

## 2012 Global Economic Energy Efficiency Ranking

Based on the Global Economic Energy Efficiency Index (**EEEI**)<sup>1</sup>, published by the Triple-E Institute and Department of Economics, Chinese Culture University, prior to Earth Day 2012, the global economic energy efficiency in 2009 has improved 6.03% in total compared to the base year of 2005. Professor Yunchang Jeffery Bor, President of the Triple-E Institute and Head of the Department of Economics, Chinese Culture University, has indicated that, according to the EEEI, there are 85 countries that have made a positive contribution to the world's economic energy efficiency and 44 countries have had a negative effect on the world's economic energy efficiency. Among all countries that have made a positive contribution, the United States is ranked in first place, China is in second place followed by Russia, and Germany is in fourth place. Global ranking can be found in <http://www.triple-e.org.tw/>.

Energy has become a critical necessity to economic development and modern living standards since the industrial revolution beginning from 1975. However, the earth's limited supply of fossil fuel is eventually going to be depleted. A shortage of energy resources and rapid economic growth push energy prices sky high again and again. Therefore, how to use energy resources efficiently has become one of the most important topics in the world. Energy efficiency can lessen the impact of high energy prices, improve energy security, and mitigate the global warming problem on mother earth. Improving energy efficiency is also the most cost-effective, ready-to-go and no-regrets strategy.

The present EEEI ranking contains 129 of the world's countries. The final energy consumption<sup>2</sup> comes from Energy Balance, published by the International Energy Agency (IEA). The real gross domestic product is derived from the Value-added Statistics of the United Nations Statistics Division (UNSD). The top ten ranking countries are: the United States, China, Russia, Germany, Ukraine, Spain, the Republic of Korea, the United Kingdom, France, and Uzbekistan. The main contribution in terms of the improvement in EEEI in the

$${}^1 \text{ EEEI} = \sum_{i=1}^m \tilde{S}_{e_{it}} \left( \frac{I_{i0}}{I_{it}} \right) + \sum_{i=m+1}^k \tilde{S}_{e_{it}} \left[ \sum_{j=1}^o \tilde{S}_{e_{ijt}} \left( \frac{I_{ij0}}{I_{ijt}} \right) \right] + \sum_{i=m+1}^k \tilde{S}_{e_{it}} \left[ \sum_{j=o+1}^p \tilde{S}_{e_{ijt}} \left( \sum_{z=1}^q \tilde{S}_{e_{ijzt}} \frac{I_{ijz0}}{I_{ijzt}} \right) \right]$$

Please refer to Bor, Y.J. (2008). "Consistent Multi-level Energy Efficiency Indicators and their Policy Implications." *Energy Economics* 30: 2401-2419 for the notation. The base year of the EEEI is 2005 and the latest global updated data is 2009.

<sup>2</sup> The data for household energy, non-energy, and own-use energy are not counted because of no corresponding economic output, non-fuel use, and no applicable sectoral distribution.

United States and Russia comes from the transportation department. Although the energy demand in China is very strong due to economic development, the growth rate of real GDP is even more rapid than the growth rate of energy consumption. This leads to the positive result for EEEI in China. As for Taiwan, the performance in terms of the EEEI in 2009 is not so impressive, it being ranked in 16<sup>th</sup> position (down 4 places compared to 2008).

India has a huge population and its economic development is surging. However, the growth of energy consumption is too fast (especially the use of coal) to be compressed by economic growth. The EEEI for India is the worst in the world in 2009 and the major cause is the inefficiency of energy use in the agricultural and service sectors. Another bad example is the United Arab Emirates. Although the United Arab Emirates enjoys a huge oil-dollar benefit by exporting crude oil, the wastage and poor performance of energy use in the manufacturing sector makes its EEEI the second worst in the world.

**Table 1. The Top 30 Economic Energy Efficiency Ranking in 2009**

Country	Ranking 2009	Compared to 2008	Country	Ranking 2009	Compared to 2008
* United States	1	(0)	* Taiwan	16	(-4)
China	2	(1)	* Australia	17	(7)
Russia	3	(-1)	* Canada	18	(-9)
* Germany	4	(1)	Romania	19	(2)
Ukraine	5	(1)	Nigeria	20	(13)
* Spain	6	(2)	South Africa	21	(1)
* Republic of Korea	7	(0)	Egypt	22	(5)
* United Kingdom	8	(2)	Turkmenistan	23	(13)
* France	9	(4)	* Czech Republic	24	(-10)
Uzbekistan	10	(7)	Malaysia	25	(88)
Argentina	11	(7)	* Netherlands	26	(8)
Azerbaijan	12	(4)	Belarus	27	(4)
Kazakhstan	13	(102)	Myanmar	28	(7)
Poland	14	(9)	Syrian Arab Republic	29	(90)
* Italy	15	(0)	Qatar	30	(8)

**Table 2. The Last 30 Economic Energy Efficiency Ranking in 2009**

Country	Ranking 2009	Compared to 2008	Country	Ranking 2009	Compared to 2008
Republic of Congo	100	(3)	Peru	115	(-15)
Georgia	101	(-13)	Oman	116	(2)
Cote d'Ivoire	102	(3)	Trinidad and Tobago	117	(0)
Guatemala	103	(-55)	Libya	118	(-22)
Ecuador	104	(-38)	Brunei Darussalam	119	(5)
Brazil	105	(22)	Bahrain	120	(2)
Kyrgyz Republic	106	(-22)	Chile	121	(0)
Benin	107	(-3)	Moldova	122	(-8)
Angola	108	(-1)	Bangladesh	123	(3)
Bolivia	109	(0)	Vietnam	124	(-8)
Uruguay	110	(1)	Algeria	125	(-2)
* Iceland	111	(1)	Mexico	126	(-1)
* Israel	112	(-2)	Islamic Republic of Iran	127	(2)
* Denmark	113	(-5)	United Arab Emirates	128	(0)
* Hong Kong	114	(-52)	India	129	(-110)