

# Green Buildings and Energy management Conference

HKU MSc ENVM-EMAHK-BSOMES

8 April 2017



Ir. Cary Chan  
Executive Director  
Hong Kong Green Building Council

# Back to the 90s ..



Environmental consciousness (society and industry)

- Awareness
- Knowledge
- Behavior

Regulations

Positive and negative drivers

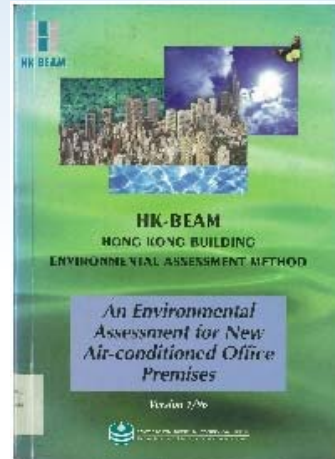
Green Building professionals

Technology and product

Demand to the building industry

Demand on indoor environmental quality

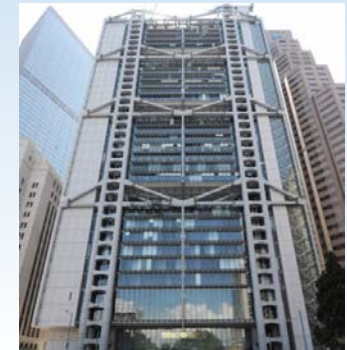
# Development of the Green Building Movement



**HK-BEAM**  
was Launched



Lincoln House  
First HK-BEAM  
New Buildings  
Project  
(Excellent  
Rating)



HSBC  
Headquarters  
First HK-BEAM  
Existing Buildings  
Project  
(Excellent Rating)



