

NEWS & RELEASE

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Energy Consumption and Cost in Office Building (December 2014)

Consumption slightly down, price rise slowed, and cost is decreasing

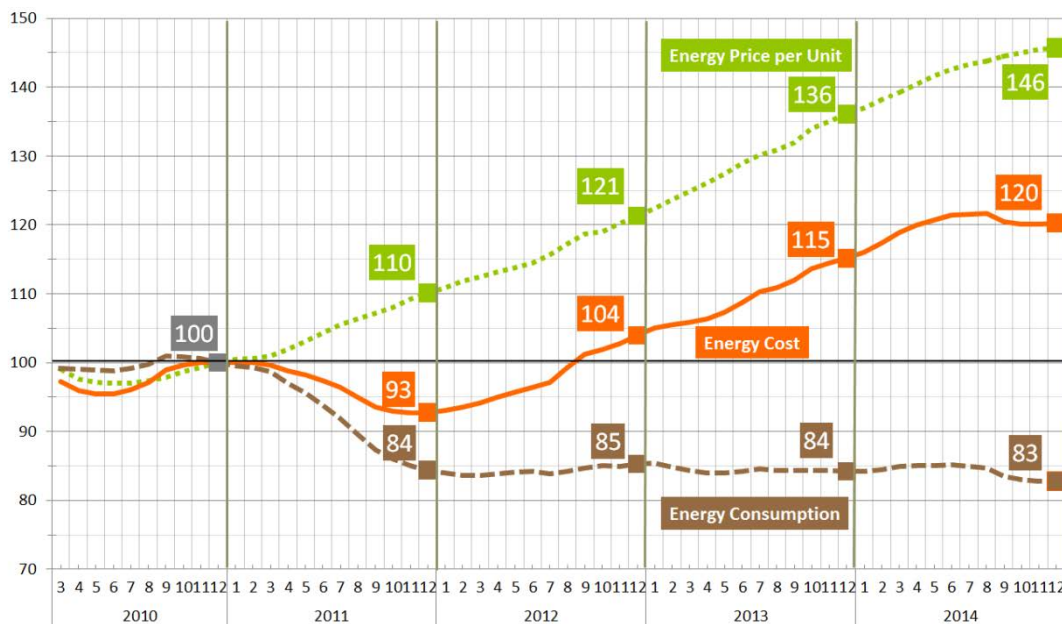
Xymax Real Estate Institute has been studying the energy consumption and energy cost in office buildings in Japan and releasing the results on regular basis. The report covering January 2010 to September 2014 was released in December last year. This issue is an update report covering up to December 2014.

Monthly data (April 2009 – December 2014) is available at the end of this report.

Findings as of December 2014 (Figure 1)

- Energy Consumption**
 17% lower compared to 2010, slightly decreased from the low level started in 2011.
- Energy Price per Unit**
 46% higher compared to 2010, the uptrend started in mid-2010 has slightly slowed.
- Energy Cost**
 20% higher compared to 2010, slightly decreased after a rise influenced by the changing trends of energy consumption and price per unit.

Figure 1: Energy Consumption, Price per Unit and Cost by 12-month Average



- The figures for each month are not based on the actual amount of a particular single month but are the average for the past 12 months.
- Indexed based on December 2010 = 100
- Energy consumption is converted to mega joule (MJ) (amount of primary energy)
- Consumption and cost are estimated based on per sqm and indexed.
- Relation among the three indexes: Cost = Price per Unit x Consumption

