

Industry's Demand-side Data and Efficiency Indicators in APEC

IEA Demand Side Data and Energy Efficiency Indicator Workshop for Southeast Asia

10-12 June 2025 (Online)

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Outline

- Information and Insights from Energy Balance Table
- Additional data requirement for Energy Efficiency Indicator

Energy Balance Table

APEC Industrial TFEC in 2022

SHARE	00APEC	01AUS	02BD	03CDA	04CHL	05PRC	06HKC	07INA	08JPN	09ROK	10MAS	11MEX	12NZ	13PNG	14PE	15PHL	16RUS	17SGP	18CT	19THA	20USA	21VN
14.01.	3.0%	23.7%	0.0%	8.9%	48.5%	1.9%	0.0%	0.0%	0.3%	0.4%	0.0%	4.9%	3.2%	0.0%	30.7%	8.0%	7.4%	0.0%	0.1%	0.4%	2.6%	4.2%
14.02.	3.3%	3.6%	0.0%	5.3%	2.2%	2.3%	0.0%	0.0%	2.9%	0.2%	0.0%	0.9%	5.7%	0.0%	0.0%	9.7%	5.2%	1.1%	0.5%	0.4%	8.9%	1.4%
14.03.01.	18.9%	3.5%	0.0%	7.7%	1.2%	23.0%	0.0%	31.7%	24.6%	17.7%	0.0%	11.6%	4.1%	0.0%	0.0%	8.4%	26.4%	0.0%	14.6%	4.9%	4.9%	11.5%
14.03.02.	22.5%	6.8%	1.5%	11.9%	0.1%	24.6%	0.0%	6.1%	23.9%	21.6%	0.0%	9.8%	14.5%	0.0%	0.0%	3.8%	27.9%	4.1%	29.9%	17.5%	26.3%	6.8%
14.03.03.	6.6%	32.0%	0.0%	15.1%	0.0%	9.3%	0.0%	0.0%	2.7%	3.2%	0.0%	0.1%	13.1%	0.0%	0.0%	0.0%	0.0%	0.0%	1.3%	0.0%	2.6%	0.0%
14.03.04.	15.0%	8.4%	0.0%	5.2%	2.4%	18.9%	0.0%	9.3%	9.7%	9.5%	0.0%	14.2%	3.2%	0.0%	0.0%	15.7%	9.8%	0.0%	7.3%	27.1%	6.8%	34.2%
14.03.05.	2.1%	0.0%	0.0%	1.7%	0.0%	1.9%	1.4%	0.0%	4.0%	6.8%	0.0%	1.0%	0.1%	0.0%	0.0%	0.0%	3.1%	0.0%	1.2%	0.0%	3.0%	0.6%
14.03.06.	6.9%	0.6%	0.0%	1.7%	0.0%	7.9%	0.0%	0.0%	9.9%	18.8%	0.0%	0.2%	0.4%	0.0%	0.0%	14.8%	3.6%	0.0%	28.0%	6.8%	5.1%	3.6%
14.03.07.	5.7%	14.7%	0.0%	6.2%	0.8%	3.7%	0.0%	0.7%	6.8%	4.8%	0.0%	6.9%	26.1%	0.0%	0.0%	30.2%	6.2%	0.0%	3.1%	27.3%	11.1%	8.4%
14.03.08.	5.7%	3.4%	0.0%	20.9%	22.8%	2.3%	0.0%	4.3%	10.5%	4.3%	0.0%	3.0%	0.9%	0.0%	0.0%	4.0%	5.0%	0.0%	4.3%	5.1%	17.5%	3.9%
14.03.09.	0.9%	1.7%	0.0%	5.7%	0.0%	0.4%	0.0%	0.0%	0.6%	0.5%	0.0%	0.0%	3.3%	0.0%	0.0%	0.2%	1.8%	0.0%	0.2%	2.5%	2.3%	2.4%
14.03.10.	2.3%	0.5%	0.0%	0.2%	0.0%	3.1%	0.0%	0.1%	0.9%	4.2%	0.0%	0.0%	0.6%	0.0%	0.0%	1.2%	0.5%	0.0%	3.8%	3.1%	0.6%	9.4%
14.03.11.	7.1%	0.9%	98.5%	9.5%	21.9%	0.9%	98.6%	47.8%	3.2%	7.9%	100.0%	47.3%	24.9%	100.0%	69.3%	3.9%	2.9%	94.8%	5.7%	4.8%	8.1%	13.5%

TOTAL (PJ)	82180	950	6	1944	464	46527	12	3194	3151	1991	797	1339	155	39	271	298	5146	179	1044	1371	11762	1542
	18746	950	6	1944	464		12	3194	3151	1991	797	1339	155	39	271	298		179	1044	1371		1542

