The 16th APEC Workshop on Energy Statistics
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2.1 APEC Energy efficiency template

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Asia-Pacific Economic Cooperation

Outline of Presentation

Background

- Milestone
- Data components

Status of Energy Data Collection

- Submissions/Timeliness
- Completeness

Sample Analysis

- Use of indicators

Way forward

Feedback

Background

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Milestone

Dec 2014
- Introduction of Energy Efficiency template

Dec 2015
- Sent Questionnaire & User Manual

Mar–Apr 2016
- Collection of Questionnaire from APEC economies

May–June 2016
- Data evaluation

Nov 2016
- Reported progress in 28th EGEDA

June 2017
- Questionnaire revised per agreement in 28th EGEDA

Sept–Oct 2017
- Submission evaluation
- Data analysis

Nov 2017
- Reported progress in 29th EGEDA

Jan 2018
- Questionnaire revised to include transport and industry sectors as agreed in 29th EGEDA

2017 Revised questionnaire components

Commercial and Public Services

- Space Heating
- Space Cooling
- Lighting
- Other Building Energy Use
- Non-Building Energy Use
- Total Energy Use in Commercial Sector

Activity data

- Activity and structure indicators (population, HHs, floor area, etc)
- GDP
- Value added

Residential

- Space Heating
- Space Cooling
- Water Heating
- Cooking
- Lighting
- Refrigerators / Freezers
- Other kitchen facilities
- Laundry facilities
- Television/PC and other Home entertainment
- Other Appliances
- Total Energy Use in Residential Sector

To analyze energy demand and how to improve energy efficiency, detailed information for energy end-use / energy related data are important for policy makers & energy analysts.

2018 Revised questionnaire components

Transport and Industry Sectors added

Transport sector (by fuel)

- Road transport
- Railways
- Domestic Aviation
- Inland waterways

Activity data

- Number of vehicles (by type, by mode, by fuel type)
- Passenger-km (Passenger)
- Vehicle-km
- Tonne-km (Freight)

Industry sector (by fuel)

- Food products and textiles
- Wood and wood products
- Paper and paper products
- Chemicals, basic pharmaceuticals, petrochemicals
- Non-metallic minerals
- Basic metals
- Fabricated metals
- Motor vehicles, trailers etc
- All Other manufacturing
- Mining and Quarrying
- Construction

Status of Data Collection

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2016 Revised EE template submission (1)

13 APEC-Non-OECD members	June 2018			Remarks
	number	Timeliness	Completeness	
Submitted	6	5	2	BD; HKC; PHL; RUS; CT; THA*
No submission	7			

*Thailand shared some information, unfortunately not useful at the moment

IEA/OECD members	June 2018		Remarks
	number	Completeness	
Shared	2	2	AUS; JPN

Chile shared old survey result but it still needs to be reflected in Chile's end use data

2016 Revised EE template submission (2)

Completeness

Economy	Activity	Commercial	Residential	Transport	Industry
BD	No HH and transport related data; value added;	Aggregated data (by fuel)		By fuel/mode	Aggregated data
HKC	No data on heating/cooling; passenger-km; vehicle-km	Disaggregated by end-use		By fuel/mode	By industry sub-sector
PHL	No data on heating/cooling; passenger-km; vehicle-km	Aggregated data (by fuel)		By fuel/mode	By industry sub-sector
Russia	No data on heating/cooling; GVA and transport data	Aggregated data		By fuel/mode	By industry sub-sector
CT	Time-series gaps	Disaggregated by end-use		By fuel/mode	By industry sub-sector

Data analysis

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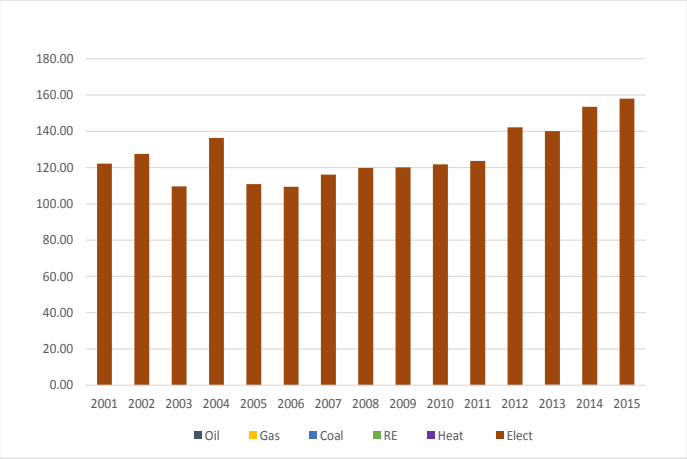
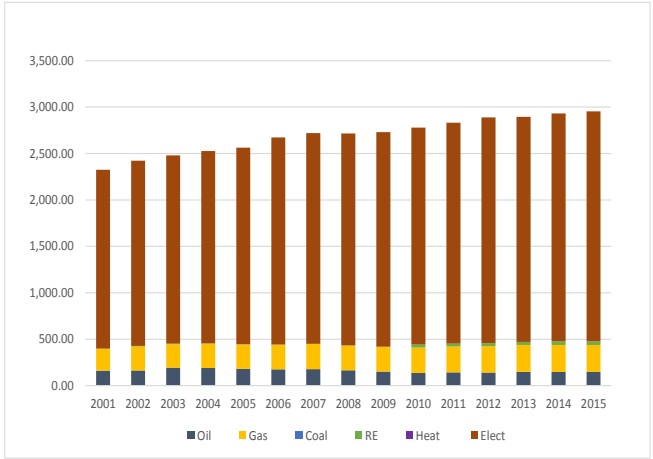
Commercial Energy consumption (ktoe)

