



Technical and Financial Performance of Hong Kong Power Utilities in 2005-2017 and Looking Ahead

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Forum 2018

Sources of Data and Statistics



Performance Analysis

- Annual Reports of CLPP 2012 – 2017
- Annual Reports of HEC 2012 – 2017

Looking Ahead

- Other People Views in the Industry
- Best Analysis by the Speaker
- Speaker Personal Views & Judgment

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Technical Performance

System Maximum Demand

Reserve Margin

System Load Factor

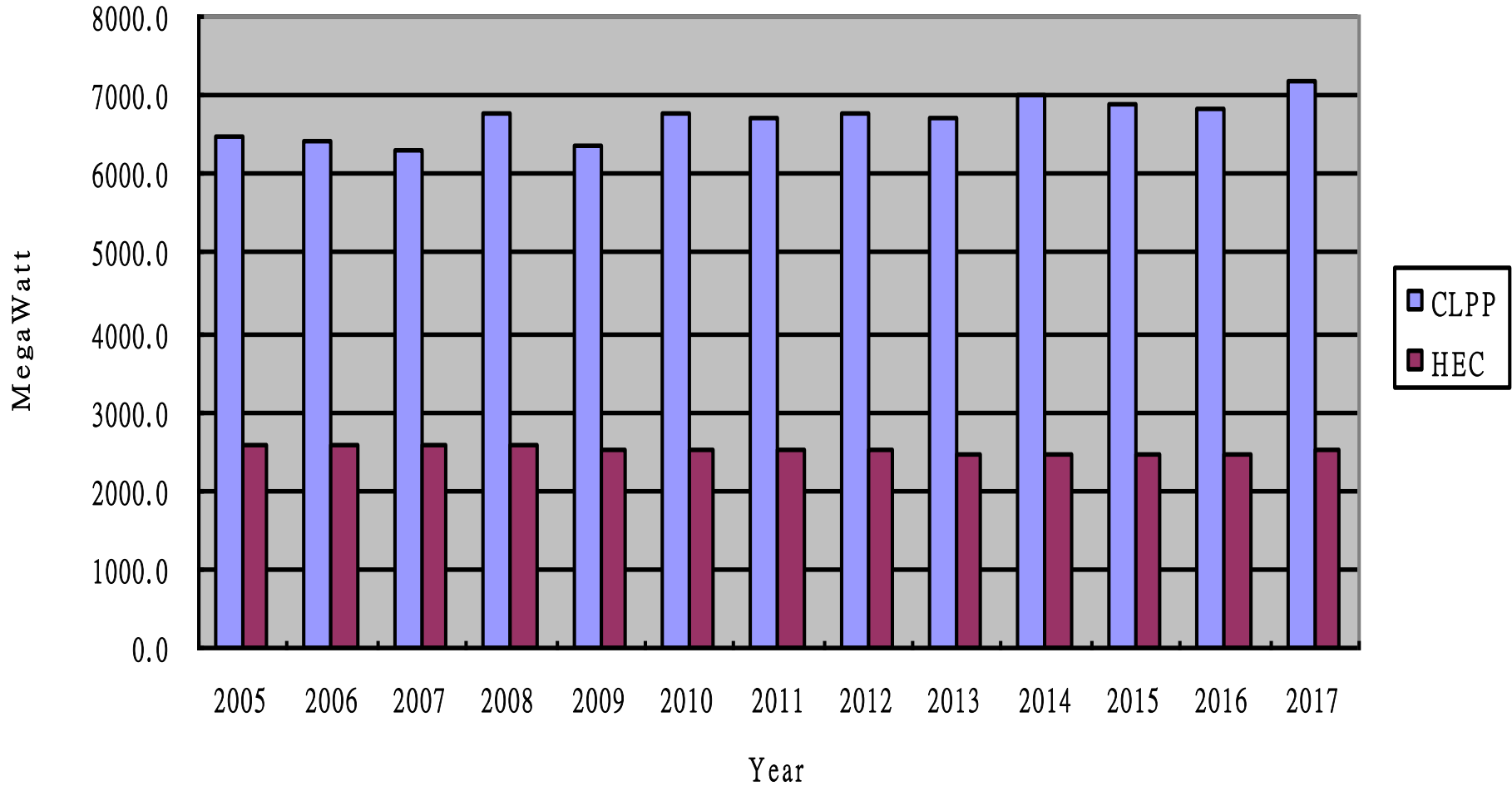
Availability

Thermal Efficiency

Use of Fuels: CLPP

System Maximum Demand

2017 Finally Increasing: CLP 4.6%, HEC 3.5%
Due to Hotter Weather Or Otherwise?

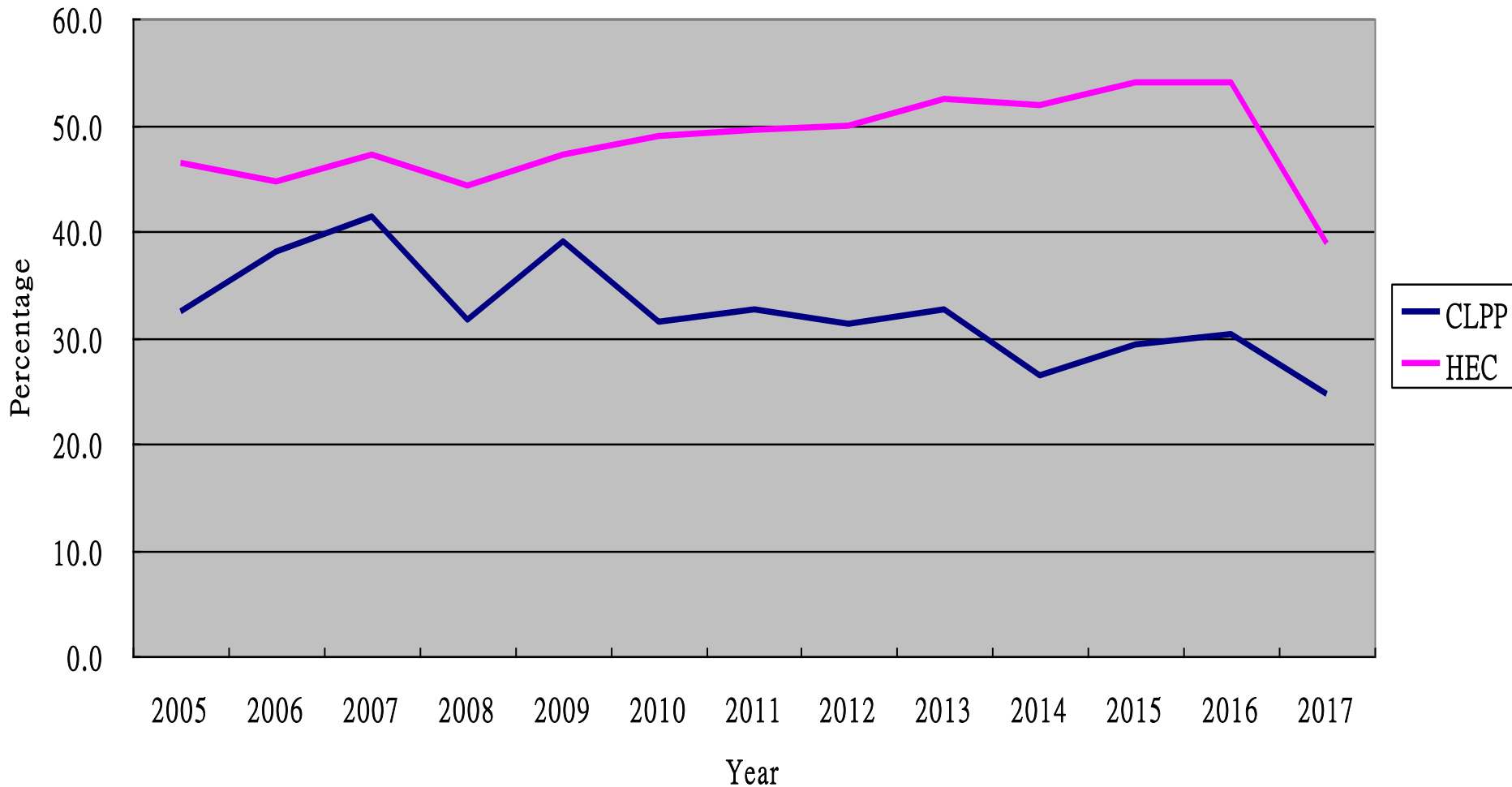


Reserve Margin (Loss of Load Probability < 0.5 days/Year)

