



APEC's Energy Intensity Reduction Goal:

Research Update

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Asia Pacific Energy Research Centre (APEREC)

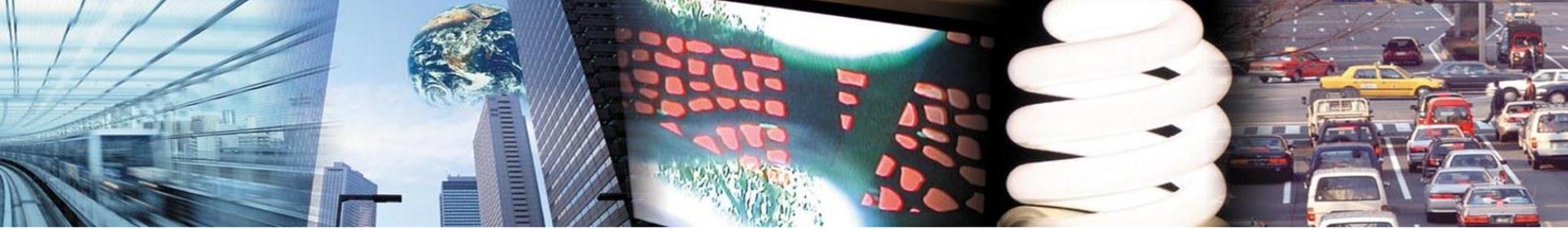


Asia-Pacific
Economic Cooperation

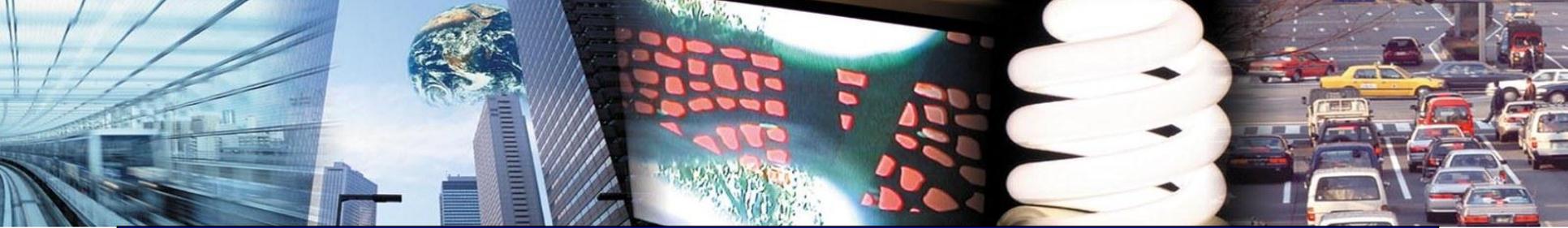


Outline

- What Happened in 2009?
- Comments on the ERIA Analysis
- A Look Back at the *2006 APEC Energy Demand and Supply Outlook*

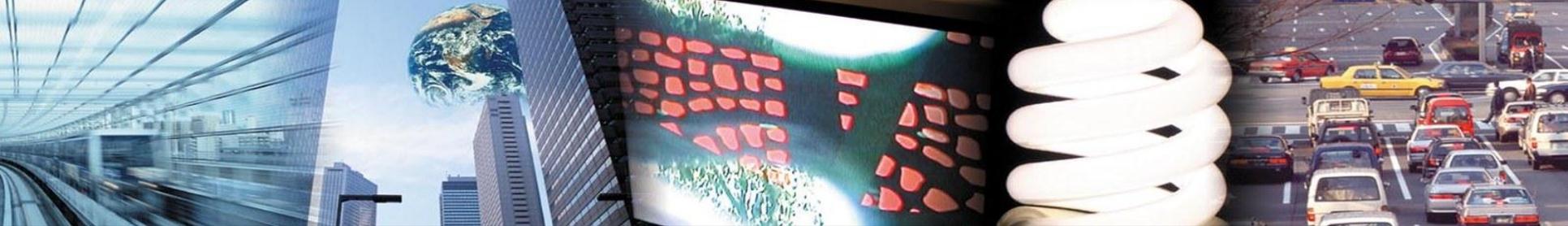


What Happened in 2009?