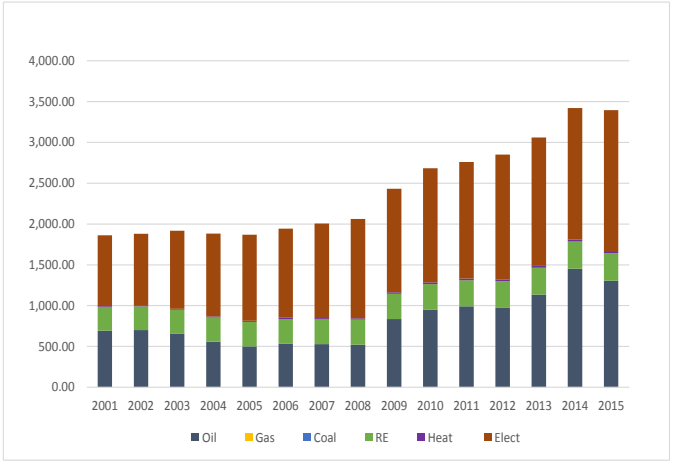
BD



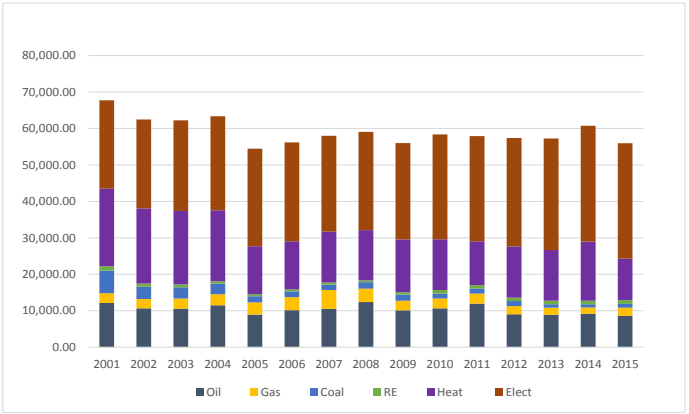
HKC



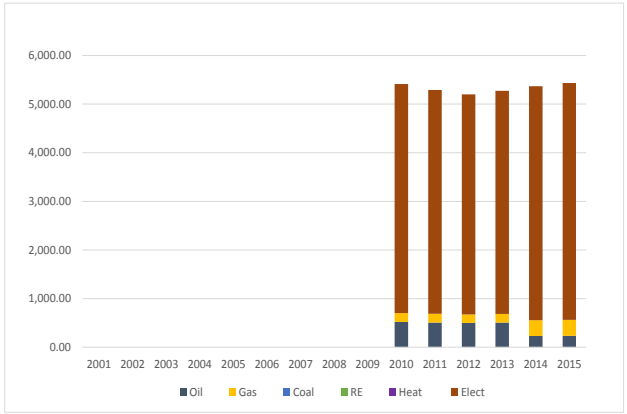
PHL



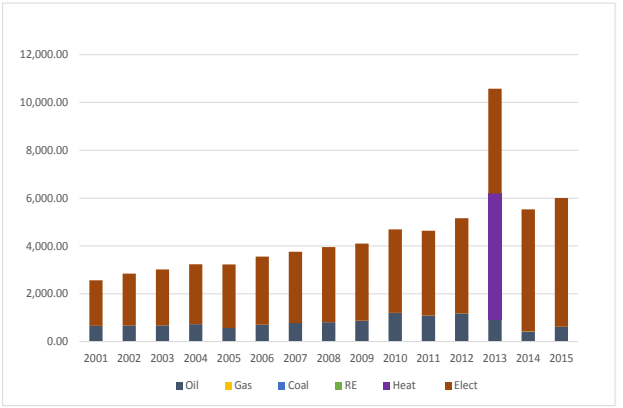
RUS



CT



THA



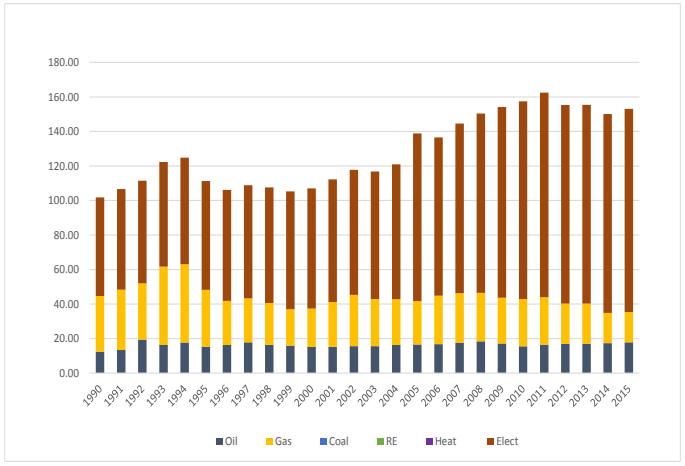
Source : Members' submission

❑ **Electricity is the major fuel in the commercial sector**

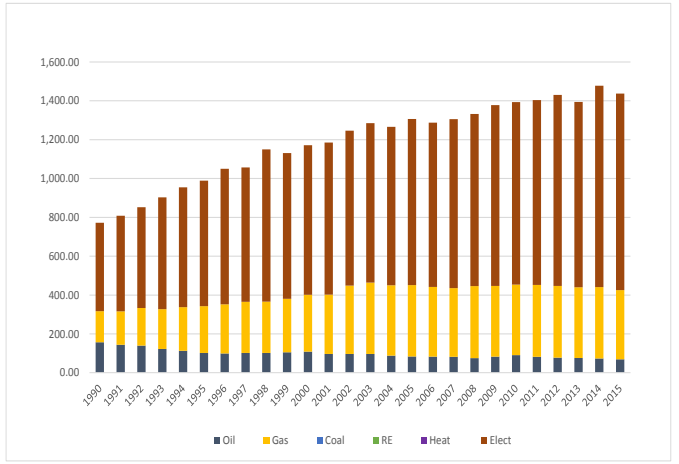
elect oil heat RE gas coal

Residential Energy consumption (ktoe)

