



Climate Policy Forum Cum Workshops

GHG Reduction Solutions for a Low Carbon Hong Kong

30 September, 2010

Disclaimer: This powerpoint presentation for this forum only reflects the opinion of our guest speakers and do not represent the stance of WWF-Hong Kong.

A graphic element consisting of a black crosshair. The top-left quadrant is a yellow square, the bottom-left is a red square, and the bottom-right is a blue square.

WWF_Climate Policy Forum

Workshop III

Energy Mix & Electricity Tariff (5 mins)

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30 Sept. 2010

Targer:kg CO₂-e/HK\$ and Total GHG emissions

- setting for Hong Kong a target to reduce carbon intensity by 50-60 % by 2020 when compared with 2005;

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reduction targets. This notwithstanding, the CPG announced on 26 November 2009 a voluntary national target (the National Target) to reduce the CO₂ produced for each yuan of national income by 40% - 45% by 2020 as compared with the 2005 level. The National Target will mainly

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Table 6 : Expected GHG emissions reduction in Hong Kong from 2005 to 2020

	2005	2020	Reduction
Carbon intensity (kg CO ₂ -e/HK dollar)	0.029	0.012 - 0.015	↓ 50-60%
Total GHG emissions (million tonnes)	42	28-34	↓ 19-33%
Per capita GHG emissions (tonnes)	6.2	3.6-4.5	↓ 27-42%

2020	<i>Low</i>	<i>Average</i>	<i>High</i>	Proposed %
Nuclear	50	50	50	50%
coal-fired	40	50	60	10%
gas-fired	70	80	90	40%
Aggregate Tariff	57	62	67	

2009	<i>Low</i>	<i>Average</i>	<i>High</i>	Proposed %
Nuclear	50	50	50	23%
coal-fired	40	50	60	54%
gas-fired	70	80	90	23%
Aggregate Tariff	49.2	56.9	64.6	

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**Do we need
to pay more?**

For illustration purpose, the current unit price of nuclear electricity imported from the Mainland is about 50 cents/kWh. The power companies' current unit generation costs of coal-fired electricity are in the range of about 40-60 cents/kWh, and gas-fired electricity in the range of about 70-90 cents/kWh. Fuel costs are subject to market fluctuation, and future imported nuclear electricity prices, for instance, will be subject to commercial negotiation. They may change over time.



Simple projection:

- **Elect. Consumption: Log Trend with GDP from 1990 TJ**

Period	GDP growth rate
2005 - 2010	4%
2011 - 2020	3.5%
2021 - 2030	3%



Emissions parameters of Electricity generation

Technology	t CO ₂ -e/MWh
Black coal	0.84
Brown coal	1.20
Oil	0.78
Natural gas	0.49

Scenarios of CO₂-e reduction in Electricity Generation

	Energy Mix			2020	28.6 Mt CO ₂ -e
Scenario	Nuclear	NG	Coal	MtCO ₂ -e	% of 2005
BAU	23%	23%	54%	37.48	31.05%
EPD	50%	40%	10%	16.23	-43.26%
NG(50%)	40%	50%	10%	18.83	-34.17%

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Do we need to highly rely
on importing Nuclear power?



