

UN Workshop on Energy Statistics for ASEAN Countries

APERC's Work on Energy Statistics

Energy Data Collection and Dissemination

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**Asia-Pacific
Economic Cooperation**

Outline

1. Responsibilities of APERC on energy statistics
2. Energy data collection
3. Energy data compilation
4. Energy data dissemination
5. Energy Statistics Training Course
6. Challenges for the future

1. Responsibilities of APERC on energy statistics

- APERC has Energy Statistics and Training Office (ESTO), which is responsible for the following main missions.
 - A. As a Coordinating Agency for APEC Expert Group on Energy Data and Analysis (EGEDA)
 - B. Manage EGEDA's website
 - C. Collect and disseminate APEC's energy data (APEC Energy Database)
 - D. Cooperate with JODI partners and other organisations
 - E. Hold annual energy statistics workshop and training courses

2. Energy data collection (1)

- APERC has a close contact with EGEDA focal points from each 21 APEC economies.
- APERC sends relevant questionnaires and collects energy data (annual, quarterly, monthly and environment, CO2 emission, prices) from the focal points.

2. Energy data collection (2)

(Annual Data)

- Energy Balance Tables, Electric Power Generation, Fuel Consumption for Electricity Generation, Electricity Generating Capacity
- Primary Energy Supply, Final Energy Consumption, Demand and Supply by Energy Sources
- Energy Prices

(Quarterly Data)

- Supply of coal, crude oil and oil products, natural gas and electricity

(Monthly Data)

- Monthly Oil Data collection in APEC
- Monthly Gas Data collection in APEC

(Environment)

- CO₂ Emission Table

2. Energy data collection (3)

Power Generation Table

Japan

		Unit:GWh							
		2007	2008	2009	2010	2011	2012	2013	2014
Total Power Generation	Total Type	1182062	1181927	1096408	1159552	1111921	1113149	1088773	1081865
	Thermal	759153	787685	682878	710171	796331	941527	922158	947441
	Hydro	85033	81595	82432	95314	89307	84157	85160	85544
	Nuclear	279009	251744	274651	292355	162927	17991	14603	–
	Geothermal	3025	2814	2901	2706	2618	2660	2564	2558
	Others	55843	58089	53546	59006	60738	66814	64287	46323
Public	Total Type	991774	986889	910021	928965	865217	836148	818742	799541
	Thermal	632450	658371	559070	554760	626987	747520	732672	725832
	Hydro	77485	74144	73590	79276	72639	67877	68807	68963
	Nuclear	279009	251744	274651	292355	162927	17991	14603	–
	Geothermal	2825	2624	2704	2534	2460	2509	2408	2399
	Others	6	6	6	41	204	251	253	2348
Autoproducers	Total Type	190288	195038	186386	230586	246704	277001	270031	282323
	Thermal	126704	129313	123808	155411	169344	194008	189487	221609
	Hydro	7548	7452	8843	16038	16668	16280	16353	16581
	Nuclear	–	–	–	–	–	–	–	–
	Geothermal	200	190	196	172	158	151	156	159
	Others	55837	58083	53540	58965	60534	66563	64035	43975

2. Energy data collection (4)

Japan

Unit: 10³kL

Oil

		2012.Q 1	2012.Q 2	2012.Q 3	2012.Q 4	2013.Q 1	2013.Q 2	2013.Q 3	2013.Q 4	2014.Q 1	2014.Q 2	2014.Q 3	2014.Q 4	2015.Q 1
Crude Oil	Production	239	188	179	188	203	165	159	160	184	160	154	146	167
	Imports	57915	51749	51749	51126	56403	49878	51740	52537	56165	47304	47722	48506	51637
	Exports													
	Stock Changes	454	911	-394	-1117	253	125	-1578	-243	348	2278	-1000	-851	-752
	Total Primary Energy Supply	58607	52847	51533	50196	56859	50168	50320	52453	56698	49743	46874	47800	51050
Petroleum Products	Import	14346	13340	13876	14507	14969	11227	12255	13396	14201	11731	12281	13066	13608
	Export	5301	6882	7472	5863	5693	8398	8295	7156	7375	6747	7389	7731	7854
	Stock changes	-1613	1625	1470	-1674	-65	-220	1397	-1799	-1510	337	3098	-1391	-1869
	Total Primary Energy Supply	7431	8083	7875	6969	9210	2608	5358	4440	5315	5322	7990	3943	3884

3. Energy data compilation (1)

(Data Quality)

Ensuring the validity of data

- Continuous checking of data: balance, outliers, statistical difference, etc.
- Comparison with external data when available
- Internal consistency check for complete submission
- Problems detected are discussed with focal points

(Estimation)

- If CO2 emission data is not submitted, APERC estimates the amount by using the APEC energy balance table.