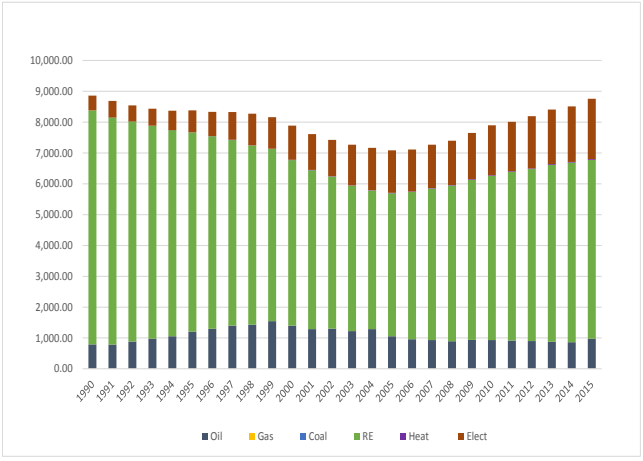
BD



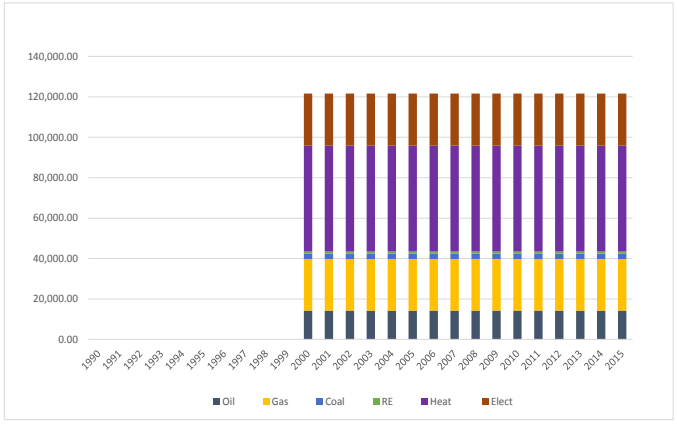
HKC



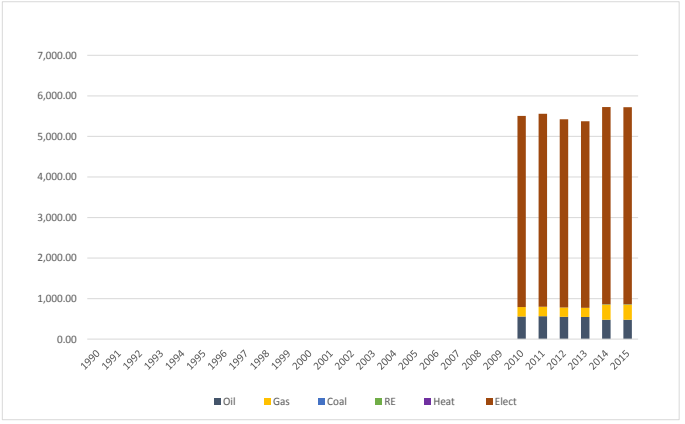
PHL



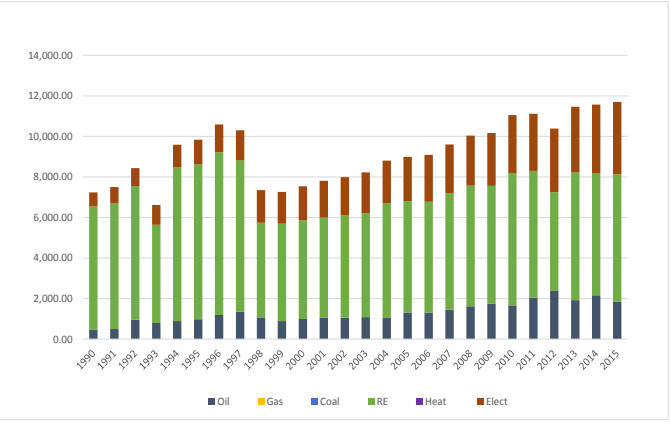
RUS



CT



THA

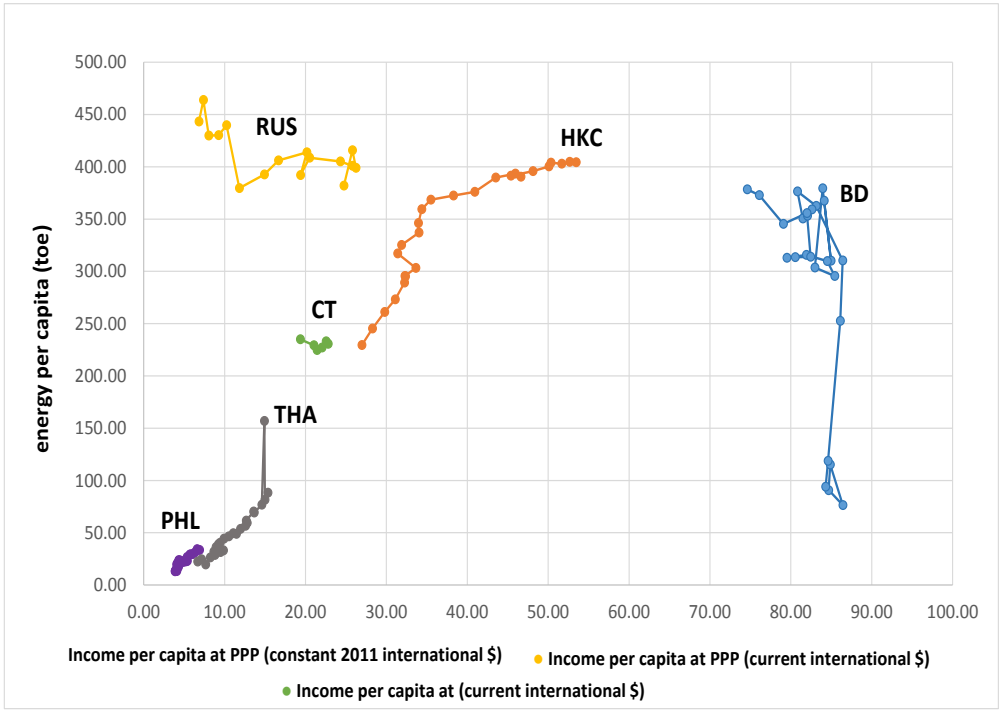


Source : Members' submission

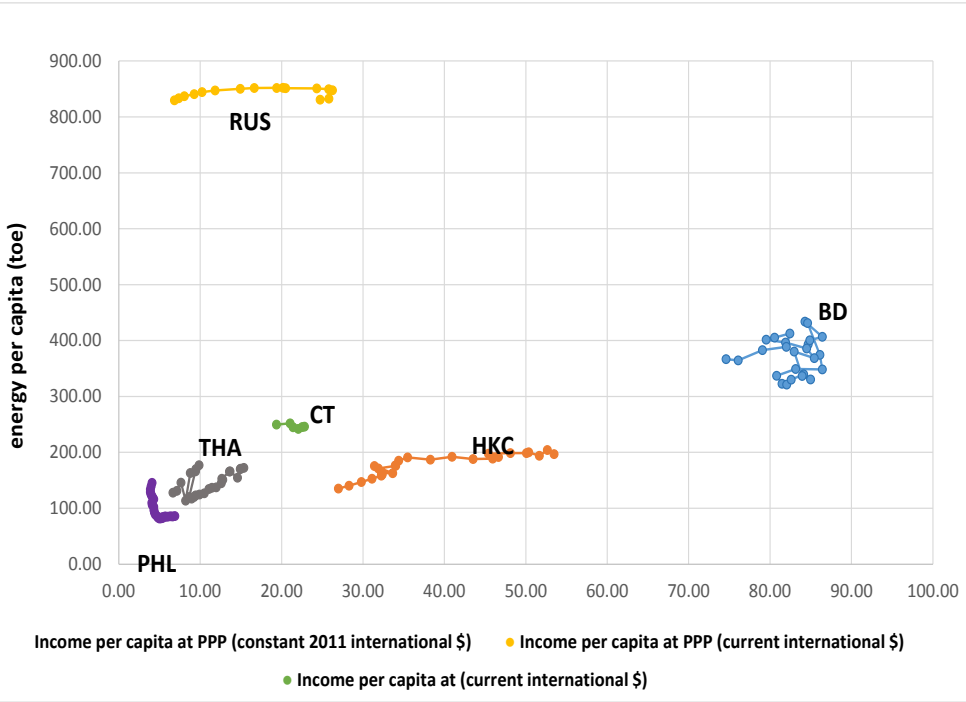
- **Electricity is the major fuel in the residential sector in BD; HKC and CT; renewables in the PHL and THA; heat in RUS**

Energy consumption pattern per capita (1990-2015)