1989



Montreal  
Protocol



1990

**BREEAM**<sup>®</sup>  
was  
launched



1992

Earth Summit



1996



1997



1998



was launched

# Development of the Green Building Movement

Fresh Water  
Plumbing  
Quality  
Maintenance  
Recognition  
Scheme



IAQ Certification  
Scheme  
was launched



BEAM for New &  
Existing Buildings  
(Version 4/04 & 5/04)  
were launched

2002



WORLD  
GREEN  
BUILDING  
COUNCIL  
was  
established

2003



was launched



2004

2005



BCA GREEN MARK

was launched

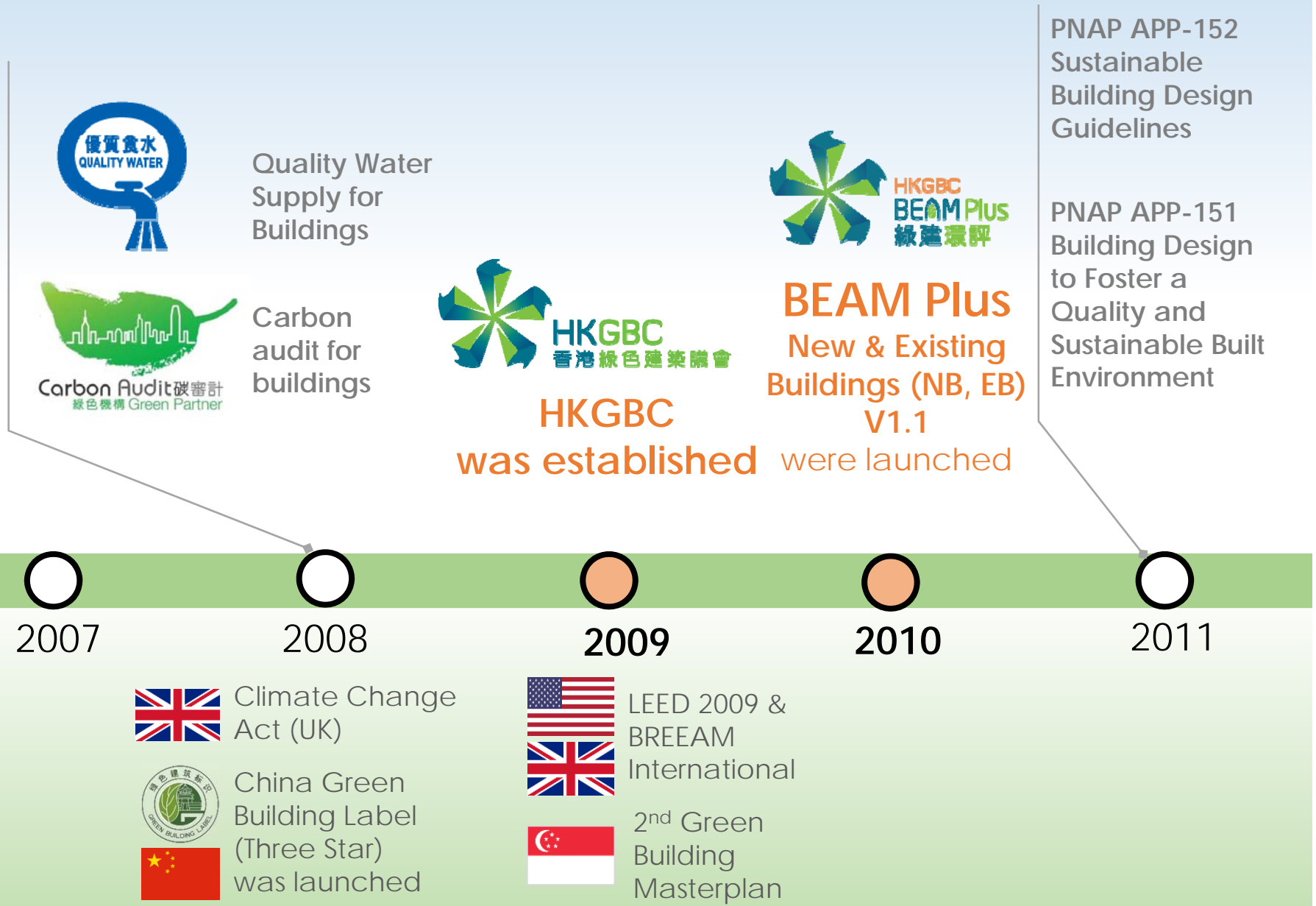


2006



1<sup>st</sup> Green  
Building  
Masterplan

# Development of the Green Building Movement



# Development of the Green Building Movement



Holiday Inn Express  
Hong Kong Soho  
First BEAM Plus NB  
Hotel Project



BEAM Plus  
NB, EB V1.2  
were launched



Building  
Energy  
Efficiency  
Ordinance



Green School  
Guide  
were  
launched



Hysan Place  
First BEAM Plus NB Commercial Project



BEAM Plus Interiors  
(BI) V1.0  
was launched



A Clean  
Air Plan  
for Hong  
Kong



Hong Kong  
Blueprint for  
Sustainable Use  
of Resources  
2013-2022

2012

2013



Subsidy on "Three Star"  
green buildings in China,  
as prescribed by China's  
12th five-year plan



# Development of the Green Building Movement



## MARINELLA

First BEAM Plus NB  
Residential Project



Energizing Kowloon  
East Office  
First BEAM Plus NB  
Government Project



Green  
Tenancy  
Driver  
was  
launched



Green  
Shop  
Guide  
was  
launched



A Food Waste &  
Yard Waste Plan for  
Hong Kong 2014-  
2022

2014



3<sup>rd</sup> Green Building  
Masterplan

# Development of the Green Building Movement



ZCB  
BEAM Plus NB Platinum



ZCB Eco-Home  
First BEAM Plus BI project

Total Gross Floor Area (GFA)  
of BEAM Plus registered  
projects exceeded  
**200,000,000** sq. ft



Energy Saving  
Plan for Hong  
Kong's Built  
Environment  
2015-2025+



Hong Kong  
Climate  
Change  
Report 2015



Building Energy  
Code (BEC)  
2015

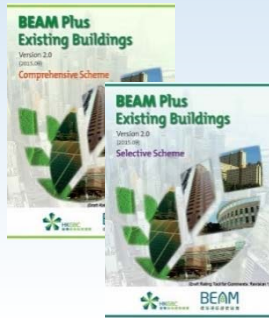
2015



COP21  
held in Paris



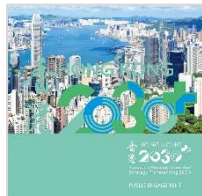
# Development of the Green Building Movement



