

NEWS & RELEASE

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Energy Consumption and Cost in Office Building

Energy consumption decreased, but cost increased due to a 15% rise in price (from 2010).

Global warming and Great East Japan Earthquake have increased our awareness of energy use and its cost. However, there is not much quantitative data of the energy use in office buildings which also includes data of cost, making it difficult to grasp the current conditions of the energy use.

Xymax Real Estate Institute conducted research on energy consumption and cost based on our original data obtained through our real estate management services. Energy, in this study, is defined as electricity, gas, heat and oil.

Findings as of December 2013 (Figure 1)

■ **Energy Consumption**

Sharp decrease after the 3.11 earthquake.

Remained at the same level (15% down from 2010) since then.

■ **Energy Price per Unit**

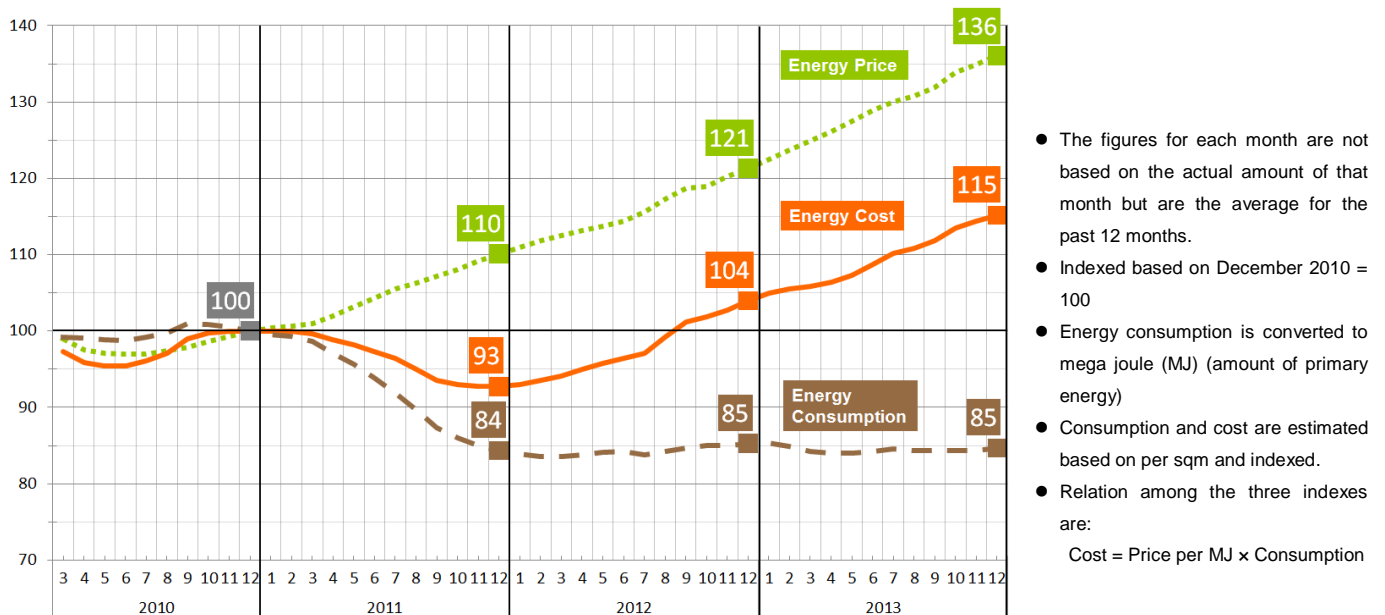
Constantly rising since mid-2010.

As of December 2013, it is 36% higher than 2010.

■ **Energy Cost**

Temporarily decreased but increased later by 15% from 2010, reflecting low consumption volume and rising price.