Commercial sector



Residential sector

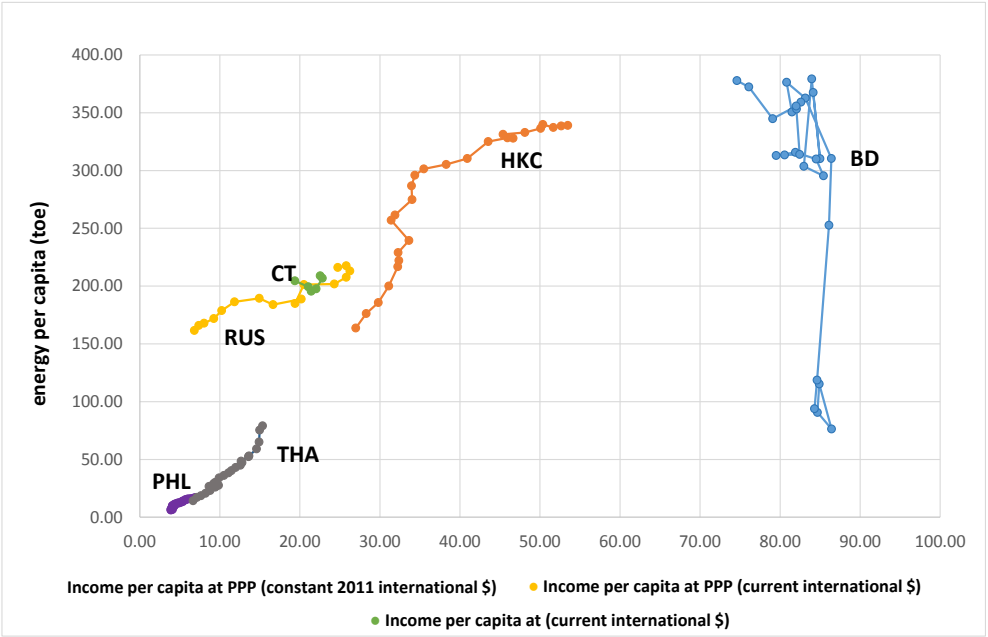


Source：Members' submission

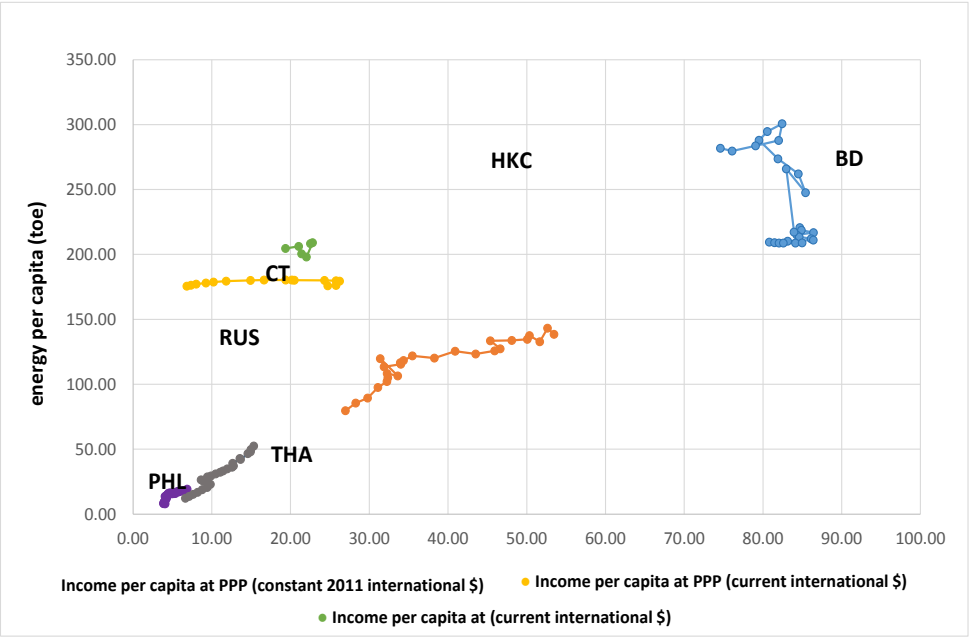
- Energy consumption per capita varied per economy; in commercial sector, energy per capita requirement increased together with income per capita
- In HKC and RUS energy per capita in residential sector were almost constant while income per capita increased;

Electricity consumption pattern per capita (1990-2015)