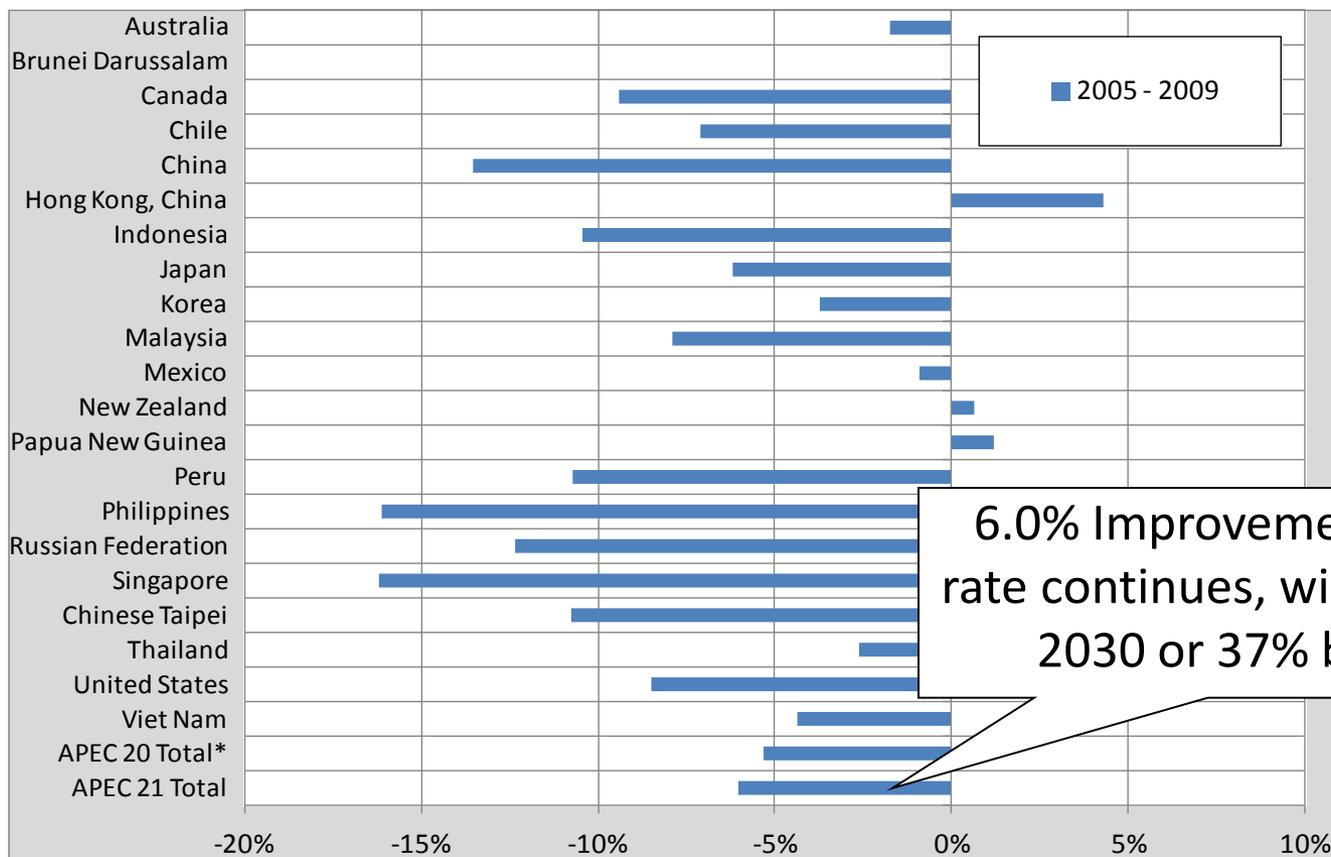


What Happened in 2009?