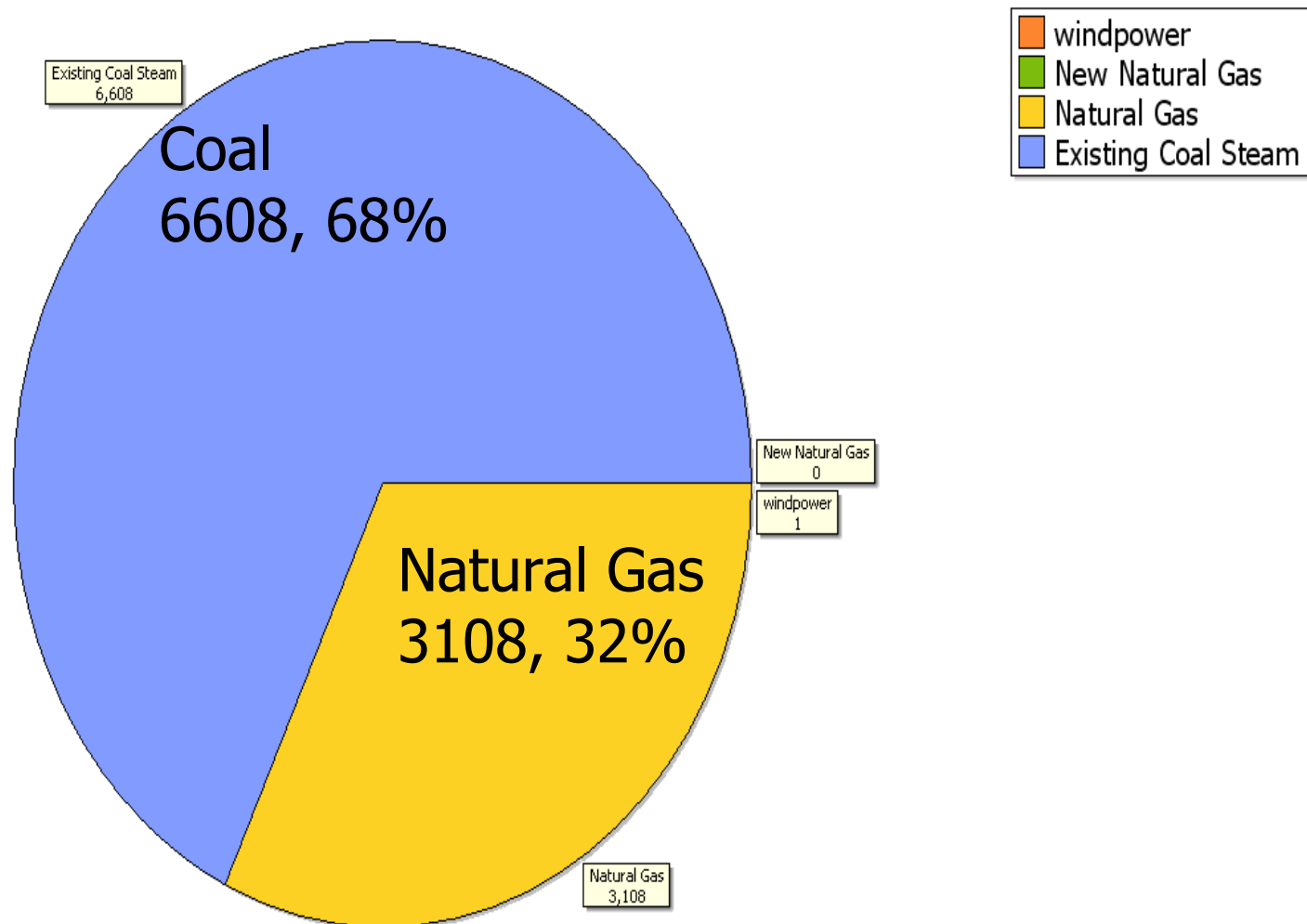
Conclusion

- Do we need to highly rely on importing Nuclear power?
- Do we use Nuclear power to help HK to remove CO₂-e not only for Electricity generation but also for other emissions segments, like Transport & other end-use?