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

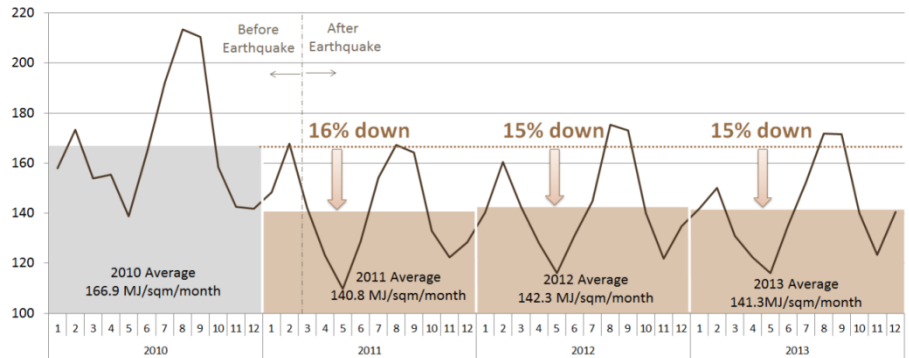


Changes in Energy Consumption, Price per Tsubo and Cost

■Energy Consumption (MJ / sqm / month)

Figure 2 shows changes in the energy consumption before and after the 3.11 earthquake. The consumption level remained about 15% lower compared to 2010, suggesting that energy-saving became important and regularly practiced in office buildings after the earthquake.

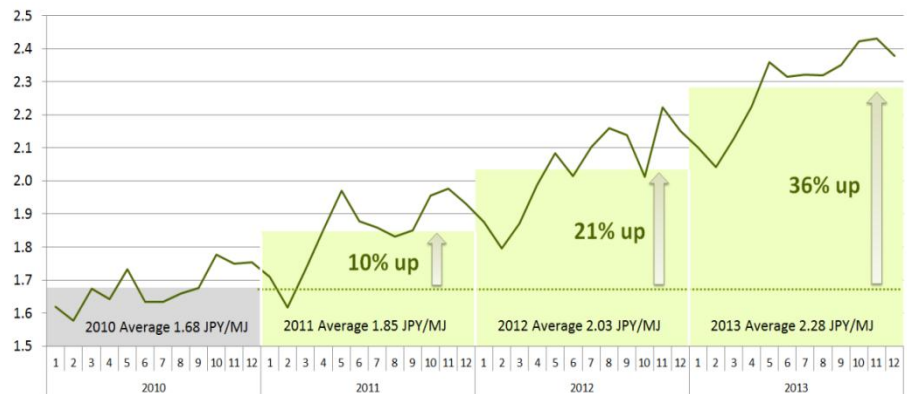
Figure 2: Energy Consumption



■Energy Price (JPY / MJ)

Figure 3 shows changes in the energy price. The price is gradually increasing. The raw materials of a great majority of energy consumed at office buildings have been imported. Therefore the price of energy is vulnerable to the cost of raw materials and also the foreign exchange rate. Rising energy price can be explained as the result of the price trends based on such situation and conditions of each energy supplier.

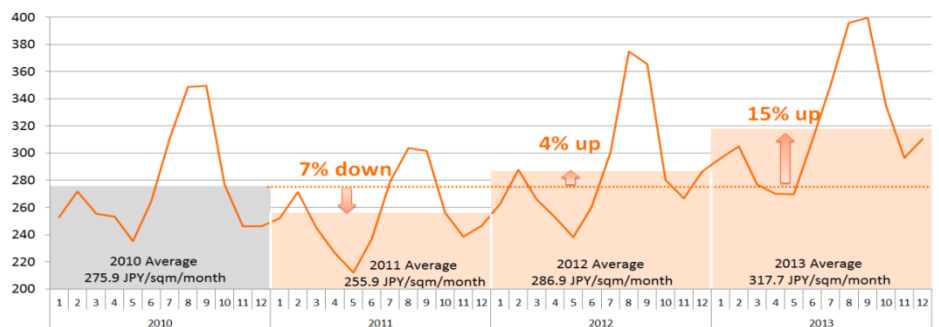
Figure 3: Energy Price (JPY/MJ)



■Energy Cost (JPY / sqm / month)

Figure 4 shows changes in the energy cost. The energy cost dropped in 2011 reflecting the low consumption. Although the consumption remained low afterward, the cost soon started to increase as the energy price continued to rise. As a result, the cost was 4% higher in 2012 and 15% higher in 2013 compared to the level in 2010.