Monthly Energy Consumption, Price per Unit and Cost

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

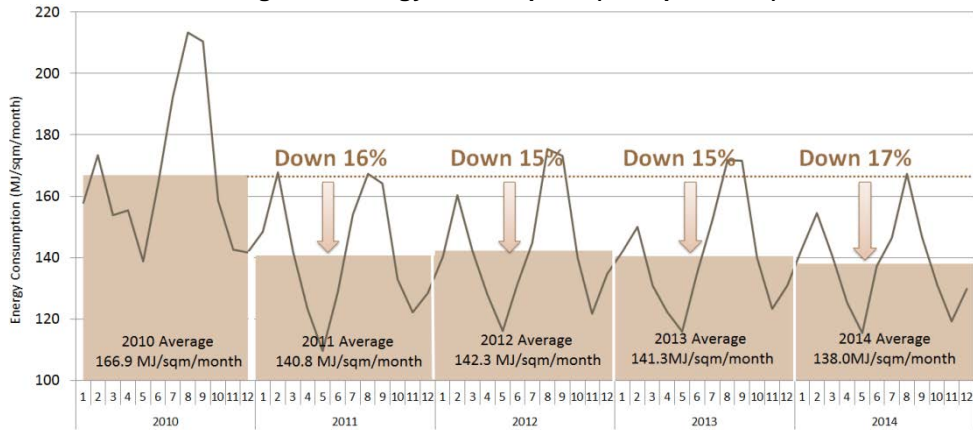


Figure 3: Energy Price per Unit (yen/MJ)

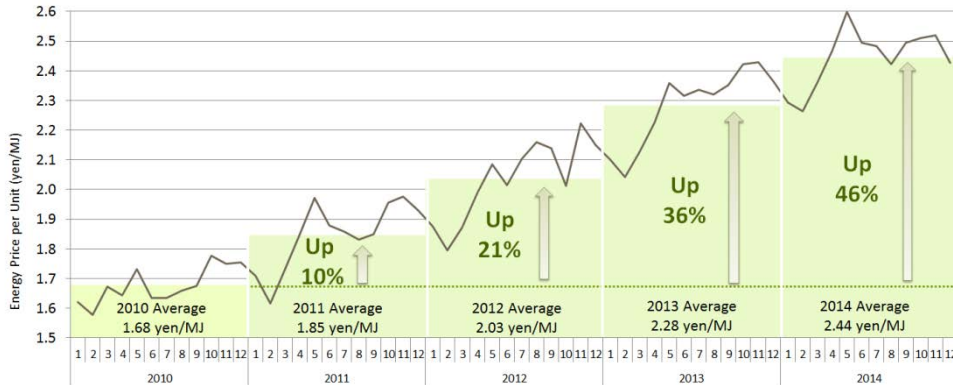


Figure 4: Energy Cost (yen/sqm/month)

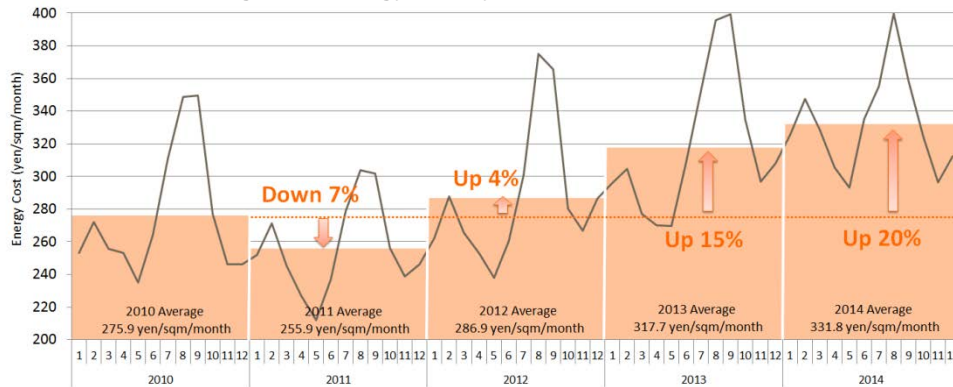


Figure 2 shows changes in energy consumption. The decreases in 2011-2013 were roughly the same level, down by 16%, 15% and 15%, respectively, from the annual average of 2010. The decrease in 2014 was, however, 17%, affected by a smaller air-conditioning load thanks to the lowest number of "summer days" (maximum temperature above 30 degrees Celsius) since 2010.