14.01. Mining and quarrying

14.02. Construction

14.03.01. Iron and steel

14.03.02. Chemical (incl. petrochemical)

14.03.03. Non ferrous metals

14.03.04. Non-metallic mineral product:

14.03.05. Transportation equipment

14.03.06. Machinery

14.03.07. Food, beverages and tobacco

14.03.08. Pulp, paper and printing

14.03.09. Wood and wood products

14.03.10. Textiles and leather

14.03.11. Non-specified industry

Data Source: EGEDA

APEC Industrial TFEC in 2022

- 14.01. Mining and quarrying
- 14.02. Construction
- 14.03.01. Iron and steel
- 14.03.02. Chemical (incl. petrochemical)
- 14.03.03. Non ferrous metals
- 14.03.04. Non-metallic mineral product
- 14.03.05. Transportation equipment
- 14.03.06. Machinery
- 14.03.07. Food, beverages and tobacco
- 14.03.08. Pulp, paper and printing
- 14.03.09. Wood and wood products
- 14.03.10. Textiles and leather
- 14.03.11. Non-specified industry

SHARE	00APEC	01AUS	02BD	03CDA	04CHL	05PRC	06HKC	07INA	08JPN	09ROK	10MAS	11MEX	12NZ	13PNG	14PE	15PHL	16RUS	17SGP	18CT	19THA	20USA	21VN
14.01.	3.0%	23.7%	0.0%	8.9%	48.5%	1.9%	0.0%	0.0%	0.3%	0.4%	0.0%	4.9%	3.2%	0.0%	30.7%	8.0%	7.4%	0.0%	0.1%	0.4%	2.6%	4.2%
14.02.	3.3%	3.6%	0.0%	5.3%	2.2%	2.3%	0.0%	0.0%	2.9%	0.2%	0.0%	0.9%	5.7%	0.0%	0.0%	9.7%	5.2%	1.1%	0.5%	0.4%	8.9%	1.4%
14.03.01.	18.9%	3.5%	0.0%	7.7%	1.2%	23.0%	0.0%	31.7%	24.6%	17.7%	0.0%	11.6%	4.1%	0.0%	0.0%	8.4%	26.4%	0.0%	14.6%	4.9%	4.9%	11.5%
14.03.02.	22.5%	6.8%	1.5%	11.9%	0.1%	24.6%	0.0%	6.1%	23.9%	21.6%	0.0%	9.8%	14.5%	0.0%	0.0%	3.8%	27.9%	4.1%	29.9%	17.5%	26.3%	6.8%
14.03.03.	6.6%	32.0%	0.0%	15.1%	0.0%	9.3%	0.0%	0.0%	2.7%	3.2%	0.0%	0.1%	13.1%	0.0%	0.0%	0.0%	0.0%	0.0%	1.3%	0.0%	2.6%	0.0%
14.03.04.	15.0%	8.4%	0.0%	5.2%	2.4%	18.9%	0.0%	9.3%	9.7%	9.5%	0.0%	14.2%	3.2%	0.0%	0.0%	15.7%	9.8%	0.0%	7.3%	27.1%	6.8%	34.2%
14.03.05.	2.1%	0.0%	0.0%	1.7%	0.0%	1.9%	1.4%	0.0%	4.0%	6.8%	0.0%	1.0%	0.1%	0.0%	0.0%	0.0%	3.1%	0.0%	1.2%	0.0%	3.0%	0.6%
14.03.06.	6.9%	0.6%	0.0%	1.7%	0.0%	7.9%	0.0%	0.0%	9.9%	18.8%	0.0%	0.2%	0.4%	0.0%	0.0%	14.8%	3.6%	0.0%	28.0%	6.8%	5.1%	3.6%
14.03.07.	5.7%	14.7%	0.0%	6.2%	0.8%	3.7%	0.0%	0.7%	6.8%	4.8%	0.0%	6.9%	26.1%	0.0%	0.0%	30.2%	6.2%	0.0%	3.1%	27.3%	11.1%	8.4%
14.03.08.	5.7%	3.4%	0.0%	20.9%	22.8%	2.3%	0.0%	4.3%	10.5%	4.3%	0.0%	3.0%	0.9%	0.0%	0.0%	4.0%	5.0%	0.0%	4.3%	5.1%	17.5%	3.9%
14.03.09.	0.9%	1.7%	0.0%	5.7%	0.0%	0.4%	0.0%	0.0%	0.6%	0.5%	0.0%	0.0%	3.3%	0.0%	0.0%	0.2%	1.8%	0.0%	0.2%	2.5%	2.3%	2.4%
14.03.10.	2.3%	0.5%	0.0%	0.2%	0.0%	3.1%	0.0%	0.1%	0.9%	4.2%	0.0%	0.0%	0.6%	0.0%	0.0%	1.2%	0.5%	0.0%	3.8%	3.1%	0.6%	9.4%
14.03.11.	7.1%	0.9%	98.5%	9.5%	21.9%	0.9%	98.6%	47.8%	3.2%	7.9%	100.0%	47.3%	24.9%	100.0%	69.3%	3.9%	2.9%	94.8%	5.7%	4.8%	8.1%	13.5%

Data Source: EGEDA

For APEC-ASEAN, INA, PHL, THA, and VN are able to breakdown the industry demand into specific sectors.