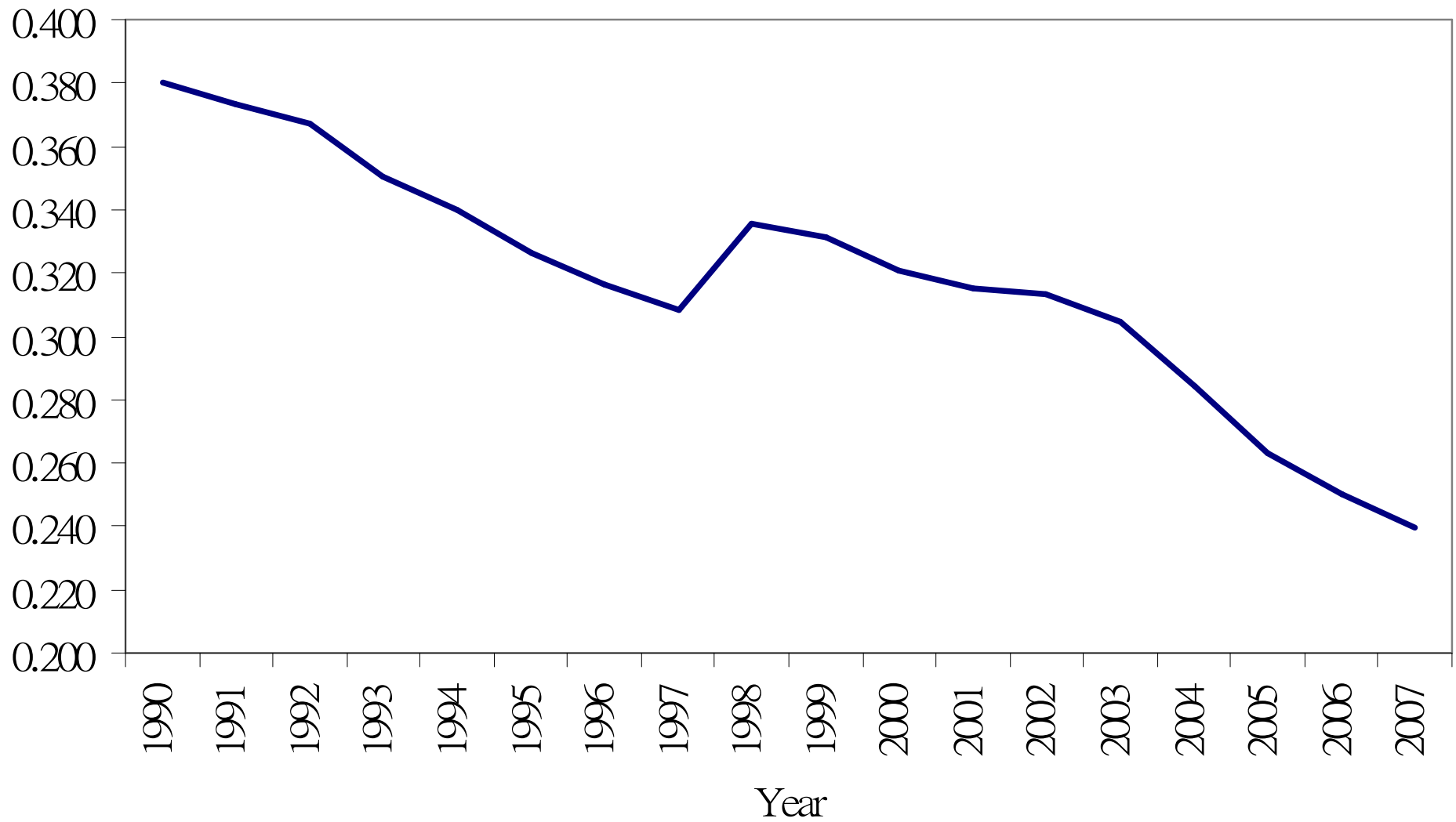
Thank You

Generation Capacity (MW)
Hong Kong, 2005

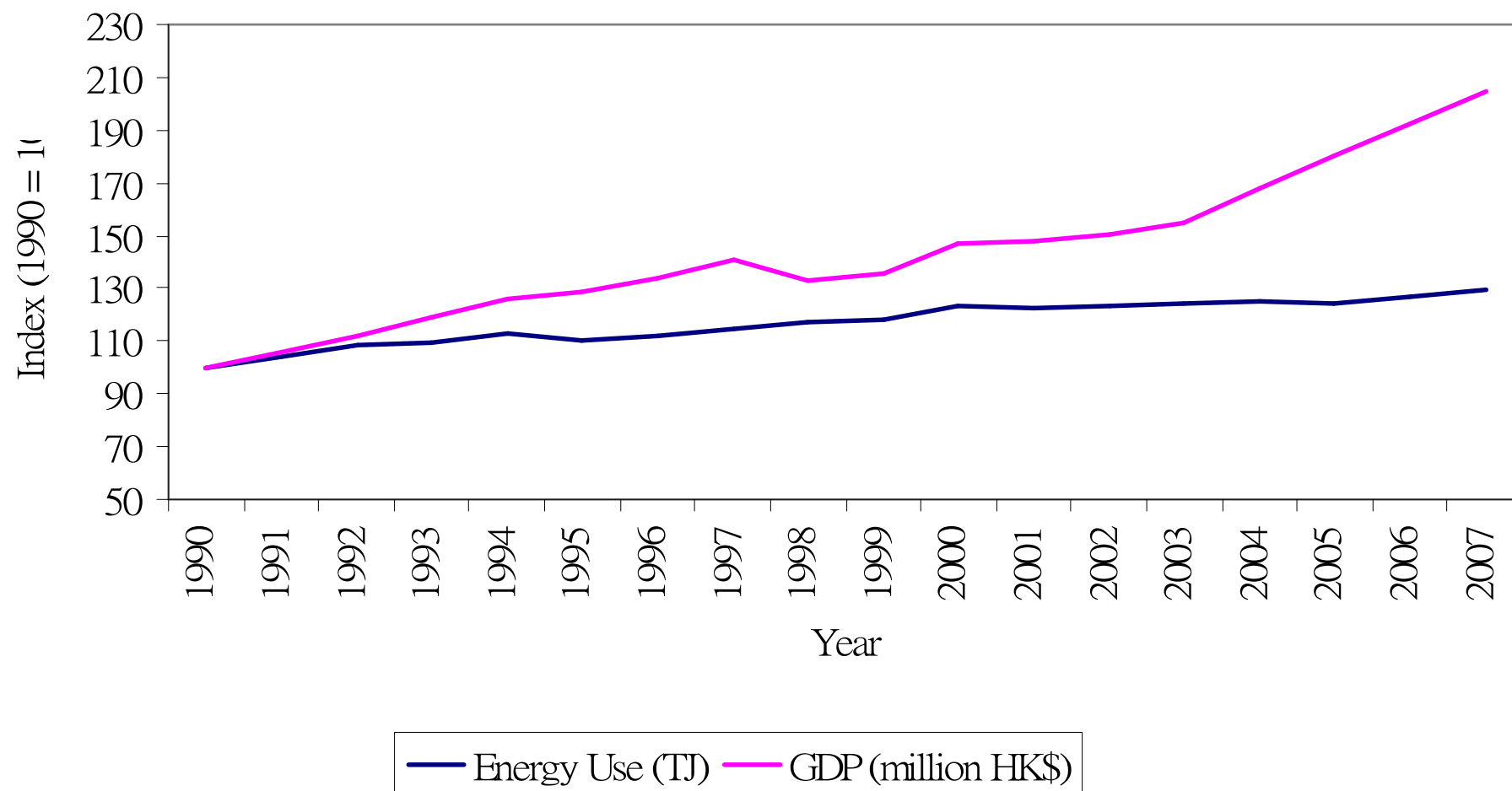


Hong Kong Energy Intensity, 1990-2007

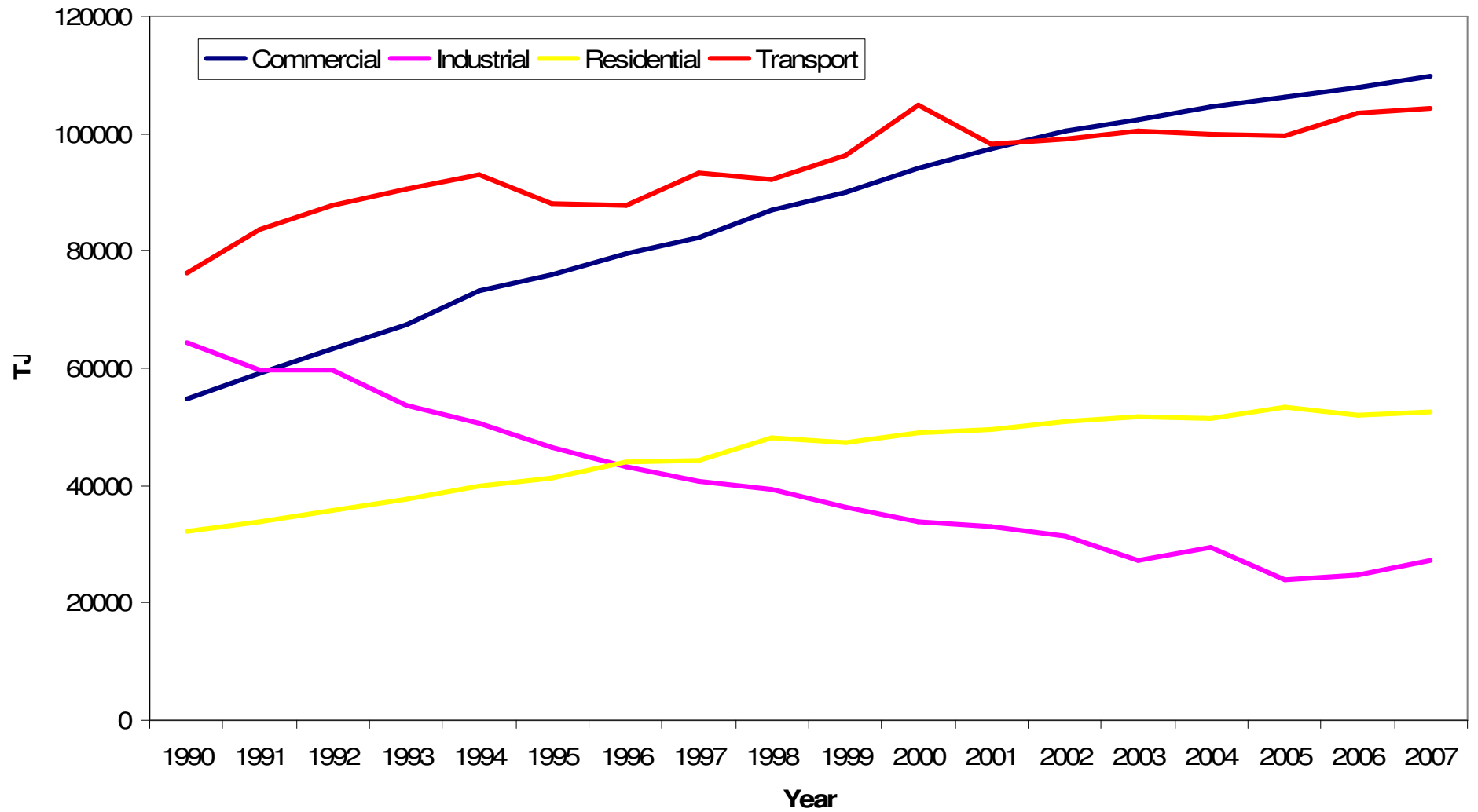
TJ/Million HK\$ (1990 real)



Decoupling of Hong Kong energy end-use from GDP (2007 real)*



Energy end-use in different sectors





Thank you.

HEC

Installed Capacity (MW)	2008	2007	2006	2005	2004	2003	2002	2001	2000	1999
Gas Turbines and Standby Units	555	920	920	920	920	920	920	805	805	805
Coal-fired Units	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500