Figure 3 shows changes in energy price per unit (yen/MJ). Although the year-on-year increase in 2014 was slightly smaller than other years, the rising trend continued. The high import price of raw materials may be the factor for the increase. There is a possibility of changes in energy price following the decrease of oil price started in the latter half of 2014.

Figure 4 shows changes in energy cost. As a result of changes in consumption and price, the annual average of 2014 was 20% greater than that in 2010, but the pace of increase has slightly slowed.

Outline

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| Period and Subject Building |
| <p>Period: April 2009 – December 2014 (69 months)</p> <p>Subject Building: Of typical tenant-occupied office buildings in Greater Tokyo under management by Xymax Group, approx. 100 buildings with valid data are used in this study.</p> |
| Estimation Method |
| <p>Monthly data were estimated as follows:</p> <ol style="list-style-type: none"> 1. Gather the amount of consumption of and cost paid for (excl. tax) the electricity, gas, heat and oil for each building. 2. Convert the above amount of consumption to mega joule (MJ) (amount of primary energy) based on the following. <ul style="list-style-type: none"> Electricity: 9.76 MJ/kWh City Gas: 45 MJ/m³ Cool/hot water, steam: 1.36 MJ/MJ Open steam: 2.68 MJ/kg Bunker A: 39.1 MJ/L <p>Then, add all the amounts.</p> <ol style="list-style-type: none"> 3. A: Energy Consumption (MJ / sqm / month) <ul style="list-style-type: none"> → Divide the total consumption calculated in 2 by the gross floor area of the building (excluding vacant space) B: Energy Price per Unit (Japanese yen / MJ) <ul style="list-style-type: none"> → Divide the total cost paid estimated in 1 by the total consumption estimated in 2. C: Energy Cost (Japanese yen / sqm / month) <ul style="list-style-type: none"> → Divide the total cost paid estimated in 1 by the gross floor area (excluding vacant space) <ol style="list-style-type: none"> 4. Calculate the average amount for A, B and C. |
| Notes |
| <ul style="list-style-type: none"> • “Month” in this study is based on the date of meter reading, which differs by building and/or the energy supplier. • To represent the continuity and accuracy of the data, the gross floor area excluding the vacant space is applied in this study. |

- Previous report: Energy Consumption and Cost in Office Building up to September 2014 (released on December 1, 2014) <http://www.xymax.co.jp/english/research/images/pdf/20141201-04.pdf>
- The original research report in Japanese and translated reports in Chinese and Korean are also available online.
 - Japanese <http://www.xymax.co.jp/>
 - Chinese <http://www.xymax.co.jp/cn/index.html>
 - Korean <http://www.xymax.co.jp/ko/index.html>

Monthly Data | Energy Consumption, Price and Cost (April 2009 – December 2014)

