

# NEWS & RELEASE

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## Energy Consumption and Cost in Office Building (March 2014)

Consumption remained flat. Price per Unit and Cost continue to increase.

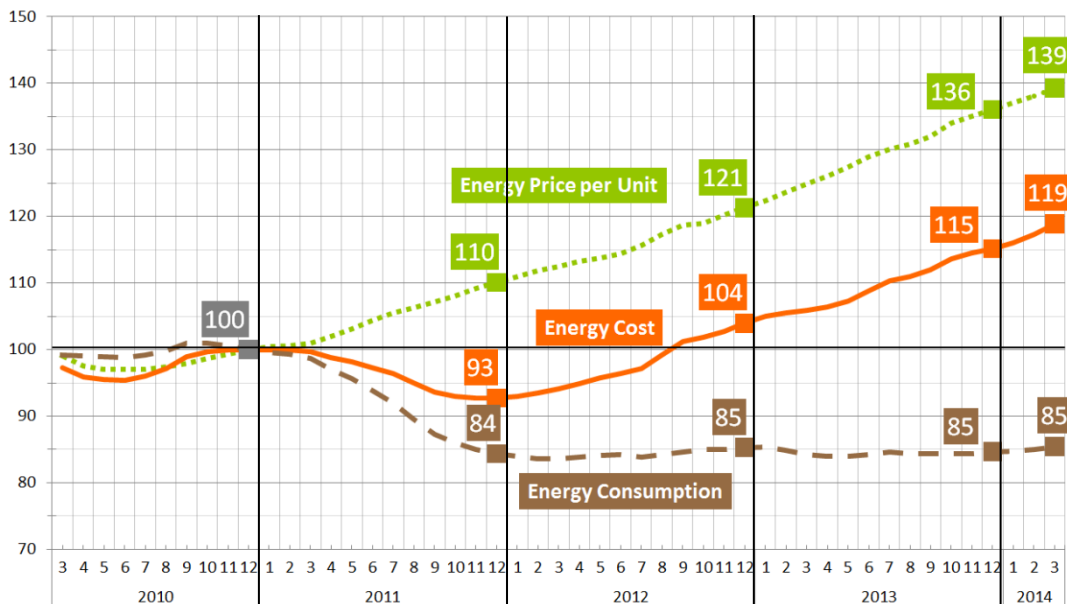
Xymax Real Estate Institute has been studying the energy consumption and cost in office buildings in Japan and releasing the results on regular basis. The report covering January 2010 to December 2013 was released in February. This is an update report for March 2014.

- Previous report: Energy Consumption and Cost in Office Building (released on February 26, 2014) <http://www.xymax.co.jp/english/research/release/140226.html>
- Monthly data (April 2009 – March 2014) is available at the end of this report.

### Findings as of March 2014 (See Figure 1)

- **Energy Consumption**  
15% lower than 2010, low trend after the earthquake continued.
- **Energy Price per Unit**  
39% higher than 2010, up trend started in mid-2010 continued.
- **Energy Cost**  
19% higher than 2010, consumption remained flat but cost continued to increase due to increased 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 are: Cost = Price per Unit (MJ) × Consumption

## Winter (January-March): Changes in Energy Consumption, Price per Unit and Cost

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

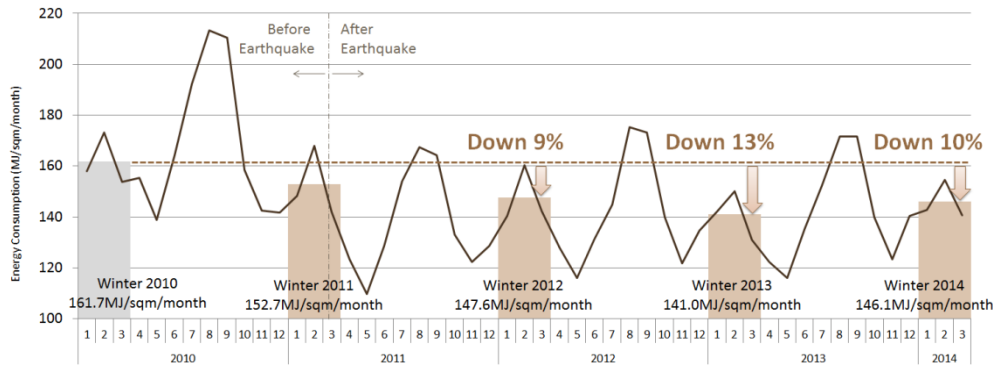


Figure 3: Energy Price per Unit (JPY/MJ)

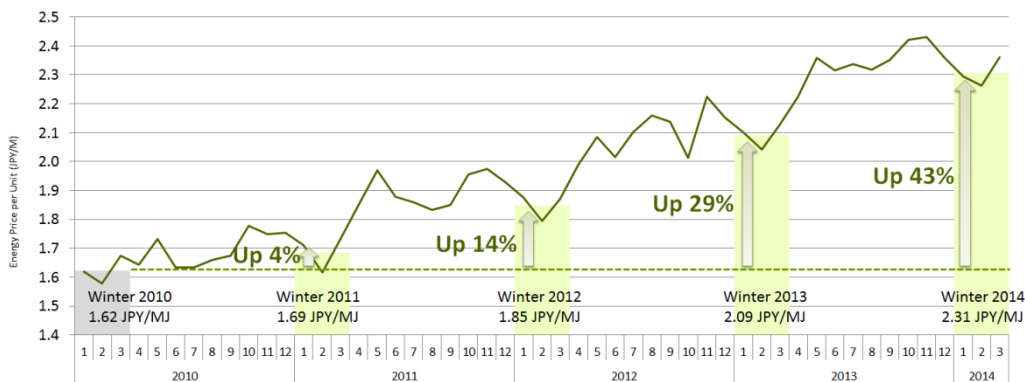


Figure 4: Energy Cost (JPY/sqm/month)