2017 Drop due to More Peaky Demand and Hotter Climate?

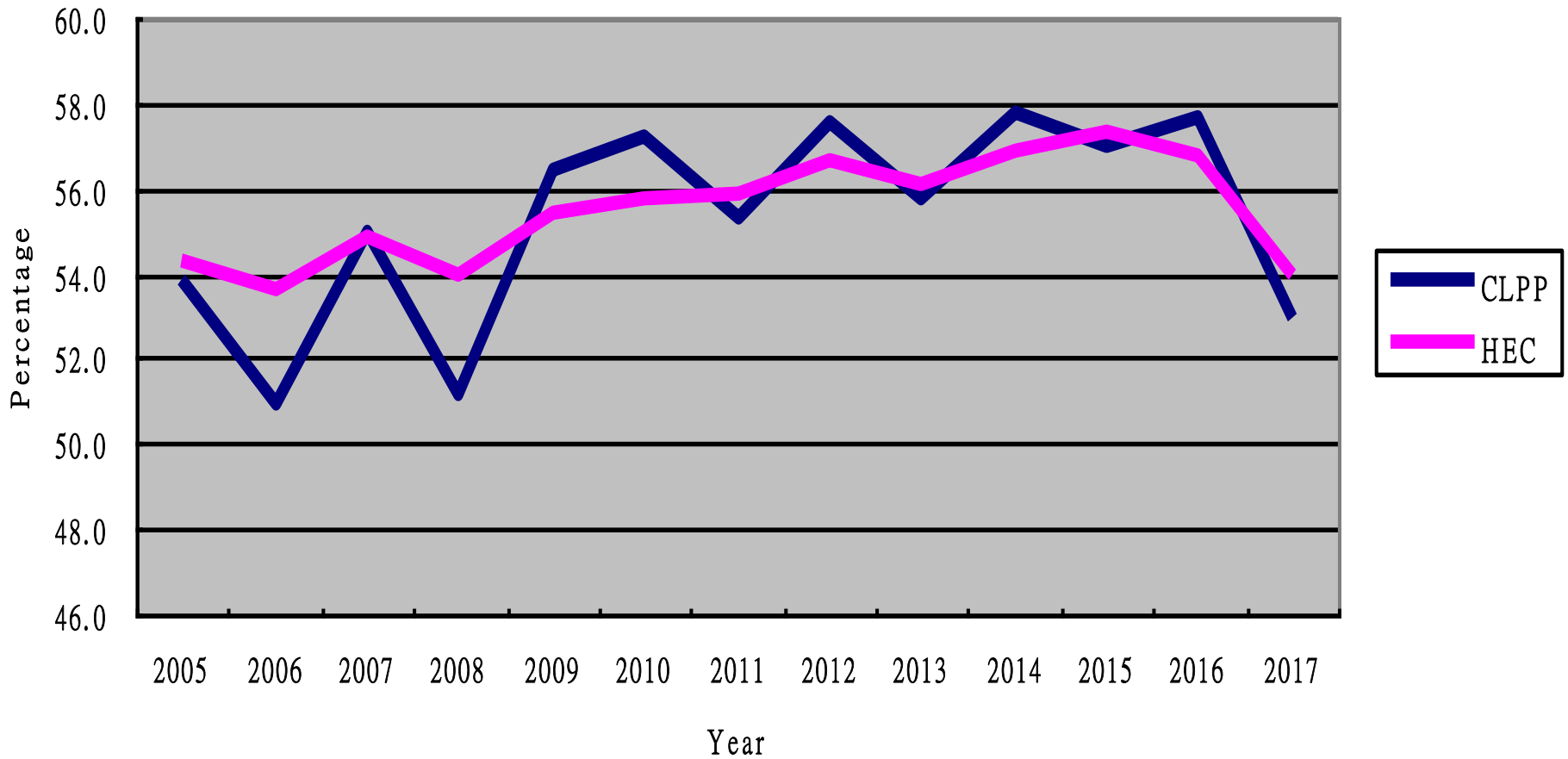
Trending Stabilizing as Gas Plant Building and Coal Plant Retiring?

What Level is Appropriate?



System Load Factor

Trending Lower due to Hotter Weather?
Sales Dropping While Max Demand Increasing
Demand Becoming More Peaky



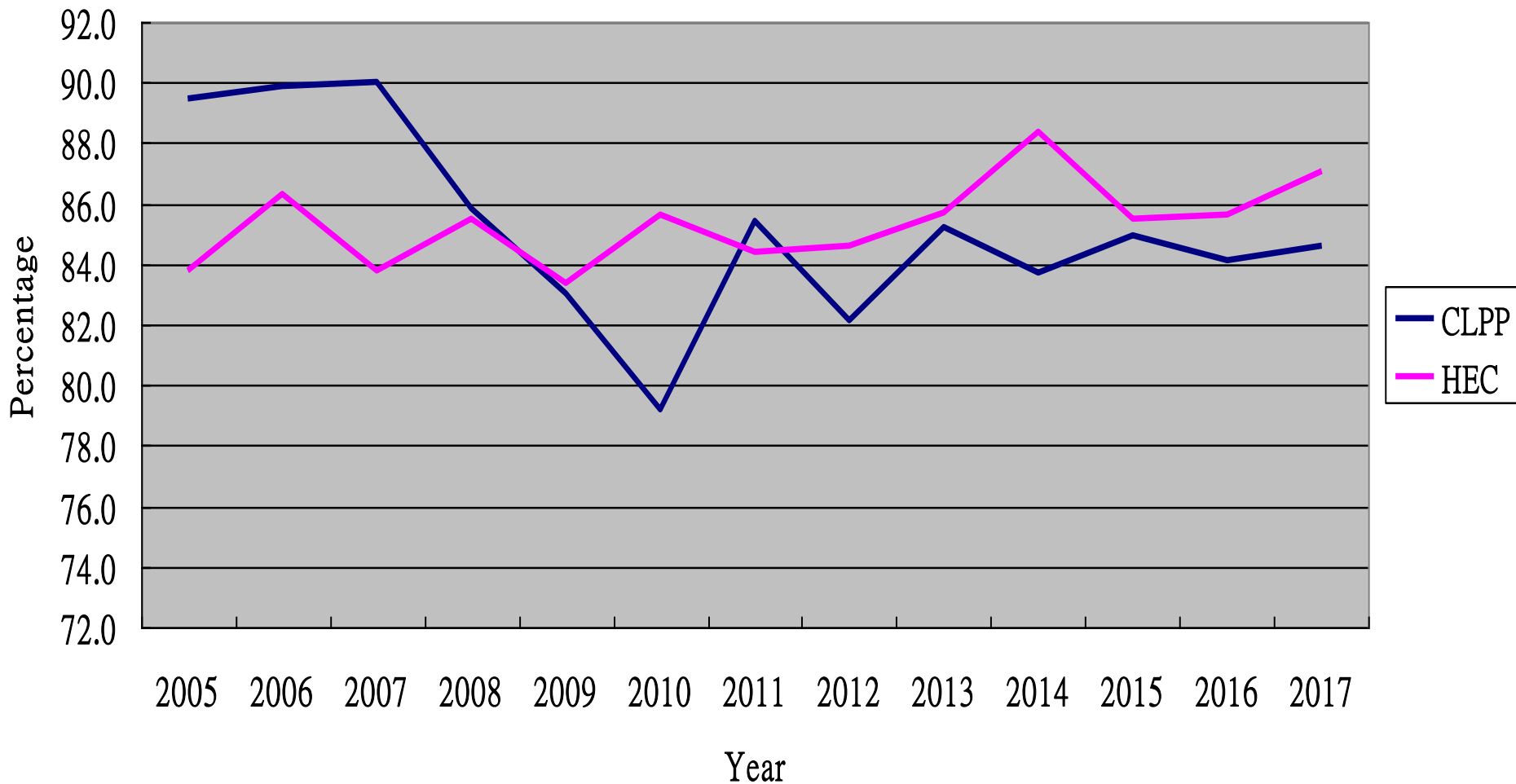
Availability

Low by Industry Standard?

CLPP Lower in 2008-10 May be Due to CPB Outage for FGD?

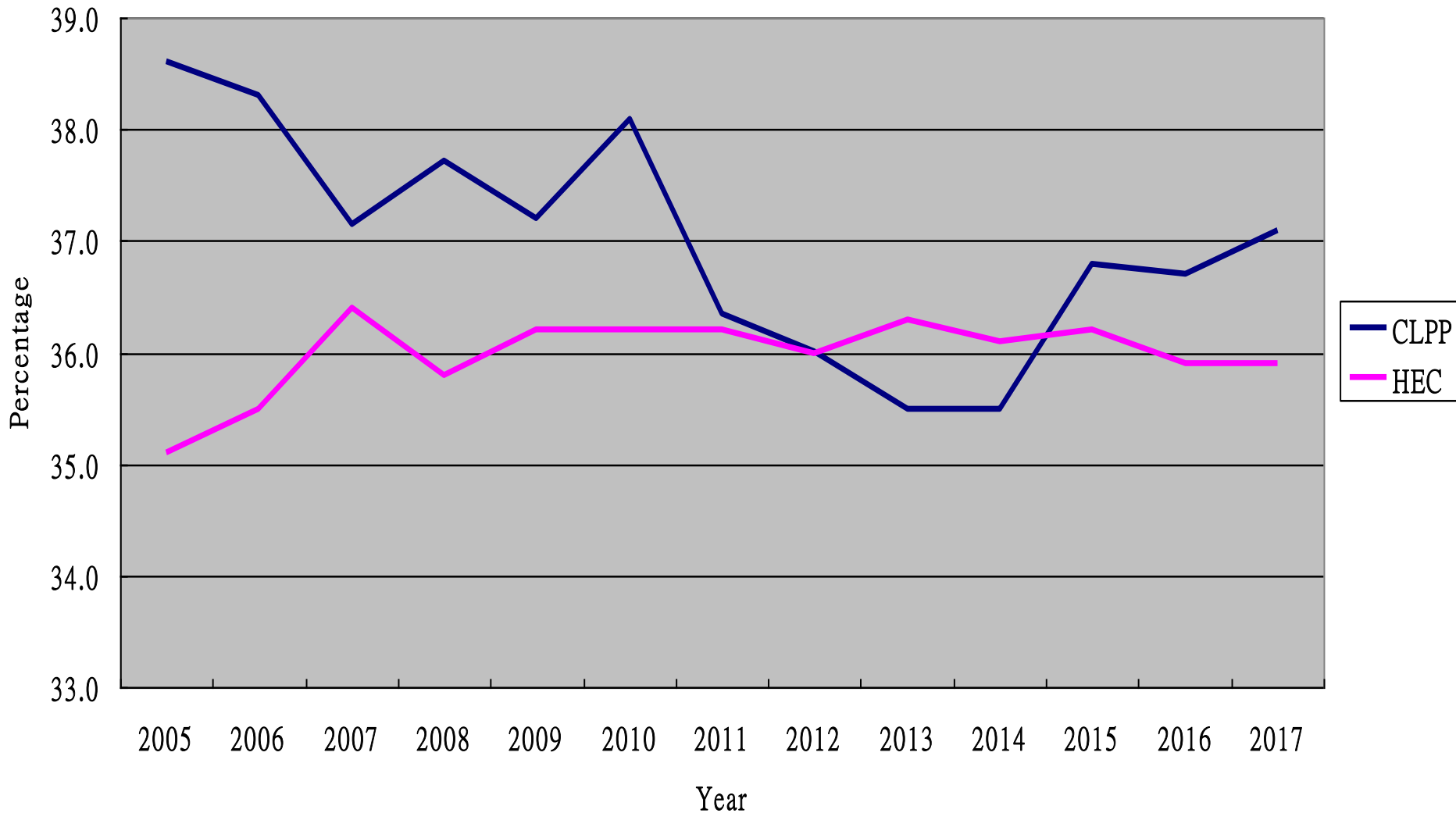
Lower Availability Means More Plant & Profit: Moral Hazard

Trending Stabilizing Unless Higher Reserve Margin?