(Energy Balance Table: New Format)

- Addition of "Final Consumption" row which is the sum of "Final Energy Consumption" and "Non-energy use"
- Addition of column showing the sum of all renewable energy

3. Energy data compilation (2)

Energy Balance Table before revision

Energy Balance Table
APEC
Year : 2015

Unit:KTOE

	1.	1.2	1.3	1.4	2.	3.	4.	5.	6	7	8	9	10	11.	12.
	Coal	Anthracite	Lignite	Peat	Coal products	Crude oil & NGL	Petroleum products	Gas	Hydro	Nuclear	Geothermal, solar etc.	Others	Electricity	Heat	Total
Indigenous production	3,137,022	191,134	157,796	230	0	1,846,703	18	1,713,876	190,692	395,217	87,922	332,595	0	64	7,704,109
Imports	414,737	27,244	15,449	3	10,446	1,317,291	521,298	372,676	0	0	0	3,919	10,966	0	2,651,333
Exports	-635,815	-13,957	-1,241	-23	-9,985	-595,331	-579,118	-384,709	0	0	0	-3,241	-10,398	0	-2,218,597
International marine bunkers	0	0	0	0	0	0	-107,381	0	0	0	0	-167	0	0	-107,548
International aviation bunkers	0	0	0	0	0	0	-82,419	0	0	0	0	0	0	0	-82,419
Stock changes	-19,356	-2,856	1,521	34	-1,395	-16,930	-5,540	-17,830	0	0	0	-680	0	0	-61,731
Total primary energy supply	2,896,588	201,567	173,523	244	-935	2,551,736	-253,140	1,684,013	190,692	395,217	87,922	332,427	570	64	7,885,152
Transfers	0	0	0	0	0	-110,637	123,764	0	0	0	0	-418	0	0	12,709
Recycled products	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Interproduct transfers	0	0	0	0	0	-112,789	125,002	0	0	0	0	-418	0	0	11,795
Products transferred	0	0	0	0	0	2,152	-1,238	0	0	0	0	0	0	0	914
Gas separation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total transformation sector	-2,181,126	-71,751	-127,505	-240	194,658	-2,413,315	2,299,687	-739,414	-190,694	-395,218	-83,803	-110,703	1,320,230	236,517	-2,063,179
Main activity producer	-1,447,162	-68,992	-121,411	-138	-9,025	-5,348	-45,738	-610,848	-186,932	-395,218	-77,667	-54,324	1,202,576	122,250	-1,507,435
Autoproducers	-202,721	-117	-3,479	-81	-42,281	-661	-31,749	-114,374	-3,761	0	-6,136	-33,152	117,643	114,332	-202,859
Gas processing	-8,473	-1,479	-2,244	0	-13	0	248	-4,042	0	0	0	-1	0	0	-12,281
Gas to liquid plants	0	0	0	0	0	0	2,109	-2,878	0	0	0	0	0	0	-768
Oil Refineries	0	0	0	0	0	-2,446,725	2,389,994	0	0	0	0	0	0	0	-56,731
Coal transformation	-522,770	-1,162	-371	-21	245,977	0	-1,064	0	0	0	0	0	0	0	-277,856
Petrochemical industry	0	0	0	0	0	16,756	-12,004	0	0	0	0	0	0	0	4,751
Biofuel processing	0	0	0	0	0	15,278	0	0	0	0	0	-15,479	0	0	-201
Charcoal processing	0	0	0	0	0	0	0	0	0	0	0	-7,735	0	0	-7,735
Non-specified transformation	0	0	0	0	0	7,386	0	-10,150	0	0	0	-13	11	-66	-2,832
Loss & own use	-45,426	-2,867	-4,719	-3	-17,675	-14,669	-105,849	-178,361	0	0	0	-586	-204,027	-38,385	-604,980
Own use	-45,424	-2,867	-4,719	-3	-17,519	-8,010	-105,751	-169,046	0	0	0	-586	-126,791	-27,819	-500,947
Transmission and distribution losses	-2	0	0	0	-157	-6,659	-98	-9,315	0	0	0	0	-77,236	-10,566	-104,032
Discrepancy	-6,522	-3,202	-1,654	-1	3,348	855	25,715	-5,232	2	1	3	4,909	-1,650	-430	21,000
Total final energy consumption	663,515	123,746	39,645	0	179,396	13,970	2,090,177	761,006	0	0	4,121	225,629	1,115,122	197,766	5,250,702
Industry sector	506,240	66,124	29,887	0	152,808	2,116	213,081	286,533	0	0	113	75,994	512,612	99,824	1,849,321
Transport sector	2,396	253	65	0	21	0	1,251,096	72,635	0	0	0	35,559	21,118	0	1,382,825
Other sector	107,567	46,525	5,081	0	5,447	68	252,660	332,926	0	0	4,008	114,075	581,391	97,942	1,496,085
Residential & commercial	72,291	30,992	2,825	0	4,976	0	151,414	325,332	0	0	3,824	108,069	510,070	91,835	1,267,812
Commerce and public services	22,710	9,627	916	0	1,049	0	40,883	104,403	0	0	2,446	5,645	229,939	19,637	426,711
Residential	49,582	21,365	1,909	0	3,927	0	110,531	220,929	0	0	1,379	102,424	280,131	72,198	841,101
Agriculture	13,628	5,704	976	0	337	10	55,068	3,544	0	0	112	4,753	17,684	2,447	97,583
Fishing	1	0	0	0	0	0	4,363	4	0	0	0	0	395	8	4,771
Non-specified others	21,646	9,829	1,280	0	134	58	41,815	4,046	0	0	72	1,253	53,242	3,653	125,920
of which: Non-energy use	47,312	10,844	4,612	0	21,121	11,786	373,340	68,911	0	0	0	0	0	0	522,470
Electricity output in GWh	7,041,894	8,090	210,139	607	31,896	11	284,577	3,459,920	2,241,747	1,515,239	626,455	138,272	0	125	15,340,136
Heat output in ktoe	75,034	16	7,385	117	1,444	430	7,492	95,646	0	339	5	4,372	0	64	184,826