Commercial sector



Residential sector

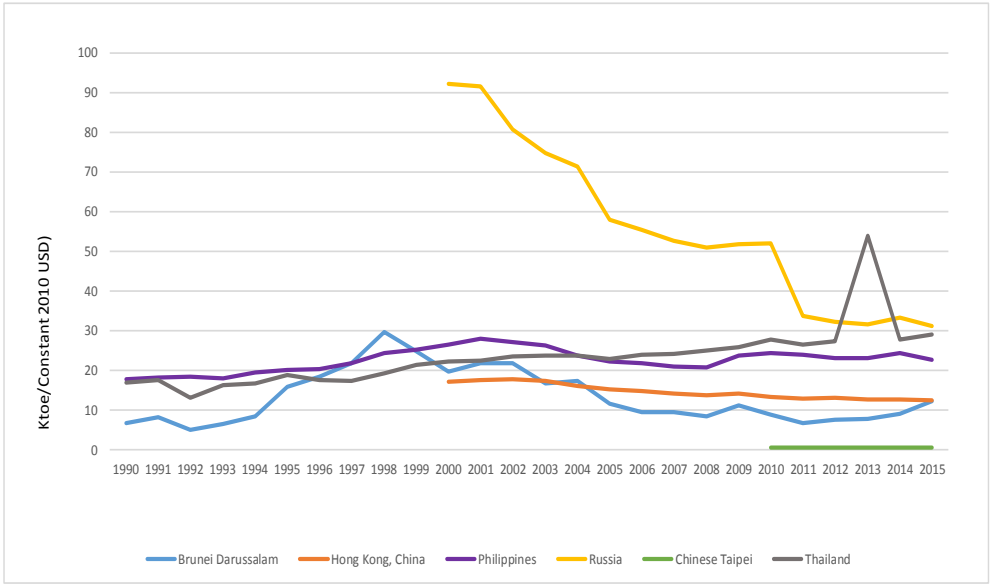


Source : Members' submission

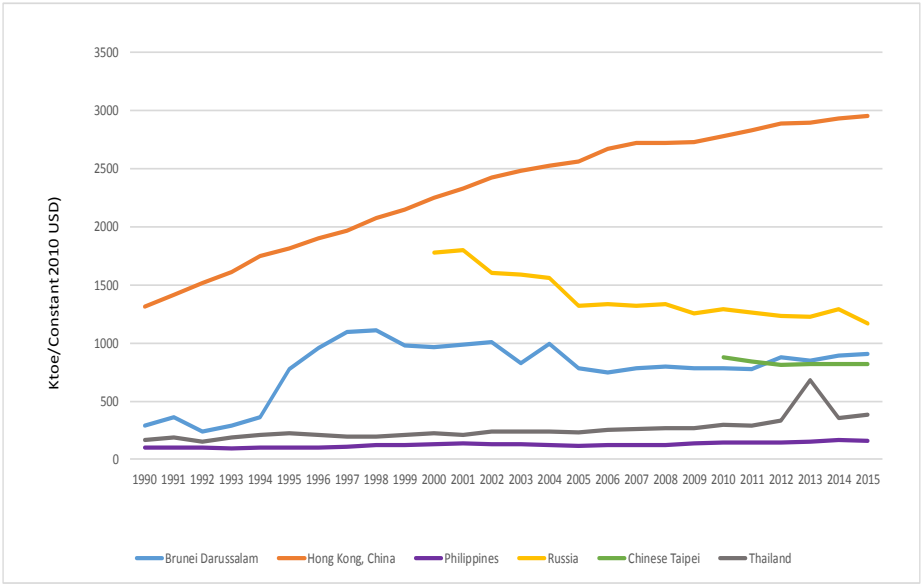
- Income drives electricity consumption per person, as income increases electricity consumption per capita increases; in RUS and HKC, household electricity consumption was almost constant while income increases faster; in THA, electricity consumption grew faster than income per capita
- Electricity has the biggest potential for energy efficiency

Energy intensity (Service sector)

by GVA (ktoe/GVA)



By employees) (Ktoe/service worker)



