

Energy Consumption and Energy Cost in Office Buildings (December 2019)

Energy price per unit flat and cost declining as energy consumption drops

May 15, 2020

Xymax Real Estate Institute has been studying the energy consumption and energy cost of office buildings in the Greater Tokyo area on a continuous basis. The results for the period between January 2010 and December 2018 were released in May 2019. This report covers the results for the period ending December 2019.

Energy consumption and energy cost are converted into indices, with figures as of December 2010 set at 100.

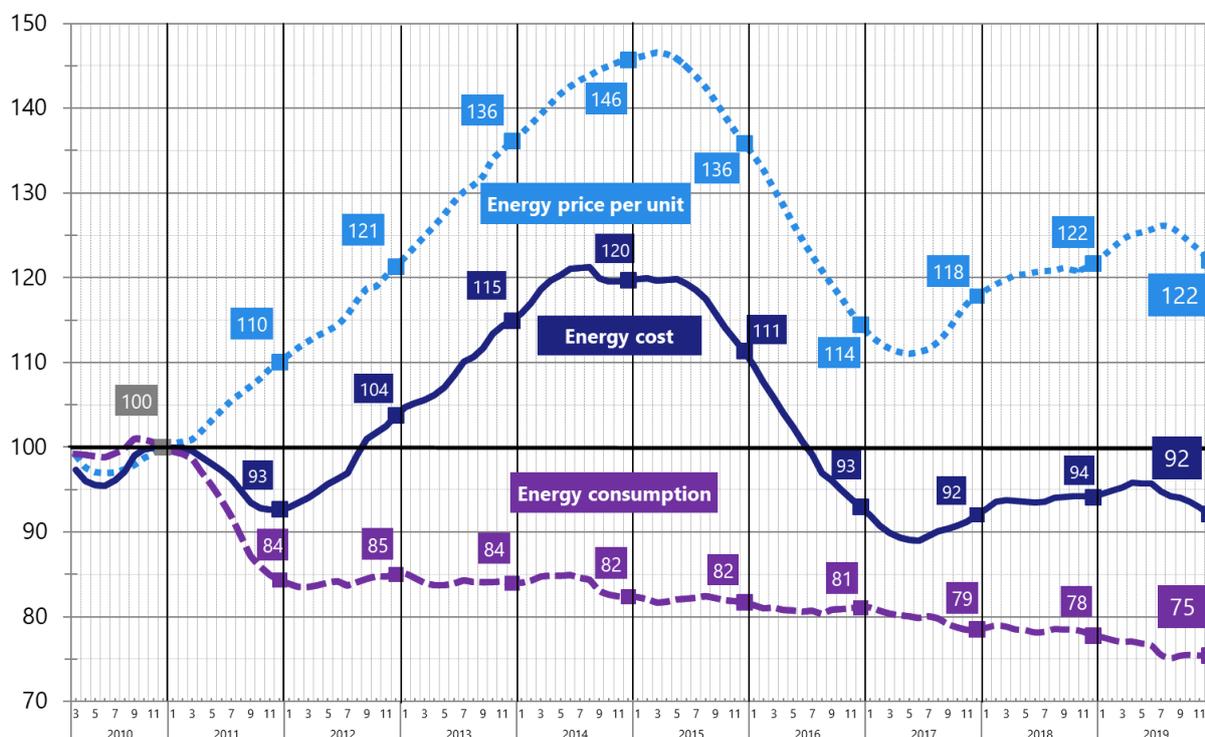
Summary of Survey Results

- Energy Consumption
3 points down from the previous survey (December 2018)
- Energy Price per Unit
Roughly flat from the previous survey (December 2018)
- Energy Cost
2 points down from the previous survey (December 2018)

1. Office Building Energy Consumption & Cost (12-Month Average)

Figure 1 shows the 12-month moving average of energy consumption, price per unit and cost. Energy consumption (dashed line) dropped 3 points from the previous survey, while energy price per unit (dotted line) was roughly flat. Energy cost (solid line) was down 2 points.