| Unit | Energy Consumption | | | Energy Cost | | | Energy Price | |
|----------|----------------------|-----------------|--------------|----------------------|-----------------|---------------|----------------------|-------------------|
| | Single Month Average | 12 Months Total | | Single Month Average | 12 Months Total | | Single Month Average | 12 Months Average |
| | MJ/sqm/month | MJ/tsubo/month | MJ/sqm/annum | yen/sqm/month | MJ/tsubo/month | yen/sqm/annum | yen/MJ | yen/MJ |
| Apr 2009 | 158 | 521 | | 298 | 986 | | 1.94 | |
| May 2009 | 142 | 469 | | 249 | 824 | | 1.83 | |
| Jun 2009 | 167 | 551 | | 266 | 879 | | 1.66 | |
| Jul 2009 | 184 | 607 | | 290 | 960 | | 1.63 | |
| Aug 2009 | 202 | 668 | | 313 | 1,034 | | 1.58 | |
| Sep 2009 | 187 | 618 | | 289 | 955 | | 1.57 | |
| Oct 2009 | 160 | 528 | | 252 | 834 | | 1.62 | |
| Nov 2009 | 149 | 494 | | 237 | 785 | | 1.62 | |
| Dec 2009 | 153 | 506 | | 245 | 810 | | 1.62 | |
| Jan 2010 | 158 | 522 | | 253 | 836 | | 1.62 | |
| Feb 2010 | 173 | 573 | | 272 | 899 | | 1.58 | |
| Mar 2010 | 154 | 509 | 1,986 | 256 | 845 | 3,220 | 1.67 | 1.66 |
| Apr 2010 | 155 | 514 | 1,984 | 253 | 837 | 3,175 | 1.64 | 1.64 |
| May 2010 | 139 | 459 | 1,981 | 235 | 777 | 3,161 | 1.73 | 1.63 |
| Jun 2010 | 164 | 543 | 1,978 | 264 | 874 | 3,160 | 1.63 | 1.63 |
| Jul 2010 | 192 | 636 | 1,987 | 311 | 1,027 | 3,180 | 1.63 | 1.63 |
| Aug 2010 | 213 | 705 | 1,998 | 349 | 1,153 | 3,216 | 1.66 | 1.63 |
| Sep 2010 | 210 | 695 | 2,022 | 349 | 1,155 | 3,276 | 1.68 | 1.64 |
| Oct 2010 | 158 | 524 | 2,021 | 277 | 915 | 3,301 | 1.78 | 1.66 |
| Nov 2010 | 143 | 471 | 2,014 | 246 | 813 | 3,310 | 1.75 | 1.67 |
| Dec 2010 | 142 | 469 | 2,002 | 246 | 814 | 3,311 | 1.75 | 1.68 |
| Jan 2011 | 148 | 491 | 1,993 | 252 | 833 | 3,310 | 1.71 | 1.68 |
| Feb 2011 | 168 | 555 | 1,988 | 271 | 897 | 3,310 | 1.62 | 1.69 |
| Mar 2011 | 142 | 469 | 1,976 | 245 | 811 | 3,299 | 1.73 | 1.69 |
| Apr 2011 | 123 | 407 | 1,943 | 227 | 750 | 3,273 | 1.85 | 1.71 |
| May 2011 | 110 | 362 | 1,914 | 212 | 701 | 3,250 | 1.97 | 1.73 |
| Jun 2011 | 129 | 426 | 1,879 | 237 | 784 | 3,223 | 1.88 | 1.75 |
| Jul 2011 | 154 | 510 | 1,840 | 279 | 922 | 3,191 | 1.86 | 1.77 |
| Aug 2011 | 167 | 553 | 1,794 | 304 | 1,004 | 3,146 | 1.83 | 1.78 |
| Sep 2011 | 164 | 543 | 1,748 | 302 | 997 | 3,098 | 1.85 | 1.80 |
| Oct 2011 | 133 | 440 | 1,723 | 256 | 847 | 3,078 | 1.96 | 1.81 |
| Nov 2011 | 122 | 404 | 1,702 | 239 | 789 | 3,070 | 1.98 | 1.83 |