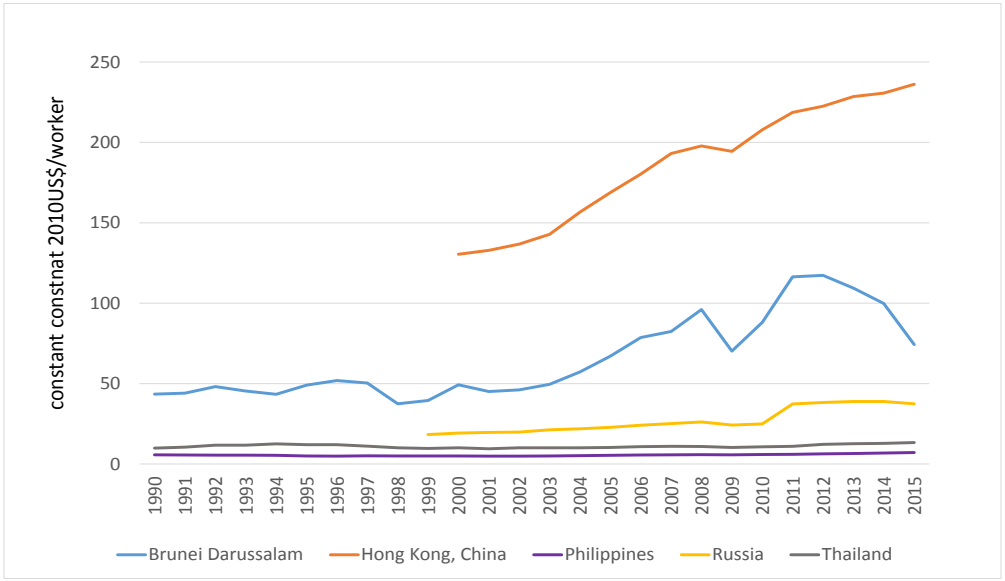
Source : Members' submission

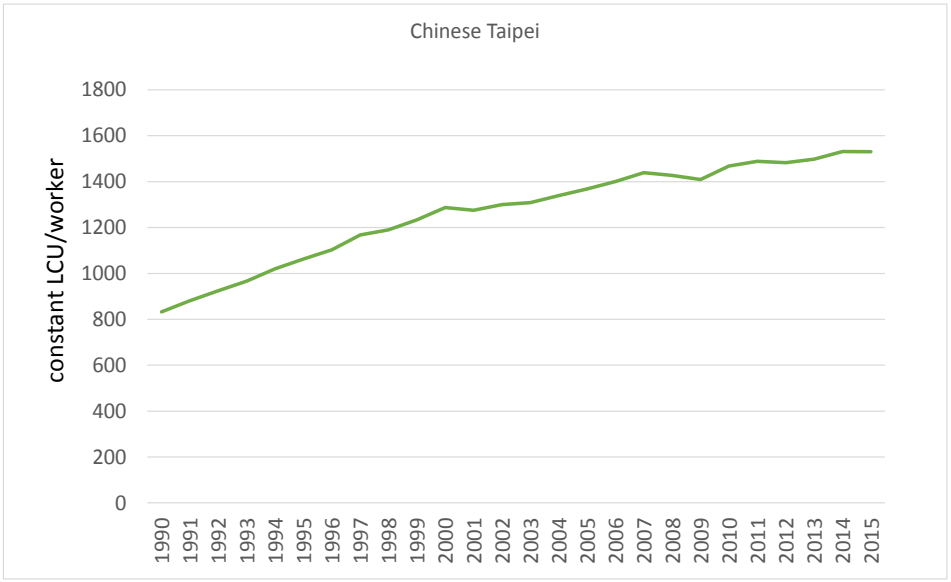
- **Energy intensity ktoe/GVA services constant 2010 USD and ktoe/services have different patterns but both show improvement over time**

*CT – GVA was constant LCU

Labor productivity (Service sector)

GVA for services/Number of service workers



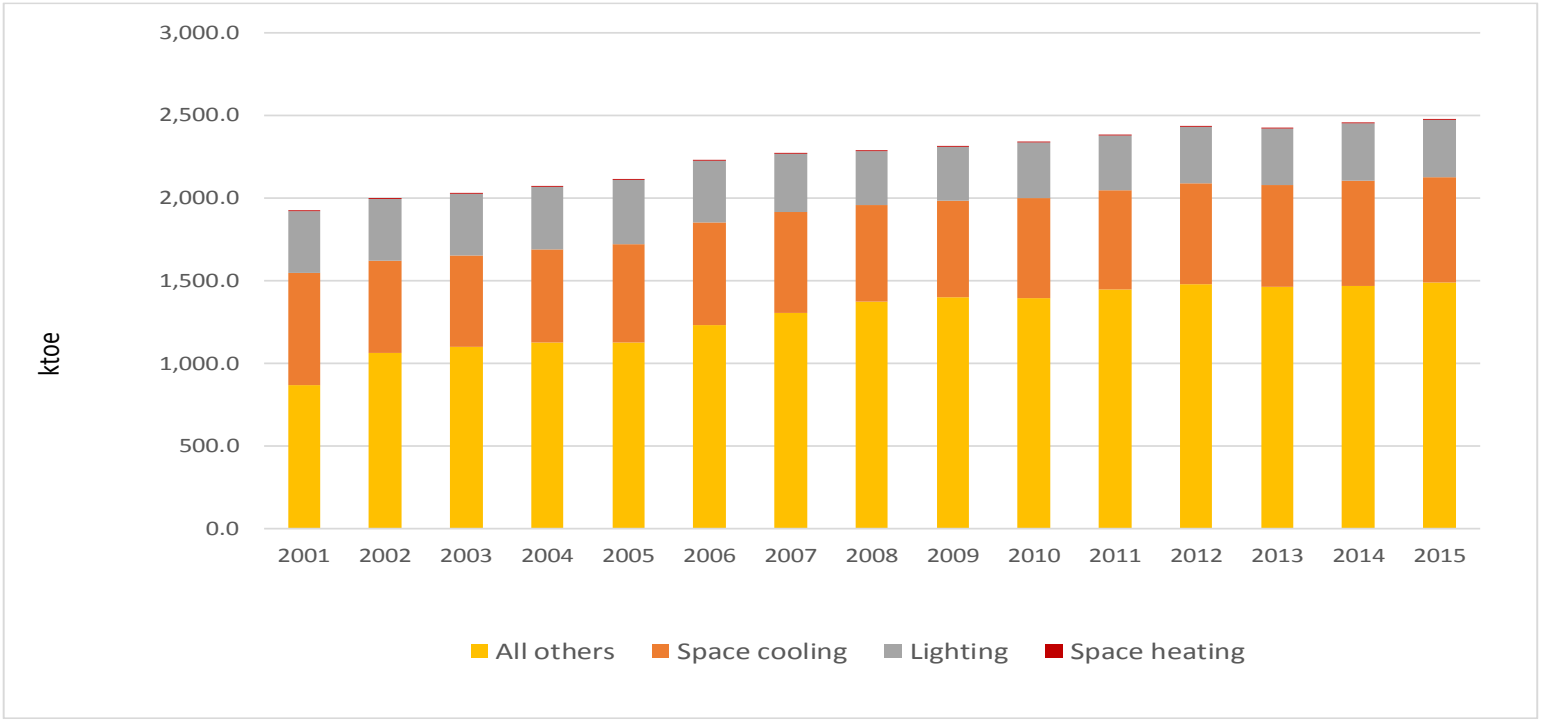


Source：Members' submission

- **Value of out provided by each worker in the services sector was increasing overtime; BD's case is unique as its income depends largely on oil and gas production**

Commercial sector (1)