INA : iron and steel

PHL : food and beverages, non-metallic mineral products, machinery

THA : food and beverages, non-metallic mineral products, chemicals

VN : non-metallic mineral product

Industrial TFEC (PJ) - Indonesia

- 14.01. Mining and quarrying
- 14.02. Construction
- 14.03.01. Iron and steel
- 14.03.02. Chemical (incl. petrochemical)
- 14.03.03. Non ferrous metals
- 14.03.04. Non-metallic mineral product
- 14.03.05. Transportation equipment
- 14.03.06. Machinery
- 14.03.07. Food, beverages and tobacco
- 14.03.08. Pulp, paper and printing
- 14.03.09. Wood and wood products
- 14.03.10. Textiles and leather
- 14.03.11. Non-specified industry

07INA	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
14.01.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14.02.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14.03.01.	1.43	6.52	37.41	34.24	30.55	18.9	18.69	48.54	71.25	67.87	66.97	50.41	49.04	36.04	30.33	29.38	35.41	34.68	71.88	272.48	342.01	308.4	1011.6
14.03.02.	107.21	105.22	124.26	121.14	137.02	145.88	141.16	138.67	146.89	170.38	141.15	141.26	144.32	87.37	87.44	92.1	153.21	160.28	193.01	203.83	193.39	202.03	193.5
14.03.03.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14.03.04.	57.74	130.1	118.14	120.45	174.24	159.04	156.97	191.96	216.11	215.75	198.62	193.37	213.65	209.28	209.33	203.95	299.05	283.38	510.83	592.87	193.37	154.27	297.84
14.03.05.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14.03.06.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14.03.07.	0	0	0	0	7.99	8.67	10.26	11.99	14.86	20.07	21.91	24.57	23.28	14.1	14.45	16.91	25.92	27.82	28.86	27.04	23.41	24.46	23.43
14.03.08.	126.43	125.47	136.56	163.1	165.6	175.14	171.1	176.24	177.69	199.18	183.7	171.77	209.55	123.04	123.05	197.37	111.5	106.2	89.38	94.08	60.83	40.74	138.58
14.03.09.	0	0	0	0	0.01	0.05	0.09	0.08	0.07	0.08	0.1	0.11	0.13	0.11	0.11	0.1	0.11	0.09	0.09	0.07	0.05	0.05	0.05
14.03.10.	0	0	0	0	6.89	7.5	3.71	5.92	8.52	8.47	7.67	8.52	8.55	4.53	4.21	4.81	6.15	5.63	5.68	4.76	3.8	3.97	3.8
14.03.11.	1331.8	1254.3	1181.8	1436.5	1299.8	1327.6	1446.6	1541	1396.4	1283.8	1569.9	1749.3	1664.9	1092	1141.4	1062.1	934.86	1009.1	1016.3	1075.8	1143	1183.8	1525.6

Data Source: EGEDA

- INA is undergoing expansion in their steel industry which caused the increase in energy consumption in 2022.
- INA's cement production and paper and pulp production seems to be recovering from the effect of the pandemic.

Industrial TFEC (PJ) - Philippines

14.01. Mining and quarrying	14.03.04. Non-metallic mineral product	14.03.09. Wood and wood products
14.02. Construction	14.03.05. Transportation equipment	14.03.10. Textiles and leather
14.03.01. Iron and steel	14.03.06. Machinery	14.03.11. Non-specified industry
14.03.02. Chemical (incl. petrochemical)	14.03.07. Food, beverages and tobacco	
14.03.03. Non ferrous metals	14.03.08. Pulp, paper and printing	