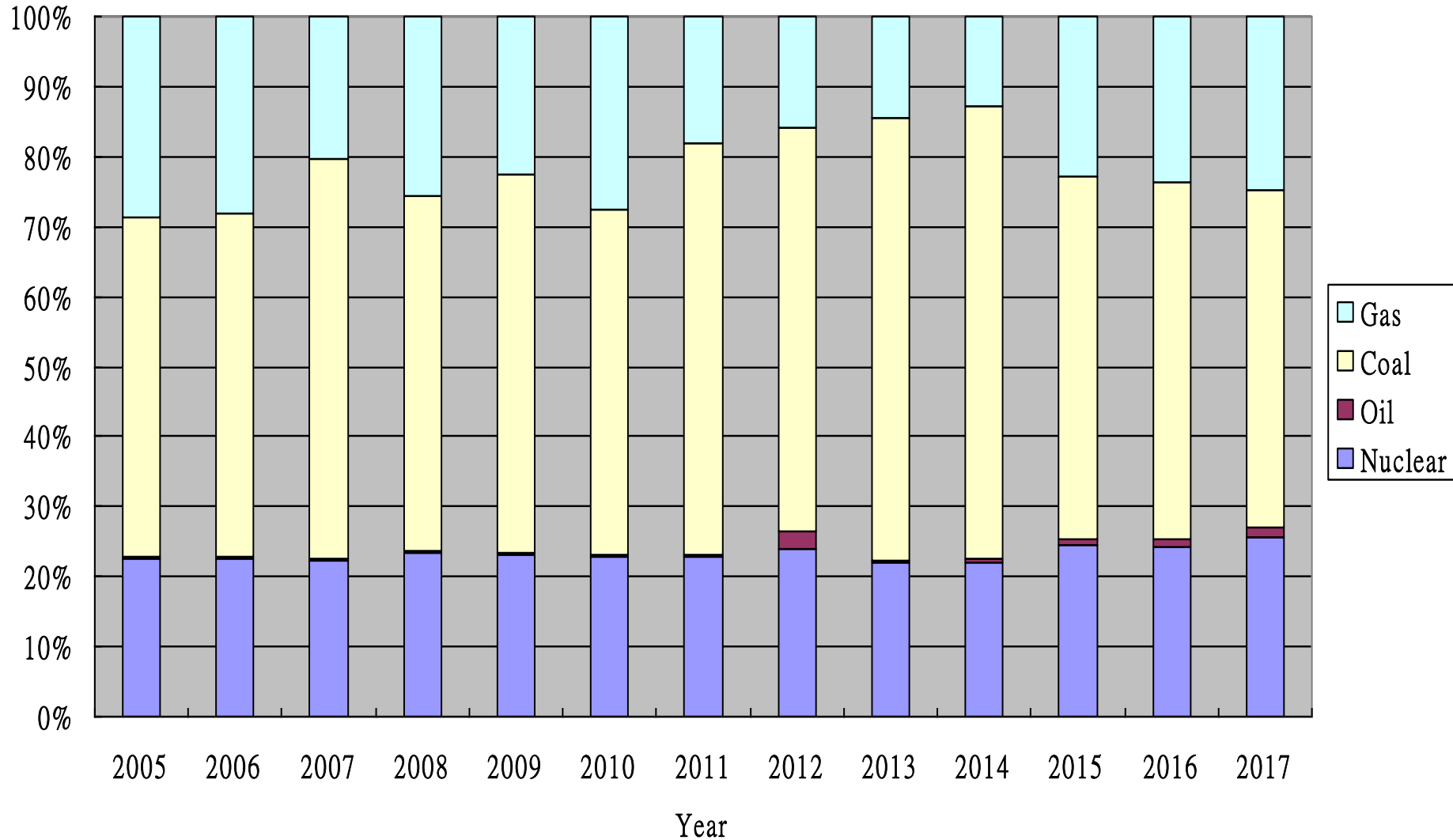
Thermal Efficiency

CLPP Dropping Due to Lesser Use of Gas Plant Until 2014, Picking Up Again
Trending Higher As More CCycle Gas Plant Commissioning?



Use of Fuels in CLPP, No data for HEC

CLPP Stabilizing Use of Coal, Heading Decreasing? Enough Gas?
Lesser Gas from 2005 Till 2014; More Gas from 2014 to How Much?