- IEA recently published the energy statistics for all APEC economies except Papua New Guinea (PNG) for 2009 and the APEC published primary energy demand statistics for PNG
- This allowed APERC to calculate the energy intensity improvement in the APEC economies in 2009
 - Primary energy intensity improved in the APEC economies in 2009 by only 0.2%
 - Final energy intensity improved in the APEC economies (except PNG) in 2009 by a only 0.1%
- Recall that 2009 was a year of economic crisis, deep recession in many economies, and (relatively) low oil prices, hence these results are unlikely to be typical of the 2005-2030 time period



What Happened to Primary Energy Intensity By Economy Since 2005?

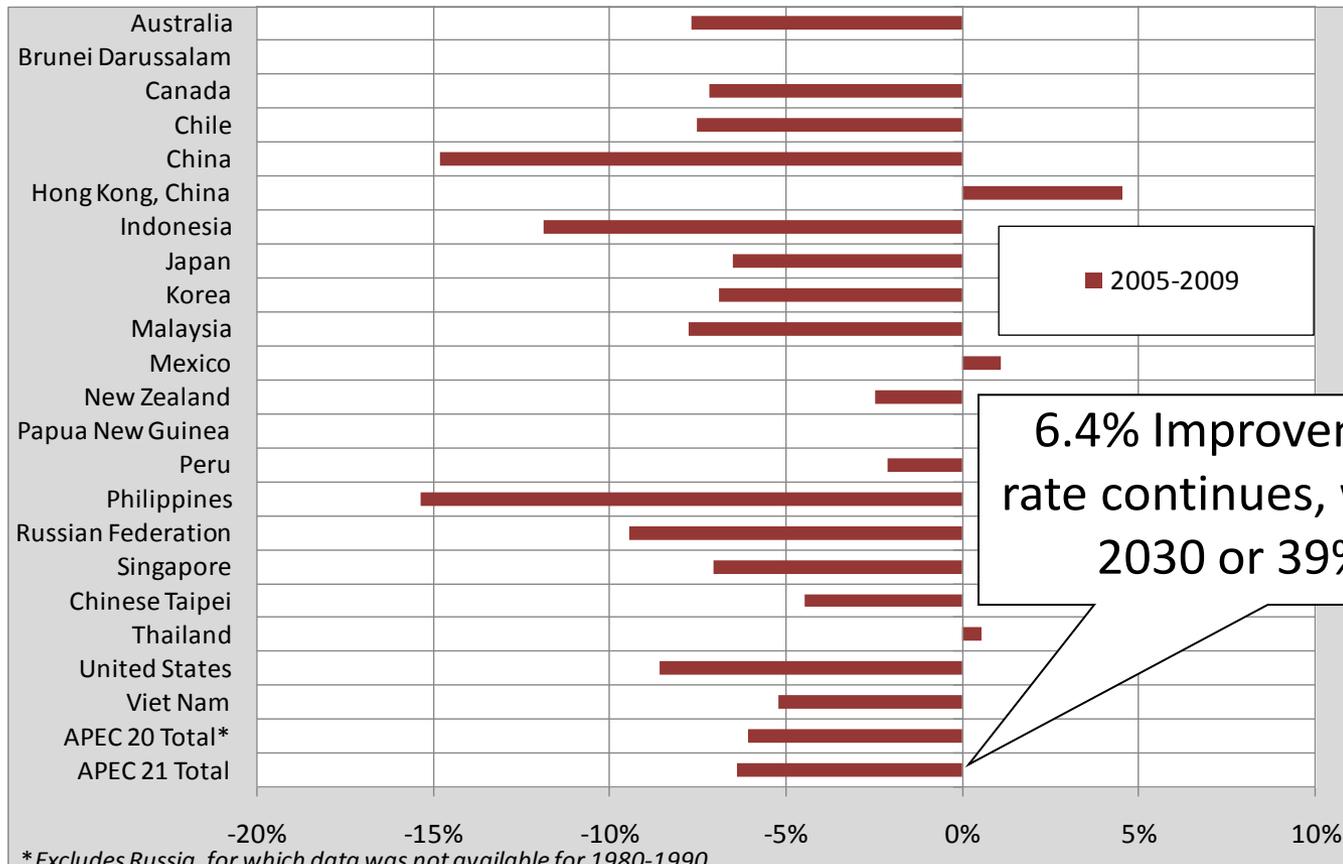


6.0% Improvement—If this rate continues, will be 32% by 2030 or 37% by 2035

*Excludes Russia, for which data was not available for 1980-1990.