15PHL	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
14.01.	4.78	3.39	3.11	3.21	3.38	3.52	4.23	4.32	4.95	5.93	8.01	9.76	11.18	13.11	13.71	15	12.68	14.56	13.61	15.04	19.98	18.46	23.74
14.02.	7.12	7.28	7.3	6.39	6.25	5.57	4.93	6.03	5.44	6.18	4.85	5.72	6.05	7.55	8.96	11.51	15.8	18.72	20.45	21.47	19.56	24.5	28.8
14.03.01.	20.9	20.22	18.15	19.45	16.67	15.87	16.92	19.02	20.68	16.62	15.93	14.81	14.53	18.12	19.92	21.44	22.02	22.14	22.85	18.94	28.47	31.34	25.01
14.03.02.	13.46	13.57	10.41	11.72	10.52	10.51	11.49	11.12	10.67	10.87	10.16	8.98	8.01	7.23	9.85	11.61	11.74	13.66	11.11	10.55	13.47	10.11	11.37
14.03.03.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14.03.04.	44.62	42.94	40.09	50.67	50.63	55.43	60.64	63.71	79.72	64.83	81.63	80.06	72.46	80.19	79.57	85.1	97.18	109.45	74.32	69.97	40.59	48.56	46.76
14.03.05.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14.03.06.	12.33	14.81	15.61	20.78	22.43	25.29	26.73	27.53	30.13	30.52	33.2	34.51	36.02	35.87	36	38.3	39.96	41.17	41.31	41.6	35.63	38.09	44.06
14.03.07.	60.56	61.82	62.67	65.89	64.83	66.27	65.52	67.55	71.84	72.32	76.84	77.34	77.71	79.69	83.02	83.05	95.03	94.41	94.85	96.49	79.54	84.94	89.95
14.03.08.	10.82	9.43	9.27	9.84	9.64	9.61	5.22	5.81	4.89	4.61	4.69	4.16	3.9	4.58	5.3	5.11	5.82	6.68	23.16	9.36	8.23	9.44	11.81
14.03.09.	1.74	1.73	1.65	1.73	1.61	1.53	1.45	1.71	1.51	1.42	1.39	1.2	1.07	1.05	0.95	1.18	1.1	1.03	1.04	1.04	1.03	0.82	0.74
14.03.10.	10.48	9.95	8.41	8.26	8.16	7.78	5.67	4.23	3.18	3	3.12	2.93	2.98	7.29	7.6	3.4	3.27	3.4	3.19	3.72	2.83	3.19	3.57
14.03.11.	3.14	3.65	3.37	4.07	4.72	5.97	8.06	9.27	8.89	8.49	9.24	9.54	9.17	9.61	8.47	6.9	7.28	6.57	9.09	17.7	16.13	16.16	11.73

Data Source: EGEDA

- The trend in the distribution of the industry energy consumption is consistent.
- PHL continues to consume more energy for the food and beverages industry.
- Non-metallic mineral product peaked in 2017, but eventually subsided.

Industrial TFEC (PJ) - Thailand

14.01. Mining and quarrying	14.03.04. Non-metallic mineral product	14.03.09. Wood and wood products
14.02. Construction	14.03.05. Transportation equipment	14.03.10. Textiles and leather
14.03.01. Iron and steel	14.03.06. Machinery	14.03.11. Non-specified industry
14.03.02. Chemical (incl. petrochemical)	14.03.07. Food, beverages and tobacco	
14.03.03. Non ferrous metals	14.03.08. Pulp, paper and printing	

19THA	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
14.01.	0.04	0.38	2.95	2.88	4.2	3.98	4.16	5.53	5.11	4.65	5.2	5.49	5.87	6	5.87	5.62	5.41	4.9	4.94	4.94	4.65	4.82	4.98
14.02.	1.01	0.85	3.56	4.5	10.19	9.86	9.51	4.82	4.44	6.43	7.06	4.73	4.99	5.11	5.07	5.16	5.58	5.62	5.58	7.27	5.41	5.49	6.09
14.03.01.	25.36	25.47	28.29	31.42	43.13	43.63	52.5	39.49	43.13	43.43	63.4	66.98	58.87	60.47	64.75	63.01	62.75	62.46	60.88	56.75	52.04	57.71	67.77
14.03.02.	93.14	100.93	111.26	127.63	126.35	125.55	119.93	77.52	80.48	89.88	93.77	86.98	105.07	119.25	106.11	134.3	148.63	142.57	147.1	155.23	172.16	187.14	240.05
14.03.03.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14.03.04.	172.6	198.65	220.56	222.02	257.23	290.34	321.26	281.89	321.47	304.19	328.82	296.18	297.94	270.36	260.79	267.31	289.52	247.53	293.2	305.77	330.71	281.81	371.56
14.03.05.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14.03.06.	2.35	2.52	35.54	38.67	65.54	61.79	65.28	69.48	67.49	52.52	63.51	66.87	73.31	79.52	84.23	94.27	100.81	90.63	89.5	88.29	77.38	85.51	93.45
14.03.07.	180.7	149.02	198.86	227.67	285.18	295.37	303.66	340.98	341.62	341.57	338.46	356.24	408.9	406.33	452.85	389.8	386.02	419.59	431.82	444.5	374.6	321.75	373.51
14.03.08.	30.63	33.68	37.09	37.43	35.75	35.99	30.63	73.75	74.2	65.41	59.64	60.17	67.64	73.45	72.5	82.65	85.59	94.94	123.02	111.47	82.52	53.75	69.89
14.03.09.	0.04	0.04	4.67	4.82	7.59	7.38	7.16	8.95	8.25	8.16	9.51	10.73	13.98	14.41	16.52	16.49	17.07	14.15	14.23	17.28	18.21	29.66	34.82
14.03.10.	0.48	0.52	26.63	28.3	47.53	44.48	39.91	50.2	42.06	36.42	33.03	30.22	34.48	36.77	35.31	36.94	38.34	40.45	43.18	50.21	40.17	36.97	42.04
14.03.11.	209.6	210.98	134.12	133.37	61.14	53.72	49.39	51.25	42.77	63.17	77.05	64.37	65.08	76.55	83.89	84.97	104.44	78.68	71.08	71.16	58.6	59.2	66.34

Data Source: EGEDA

- High energy demand for the food and beverages subsector; but, this demand has been hovering in the same value since around 2010. The pandemic decreased this but it has already recovered.
- Same can be said for non-metallic product.
- Chemical seems to be growing, where the 2022 energy consumption is double that of 2012.