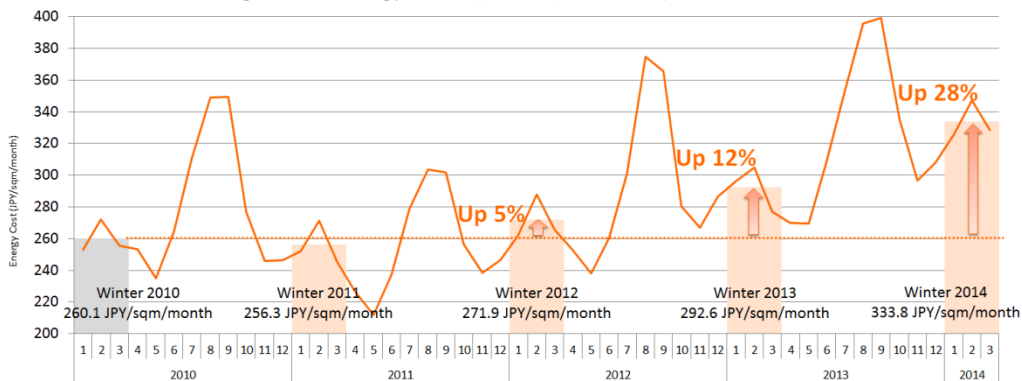


Figure 2 shows changes in the energy consumption. Compared to winter 2010, the energy consumptions in winter after the earthquake (2012-2014) were lower by 9%-13%. Although energy consumptions depend on climate and business activities in the year, our data shows that the office building occupiers have been pursuing energy-saving since the earthquake. Energy-saving has now become a popular practice.

Figure 3 shows changes in the energy price per unit. The rise of the price started before the earthquake. In winter 2014, the price was 43% higher than winter 2010.

Figure 4 shows changes in the energy cost, which moves together with the consumption volume and price per unit. The data, as a result, shows that the cost increased by 28% in winter 2014 from winter 2010 because the increase in energy price per unit was larger than the decrease in energy consumption, marked three consecutive winters of cost increases.

## Outline

Period and Subject Building
<p>Period: April 2009 – March 2014 (60 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
<ol style="list-style-type: none"> <li>1. Gather the amount of consumption of and cost paid for (excl. tax) the electricity, gas, heat and oil for each building.</li> <li>2. Convert the amount of consumption to mega joule (MJ) (amount of primary energy) based on the following. <ul style="list-style-type: none"> <li>Electricity: 9.76 MJ/kWh</li> <li>City Gas: 45 MJ/m<sup>3</sup></li> <li>Cool/hot water, steam: 1.36 MJ/MJ</li> <li>Open steam: 2.68 MJ/kg</li> <li>Bunker A: 39.1 MJ/L</li> </ul> <p>Then, add all the results.</p> </li> <li>3. A: Energy Consumption (MJ / sqm / month) <ul style="list-style-type: none"> <li>→ Divide the total consumption calculated in 2. by the gross floor area of the building (excluding vacant space)</li> </ul> <p>B: Energy Price per Unit (JPY / MJ)</p> <ul style="list-style-type: none"> <li>→ Divide the total cost paid in 1. by the total consumption in 2.</li> </ul> <p>C: Energy Cost (JPY / sqm / month)</p> <ul style="list-style-type: none"> <li>→ Divide the total cost paid in 1. by the gross floor area (excluding vacant space)</li> </ul> </li> <li>4. Calculate the average of A, B, C in 3.</li> </ol>
Notes
<ul style="list-style-type: none"> <li>· “Month” in this study is based on the date of meter reading, which differs by building and/or the energy supplier.</li> <li>· To represent the continuity and accuracy of the data, the gross floor area excluding the vacant space is applied in this study.</li> </ul>

## Monthly Data | Energy Consumption, Price and Cost (April 2009 – March 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	JPY/sqm/month	MJ/tsubo/month	JPY/sqm/annum	JPY/MJ	JPY/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	350	1,155	3,650	2.32	2.18
Aug 2013	172	568	1,690	396	1,308	3,670	2.32	2.19
Sep 2013	171	567	1,688	399	1,320	3,704	2.35	2.21
Oct 2013	140	463	1,688	335	1,107	3,759	2.42	2.25
Nov 2013	123	408	1,690	297	981	3,788	2.43	2.26
Dec 2013	140	464	1,696	310	1,026	3,812	2.38	2.28
Jan 2014	143	472	1,697	326	1,077	3,842	2.29	2.30
Feb 2014	155	511	1,701	347	1,148	3,885	2.26	2.32
Mar 2014	141	465	1,711	328	1,086	3,936	2.36	2.34