Financial Performance

Return to Shareholder Fund

Return of Average Net Fixed Assets

Liability Equity Ratio

Capital Expenditure

Customer Money in Financing Asset

% Fuel Costs in Net Tariff

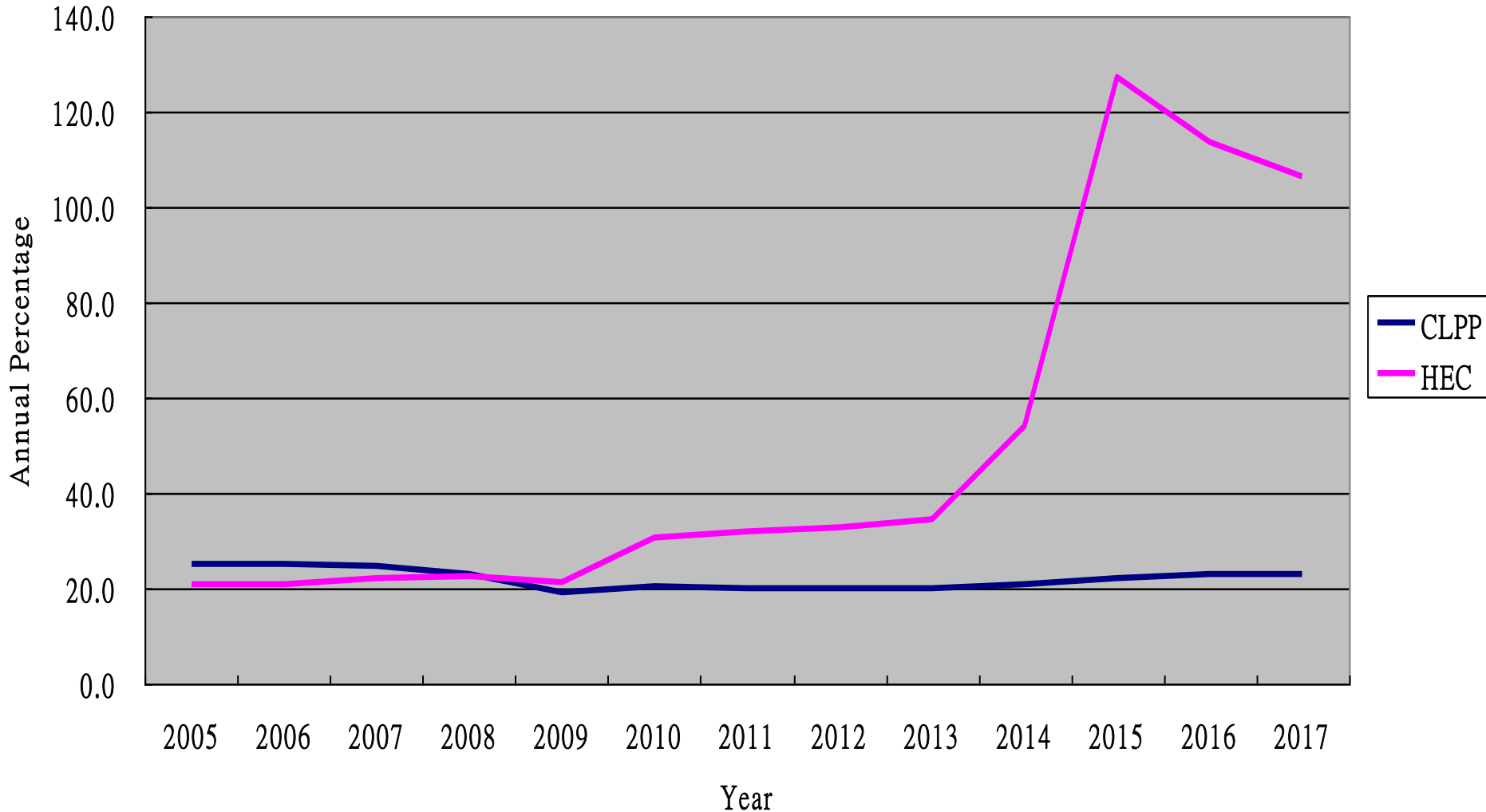
Nuclear Power Cost: CLPP

Return to Shareholder Fund

CLPP 43.4; HEC 4.0 Billion HK\$ Total Equity in 2017

HK Power Business Highly Self Financing

Supporting Higher Loan Equity Ratio & Lead to Higher Return Rate

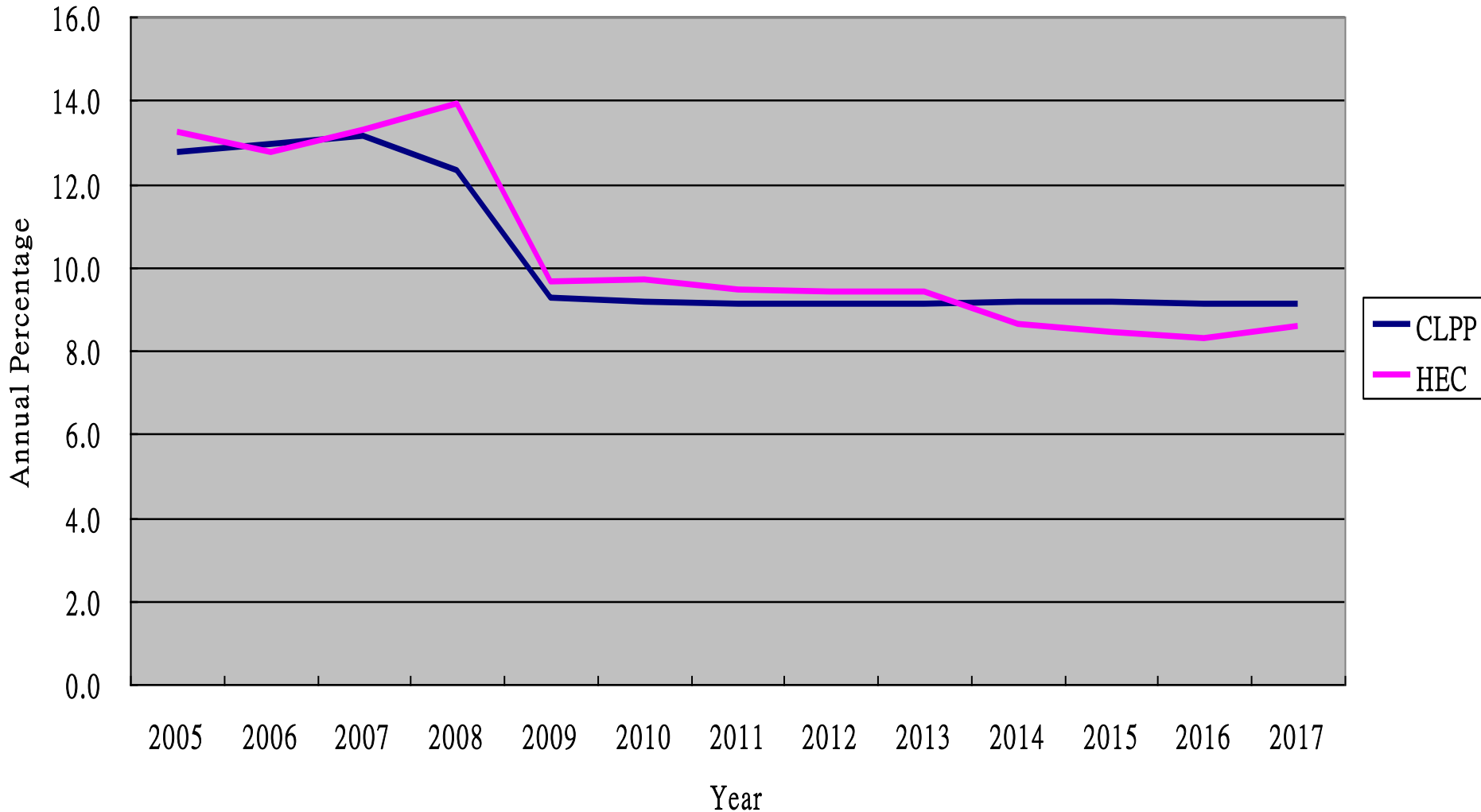


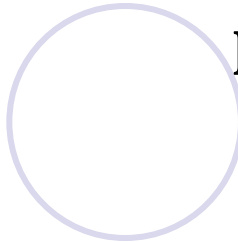
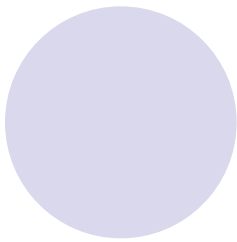
Return Rate of Average Net Assets

Consistent with Return Rates Provided Under Scheme of Controls

Pre 2009: 13.5%/15%(3.97%); Post 2009: 8.99%(0.38%)

Expecting Below 8%(0.96%) After 2019 (6-M Hibor %)

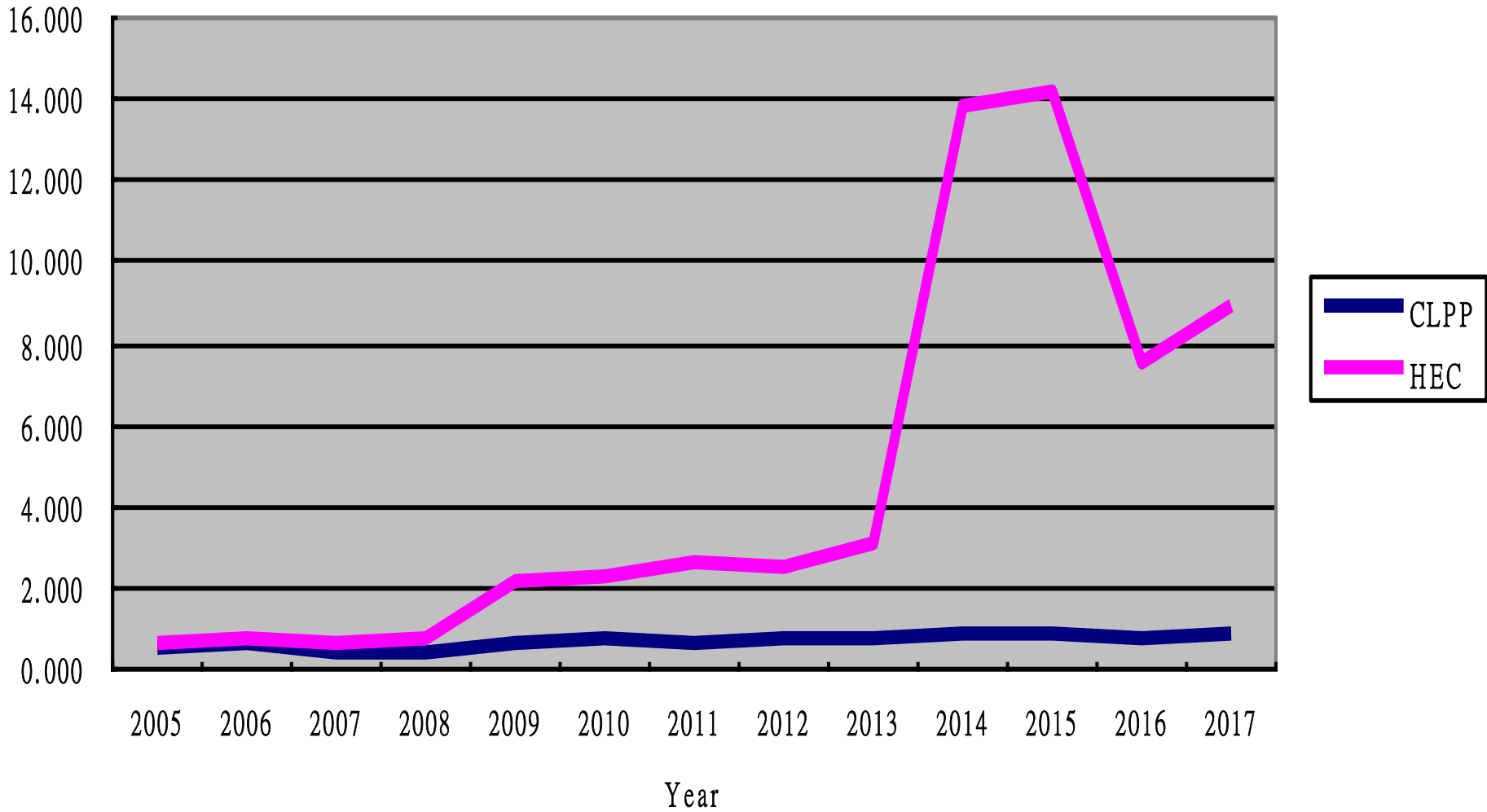
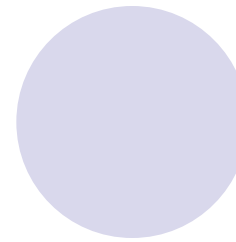
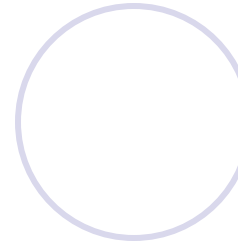
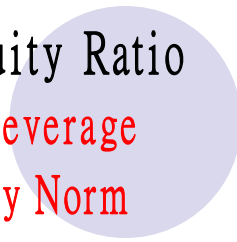