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



Research Outline

Period and Subject Building
Period: April 2009 – December 2013 (57 months) Subject Building: Valid data of approx. 100 office buildings of typical lease office buildings managed by Xymax Group in Greater Tokyo
Estimation Method
1. Calculate the amount of consumption and the paid cost (excl. tax) of electricity, gas, heat and oil for each building. 2. Convert the amount of consumption in 1. to MJ (amount of primary energy) based on the following. Electricity: 9.76 MJ/kWh City Gas: 45 MJ/m ³ Cool/hot water, steam: 1.36 MJ/MJ Open steam: 2.68 MJ/kg Bunker A: 39.1 MJ/L Then, add all the results. 3. A: Energy Consumption (MJ / sqm / month) → Divide the total consumption calculated in 2. by the gross floor area (excluding the vacant space) B: Energy Price (JPY / MJ) → Divide the paid amount calculated in 1. by the total consumption in 2. C: Energy Cost (JPY / sqm / month) → Divide the paid amount calculated in 1. by the gross floor area (excluding the vacant space) 4. Calculate the average of A, B, C in 3.
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, the gross floor area excluding the vacant space is applied in this research.

Reference: Electric Power Consumption by Office Tenants

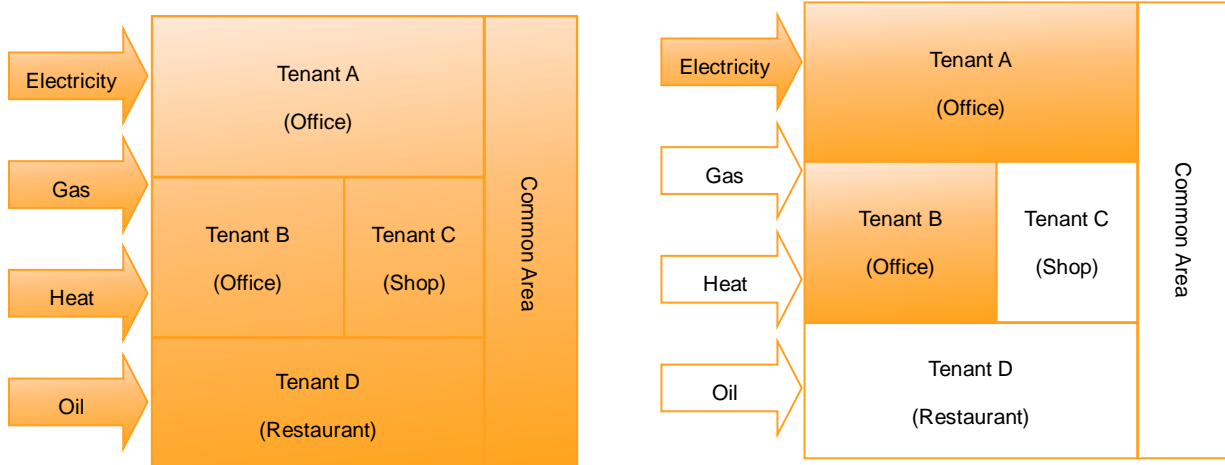
Other than this report, Xymax Real Estate Institute releases research report “Electric Power Consumption by Office Tenants” on a regular basis. The report covers only the electric power consumed within the office space occupied by tenants. The latest report is available online: <http://www.xymax.co.jp/english/research/release/131224.html>

Xymax Real Estate Institute will release both of the research reports regularly.

■ Coverage of this research and “Electric Power Consumption by Office Tenants” (sample)

This Research: “Energy Consumption and Cost in Office Building”

“Electric Power Consumption by Office Tenants”



Monthly Data | Energy Consumption, Price and Cost (April 2009 – December 2013)

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