

Energy Consumption and Energy Cost in Office Buildings (December 2017)

Unit price rises while energy consumption and energy cost decline

June 6, 2018

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 2016 were released in March 2017 (Japanese version only). This report covers the results for the period ending December 2017.

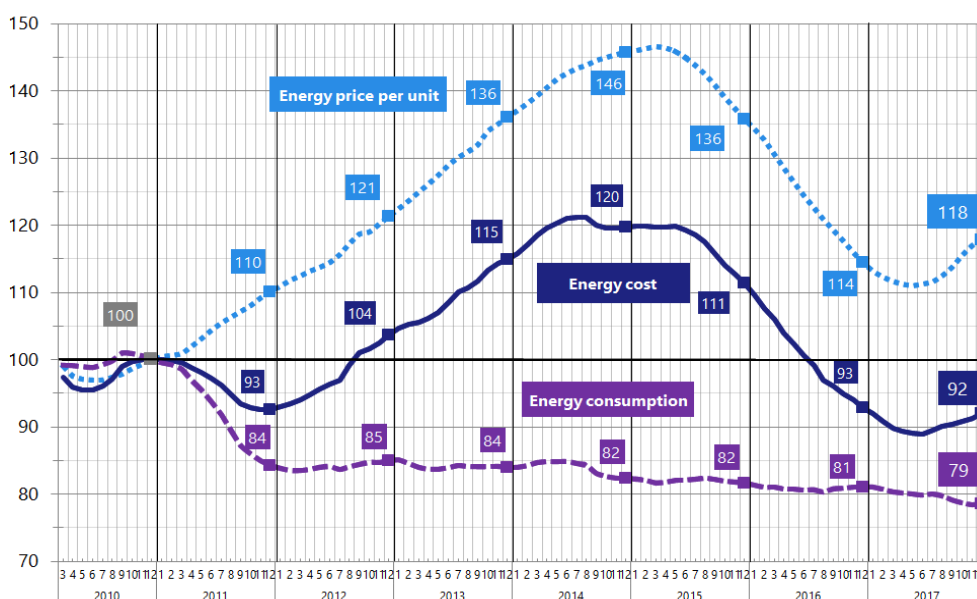
Summary of Survey Results

- Energy Consumption
2 points down from the previous survey (December 2016)
- Energy Price per Unit
After being on a declining trend since 2015, turned upward in 2017 and was up 4 points from the previous survey (December 2016)
- Energy cost
1 point down from the previous survey (December 2016)

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. The energy price per unit (dotted line) had been falling since 2015 but turned upward in 2017. Energy consumption (dashed line) dropped 2 points from the previous survey. Energy cost was 1 point down.

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 changes in energy consumption volume. The average for 2017 was 130.2 MJ/sqm/month (1562 MJ/sqm/year), down approx. 22% from 2010.