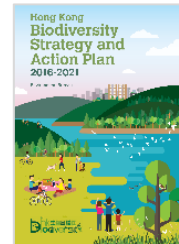
BEAM Plus  
EB V2.0  
was  
launched



BEAM Plus  
ND  
was  
launched



Hong Kong 2030+:  
Towards a Planning  
Vision and Strategy  
Transcending 2030



Hong Kong  
Biodiversity  
Strategy and  
Action Plan  
2016-2021



Climate  
Action Plan  
2030+

2016

UNITED NATIONS  
PARIS CLIMATE  
AGREEMENT  
SIGNING CEREMONY  
— 22 APRIL 2016 —

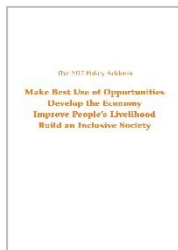


Paris  
Agreement  
was  
rectified

# Development of the Green Building Movement

**BEAM Plus NB V2.0**  
will be launched

**WSBE17**  
Conference



Policy Address 2017 proposed to raise prerequisite for application for GFA concession

## Promoting Green Buildings

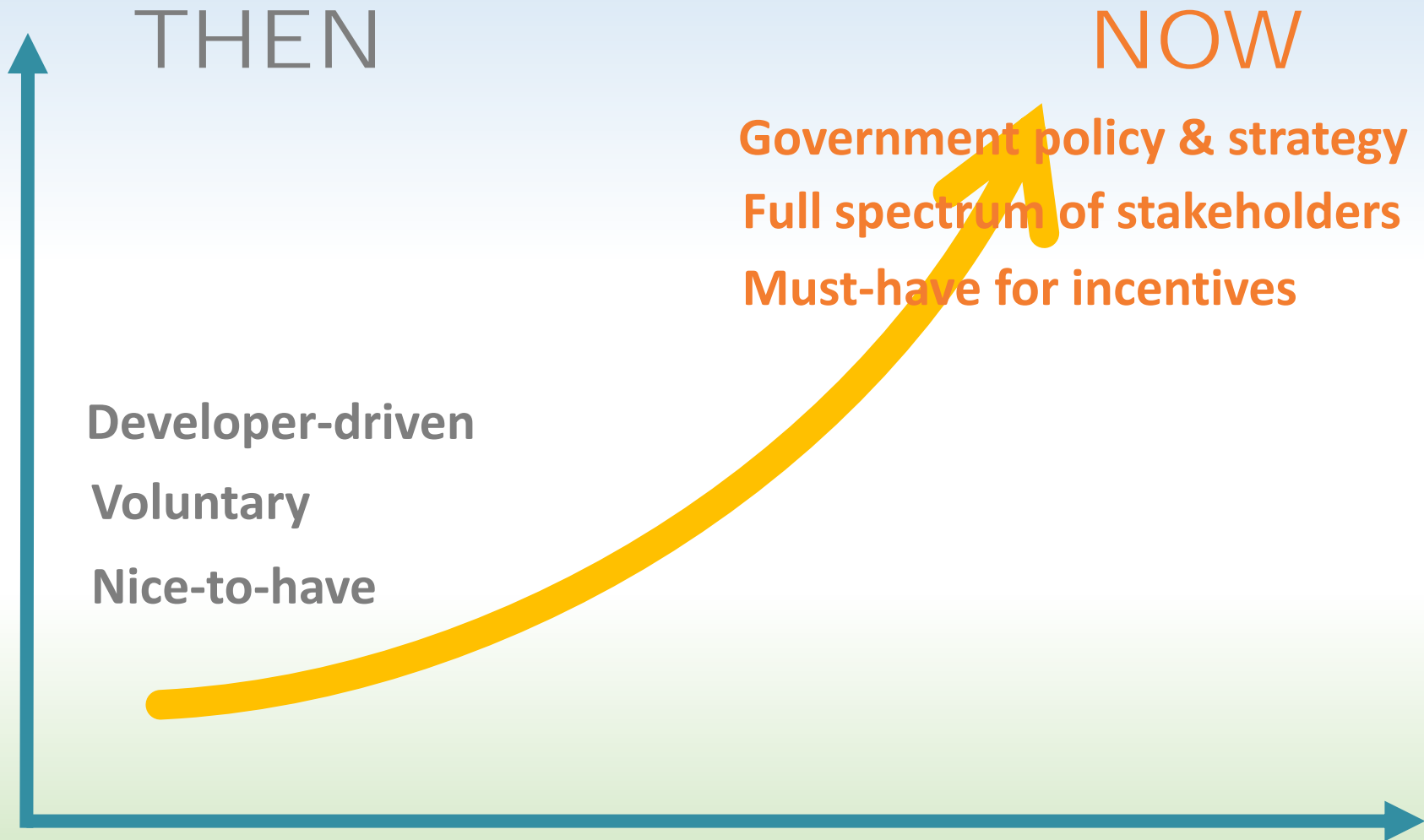
**118.** Under the current arrangement, a private housing development project is required, among other things, to register for Building Environmental Assessment Method Plus (BEAM Plus) as a prerequisite for application for gross floor area concession for amenity features. We will review this arrangement to further promote green building. In the review, we will consider tightening the prerequisite by requiring a development project to attain specific standards of performance in environmental protection, or even adopt performance-based and site-specific approaches to determine the maximum gross floor area concession.