Industrial TFEC (PJ) – Viet Nam

14.01. Mining and quarrying	14.03.04. Non-metallic mineral product	14.03.09. Wood and wood products
14.02. Construction	14.03.05. Transportation equipment	14.03.10. Textiles and leather
14.03.01. Iron and steel	14.03.06. Machinery	14.03.11. Non-specified industry
14.03.02. Chemical (incl. petrochemical)	14.03.07. Food, beverages and tobacco	
14.03.03. Non ferrous metals	14.03.08. Pulp, paper and printing	

21VN	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
14.01.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	23.67	34.28	37.01	46.48	48.2	43.08	56.45	65.05
14.02.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15.45	33.56	28.16	28.42	28.4	26.16	18.88	22.34
14.03.01.	0	0	0	0	0	0	0	0	0	0	29.94	31.69	32.19	34.7	38.78	75.84	93.31	100.8	118.41	124.31	139.27	164.68	176.97
14.03.02.	0.75	0.64	0.79	0.75	0.87	4.18	13.65	22.67	22.62	26.74	42.29	58.67	83.82	86.44	89.44	81.47	57.43	56.27	75.59	84.21	97.66	95.87	105.56
14.03.03.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14.03.04.	0	0	0	0	0	0	0	0	0	0	233.4	242.93	240.54	259.91	299.01	212.77	241.7	268.06	363.3	414.57	532.02	514.24	527.08
14.03.05.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3.47	5.37	6.23	6.51	7.04	6.79	7.89	9.32
14.03.06.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	38.91	37.17	47.06	51.06	51.74	51.23	50.81	55.42
14.03.07.	0	0	0	0	0	0	0	0	0	0	70.44	73.24	70.99	73.48	114.61	112.81	102	106.73	120.52	133.11	131.09	121.42	130.3
14.03.08.	0	0	0	0	0	0	0	0	0	0	30.85	32.92	34.14	37.22	41.58	16.18	31.42	34.74	50.5	55.14	60.48	57.57	60.24
14.03.09.	0	0	0	0	0	0	0	0	0	0	9.13	9.41	9.69	9.88	37.36	33.31	20.41	22.82	25.58	27.53	25.25	32.59	36.4
14.03.10.	0	0	0	0	0	0	0	0	0	0	99.06	103.24	103.68	110.53	143.39	122.59	96.36	98.78	130.57	143.68	152.37	138.1	144.55
14.03.11.	194.07	219.53	250.43	275.71	357.5	339.24	365.22	401.54	494.57	545.34	142.59	151.83	152.31	159.92	178.44	83.77	93.8	103.57	121.89	144.39	171.56	200.41	208.95

Data Source: EGEDA

- VN started disaggregating their data from 2010.
- The high energy consumption under non-metallic mineral product is attributed to the mining of bauxite, a raw product of aluminum.
- Energy demand for iron and steel, food and beverages is also increasing.

Insights from the Energy Balance Table

- Energy consumption data for each economy can reveal the industrial focus of each sector. This allows us to focus our efforts on making energy-intensive industries more efficient.
- An increase in energy consumption could indicate a rise in production within each industrial sector.
- *Despite this, we need more information because more efficient production could distort this numbers (in a good way).*

Energy Efficiency Indicator Template

10-year history of the APEC Energy Efficiency Indicator Template

2014 Dec	Energy Efficiency Indicators (EEI) template
2015 Dec	EEI template & User Manual sent to member economies
2016 Mar–Apr	Collection of EEI templates
2016 May–June	Data evaluation
2016 Nov	28th EGEDA: Reported the progress; low turnout
2017 June	EEI template revised
2017 Sept–Oct	Submission, evaluation, and data analysis
2017 Nov	29th EGEDA: Reported the progress; still low turnout
2018 Jan	EEI template revised to include transport and industry sectors as agreed in 29th EGEDA
	Requested OECD/IEA members to share their submitted IEA-EEI template
2019 February	30th EGEDA: Two OECD APEC Economies shared the IEA-EEI template submitted to IEA.
2020 November	31st EGEDA/55th EGEEC Joint (Virtual) Meeting
2021 June	1st APEC-IEA Joint Training Workshop on End-use Energy Consumption Data (19th APEC Workshop on Energy Statistics)
2021 October	32nd EGEDA: Number of submission improved
2022 April	APEC adopted IEA template
2022 May	HKC and CT EEI templates submission to IEA
2022 November	2nd APEC-IEA Joint Training Workshop on End-use Energy Consumption Data (20th APEC Workshop on Energy Statistics)
2022 October	33rd EGEDA: 7 OECD Economies and 6 non-OECD Economies submitted their EEI Template
2023 April	34th EGEDA/58th EGNRET Joint Meeting
2023 December	Calculated a sample of end-use energy consumption for economies that conducted surveys (BD, MAS, PHL)
2024 January	35th EGEDA: Initial proposal of the methodology for estimating end-use consumption

What can we learn from the EEI template?