Hong Kong electricity consumption

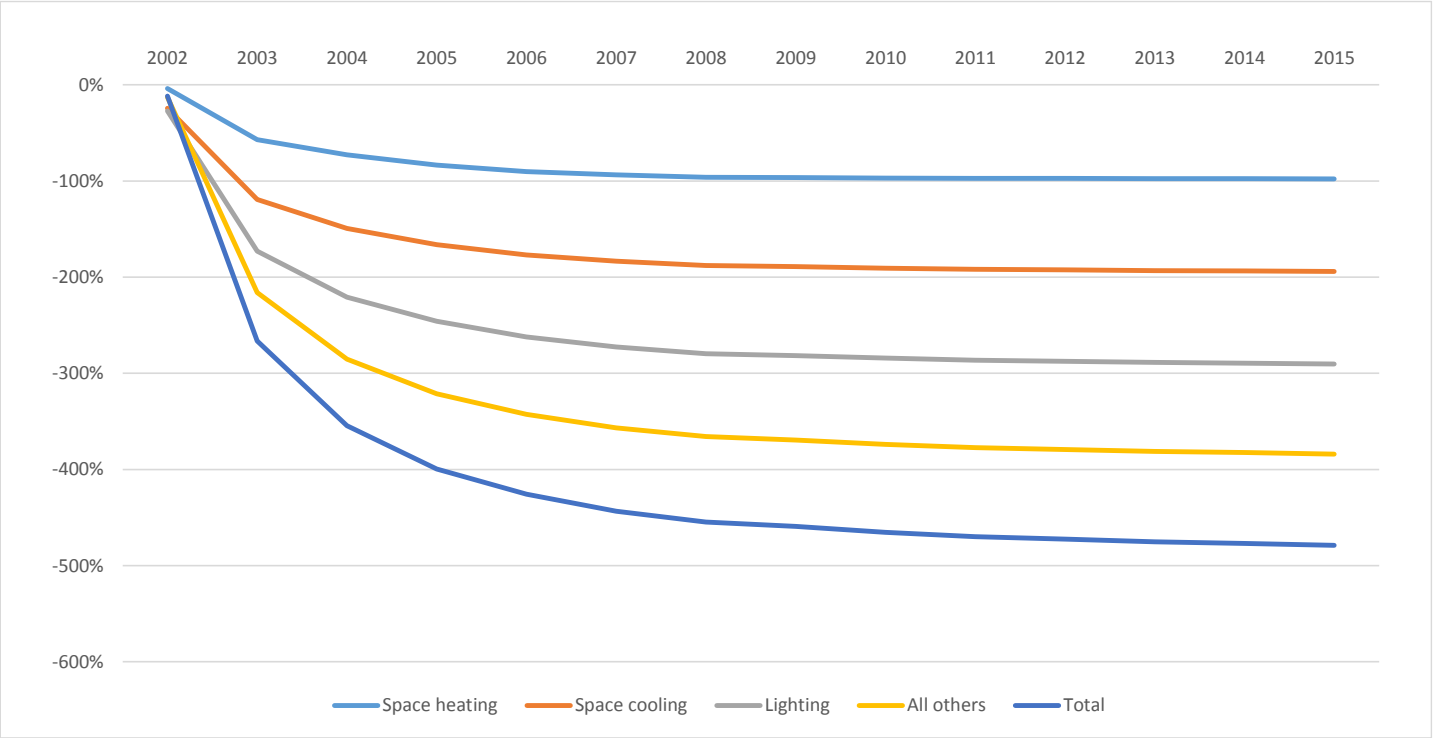


Source : Economy submission

- ***Electricity consumption grew by CAGR 1.8% since 2001; space cooling and lighting declined by 2.2; space heating by 5.7% and all others increased by 2.1%***
- ***Aside from all others, space cooling share was 27%; lighting share 15% and space heating share was very small, on average***

Commercial sector (2)

Intensity analysis – Ktoe/GVA services

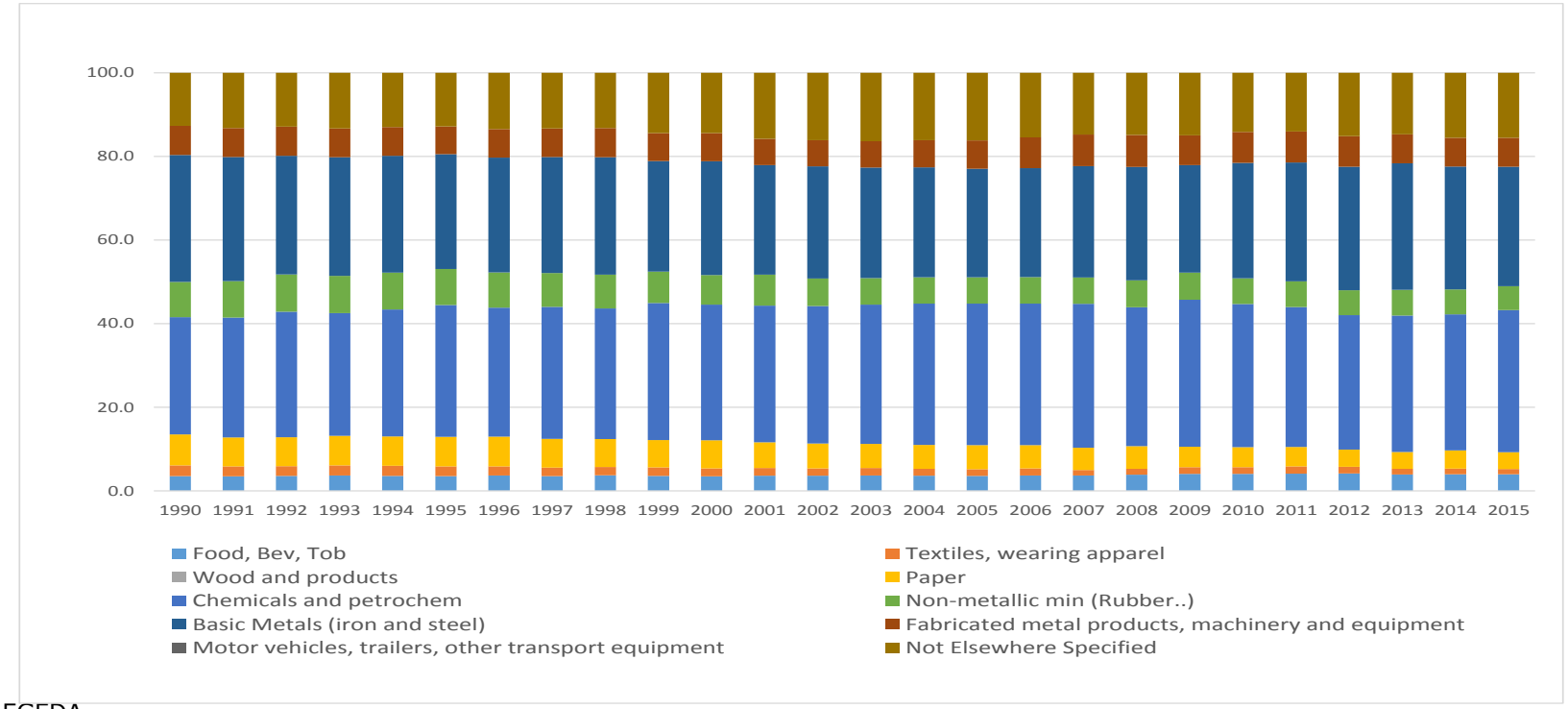


Energy intensity in the commercial sector of HK continuously improving since 2000

