companies which had an interest in climate change, and environmental NGOs participated. The meetings were open to the public and media. Over 200 people attended each of the meetings.

The meetings allowed discussions to remain as transparent as possible, and ensured all discussions were in the public domain with regard to the arguments of both industry and TMG. This approach enabled TMG to successfully gain supporters in business sectors. They also enabled TMG to refine their proposals in response to stakeholder concerns. One such area was around buildings with multiple tenants. Building

owners (the compliance entities) had concerns that they would be unable to control emissions from new tenants. A mechanism was created to ensure the cooperation of tenants and compensate for major shifts in tenant occupancy.



## In detail

### Low Emissions buildings Top 30 in Tokyo

In 2011 Tokyo Metropolitan Government published a report setting out 30 buildings that were evaluated highly under the City's Cap and Trade program (for existing buildings) or the Tokyo Green Building program (for new buildings).

The Dentsu Head Office Building is a great example of a building that has continued to reduce its emissions. The building is 231,701m<sup>2</sup> and is 48 storeys above ground and a further 5 basement floors. The building's primary energy consumption is 2,129 MJ/m/year and has CO<sub>2</sub> emissions of 83.8kg/m/year.

The building was completed in 2002 and was designed to be 30% more efficient than similar conventional buildings at the time. Around 35 major architectural and equipment features were incorporated into the building. Measures focused on restraining air conditioning load, boosting resource and energy efficiency.

The building management works with tenants to identify problems and find solutions and efforts to reduce energy use and CO<sub>2</sub> emissions have continued whilst the building has been operational. There have been over 40 major initiatives including the introduction of dead bands for air conditioning controls, improvements to the variable air volume (VAV), equipping cold-water heat exchangers in the heating system with thermal jackets to prevent heat discharge. The building has also been installed with grey water treatment ensuring that kitchen water is reused. 20,000 LED lights have also been installed in office areas.

Low Emissions buildings Top 30 in Tokyo Report is available at the following web address: [https://www.kankyo.metro.tokyo.jp/en/int/TOP30\\_English.pdf](https://www.kankyo.metro.tokyo.jp/en/int/TOP30_English.pdf)





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