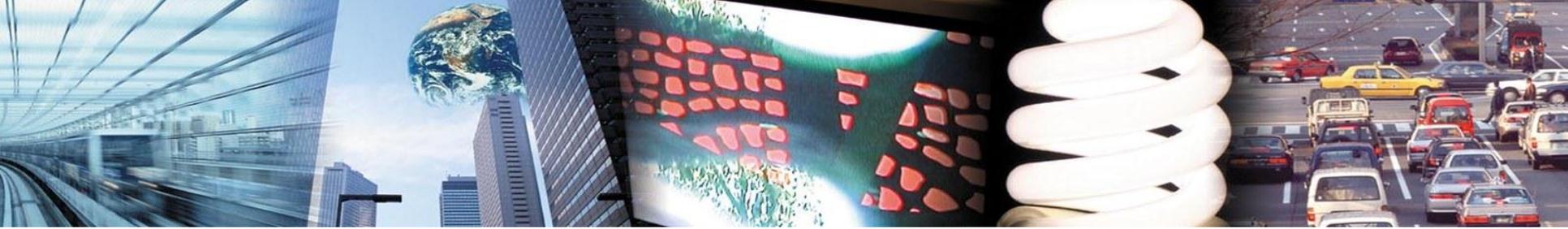


What Happened to Final Energy Intensity By Economy Between 2005 and 2009?

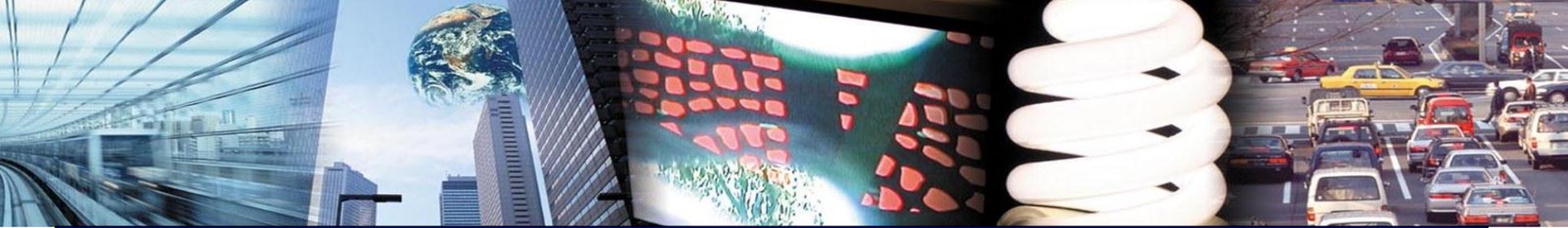


6.4% Improvement—If this rate continues, will be 34% by 2030 or 39% by 2035

* Excludes Russia, for which data was not available for 1980-1990.