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

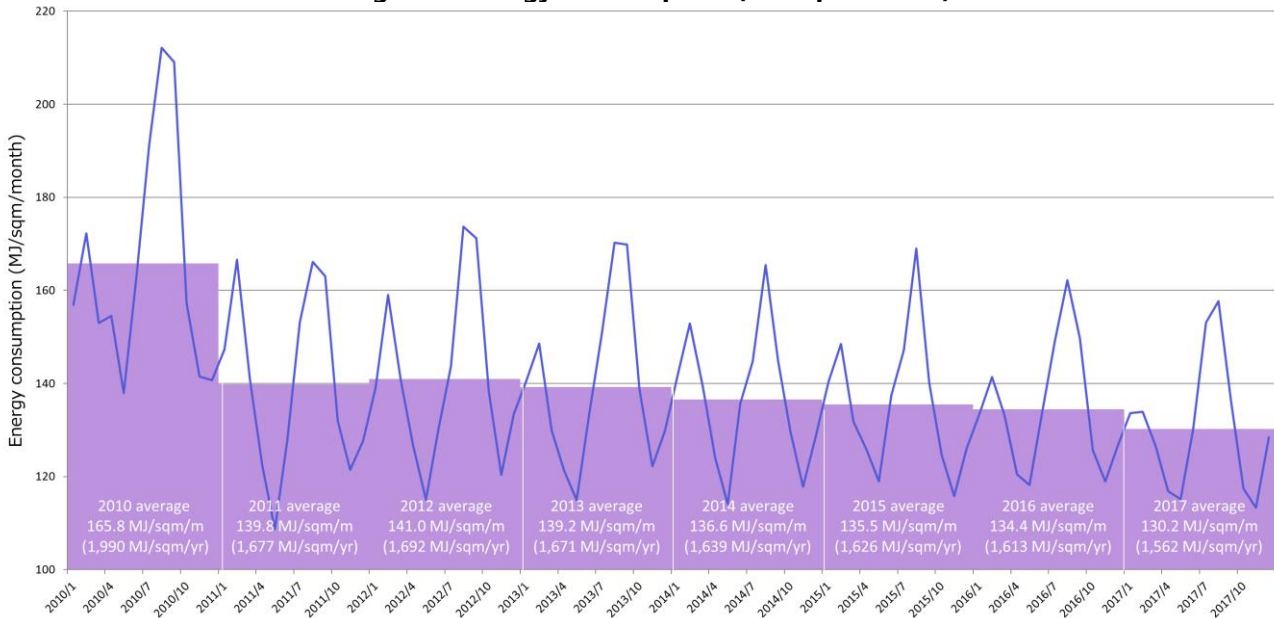
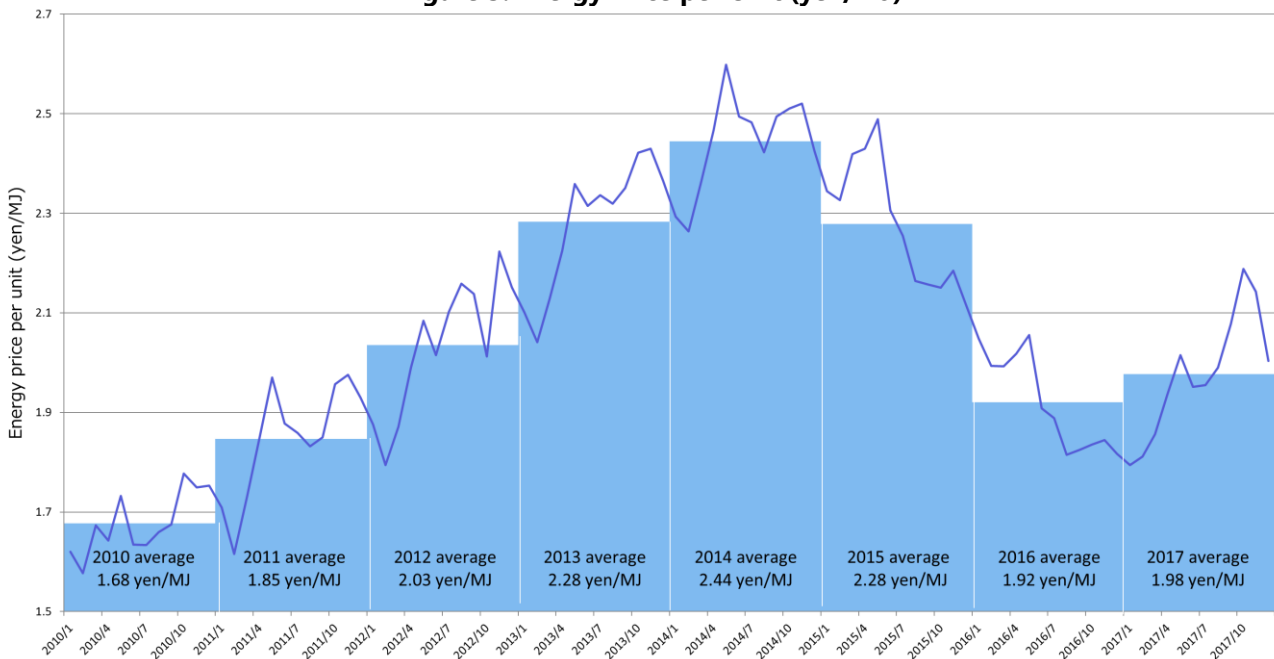


Figure 3 shows changes in energy price per unit. After having risen continuously since the start of the survey in 2010 until 2014, unit price started to decline in 2015 but turned upward again in 2017.