How much energy is consumed in the production of various products, such as a ton of cement, a ton of steel, etc.?



How much energy is required for heating or cooling a square meter of floor area in residential or commercial buildings?



What is the average fuel consumption per passenger-kilometer for a car, bus, or train?



Is there a noticeable improvement in energy efficiency over time?



Using the EEI template, policymakers can identify which sectors should be prioritized.

Data requirements (1): Beyond Energy Balances

The template requires significantly more details than what traditional energy balances can provide

Industry energy use

- Clinker
- Cement
- Pulp
- Paper
- Iron and steel
- Aluminum
- Chemicals

Residential/services

- Space heating
- Space cooling
- Water heating
- Cooking
- Lighting
- Refrigerators/freezers
- Other building use
- Non-building use

Transport energy use

- Passenger transport
- Freight transport
- Cars
- Personal light trucks
- Motorcycles
- Buses
- Passenger trains

Data requirements (2): Activity Data

Industry Gross Value Added and Production

- Clinker
- Cement
- Pulp
- Paper
- Iron and steel
- Aluminum
- Chemicals

Residential Data and Services

- Population
- Number of dwellings
- Floor area of dwellings
- Household occupancy
- Heating degree-days
- Cooling degree-days
- Services employment
- Services floor area

Transportation activity by type of vehicles

- Passenger-km
- Ton-km
- Number of vehicles in use by type of vehicles

Selected Energy-intensive Industrial Processes

- **Iron & Steel (14.03.01, ISIC 241 & 2431)**

- Steelmaking is one of the most energy-consuming industrial activities.
- Especially energy-intensive in primary production (blast furnace route).
- Energy can account for up to 40% of production costs.

- **Chemicals (14.03.02, ISIC 20 & 21)**

- Ethylene requires steam cracking at temperatures exceeding 800°C to break down hydrocarbon feedstocks
- Propylene high-temperature dehydrogenation processes require frequent, energy-consuming purging of unwanted side products via burning.
- For ammonia, about 90 of its production energy is used for hydrogen generation through steam methane reforming.

- **Aluminum (part of 14.03.03, ISIC 242 & 2432)**

- Aluminum smelting is extremely electricity-intensive.
- Smelting alone accounts for nearly half of total energy use in the industry.

- **Clinker & Cement (part of 14.03.04, ISIC 239)**

- Clinker production (the key component in cement) is highly energy-intensive.
- Requires high-temperature kilns for calcining limestone.
- Energy use varies by kiln type and process efficiency.

- **Pulp & Paper (14.03.08)**

- Pulp and paper mills use large amounts of energy for pulping, drying, and processing.
- Energy performance indicators help mills compare efficiency.