Figure 1: 12-Month Average Energy Consumption / Price per Unit / Cost



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2. Energy Consumption, Price per Unit, Cost (Annual Average)

Figure 2 indicates the trend of energy consumption volume. The average for 2019 was 125.0 MJ/sqm/month (1,500 MJ/sqm/year), down approximately 25% from 2010. Compared to 2018, consumption decreased by 46 MJ/sqm/year (approx. 3%).

Figure 2: Energy Consumption (MJ/sqm/month)

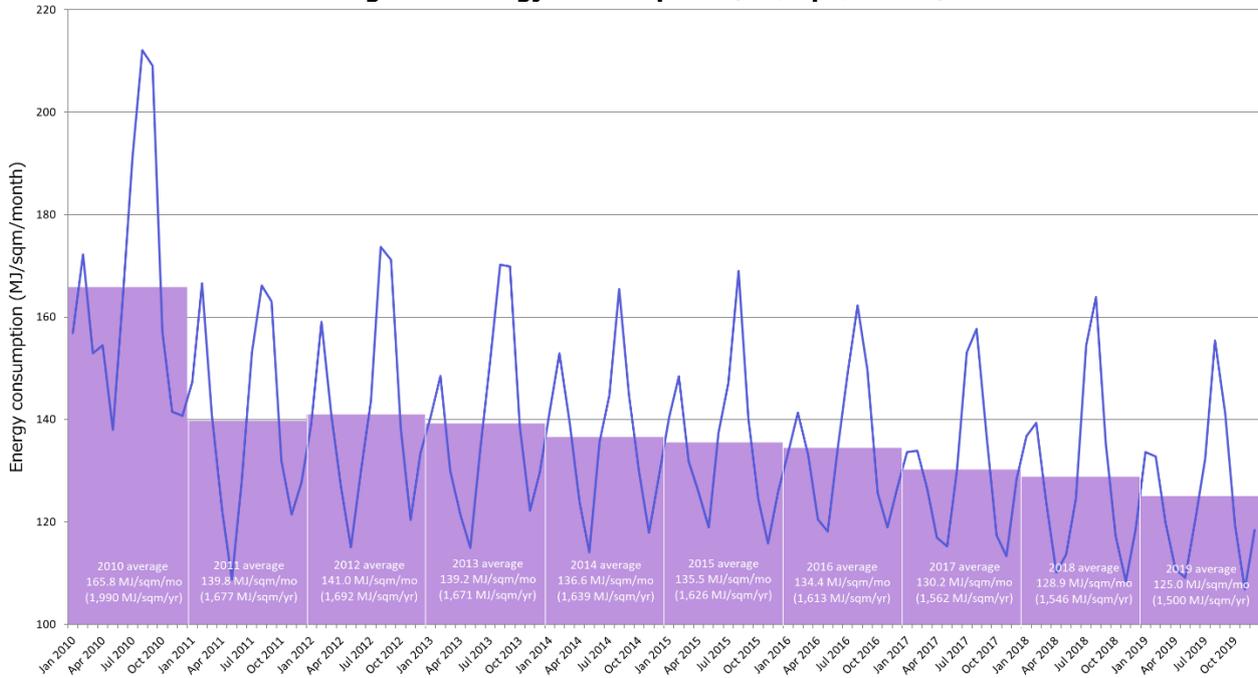
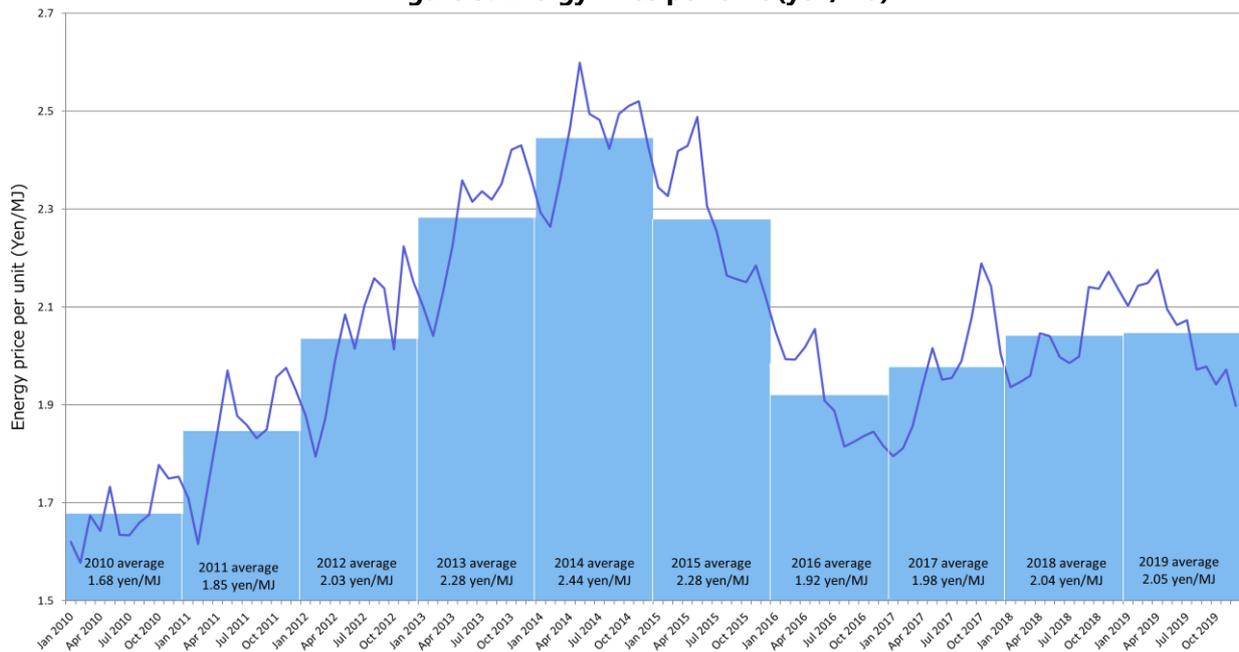