| Dec 2011 | 129 | 425 | 1,689 | 246 | 814 | 3,070 | 1.93 | 1.85 |
| Jan 2012 | 140 | 464 | 1,681 | 262 | 867 | 3,081 | 1.88 | 1.86 |
| Feb 2012 | 160 | 530 | 1,674 | 288 | 952 | 3,097 | 1.79 | 1.88 |
| Mar 2012 | 142 | 470 | 1,674 | 266 | 878 | 3,117 | 1.87 | 1.89 |
| Apr 2012 | 128 | 423 | 1,678 | 253 | 836 | 3,143 | 1.99 | 1.90 |
| May 2012 | 116 | 384 | 1,685 | 238 | 787 | 3,169 | 2.08 | 1.91 |
| Jun 2012 | 131 | 434 | 1,687 | 261 | 861 | 3,193 | 2.01 | 1.92 |
| Jul 2012 | 145 | 479 | 1,678 | 301 | 995 | 3,215 | 2.10 | 1.94 |
| Aug 2012 | 175 | 580 | 1,686 | 375 | 1,239 | 3,286 | 2.16 | 1.97 |
| Sep 2012 | 173 | 572 | 1,695 | 366 | 1,209 | 3,350 | 2.14 | 1.99 |
| Oct 2012 | 140 | 463 | 1,702 | 280 | 926 | 3,374 | 2.01 | 2.00 |
| Nov 2012 | 122 | 403 | 1,702 | 267 | 882 | 3,402 | 2.22 | 2.02 |
| Dec 2012 | 135 | 445 | 1,708 | 287 | 947 | 3,443 | 2.15 | 2.03 |
| Jan 2013 | 142 | 469 | 1,709 | 296 | 979 | 3,476 | 2.10 | 2.05 |
| Feb 2013 | 150 | 496 | 1,699 | 305 | 1,008 | 3,493 | 2.04 | 2.07 |
| Mar 2013 | 131 | 433 | 1,688 | 277 | 915 | 3,504 | 2.13 | 2.10 |
| Apr 2013 | 122 | 405 | 1,682 | 270 | 892 | 3,521 | 2.23 | 2.12 |
| May 2013 | 116 | 383 | 1,682 | 269 | 891 | 3,553 | 2.36 | 2.14 |
| Jun 2013 | 135 | 447 | 1,686 | 309 | 1,021 | 3,601 | 2.31 | 2.16 |
| Jul 2013 | 152 | 503 | 1,693 | 353 | 1,165 | 3,652 | 2.34 | 2.18 |
| Aug 2013 | 172 | 568 | 1,690 | 396 | 1,308 | 3,673 | 2.32 | 2.20 |
| Sep 2013 | 171 | 567 | 1,688 | 399 | 1,320 | 3,707 | 2.35 | 2.21 |
| Oct 2013 | 140 | 463 | 1,688 | 335 | 1,107 | 3,762 | 2.42 | 2.25 |
| Nov 2013 | 123 | 408 | 1,690 | 297 | 981 | 3,791 | 2.43 | 2.26 |
| Dec 2013 | 131 | 433 | 1,686 | 308 | 1,018 | 3,813 | 2.37 | 2.28 |
| Jan 2014 | 143 | 472 | 1,687 | 326 | 1,077 | 3,842 | 2.29 | 2.30 |
| Feb 2014 | 155 | 511 | 1,691 | 347 | 1,148 | 3,885 | 2.26 | 2.32 |
| Mar 2014 | 141 | 465 | 1,701 | 328 | 1,086 | 3,936 | 2.36 | 2.34 |
| Apr 2014 | 125 | 414 | 1,704 | 306 | 1,010 | 3,972 | 2.47 | 2.36 |
| May 2014 | 115 | 382 | 1,704 | 293 | 969 | 3,996 | 2.60 | 2.38 |
| Jun 2014 | 137 | 454 | 1,706 | 335 | 1,108 | 4,022 | 2.49 | 2.39 |
| Jul 2014 | 146 | 484 | 1,700 | 355 | 1,174 | 4,025 | 2.48 | 2.40 |
| Aug 2014 | 167 | 553 | 1,696 | 400 | 1,322 | 4,029 | 2.42 | 2.41 |
| Sep 2014 | 147 | 485 | 1,671 | 359 | 1,186 | 3,988 | 2.49 | 2.42 |
| Oct 2014 | 131 | 433 | 1,662 | 324 | 1,072 | 3,978 | 2.51 | 2.43 |
| Nov 2014 | 119 | 394 | 1,658 | 297 | 981 | 3,978 | 2.52 | 2.44 |
| Dec 2014 | 130 | 429 | 1,657 | 312 | 1,033 | 3,982 | 2.43 | 2.44 |