Gas-fired Combined Cycle Unit	680	335	335	-	-	-	-	-	-	-
Wind Turbine	1	1	1	1	-	-	-	-	-	-
Total (MW)	3,736	3,756	3,756	3,421	3,420	3,420	3,420	3,305	3,305	3,305

CLP

	Year	Fuel type	MW	number of unit		
A1-A4	1989	coal-fired	350	4	1400	Castle Peak
B1,B4		coal-fired	677	2	1354	
B2,B3		gas or coal	677	2	1354	
	1996-2006	gas-fired	313	8	2500	Black Point
	1989	Diesel	100	3	300	Penny's Bay
					6908	

Table 3.1: Life of Existing Coal-fired Generating Units

	Location	Units	Capacity (MW)	Commissioning Date	End of Book Life ^[1]
CLP	Castle Peak A	A1	350	1-Jun-82	2007
		A2	350	1-May-83	2008
		A3	350	1-Mar-84	2009
		A4	350	1-Mar-85	2010
	Castle Peak B	B1	677.5	1-Mar-86	2011
		B2	677.5	1-Jan-87	2012
		B3	677.5	1-Jan-88	2013
		B4	677.5	1-Jan-90	2015
HEC	Lamma Island	L1	250	15-May-82	2017
		L2	250	1-Oct-82	2017
		L3	250	1-May-83	2018
		L4	350	1-May-87	2022
		L5	350	31-Mar-88	2023
		L6	350	20-Apr-92	2027
		L7	350	31-Dec-95	2030
		L8	350	31-Dec-97	2032
Total CLP			4,110		
Total HEC			2,500		
Total CLP + HEC			6,610		

Note: ^[1] Book life for CLP and HEC coal units are respectively 25 and 35 years according to the Scheme of Control.

Source: Energy Environment Economy Research Institute, Tsinghua University