Figure 3 shows the trend of energy price per unit. After rising continuously since the start of the survey in 2010 until 2014, unit price started to decline in 2015 but turned upward again in 2017. The average unit price in 2019 rose 0.01 yen year on year to 2.05 yen/MJ.

Figure 3: Energy Price per Unit (yen/MJ)

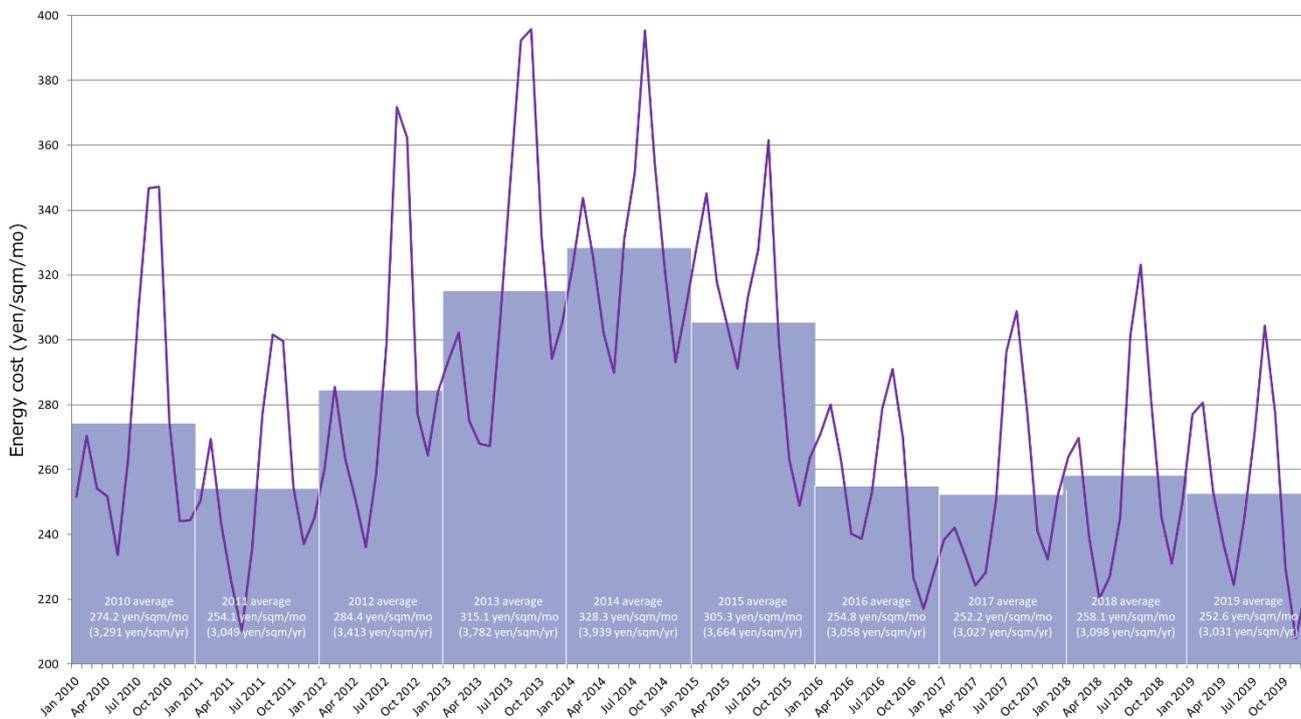


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Figure 4 shows energy cost. The rising trend since after the Great East Japan Earthquake turned downward in 2015. It resumed its upward trend in 2018 but dropped again in 2019.

Figure 4: Energy Cost (yen/sqm/month)



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Survey Overview

Period	April 2009 – December 2019 (129 months)
Targets	Approx. 100 typical tenant-occupied office buildings in Greater Tokyo managed by the Xymax Group from which we were able to obtain valid data
Calculation method	<p>A. Monthly energy consumption, price per unit and cost</p> <ol style="list-style-type: none"> 1) Aggregate the consumption volume of and cost paid (excluding tax) for electricity, gas and heat of each building. 2) Convert the consumption volume of 1 above to mega joules (MJ) (primary energy volume) based on the following coefficients and sum up the results. Electricity: 9.76 MJ/kWh City gas: 45 MJ/cubic meters Cold/hot water, steam: 1.36 MJ/MJ 3) Energy consumption (MJ/sqm/month) ⇒ Divide the total consumption volume calculated in 2 above by gross floor area (excl. vacant space) Energy price per unit (yen/MJ) ⇒ Divide the total cost paid calculated in 1 above by the total consumption volume calculated in 2 above. Energy cost (yen/sqm/month) ⇒ Divide the total cost paid calculated in 1 above by gross floor area (excl. vacant space) 4) Calculate the average value of the survey targets for each of the items derived in 3 above. <p>B. 12-month average</p> <ol style="list-style-type: none"> 1) Calculate the 12-month average of consumption, unit price and cost obtained in A for each month. 2) Convert the figures to indices with December 2010 = 100.
Remarks	<p>“Month” in this report is based on the date of the meter reading, which differs by building and by energy supplier.</p> <p>To ensure continuity and accuracy of data, the gross floor area used in this survey excludes vacant space.</p>

*Please refer to *Energy Consumption and Energy Cost in Office Buildings (December 2018)* released on May 15, 2019 for the previous survey. <https://www.xymax.co.jp/english/research/images/pdf/20190515.pdf>

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