Comments on the ERIA Analysis

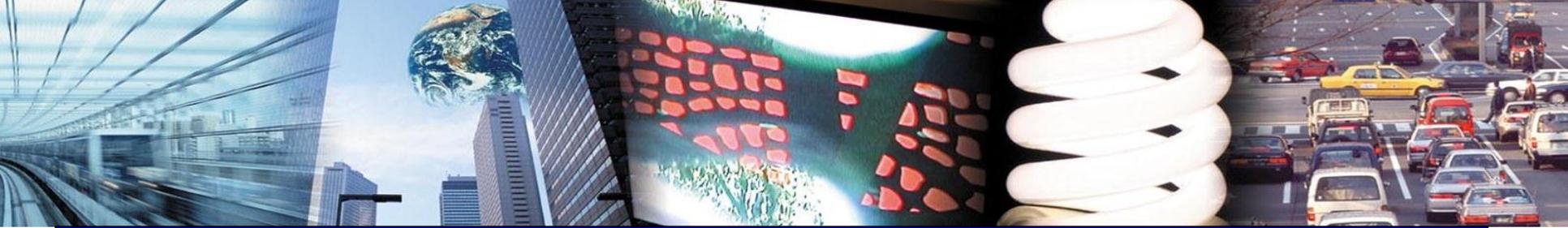


Background – ERIA Analysis

- The Economic Research Institute of East Asia (ERIA) has done several analyses of 2005-2030 energy saving potential for the ASEAN+6 economies
 - The latest appeared to show that 2005-2030 primary energy intensity improvement in these economies would be only 9.9% in the Base Case and only 26.7% in the “Aggressive Policy Scenario” (APS)
 - The ASEAN+6 economies are not the same as the APEC economies, but still these results appear to be at odds with the other research that APERC has presented, which project much higher rates of energy intensity improvement
 - Why is this?

ERIA's 2005-2030 Primary Intensity Improvement by Economy

	BAU Case	APS Case
APEC Economies:		
Australia	-21.4%	-21.4%
Brunei Darussalam	-18.4%	-35.0%
China	-47.5%	-57.1%
Indonesia	-10.6%	-33.4%
Japan	-30.7%	-38.5%
Korea	-34.6%	-47.5%
Malaysia	-38.0%	-46.1%
New Zealand	-25.6%	-33.2%
Philippines	-14.9%	-22.2%
Singapore	-37.0%	-38.7%
Thailand	-6.4%	-26.5%
Viet Nam	-8.1%	-14.2%
Total APEC ASEAN+6	-4.2%	-21.1%
Non-APEC Economies		
Cambodia	7.7%	-6.0%
India	-49.3%	-61.4%
Lao PDR	98.4%	85.6%
Myanmar	-60.8%	-63.4%
Total ASEAN + 6	-9.9%	-26.7%

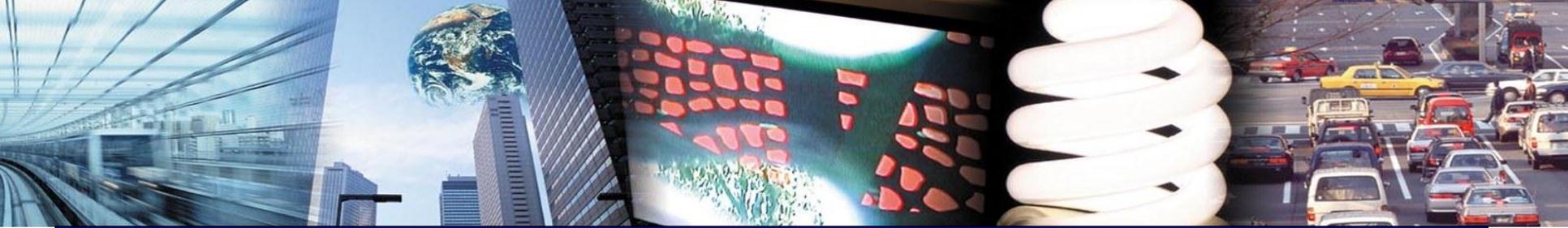


Initial Observations on the ERIA Results

- Individual economy intensity improvements appear to be in line with other APERC findings, with typical percentage improvements in the 30's and 40's
- Total regional averages are quite low, however
 - For example, BAU case Total APEC ASEAN+6 improvement is smaller than improvement of every single economy in that region
 - Why?

