

## Energy Consumption and Cost in Office Building (June 2015)

*Price rise slowed down, consumption and cost continued to remain flat*

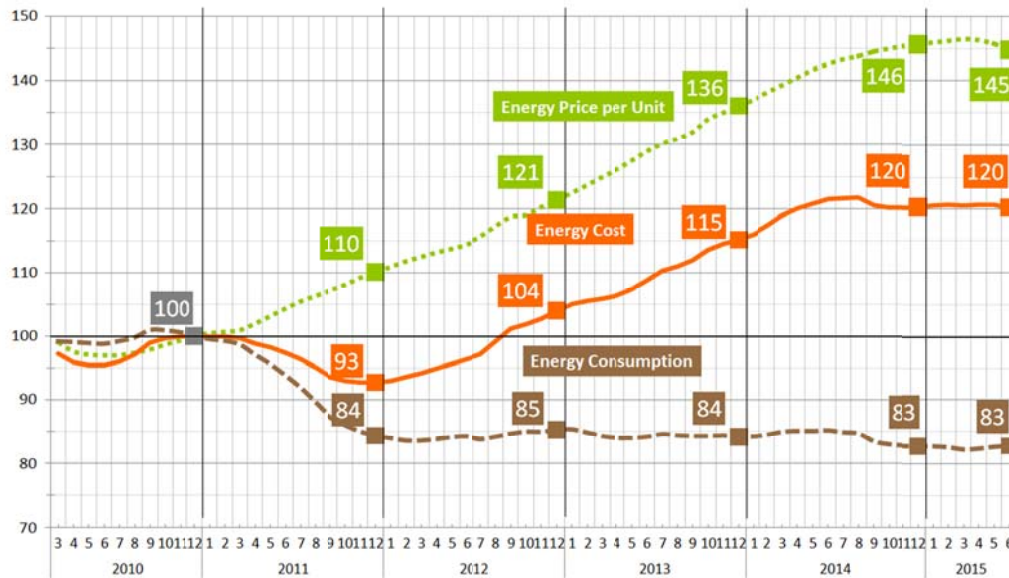
Xymax Real Estate Institute has been studying the energy consumption and energy cost in office buildings in Japan and releasing quarterly results. The report covering January 2010 to March 2015 was released in June this year. This issue is an update of the study, covering up to June 2015.

Monthly data (April 2009 – June 2015) is available at the end of this report.

### Findings as of June 2015 (Figure 1)

- Energy Consumption**  
 The level in 2011 continued and remained nearly flat.
- Energy Price per Unit**  
 The increase since 2011 has slowed down and the level remained nearly flat.
- Energy Cost**  
 The level remained nearly flat after the second half of 2014.

**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. They are the average of 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 × Consumption

## Monthly Energy Consumption, Price per Unit and Cost

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

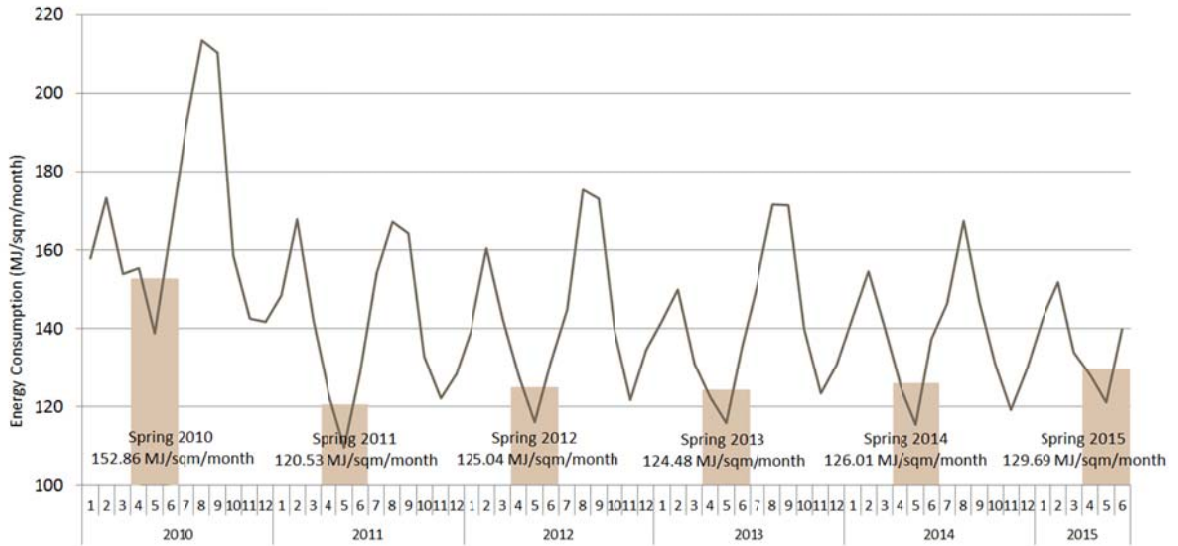


Figure 3: Energy Price per Unit (yen/MJ)