2017



President Trump dismantles Obama climate change policies

# The Growth of GB Movement





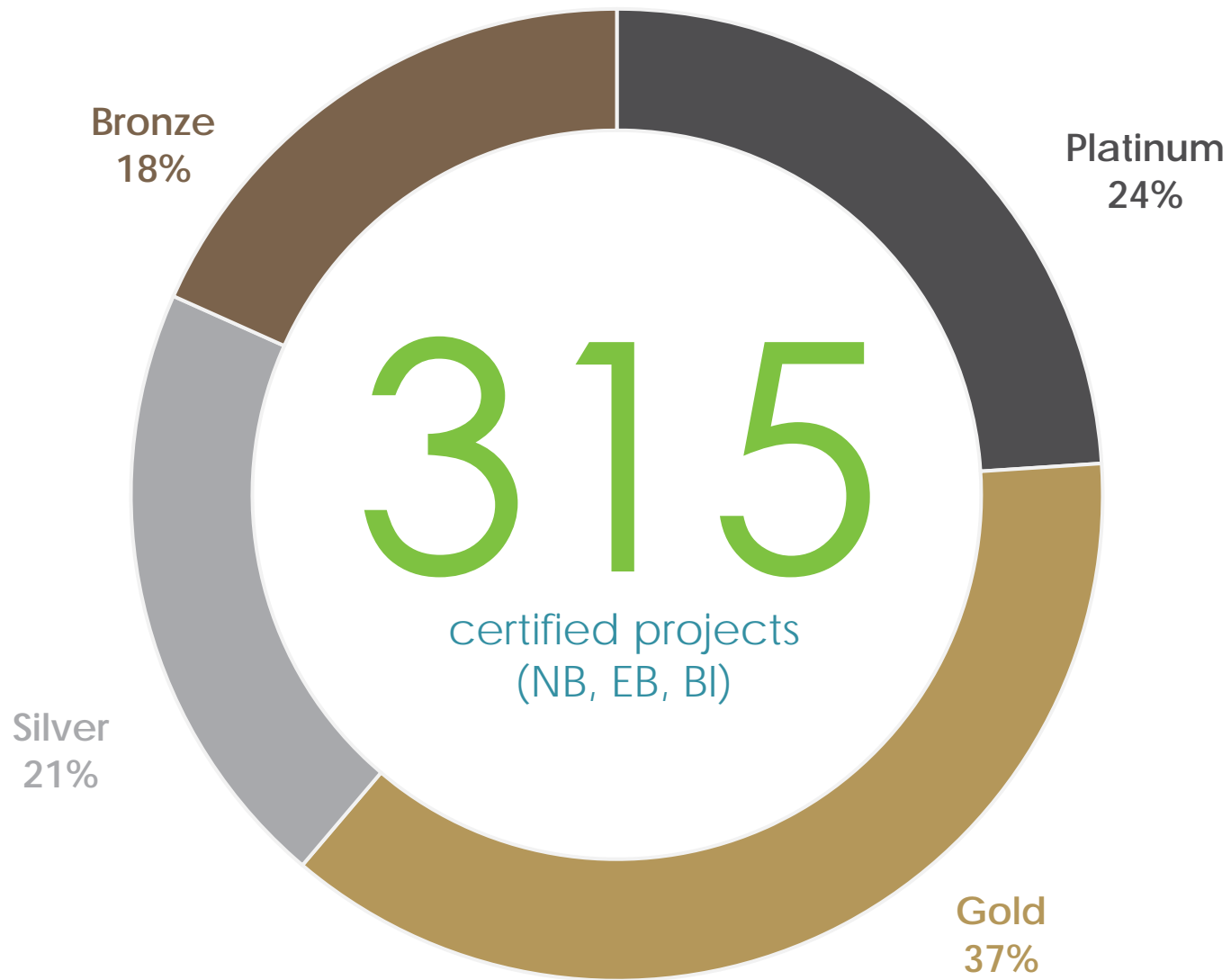
# BEAM Plus: Current update

# 944

registered projects



# BEAM Plus: Current update



(Data as of  
1 Mar 2017)

# BEAM Plus: Current update



Average water saving:

**39%**



Average energy saving:

**29%**



Average greenery ratio:

**39%**



## BEAM Plus: Current update



Water saved  
equals to  
consumption of

**31,600**

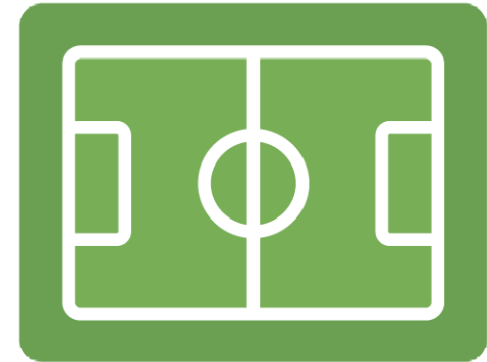
households



Electricity reduction  
equals to  
consumption of

**97,900**

households



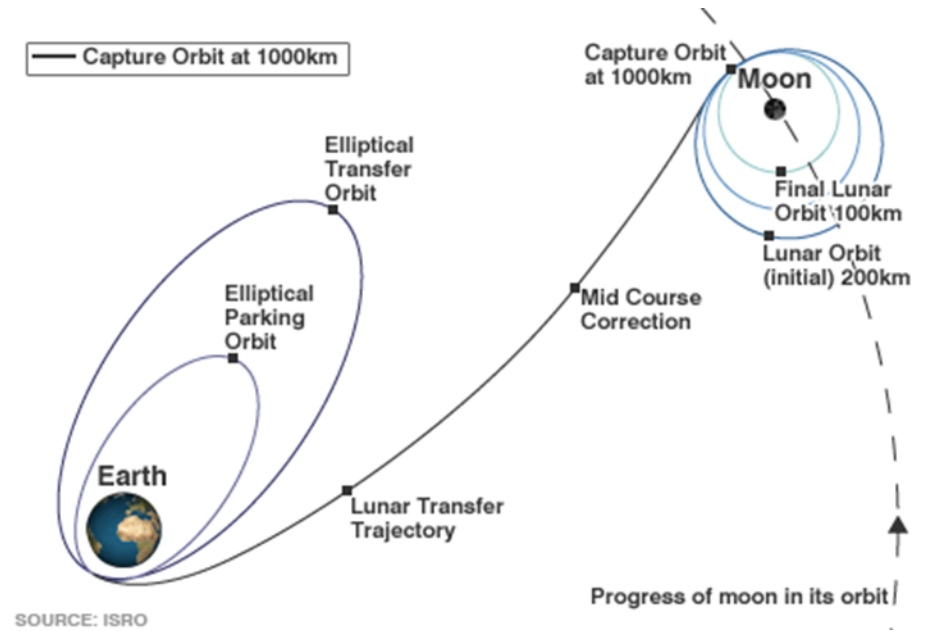
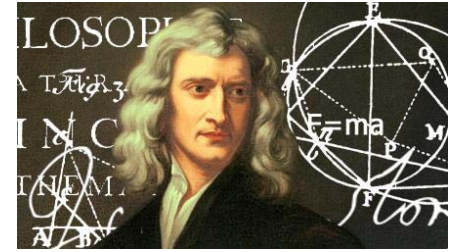
Total area of  
soft landscaping:

**73**

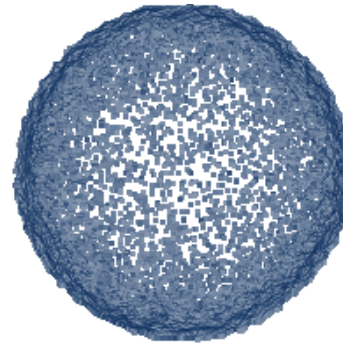
Hong Kong  
Stadium Pitch

# Driving forces

$$\sum F = ma$$



# Drivers for change: Political



COP 21

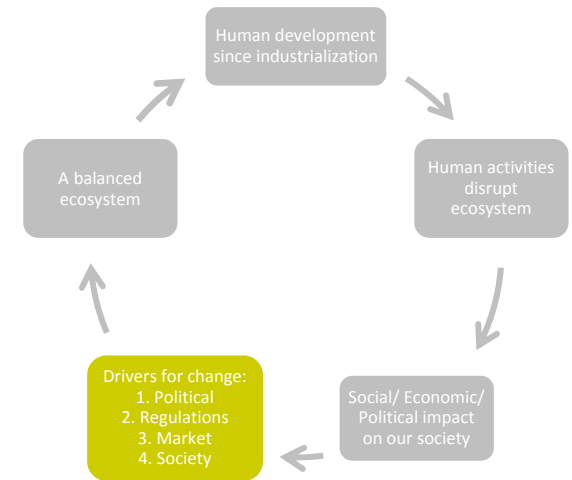


Photo source: Guardian News

Barack Obama listed climate change among the top three priorities of his second term