3. Energy data compilation (3)

Energy Balance Table after revision

Energy Balance Table
APEC
Year : 2015

	Unit:KTOE															
	1.	1.2	1.3	1.4	2.	3.	4.	5.	6	7	8	9	10	11.	12.	13.
	Coal	Anthracite	Lignite	Peat	Coal products	Crude oil & NGL	Petroleum products	Gas	Hydro	Nuclear	Geothermal, solar etc.	Others	Electricity	Heat	Total	Total Renewables
Indigenous production	3,137,022	191,134	157,796	230	0	1,846,703	18	1,713,876	190,692	395,217	87,922	332,595	0	64	7,704,109	598,491
Imports	414,737	27,244	15,449	3	10,446	1,317,291	521,298	372,676	0	0	0	3,919	10,966	0	2,651,333	3,918
Exports	-635,815	-13,957	-1,241	-23	-9,985	-595,331	-579,118	-384,709	0	0	0	-3,241	-10,398	0	-2,218,597	-3,240
International marine bunkers	0	0	0	0	0	0	-107,381	0	0	0	0	-167	0	0	-107,548	-167
International aviation bunkers	0	0	0	0	0	0	-82,419	0	0	0	0	0	0	0	-82,419	0
Stock changes	-19,356	-2,856	1,521	34	-1,395	-16,930	-5,540	-17,830	0	0	0	-680	0	0	-61,731	-684
Total primary energy supply	2,896,588	201,567	173,523	244	-935	2,551,736	-253,140	1,684,013	190,692	395,217	87,922	332,427	570	64	7,885,152	598,317
Transfers	0	0	0	0	0	-110,637	123,764	0	0	0	0	-418	0	0	12,709	-418
Recycled products	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Interproduct transfers	0	0	0	0	0	-112,789	125,002	0	0	0	0	-418	0	0	11,795	-418
Products transferred	0	0	0	0	0	2,152	-1,238	0	0	0	0	0	0	0	914	0
Gas separation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total transformation sector	-2,181,126	-71,751	-127,505	-240	194,658	-2,413,315	2,299,687	-739,414	-190,694	-395,218	-83,803	-110,703	1,320,230	236,517	-2,063,179	-376,810
Main activity producer	-1,447,162	-68,992	-121,411	-138	-9,025	-5,348	-45,738	-610,848	-186,932	-395,218	-77,667	-54,324	1,202,576	122,250	-1,507,435	-315,392
Autoproducers	-202,721	-117	-3,479	-81	-42,281	-661	-31,749	-114,374	-3,761	0	-6,136	-33,152	117,643	114,332	-202,859	-38,189
Gas processing	-8,473	-1,479	-2,244	0	-13	0	248	-4,042	0	0	0	-1	0	0	-12,281	-1
Gas to liquid plants	0	0	0	0	0	0	2,109	-2,878	0	0	0	0	0	0	-768	0
Oil Refineries	0	0	0	0	0	-2,446,725	2,389,994	0	0	0	0	0	0	0	-56,731	0
Coal transformation	-522,770	-1,162	-371	-21	245,977	0	-1,064	0	0	0	0	0	0	0	-277,856	0