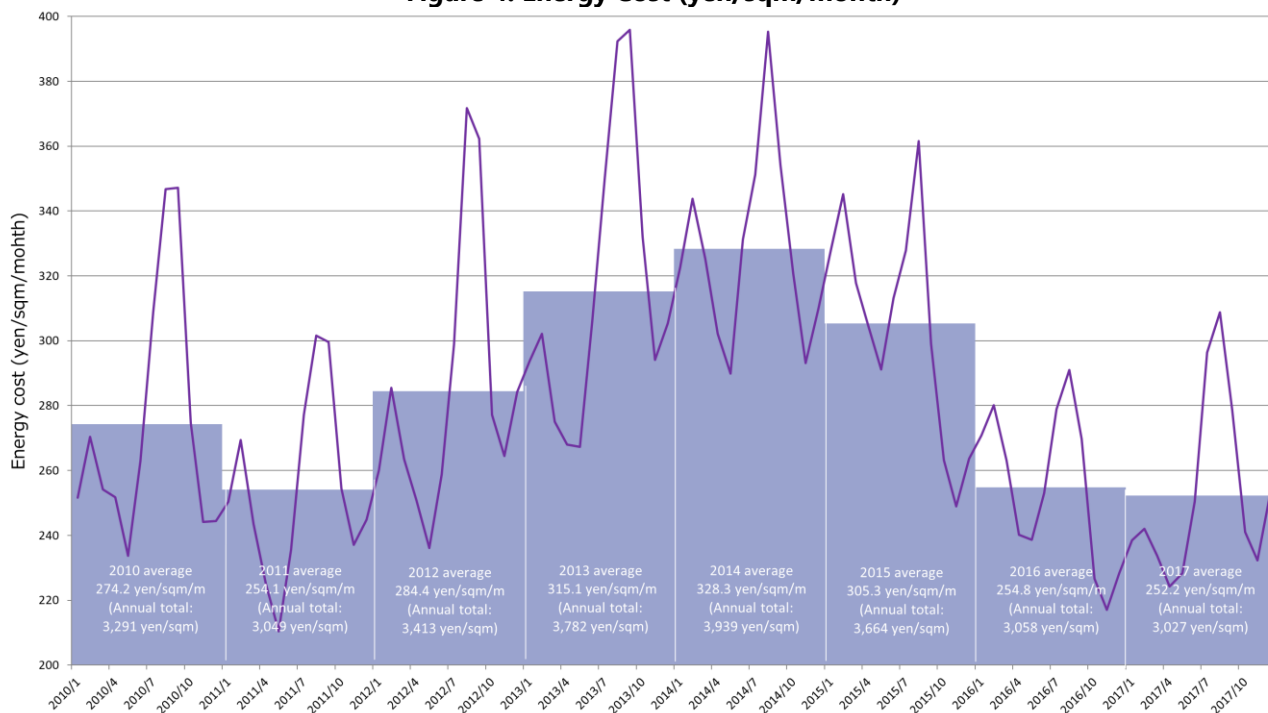
Figure 3: Energy Price per Unit (yen/MJ)



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Figure 4 indicates changes in energy cost. The rising trend since after the Great East Japan Earthquake in 2011 turned downward in 2015, recording the lowest figure in 2017 since the start of measurements.

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



Survey Overview

Survey period	April 2009 – December 2017 (105 months)
Survey targets	Approx. 100 of typical tenant-occupied office buildings in Greater Tokyo managed by the Xymax Group, from which we obtained 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 (excl. tax) for electricity, gas, heat and oil in each building. 2) Convert the consumption volume of 1 into mega joules (MJ) (primary energy volume) based on the following coefficients and sum up the results. Electricity: 9.76MJ/kWh City gas: 45MJ/sqm Cold/hot water, steam: 1.36MJ/MJ Open steam: 2.68MJ/kg Bunker A: 39.1MJ/L 3) Energy consumption (MJ/sqm/month) ⇒ Divide the total consumption volume calculated in 2 by gross floor area (excl. vacant space) Energy price per unit (yen/MJ) ⇒ Divide the total cost paid calculated in 1 by the total consumption volume calculated in 2. Energy cost (yen/sqm/month) ⇒ Divide the total cost paid calculated in 1 by gross floor area (excl. vacant space) 4) Calculate the average value of the survey target for each of the items calculated in 3. <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) Index the figures based on 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. To ensure continuity and accuracy of the 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 2017)” released on March 3, 2017 (in Japanese only) for the previous survey.

Contact for inquiries concerning this report

Xymax Real Estate Institute

<https://soken.xymax.co.jp>

TELEPHONE: +81 3 3596 1477 | FAX: +81 3 3596 1478 | E-MAIL: info-rei@xymax.co.jp