ERIA's Original APS Case Calculations Using Year 2000 Exchange Rates

	2005 GDP	2005 Energy	2005 Energy/GDP		2030 GDP	2030 Energy	2030 Energy/GDP	Energy/GDP Improvement
	billion 2000 US\$	mtoe			billion 2000 US\$	mtoe		
Australia	468.4	122	0.260		898.4	184	0.205	-21.4%
Brunei	6.6	2.6	0.394		16.8	4.3	0.256	-35.0%
China	1893.0	1505.2	0.795		11996.0	4089.7	0.341	-57.1%
Indonesia	207.9	135.1	0.650		937.3	405.6	0.433	-33.4%
Japan	4980.0	517.8	0.104		6984.0	446.6	0.064	-38.5%
Korea	639.6	218.5	0.342		1623.9	291.5	0.180	-47.5%
Malaysia	112.5	62.8	0.558		347.1	104.5	0.301	-46.1%
New Zealand	61.7	15.2	0.246		100.9	16.6	0.165	-33.2%
Philippines	94.5	33.8	0.358		395.4	110	0.278	-22.2%
Singapore	114.7	27.7	0.241		296.4	43.9	0.148	-38.7%
Thailand	157	98.9	0.630		419.9	194.4	0.463	-26.5%
Viet Nam	44.8	27.3	0.609		280.1	146.5	0.523	-14.2%
Total – APEC in ASEAN+6	8780.7	2766.9	0.315		24296.2	6037.6	0.248	-21.1%
Cambodia	5.7	1.3	0.228		35	7.5	0.214	-6.0%
India	645	379.9	0.589		4513	1026.2	0.227	-61.4%
Lao PDR	2.4	0.5	0.208		15	5.8	0.387	85.6%
Myanmar	13.3	5.8	0.436		131.1	20.9	0.159	-63.4%
Total- ASEAN +6	9447.1	3154.4	0.334		28990.3	7098	0.245	-26.7%

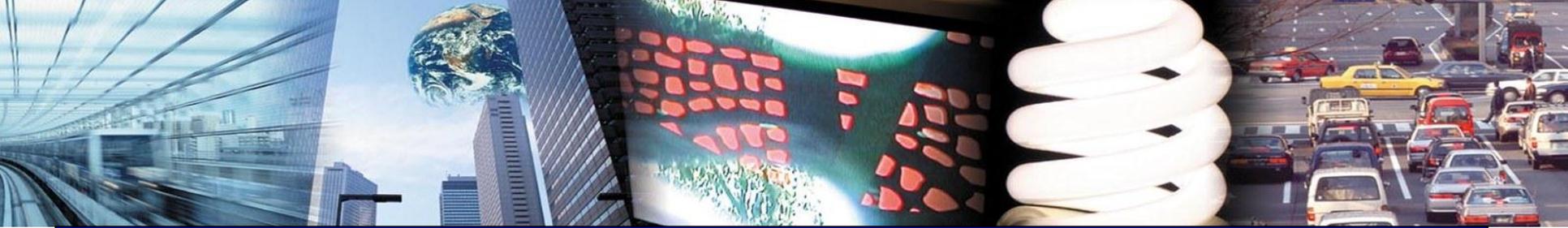


Observations on the ERIA Calculations

- Slow-growing Japan has a large GDP and drags down the total GDP growth rate
- Fast-growing developing economies, such as China, have large energy demand and push-up the energy demand growth rate
- Since energy intensity is energy demand divided by GDP, total energy intensity improves slowly
- But all GDP's were converted to US dollars at their year 2000 exchange rate
 - These exchange rates tended to over-value Japanese currency relative to its actual purchasing power
 - But they under-valued most developing economy currencies relative to their actual purchasing power

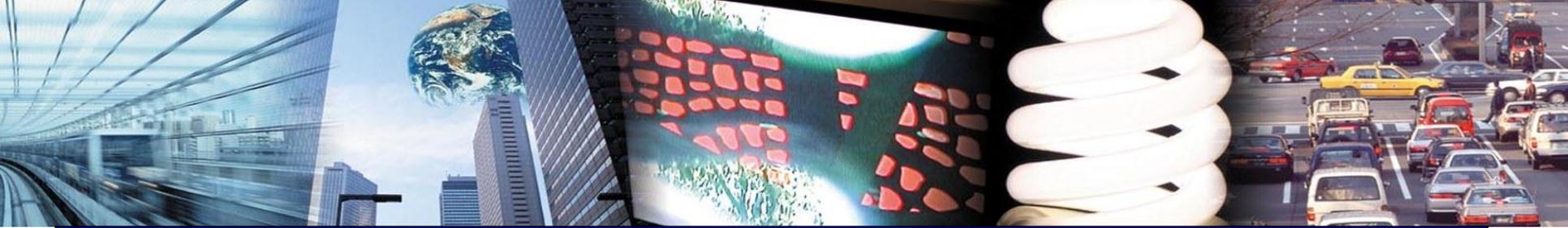
ERIA's APS Results Recalculated Using 2005 Purchasing Power Parities (PPP)