Petrochemical industry	0	0	0	0	0	16,756	-12,004	0	0	0	0	0	0	0	4,751	0
Biofuel processing	0	0	0	0	0	15,278	0	0	0	0	0	-15,479	0	0	-201	-15,479
Charcoal processing	0	0	0	0	0	0	0	0	0	0	0	-7,735	0	0	-7,735	-7,736
Non-specified transformation	0	0	0	0	0	7,386	0	-10,150	0	0	0	-13	11	-66	-2,832	-13
Loss & own use	-45,426	-2,867	-4,719	-3	-17,675	-14,669	-105,849	-178,361	0	0	0	-586	-204,027	-38,385	-604,980	-348
Own use	-45,424	-2,867	-4,719	-3	-17,519	-8,010	-105,751	-169,046	0	0	0	-586	-126,791	-27,819	-500,947	-348
Transmission and distribution losses	-2	0	0	0	-157	-6,659	-98	-9,315	0	0	0	0	-77,236	-10,566	-104,032	0
Discrepancy	-6,522	-3,202	-1,654	-1	3,348	855	25,715	-5,232	2	1	3	4,909	-1,650	-430	21,000	4,915
Total final consumption	663,515	123,746	39,645	0	179,396	13,970	2,090,177	761,006	0	0	4,121	225,629	1,115,122	197,766	5,250,702	225,656
Total final energy consumption	616,203	112,902	35,033	0	158,276	2,184	1,716,837	692,095	0	0	4,121	225,629	1,115,122	197,766	4,728,232	225,656
Industry sector	506,240	66,124	29,887	0	152,808	2,116	1,213,081	286,533	0	0	113	75,994	512,612	99,824	1,849,321	72,746
Transport sector	2,396	253	65	0	21	0	1,251,096	72,635	0	0	0	35,559	21,118	0	1,382,825	35,559
Other sector	107,567	46,525	5,081	0	5,447	68	252,660	332,926	0	0	4,008	114,075	581,391	97,942	1,496,085	117,351
Residential & commercial	72,291	30,992	2,825	0	4,976	0	151,414	325,332	0	0	3,824	108,069	510,070	91,835	1,267,812	111,202
Commerce and public services	22,710	9,627	916	0	1,049	0	40,883	104,403	0	0	2,446	5,645	229,939	19,637	426,711	7,401
Residential	49,582	21,365	1,909	0	3,927	0	110,531	220,929	0	0	1,379	102,424	280,131	72,198	841,101	103,801
Agriculture	13,628	5,704	976	0	337	10	55,068	3,544	0	0	112	4,753	17,684	2,447	97,583	4,823
Fishing	1	0	0	0	0	0	4,363	4	0	0	0	0	395	8	4,771	0
Non-specified others	21,646	9,829	1,280	0	134	58	41,815	4,046	0	0	72	1,253	53,242	3,653	125,920	1,325
Non-energy use	47,312	10,844	4,612	0	21,121	11,786	373,340	68,911	0	0	0	0	0	0	522,470	0
Electricity output in GWh	7,041,894	8,090	210,139	607	31,896	11	284,577	3,459,920	2,241,747	1,515,239	626,455	138,272	0	125	15,340,136	2,992,065
Heat output in ktoe	75,034	16	7,385	117	1,444	430	7,492	95,646	0	339	5	4,372	0	64	184,826	1,889