Source : Economy submission

Industry sector (1)

Japan - Energy consumption in manufacturing sector

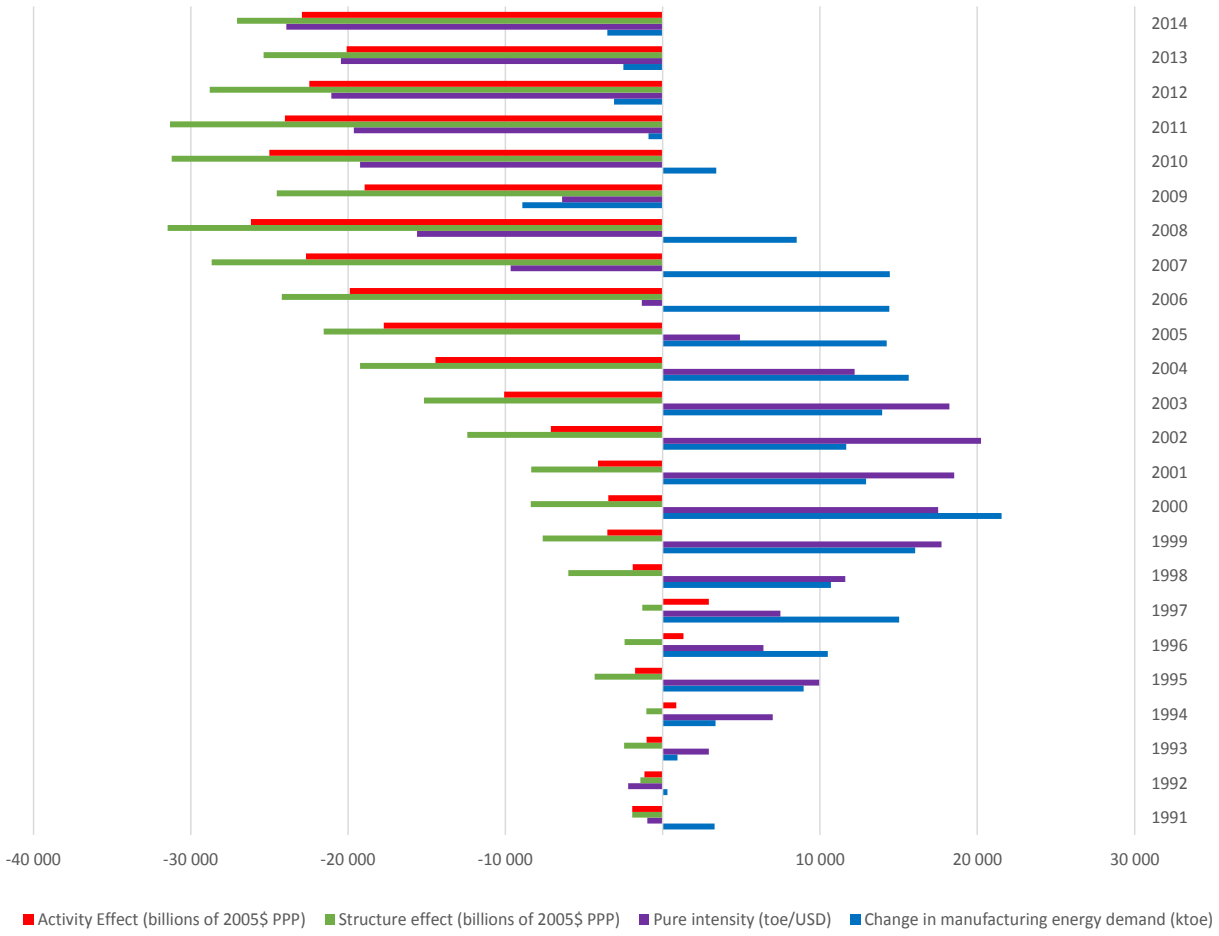


Source：EGEDA

- ***Energy consumption in the manufacturing declined by 0.11% since 1990***
- ***Energy intensive industries include manufacturing of chemicals and petrochemicals (32%) and manufacturing of basic metals [iron and steel] (27%)***

Industry sector (2)

Japan – Intensity analysis



- ***Growth in manufacturing GVA (0.7%) surpassed growth in total manufacturing energy consumption (-0.11%) since 1990***
- ***Decline in Japan's energy consumption in manufacturing sector was mostly due to <u>Structural effect and Activity effect</u>***
  - *energy intensive industries have a smaller share of GDP compared with the base year*
- ***The <u>Pure intensity effect</u> was obvious after 2005***

Source: EGEDA (Energy data), World Bank (GVA)

Variables used in decomposition

Sector	Sub-sector	Activity (A)	Structure (S)	Intensity (I=E/A)
Household	Space heating Water heating Cooking Lighting Appliance	Population	Flr area/capita Person/hh Person/hh Flr area/capita Ownership/capita	Heat/floor area Energy/capita Energy/capita Electricity/flr area Energy/appliance
Transport	Cars Bus Rail Dom air	Passenger-km	Share of total passenger-km	Energy/passenger-km
Service	Total services	Services GDP		Energy/GDP
Manufacturing	Paper and pulp Chemicals Non-metallic Iron and steel Non-ferrous metals Food and bev	Value added	Share of value added	Energy/value added
Other industry	Agri and fishing Mining Construction	Value added	Share of total value added	Energy/value added

Way forward

- Continue analysing other sectors;
- ESTO will make a study on energy efficiency indicators;
- Assess template which indicators can be obtained or estimated; needs to be simplified.

For Discussion

- Feedback on filling out EE template?
  - problems encountered
  - share experiences in filling-out
- How can ESTO help in filling out the data?

We appreciate any feedback

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Thank you for your kind attention

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