Liabilities Equity Ratio

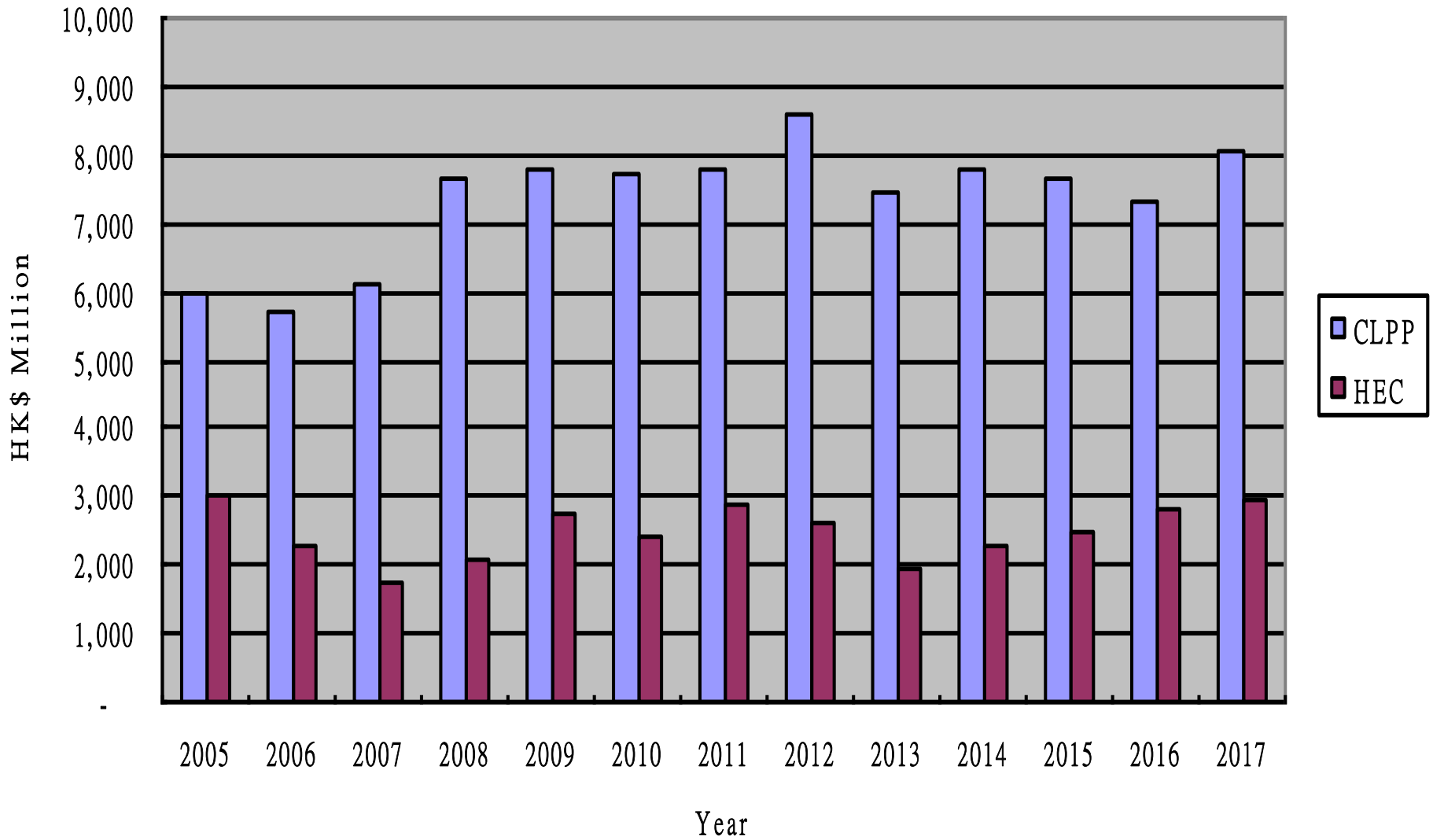
HEC Highly Leverage

CLPP Industry Norm



Capital Expenditure

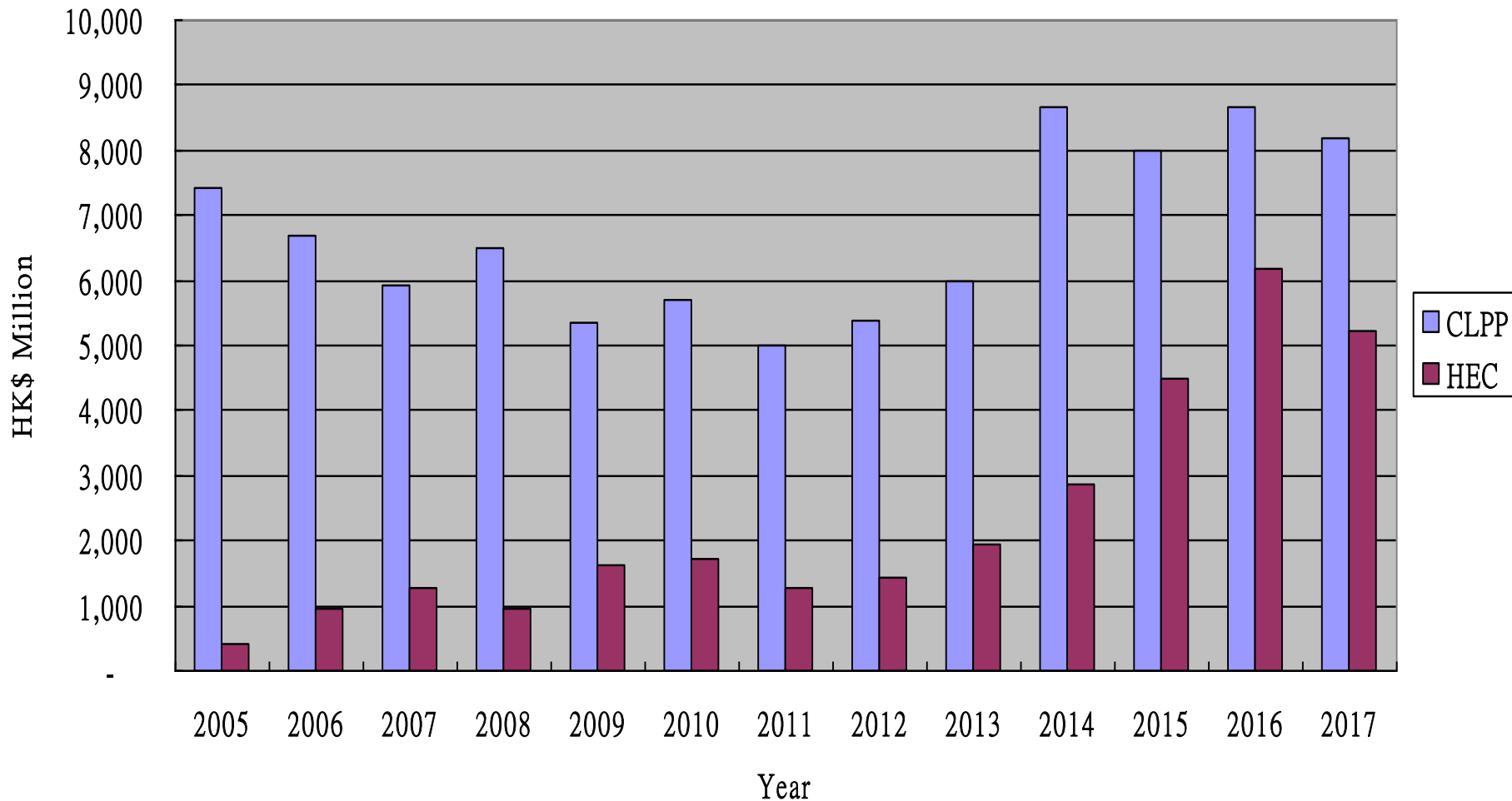
Trending Higher As More Gas Plant and Coal Plant Retiring?



Customer Money (Fuel + Stabilization Fund + Deposit)

Utilities Are Using More Customer Money in Financing Assets

CLPP: 7.4%(20.9%); HEC: 10.4% (44.9%) of Net Fixed Assets (Sales) in 2017

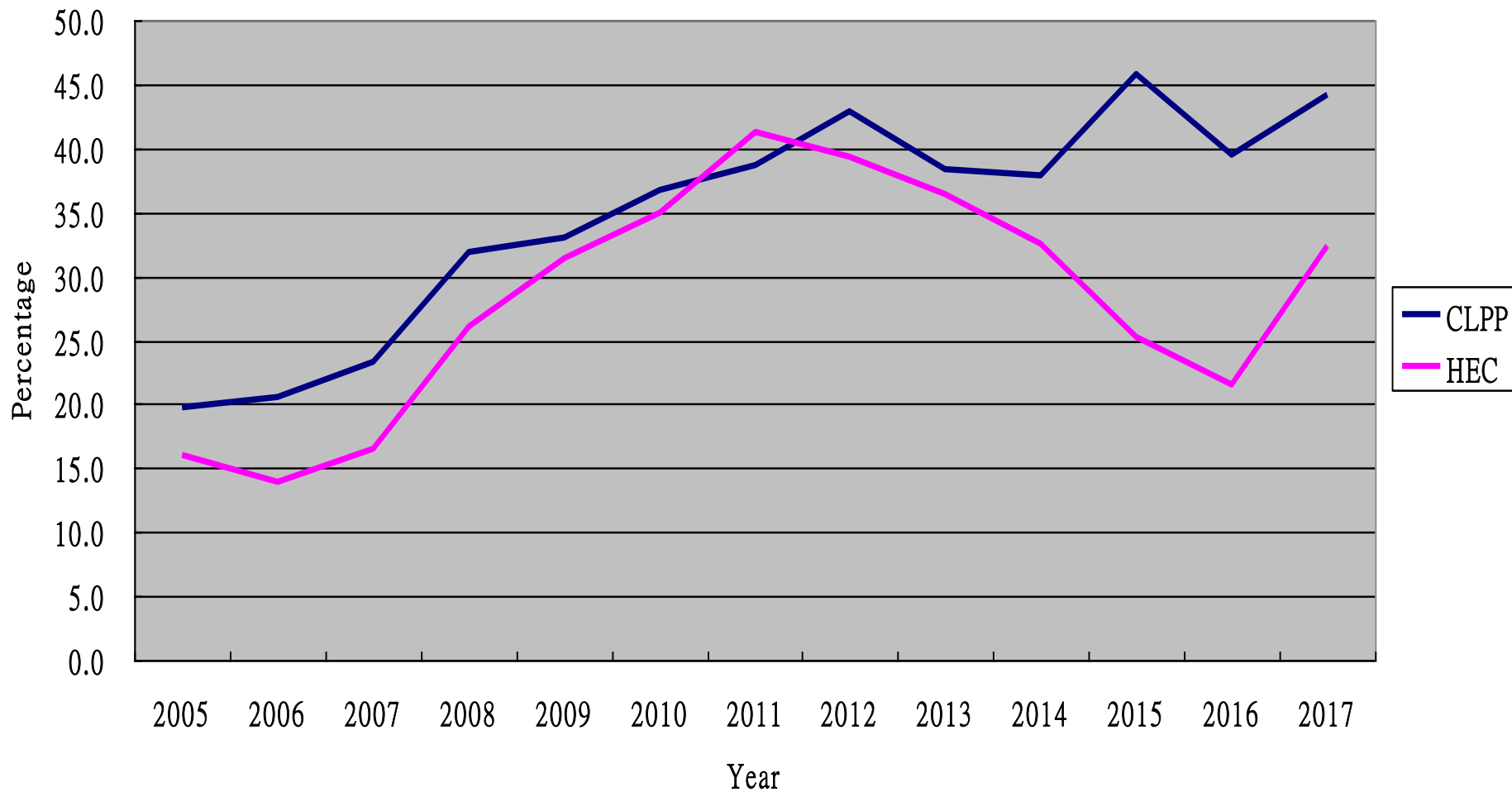


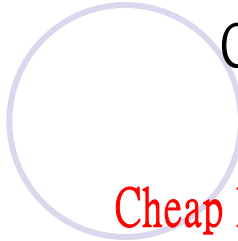
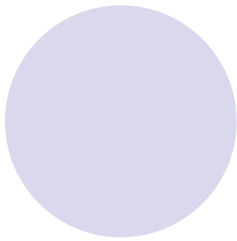
% Fuel Cost in Net Tariff, Not Including Nuclear