4. Energy data dissemination (1)

- Disseminate energy data (annual, quarterly, monthly and environment) on the EGEDA's website (<http://www.egeda.ewg.apec.org/>).

APEC
Asia-Pacific
Economic Cooperation

EGEDA
under EWG-APEC

Expert Group on Energy Data Analysis

- Introduction
- Focal Point
- Meeting Summary
- DATABASE**
- Publications
- Contact us
- Link

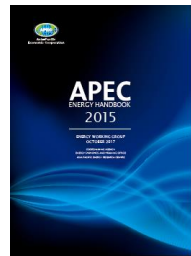
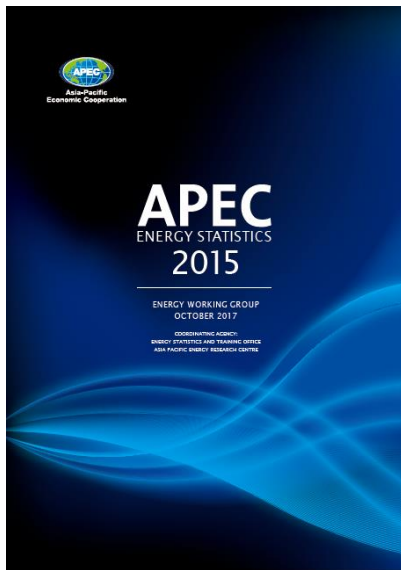
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The Institute of Energy Economics, Japan

- Send Monthly JODI Oil and Gas Data to the International Energy Forum (IEF).

4. Energy data dissemination (2)

- Publish “APEC Energy Statistics” and “APEC Energy Handbook” annually.
- APERC published “APEC Energy Statistics 2015” and “APEC Energy Handbook 2015” in October 2017.



- APERC will publish “APEC Energy Statistics 2016” and “APEC Energy Handbook 2016” in not later than October 2018.

4. Energy data dissemination (3)

- The New EGEDA website will be opened in December 2017.
 - <http://www.egeda.ewg.apec.org/>