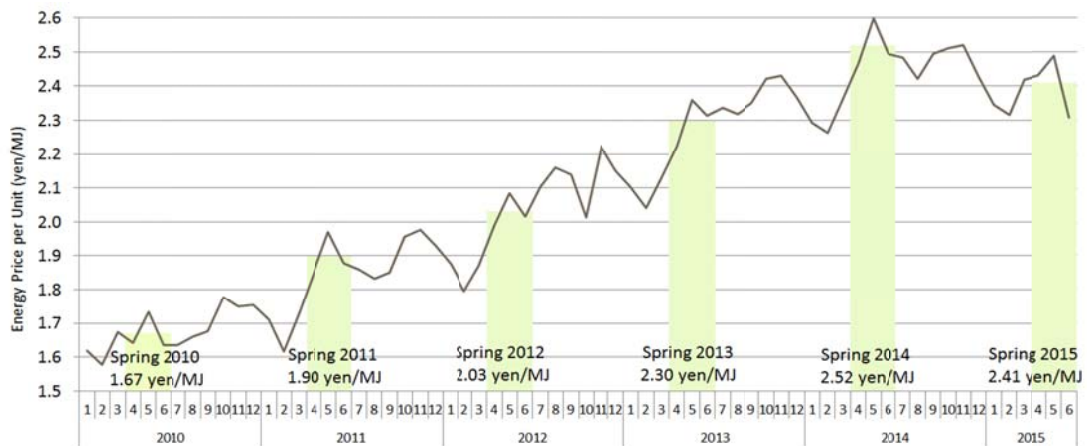


Figure 4: Energy Cost (yen/sqm/month)

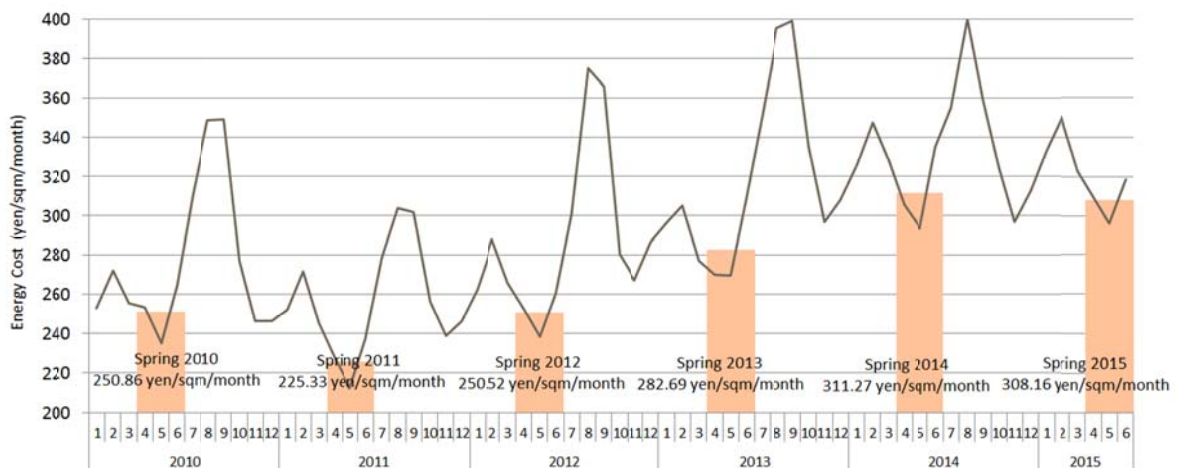


Figure 2 shows changes in energy consumption. The consumption in the spring of 2015 was 23.17 MJ/sqm/month lower than that in the spring of 2010, before the 3.11 earthquake, but on the year-on-year comparison, it was 3.68 MJ/sqm/month higher than that in the spring of a year earlier in 2014.

Figure 3 shows changes in energy price per unit. The price per unit decreased year-on-year by 0.11 yen/MJ along with the decrease of fuel adjustment charges since April 2015. The decrease of price per unit is expected to continue until at least September as fuel adjustment charges, which are linked with import price of raw oil, LNG and coal, are likely to keep on decreasing.

Figure 4 shows changes in energy cost. As a result of changes in consumption and price per unit, the spring of 2015 saw a year-on-year decrease by approximately 1% or 3.11 yen/sqm/month. The end of the increase of and start of the decrease of the price per unit is likely to have contributed to the decrease of energy cost.

## Outline

Period and Subject Building
Period: April 2009 – June 2015 (75 months) Subject Building: Of typical tenant-occupied office buildings in Greater Tokyo managed by Xymax Group, approx. 100 buildings with valid data are used in this study.
Estimation Method
Monthly data were estimated as follows: <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>               Then, add all the amounts.             </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>               B: Energy Price per Unit (Japanese yen / MJ)               <ul style="list-style-type: none"> <li>→ Divide the total cost paid estimated in 1 by the total consumption estimated in 2.</li> </ul>               C: Energy Cost (Japanese yen / sqm / month)               <ul style="list-style-type: none"> <li>→ Divide the total cost paid estimated in 1 by the gross floor area (excluding vacant space)</li> </ul> </li> <li>4. Calculate the average amount for A, B and C.</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>

- Previous report: Energy Consumption and Cost in Office Building up to March 2015 (released on June 8, 2015) <http://www.xymax.co.jp/english/research/images/pdf/20150608-02.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 – June 2015)

Unit	Energy Consumption			Energy Cost			Energy Price	
	Single Month Average		12 Months Total MJ/sq/annum	Single Month Average		12 Months Total yen/sq/annum	Single Month Average yen/MJ	12 Months Average yen/MJ
	MJ/sq/month	MJ/tsubo/month		yen/sq/month	MJ/tsubo/month			
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
Jan 2015	143	472	1,657	333	1,101	3,990	2.34	2.45
Feb 2015	152	502	1,654	351	1,159	3,993	2.32	2.45
Mar 2015	134	443	1,647	323	1,067	3,987	2.42	2.46
Apr 2015	128	423	1,650	310	1,023	3,992	2.43	2.45
May 2015	121	400	1,656	296	980	3,995	2.49	2.45
Jun 2015	140	463	1,658	319	1,053	3,978	2.31	2.43

After reviewing some data, we have revised the figures for January 2015 and beyond from our previous issues.