HEC Smart in Pricing Fuel Resulting Huge Built-up of Fuel Clause Recovery Account

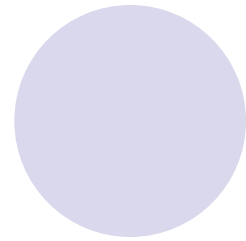
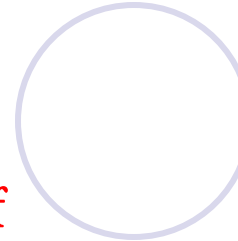
CLLP Uses More Gas and Gas Not From Hainan

Trending Higher as More Gas Plant in Operation?

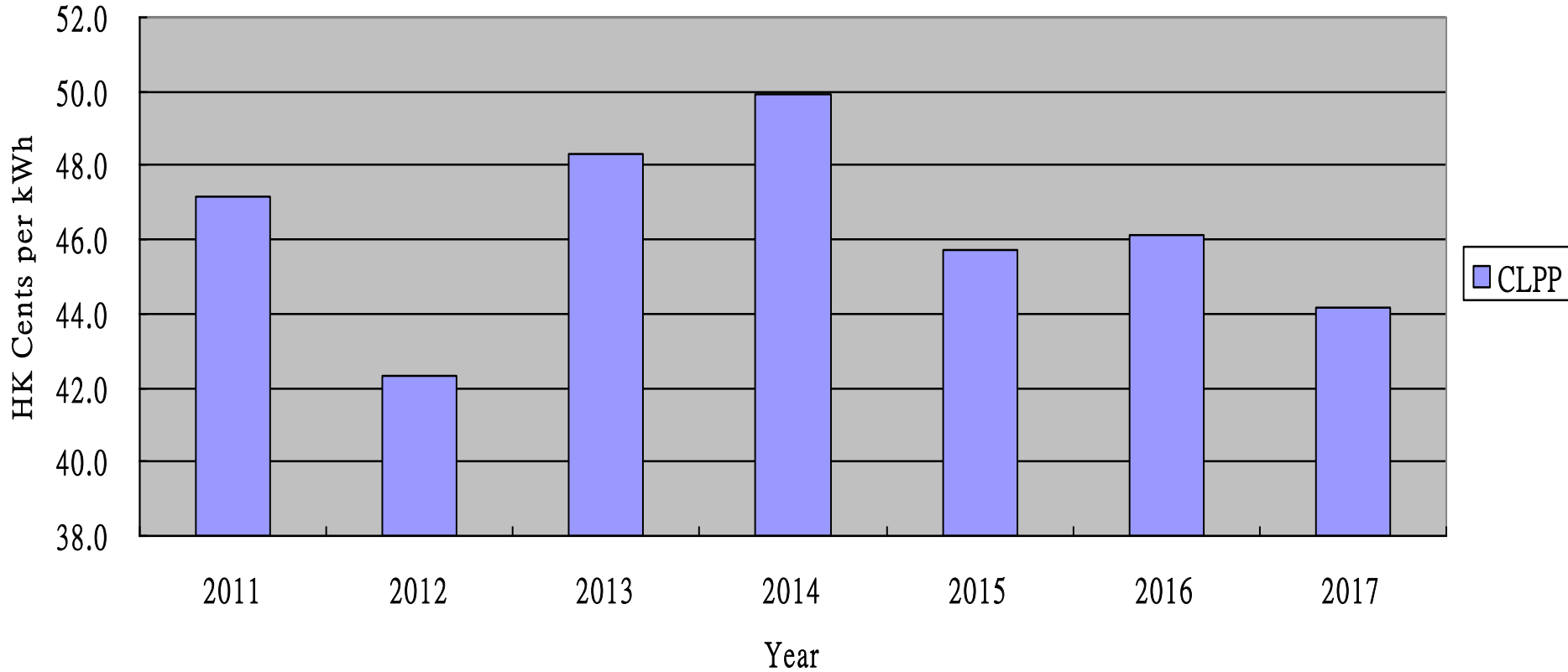




CLPP Nuclear Power Cost 2011 - 2017



Cheap Nuclear Power Finally Paying Off
in the Last Energy Price Boom & Burst Cycle?