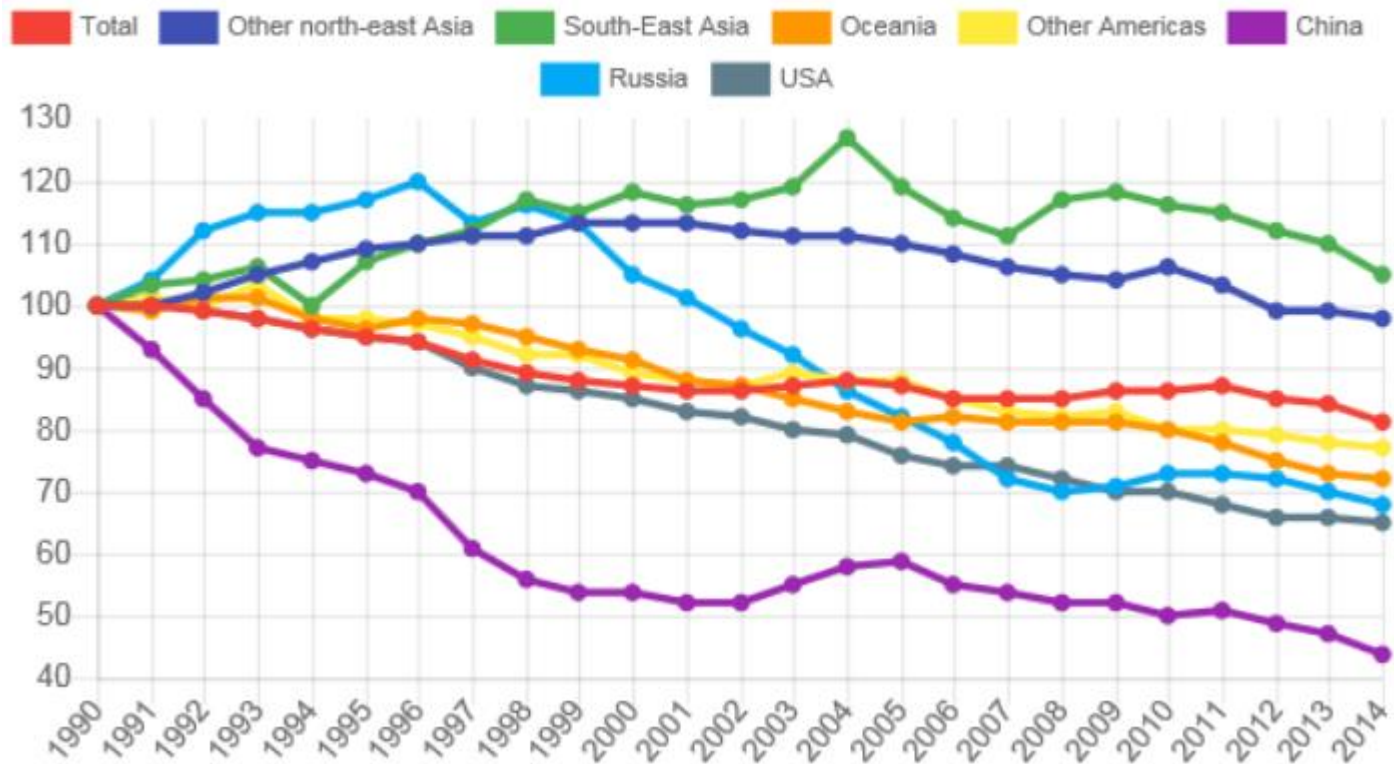
Some new contents will be added

- Data visualisation by charts
- Online submission
- Data analysis reports

APERC will continue to improve the website to disseminate the data collected from member economies

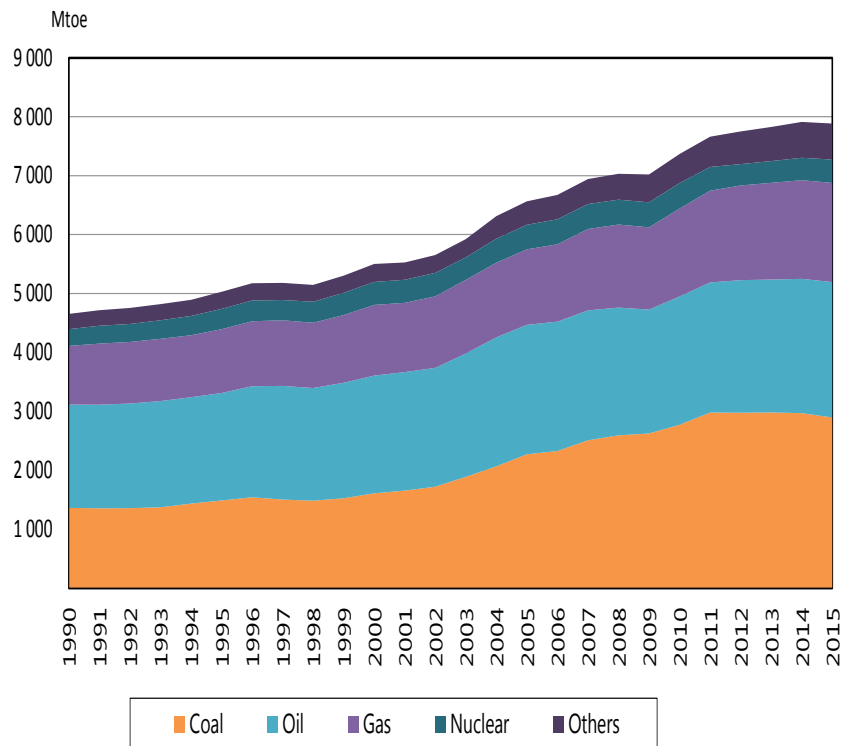
4. Energy data dissemination (4)