	Currency Conversion	2005 GDP billion 2005 PPP US\$	2005 Energy mtoe	Energy/GDP		2030 GDP billion 2005 PP US\$	2030 Energy mtoe	Energy/GDP	Improvement
Australia	1.43	671.5	122	0.182		1287.9	184	0.143	-21.4%
Brunei	2.67	17.6	2.6	0.148		44.8	4.3	0.096	-35.0%
China	2.82	5333.2	1505.2	0.282		33796.7	4089.7	0.121	-57.1%
Indonesia	3.41	707.9	135.1	0.191		3191.5	405.6	0.127	-33.4%
Japan	0.78	3870.3	517.8	0.134		5427.7	446.6	0.082	-38.5%
Korea	1.61	1027.4	218.5	0.213		2608.5	291.5	0.112	-47.5%
Malaysia	2.66	299.6	62.8	0.210		924.4	104.5	0.113	-46.1%
New Zealand	1.63	100.7	15.2	0.151		164.7	16.6	0.101	-33.2%
Philippines	2.65	250	33.8	0.135		1046.0	110	0.105	-22.2%
Singapore	1.57	180.1	27.7	0.154		465.4	43.9	0.094	-38.7%
Thailand	2.83	444.9	98.9	0.222		1189.9	194.4	0.163	-26.5%
Viet Nam	3.98	178.1	27.3	0.153		1113.5	146.5	0.132	-14.2%
Total – APEC in ASEAN+6		13081.3	2766.9	0.212		51261.1	6037.6	0.118	-44.3%
Cambodia	3.53	20.1	1.3	0.065		123.4	7.5	0.061	-6.0%
India	3.63	2341	379.9	0.162		16379.7	1026.2	0.063	-61.4%
Lao PDR	4.25	10.2	0.5	0.049		63.8	5.8	0.091	85.6%
Myanmar	1.00	13.3	5.8	0.436		131.1	20.9	0.159	-63.4%
Total - ASEAN +6		15465.9	3154.4	0.204		67959.1	7098	0.104	-48.8%



Observations on the Re-Calculation

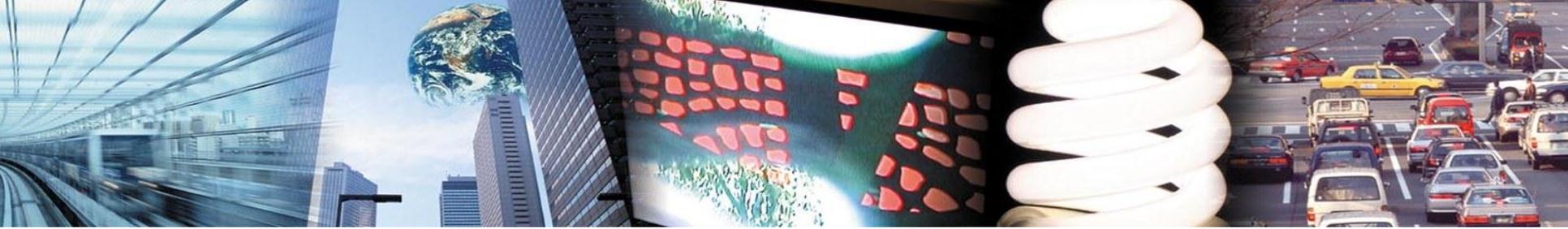
- Purchasing Power Parity (PPP) rates value currencies based on how much they will actually buy
- In APERC's view, PPP is more suitable for calculating energy intensities, since an economy's energy use should be related to how much its GDP will actually buy, rather than how many US dollars it could be exchanged for at a bank
 - APERC has consistently used PPPs in all its analysis of the APEC energy intensity improvement goal
- When the results are recalculated using PPP's, the regional total primary energy intensity improvements are consistent with the other results that APERC has presented, as well as individual economy results