Tariff Performance



Tariff

Profit per Unit of Sales

Tariff Over/Under Charge

Tariff Over/Under Charge in Cents Per Unit

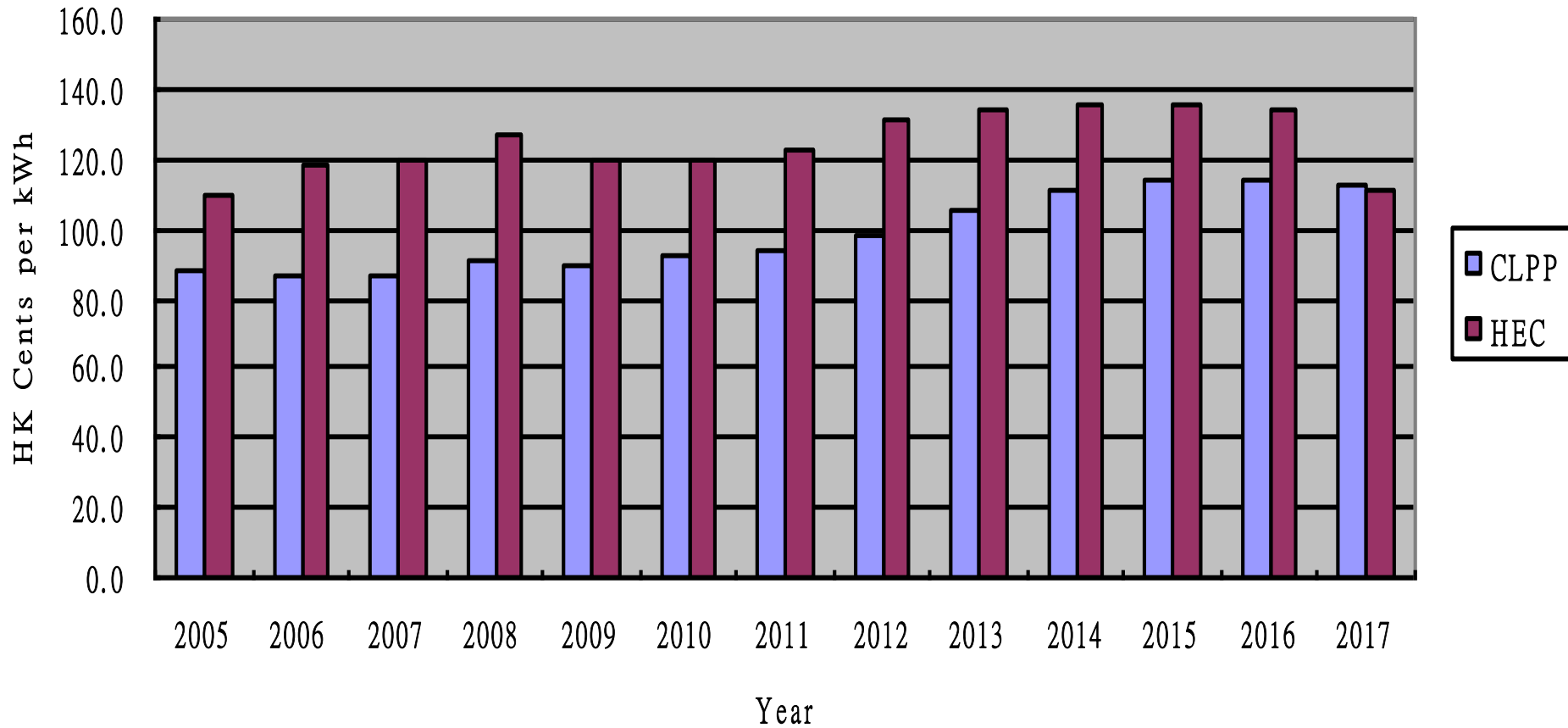
Fuel Cost in Net Tariff

Net Tariff

HEC Returning Fuel Over Charges in 2017

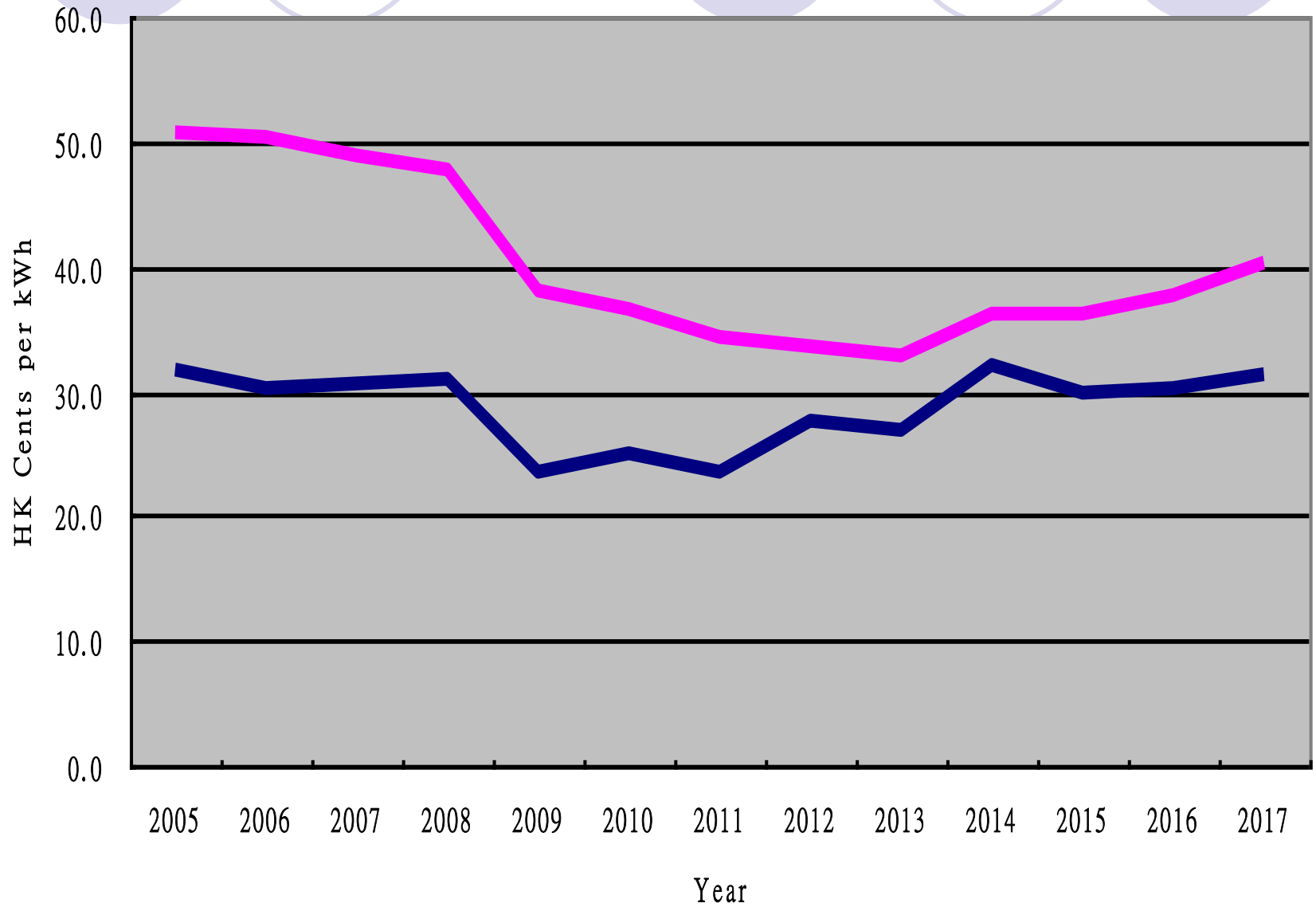
More to Come in Future?

Tariff More Sensitive to Fuel Price?



Profit per Unit of Sales

Trending Lower as 8% Asset Return Rate Effective in 2019
Same as in 2009?

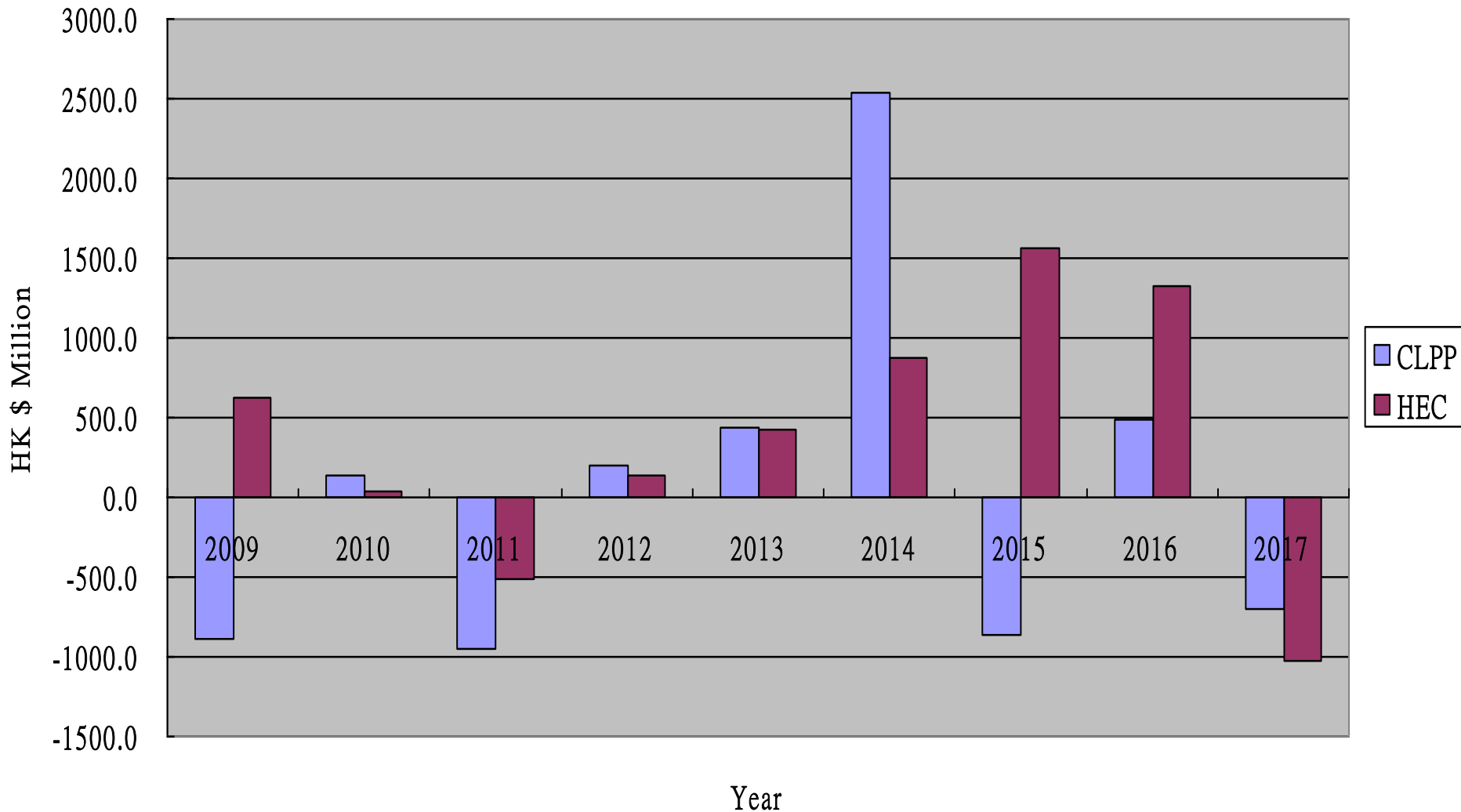


Tariff Over/Under Charge (Total HK\$ Amount)

Extreme Figures for 2014 - 16

2012 - 2016 Overcharges Finally Returning to Customers?

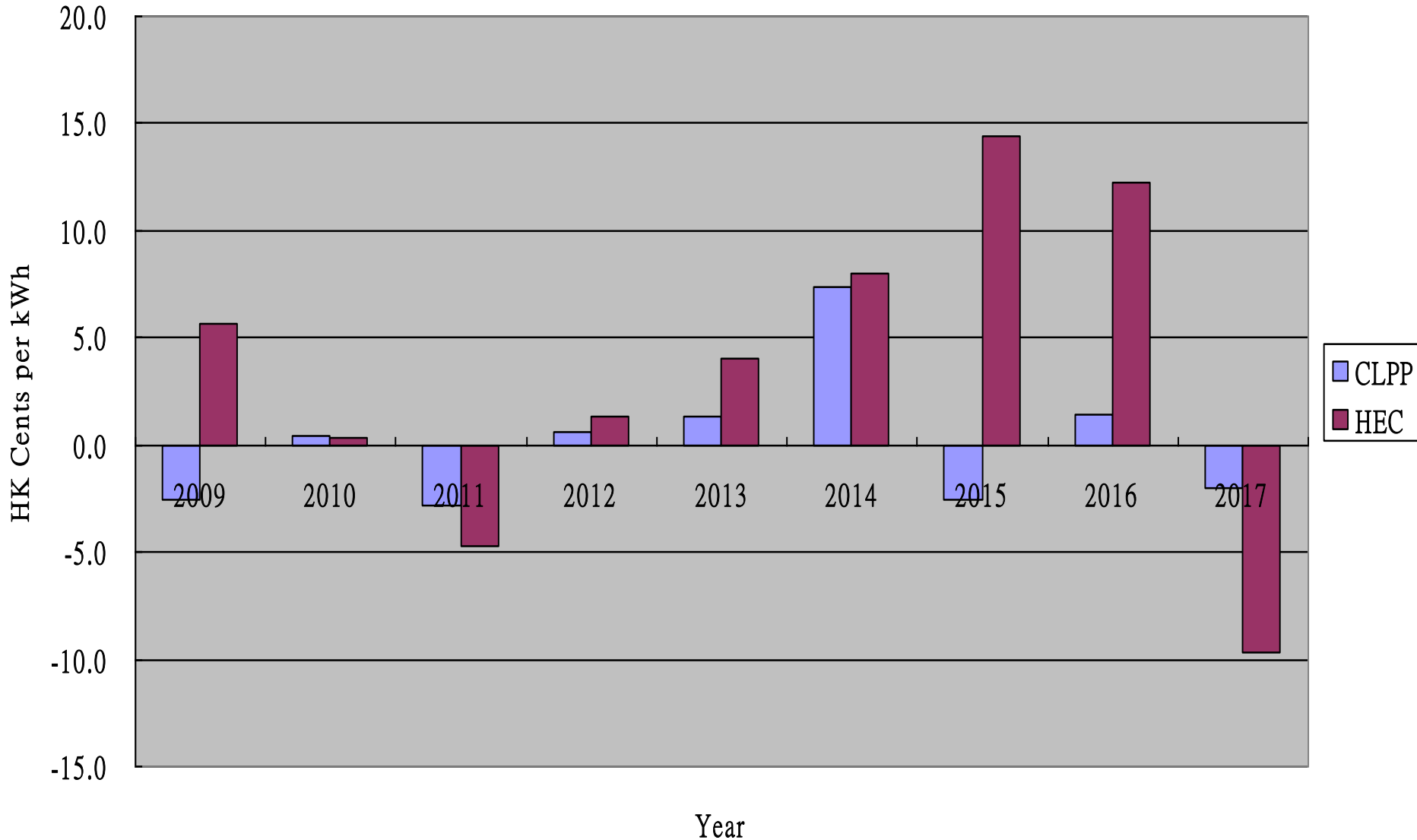
Continue Further?