Final energy intensity by region, 1990-2014 (1990=100)

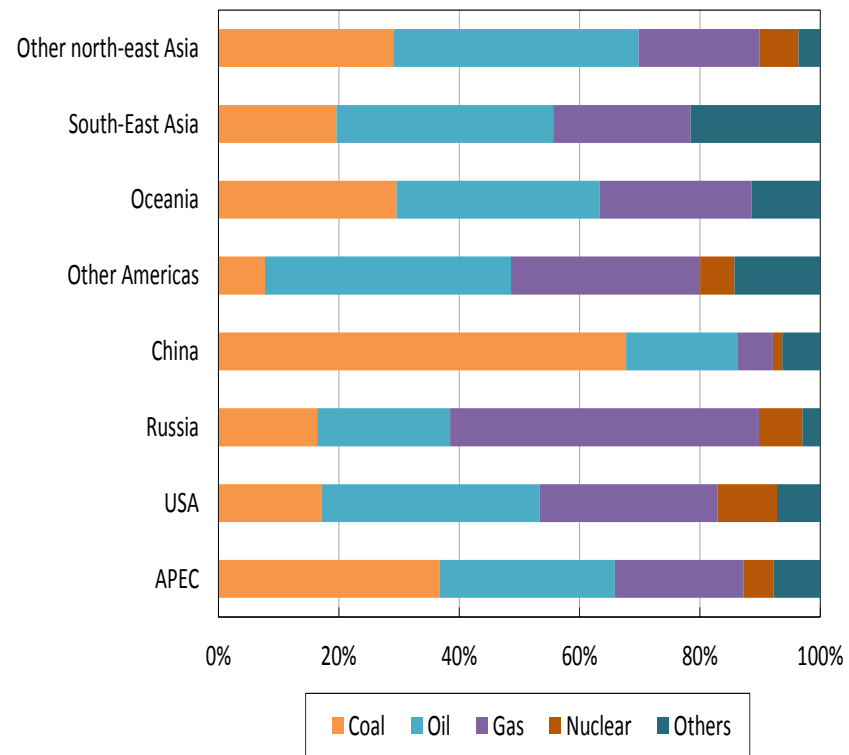


4. Energy data dissemination (5)

APEC TPES by type of fuel

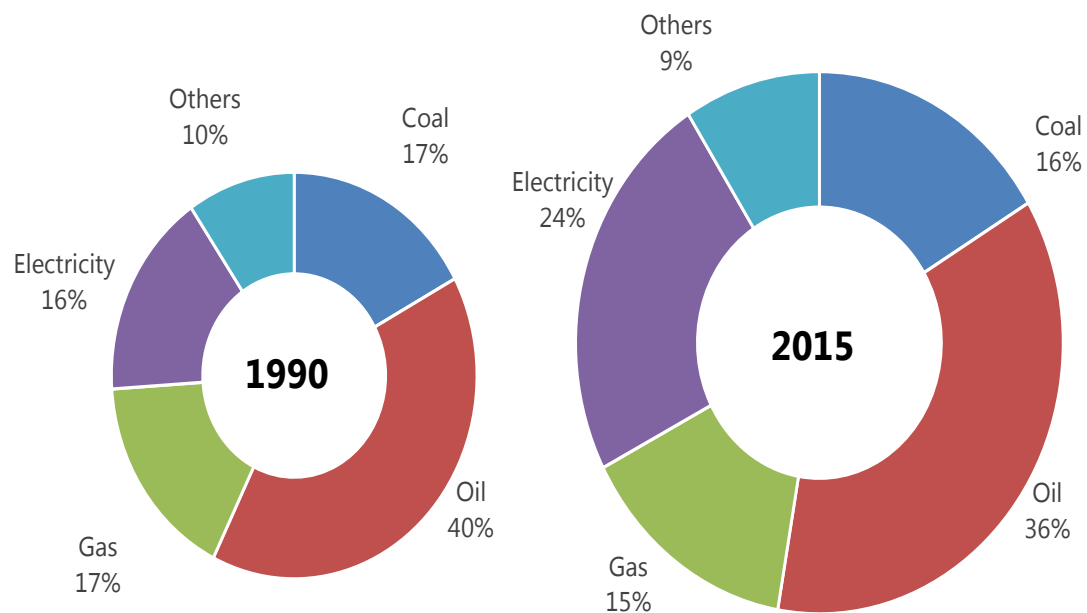


APEC's TPES energy mix by region in 2015

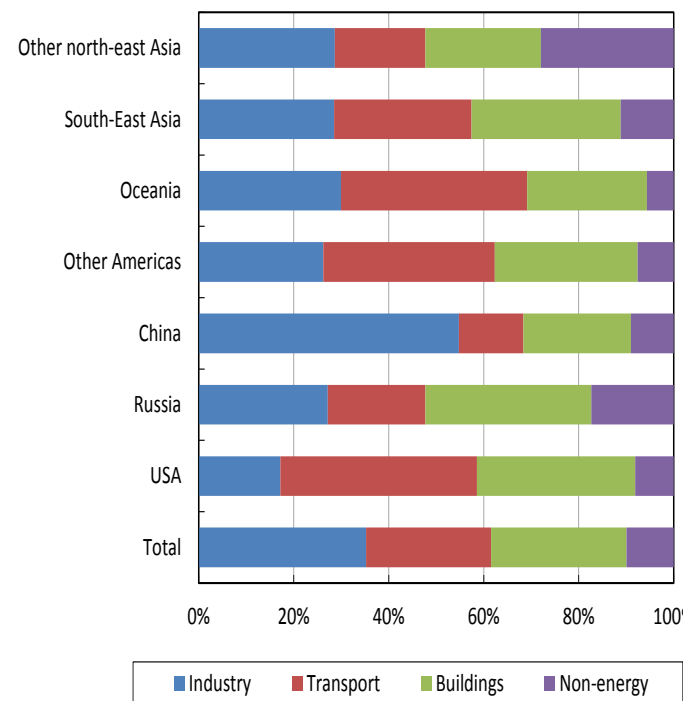


4. Energy data dissemination (6)

APEC TFC by fuel



APEC TFC by region in 2015



4. Energy data dissemination (7)

(Contents of the website)

- Introduction (EGEDA Terms of Reference)
- List of EGEDA focal points
- Meeting Summary (regular meetings and workshops)
- APEC Energy Database
- Publications (statistics book and handbook)
- Contact us (ESTO's contact info.)
- Links (member economies, international organisations)
 - [APEC data in Charts](#)
 - [Statistical reports](#)
 - [Training](#)
 - [Questionnaires, manuals](#)
 - [Online data submission](#)

5. Energy Statistics Training Course (1)

- APERC held four sets of “Short-term” and “Middle-term” Energy Statistics training Course, respectively from 2014 to 2017. There were 25 trainees from 12 APEC economies for the Short-term and eight trainees from six APEC economies for the Middle-term. The training course will continue until 2023.



Short-term Course
12-23 June 2017



Middle-term Course
4 September -27 October 2017

5. Energy Statistics Training Course (2)

- The objectives of the training courses are as follows;
 - Increase the capability of energy statisticians in APEC economies;
 - Enhance human resources network between APEC economies and APERC;
 - Improve reliability of the APEC energy database;
 - Provide hands-on experience on data processing and analysis

5. Energy Statistics Training Course (3)

(Short-term) Duration of 2 weeks for beginners in energy statistics

- Lectures on energy data, energy balances and APEC annual energy questionnaires with hands-on exercises
- Lectures on JODI, data validation techniques, energy efficiency indicators and calculating CO2 emissions from energy consumption
- Energy demand forecasting using econometrics approach

(Middle-term) Duration: 8 weeks for energy statisticians with at least 2 years of experience

- Data processing and preparation of energy balance tables
- Preparation of APEC energy statistics publication
- Validation check on historical data
- Energy demand forecasting, power supply optimization analysis
- Energy indicator analysis

6. Challenges

- Data collection :
 - Sustainability, timeliness and completeness remain as challenges to some APEC economies
 - Continue close communication with our focal points
- Data dissemination:
 - Improve the quality of website based on feedbacks from our users
- Training Course:
 - Revise training program based on feedbacks from our trainees and new developments in the energy sector



Thank you for your kind attention

<http://egeda.ewg.apec.org/>