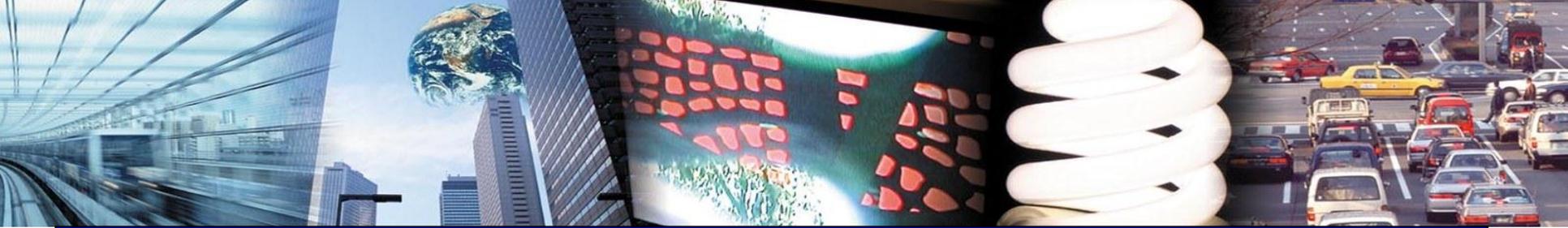
Summary of the ERIA Primary Intensity Improvement Results

Original: Exchange Rates	All ASEAN+6 Economies	APEC Economies in ASEAN+6
BAU Case	-9.9%	-4.2%
APS Case	-26.7%	-21.1%

Recalculated: PPP	All ASEAN+6 Economies	APEC Economies in ASEAN+6
BAU Case	-37.2%	-32.5%
APS Case	-48.8%	-44.3%

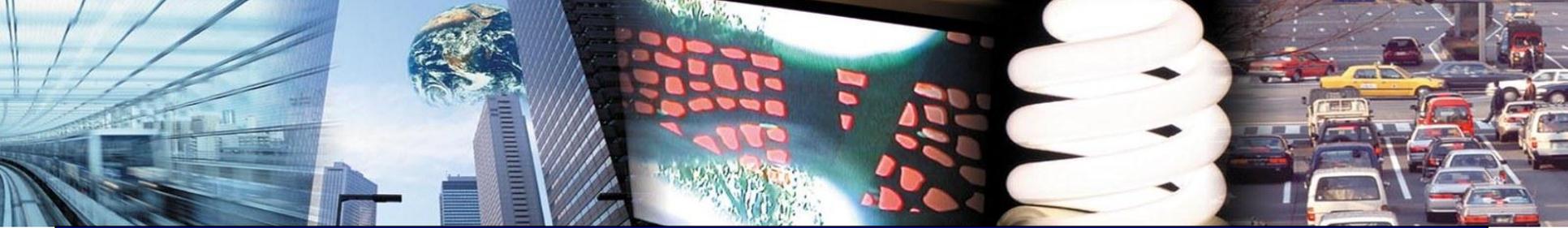


A Look Back at the 2006 APEC Energy Demand and Supply Outlook



2006 APEC Energy Demand and Supply Outlook Comparison

	2006 APEC Outlook	APEC Outlook 4th Edition (2009)
Primary Energy Intensity Improvement	-39.2%	-37.9%
Final Energy Intensity Improvement	-38.1%	-40.4%



Observations on the 2006 Outlook

- Compared to the *APEC Energy Demand and Supply Outlook 4th Edition* (2009), the *2006 APEC Energy Demand and Supply Outlook* was developed
 - Under a different APERC president and vice-president, and mostly different research staff
 - Used a different set of demand models and model assumptions
- Yet the APEC-wide 2005-2030 business-as-usual energy intensity improvement projections are remarkably similar
- This comparison thus provides further evidence for the robustness of the conclusion that the current APEC-wide 25% intensity improvement goal will be easily met under business-as-usual