Tariff Over/Under(-ve) Charge (HK Cents per Unit Sales)

2012 - 2016 Overcharges Finally Returning to Customers?

Continue Further?

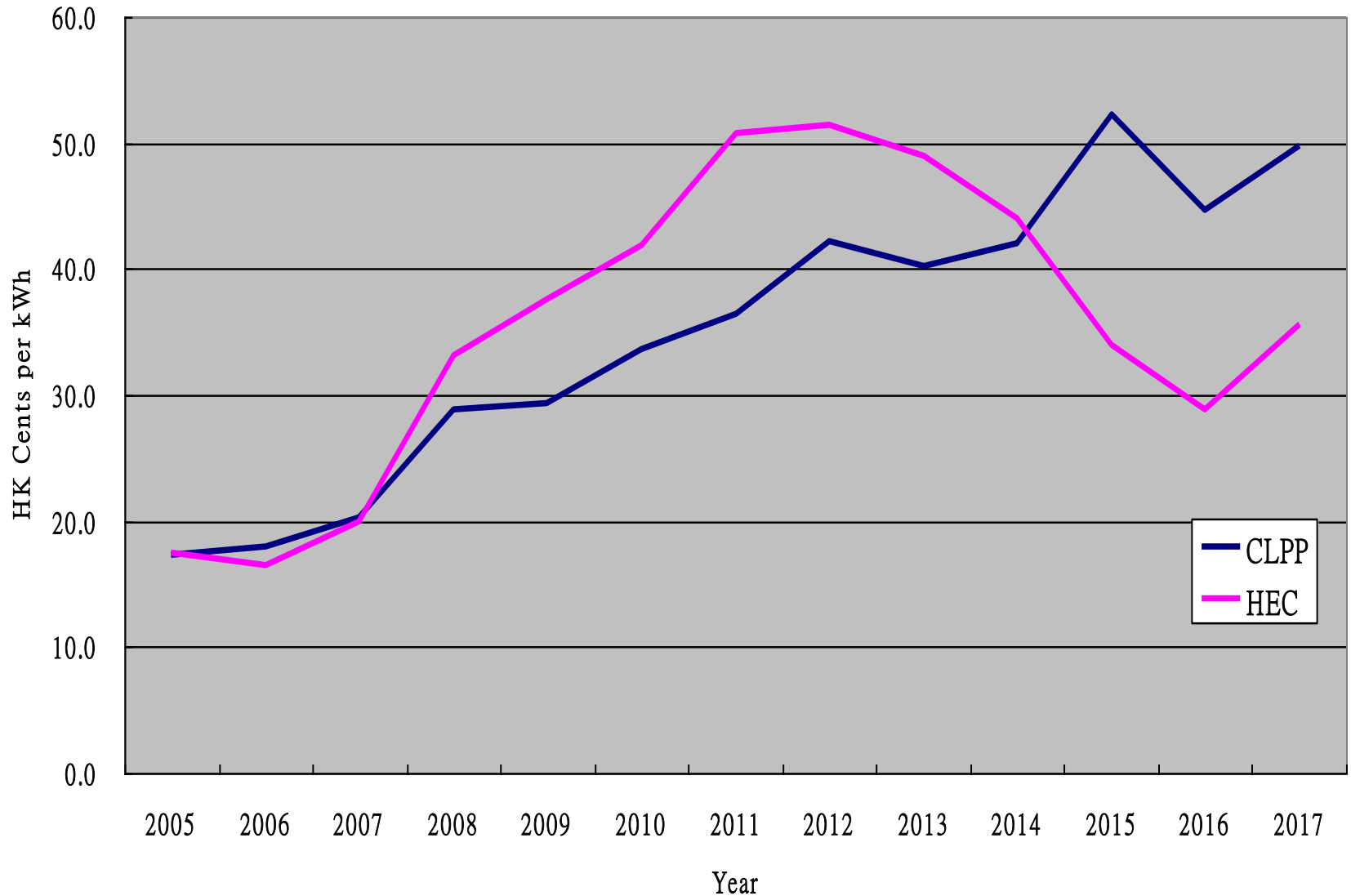


Cost of Fuels, Not Including Nuclear

HEC Smart in Pricing Fuel; CLLP Uses More Gas and Gas Not From Hainan

The Gap Probably Due to Fuel Pricing Formula Set At Different Time

Trending Higher as More Gas Plant in Operation?



Looking Ahead

for Further Actions

Power Industry Structure Options

Concept of Regulatory Capture

Case for Fully Integrated Power System

Utilities Performance Assessments

Role of Customers in Regulatory Framework

Power Industry Structure Options



Existing Industry Structure:

Private Investor Owned Fully **Vertically Integrated** (Generation, Transmission, Distribution and Sales) Utilities Under a SOC Regulatory Framework

New Structure Options:

- I. As It is Now, But Hong Kong Under **One Single Power Company**
- II. Private Investor Owned Fully **Horizontally Integrated** Utilities Under a Regulatory Framework: Separating Generation, Transmission, and Distribution and Sales Under Different Companies But Still Under a Regulatory Framework
- III. With Many Generation Plants under **Long Term S&P Agreements or Open Bidding**, One Central System Operator for System Operation & Transmission, And Several Distribution and Sales Companies

Objective of Option Decision:

Efficient and Effective Operation, and Economical Power Supply

Concept of Regulatory Capture

- A Theory in Public Choice Economics Associated w/ George Stigler
- Regulatory Capture is a form of **government failure** which occurs when a **regulatory agency**, created to act in the public interest, instead advances the commercial or political concerns of **special interest groups** that dominate the industry or sector it is charged with regulating, leading to a net loss for society.
- Actions by interest groups are successful at "capturing" influence with the staff or commission members of the regulatory agency, while **members of the public**, each with only a tiny individual stake in the outcome, will be **ignored** altogether.
- Extreme: **Collusion** of Govt, Corporations and Thiefs 官商盜合流
- **Are We Tending to Regulatory Capture?**
- If We Are, Think About How to **Reduce or Avoid**

Case for Fully Integrated Power System of 10,000 MW

Benefits:

- Sharing of **Capacity Reserve** Resulting in Lesser Generation Plant Built, Margin Coming Down to 20 – 25% And Saving 13 Billion HK\$
- Facilitate **Retiring** Coal Plants and **Switching** to Gas Plants
- **Same** Tariff Everywhere in Hong Kong SAR
- Facilitate Import of LNG and Construction of **Gas Terminals** in HK for 5 M Tonne Annual Consumption: Better Price & Secure Supply
- Bringing 275 kV Connection to East HK Island Thru **400/275 kV Interconnection**. Existing 132 kV Interconnection is 35 Yrs Old
- CLPP and HEC Can Still Be Operated Separately Under SOC

Costs:

- 400/275 kV Interconnection Costs at High Level About **8 Billion HK\$**
- **Sharing** of Generation Plants in Either Side of Harbour

Technical Issues

- **Centralized** System Operator and Dispatcher
- Transmission **Network Modification** Based on System Studies

Utilities Performance Assessments



Past Performance of SOC Not So Encouraging

- Technical: Availability, Thermal Efficiency & Reserve Margin etc
- Huge Built-up of Customer Money e.g. Fuel Clause Account

But We Are Still Able to Have **Highly Reliable Electricity Supply**

Our New SOC Agreement Effective in 2019. It is **Not Performance Based**,
Still Asset Based With Allowance For Renewable Energy Development

We Need **More Public Disclosure** on Technical, Financial and Tariff
Performance: More Data, Statistics, Investigations and Documents

Regulator To Ask for

- Better Technical and Tariff Performance: Monetary Incentive/Penalty
- A **Cap** on Customer Money Although Utilities Are Paying Interests
- Show to the Public That Regulator Always **Acts in the Public Interests**
- Moving to Performance Based?

Role of Customers in Regulatory Framework

To Make Regulatory Framework Functioning Well, Community Members Needs to **Express Actively Opinions** on Power Supply, Pricing & Development Incl Renewable Energy

As **Groups**:

- Consumer Council
- Non Profit Making Entities: Environmentalists, Socialists etc
- Special Interest Groups
 - Commercial Bodies
 - Education Institutes and Learned Societies
 - Labour Unions

As an **Individuals & Customers** with Diverse Expertise

- Thru Mass Media
- Open Discussion in Forum, Seminars etc

Let Our Regulator, Environmental Bureau, Hearing Customer Voices and Working in the Public Interests

Avoiding Falling into Regulatory Capture