14.01. Mining and quarrying

14.02. Construction

14.03.01. Iron and steel

14.03.02. Chemical (incl. petrochemical)

14.03.03. Non ferrous metals

14.03.04. Non-metallic mineral product:

14.03.05. Transportation equipment

14.03.06. Machinery

14.03.07. Food, beverages and tobacco

14.03.08. Pulp, paper and printing

14.03.09. Wood and wood products

14.03.10. Textiles and leather

14.03.11. Non-specified industry

Japan: Gross Value Added

IV. Value-added (2017 USD PPP)	units	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
ISIC Rev.4 Division																
01 - 03: Agriculture, forestry and fishing		62.14	61.25	64.94	69.80	64.34	60.59	61.28	61.67	61.84	59.90	57.21	53.05	53.53	54.33	
05 - 09: Mining and quarrying		9.37	9.04	8.28	7.17	3.93	4.08	4.15	3.59	3.90	3.77	3.05	2.77	3.08	2.99	
10 - 32: Manufacturing		957	994	1,048	1,046	861	1,001	974	997	997	1,026	1,069	1,063	1,111	1,132	
10 - 12: Manufacture of food products, beverages, tobacco products		136.11	135.83	138.42	130.93	120.14	125.07	119.29	121.57	121.85	123.92	128.57	130.18	132.65	131.30	
13 - 15: Manufacture of textiles, wearing apparel, leather and related products		18.34	18.07	18.02	17.51	14.60	14.15	14.18	14.61	13.55	13.01	14.58	12.74	12.67	12.62	
16: Manufacture of wood and of products of wood and cork, except furniture; manufact		0	0	0	0	0	0	0	0	0	0	0	0	0	0	
17: Manufacture of paper and paper products		26.75	25.10	23.44	22.38	18.19	20.15	20.47	17.61	18.14	17.73	19.96	20.31	20.86	20.68	
18: Printing and reproduction of recorded media		0	0	0	0	0	0	0	0	0	0	0	0	0	0	
17 - 18: Paper & Printing		26.75	25.10	23.44	22.38	18.19	20.15	20.47	17.61	18.14	17.73	19.96	20.31	20.86	20.68	
19: Manufacture of coke and refined petroleum products		34.21	35.52	33.09	32.53	34.58	36.13	33.97	38.09	48.23	40.45	37.47	35.23	33.55	31.39	
20 - 21: Manufacture of chemicals and chemical products & basic pharmaceutical pro		84.56	86.42	86.92	87.37	84.29	94.12	92.22	95.15	98.30	98.96	111.48	122.21	123.05	125.12	
22: Manufacture of rubber and plastics products		0	0	0	0	0	0	0	0	0	0	0	0	0	0	
23: Manufacture of other non-metallic mineral products		33.93	34.89	37.23	35.41	23.47	26.96	29.14	26.70	27.57	28.34	27.98	26.67	29.21	28.79	
24: Manufacture of basic metals		87.11	93.19	98.16	96.76	70.36	104.19	87.05	90.37	93.87	97.24	92.49	95.06	95.13	99.47	
Class 2410+2431: Manufacture + Casting of iron and steel		0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Class 2420+2432: Manufacture + Casting of precious and non-ferrous metals		0	0	0	0	0	0	0	0	0	0	0	0	0	0	
25 - 28: Manufacture of fabricated metal products, machinery and equipment		249.27	266.42	279.42	281.37	213.04	240.23	249.10	252.65	247.27	262.59	273.41	266.71	292.85	301.91	
29 - 30: Manufacture of motor vehicles, trailers, other transport equipment		163.74	165.65	177.69	181.61	136.65	167.59	152.04	171.11	154.06	161.26	171.89	170.42	183.53	191.61	
31 - 32: Manufacture of furniture & Other manufacturing		106.35	102.33	108.22	104.97	81.11	91.67	92.51	93.34	95.99	97.50	102.26	96.08	103.97	105.69	
35 -36: Electricity, gas, steam, air conditioning, and water supply		216.53	216.15	205.61	215.17	180.31	196.41	172.16	138.35	147.52	149.13	134.60	137.63	150.43	152.03	
41 - 43: Construction		300.76	299.15	278.16	258.81	254.87	241.95	243.28	248.08	270.72	281.34	283.83	288.21	298.11	295.09	
33 - 99: Services		3,408.19	3,437.21	3,485.08	3,440.53	3,352.67	3,387.43	3,417.19	3,472.74	3,538.33	3,522.54	3,559.05	3,585.71	3,631.85	3,644.97	
Total gross value added at basic prices		4,906.70	4,974.12	5,056.34	5,000.80	4,692.38	4,870.91	4,858.62	4,921.69	5,017.05	5,040.20	5,106.72	5,130.72	5,248.19	5,280.71	
EEl statistical discrepancy		40.73	41.20	33.40	26.64	48.83	64.60	78.05	82.85	87.84	79.81	93.20	108.40	78.69	75.94	
GDP USD PPP 2017)		4,947.43	5,015.32	5,089.75	5,027.43	4,741.21	4,935.50	4,936.68	5,004.54	5,104.89	5,120.01	5,199.92	5,239.11	5,326.89	5,356.66	

billion of 2017\$ PPP

Data Source: IEA/EGEDA

Japan: Commodities/Production

COMMODITIES	units	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	sources	comments and methodology
Production of commodities based on ISIC Rev.4 Division																			
17: Manufacture of paper and paper products																			
Pulp	Mt	10.80	10.84	10.85	10.71	8.50	9.39	9.00	8.64	8.77	8.95	8.73	8.64	8.74	8.63	8.37	7.06		FAO Stats
Chemical pulp	Mt	9.49	9.57	9.71	9.65	7.71	8.62	8.26	7.92	8.08	8.28	8.11	8.03	8.17	8.06	7.84	6.61		FAO Stats
Mechanical pulp	Mt	1.20	1.17	1.03	0.96	0.75	0.74	0.71	0.69	0.67	0.65	0.59	0.58	0.55	0.54	0.51	0.43		Country submission
Recovered Paper	Mt	22.32	22.83	23.04	22.75	21.66	21.72	21.55	21.75	21.89	21.78	21.44	21.27	21.09	20.69	19.61	18.87		FAO Stats
Inked	Mt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
De-inked	Mt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Paper and paperboard	Mt	30.95	31.11	31.27	30.63	26.27	27.36	26.61	25.96	26.24	26.63	26.40	26.22	26.54	26.06	25.38	22.70		FAO Stats
Household + Sanitary Paper	Mt	1.76	1.80	1.77	1.81	1.78	1.79	1.78	1.77	1.75	1.77	1.77	1.81	1.79	1.78	1.81	1.84		FAO Stats
Newsprint	Mt	3.72	3.77	3.80	3.68	3.46	3.35	3.21	3.25	3.22	3.13	2.99	2.91	2.78	2.59	2.42	2.06		FAO Stats
Printing + Writing Paper	Mt	11.48	11.54	11.67	11.50	9.12	9.55	8.77	8.42	8.58	8.49	8.41	8.11	8.27	7.87	7.51	5.70		FAO Stats
Wrapping + Packaging Paper + Paperboard	Mt	12.18	12.16	12.22	12.05	10.64	11.22	11.41	11.12	11.28	11.75	11.80	11.97	12.18	12.28	12.16	11.85		FAO Stats
Other	Mt	1.82	1.83	1.81	1.59	1.28	1.45	1.45	1.39	1.42	1.49	1.45	1.44	1.53	1.53	1.47	1.26		FAO Stats
20 - 21: Manufacture of chemicals and chemical products & basic pharmaceutical products and pharmaceutical preparations																			
Ethylene	Mt	7.62	7.52	7.74	6.88	6.91	7.02	6.69	6.15	6.70	6.65	6.88	6.28	6.53	6.16	6.42	5.94		USGS Minerals Yearbook
Propylene	Mt	6.03	6.09	6.29	5.67	5.59	5.99	5.62	5.24	5.65	5.67	5.72	5.22	5.46	5.17	5.50	5.00		USGS Minerals Yearbook
BTX	Mt	12.23	12.23	12.89	11.72	11.30	12.09	11.51	11.58	13.04	12.00	12.50	12.76	13.29	12.85	11.99	9.89		USGS Minerals Yearbook
Ammonia (NH3)	Mt	1.32	1.33	1.36	1.24	1.02	1.18	1.21	1.05	1.01	0.96	0.94	0.88	0.87	0.82	0.85	0.78		Country submission
Butadiene	Mt	1.04	1.00	1.02	0.95	0.87	0.98	0.93	0.90	0.96	0.93	0.94	0.87	0.92	0.86	0.89	0.78		USGS Minerals Yearbook
Caustic Soda	Mt	4.55	4.45	4.48	4.37	3.90	4.22	3.96	3.57	3.64	3.64	3.80	3.86	3.99	4.02	4.02	3.93		USGS Minerals Yearbook
23: Manufacture of other non-metallic mineral products																			
Cement																			
Clinker production	Mt	66.80	66.80	60.49	57.16	50.11	47.78	47.74	49.89	51.50	52.08	50.39	50.14	51.72	50.93	49.37	48.57		Country submission
Cement production	Mt	73.54	73.22	71.44	67.60	59.56	56.56	56.35	59.26	61.69	61.92	59.47	58.98	60.79	60.09	58.34	57.08		Country submission
24: Manufacture of basic metals																			
Crude Steel	Mt	112.47	116.23	120.20	118.74	87.53	109.60	107.60	107.23	110.59	110.67	105.13	104.78	104.66	104.32	99.28	83.19		worldsteel
Basic Oxygen Furnace production	Mt	83.63	85.96	89.24	89.24	68.34	85.76	82.74	82.31	85.68	84.99	81.08	81.51	79.34	78.23	74.98	62.05		worldsteel
Electric Arc Furnace production	Mt	28.84	30.26	30.96	29.50	19.20	23.46	24.43	24.53	24.56	25.34	23.73	22.95	24.94	25.70	23.96	20.85		worldsteel
Direct Reduced Iron	Mt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Bauxite	Mt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Alumina refining	Mt	0.35	0.33	0.30	0.32	0.20	0.32	0.34	0.30	0.27	0.20	0	0	0	0	0	0		Aluminium statistics yearbook
Aluminium	Mt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Primary production	Mt	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	0		Aluminium statistics yearbook
Recycled production	Mt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		

Submission of non-OECD APEC Economies

Energy	Commodity	GVA	Count
TRUE	TRUE	TRUE	1
TRUE	TRUE	FALSE	1
TRUE	FALSE	TRUE	2
FALSE	TRUE	TRUE	1
FALSE	FALSE	FALSE	1

33rd EGEDA (2022 October): 6 of 13 non-OECD Economies submitted their EEI Template. True: > 50% of the desired industry-related data was submitted. One economy submitted the template but were more focused on the other sectors.

Insights from currently available data

- Collecting the industrial data would allow each economy to evaluate and compare their energy efficiency.
 - This enables each economy to identify areas for improvements.
- However, we should recognize that collecting detailed data will be challenging, and its benefits can only be realized if all parties have access to complete data.
- Through our mandate of supporting all member economies through knowledge sharing and providing training programs to enhance research capabilities across the region, APERC remains supportive of economies seeking to collect their own data

Thank you for your kind attention!

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