– UK Guardian News, 09 Jan 2013

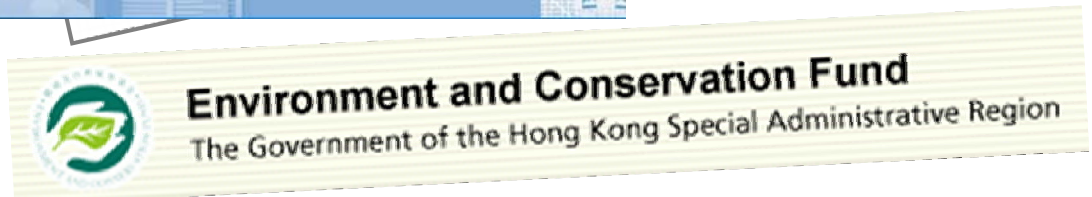
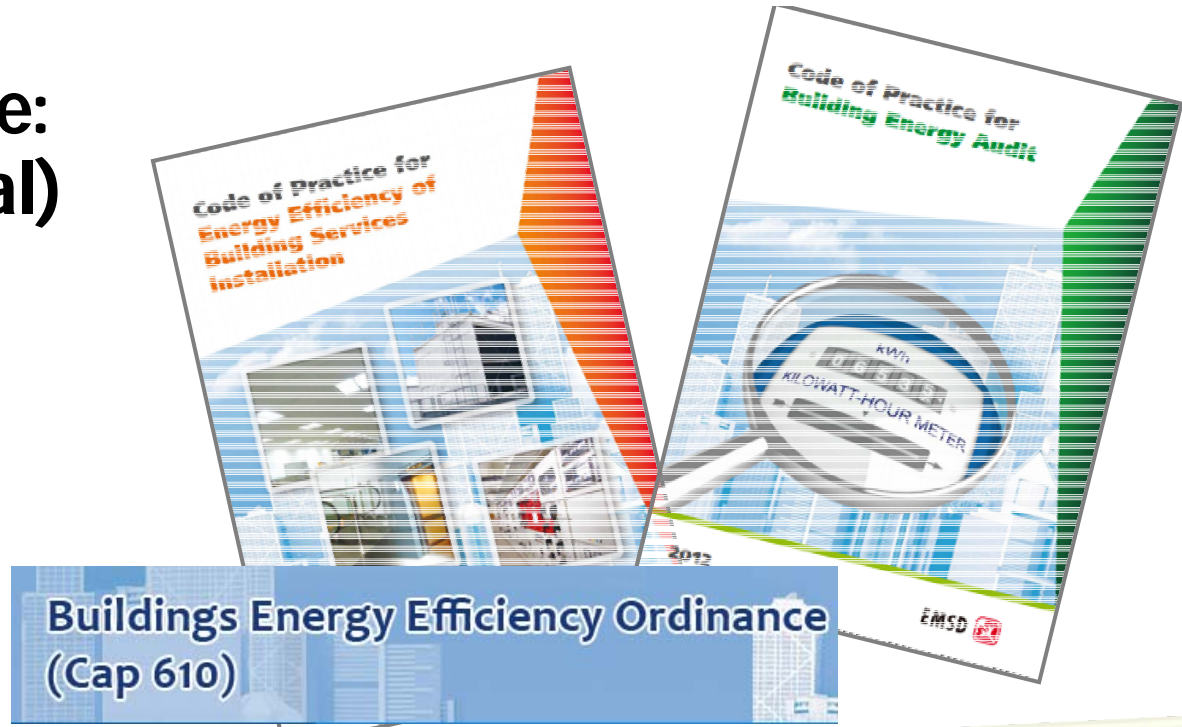
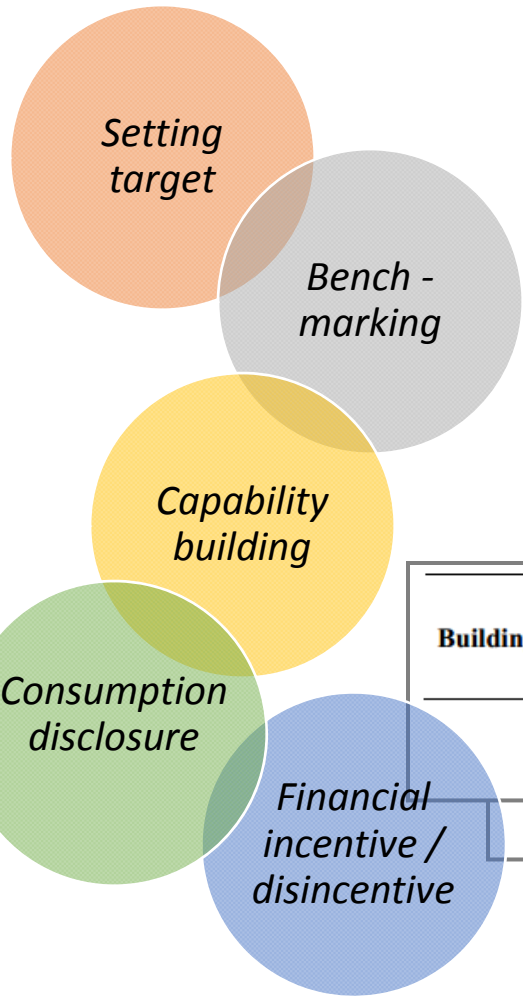


Photo source: The Telegraph

China committed about \$290 billion to clean energy investments in 12<sup>th</sup> five-year plan

– Business Week, 21 Nov 2012

# Drivers for change: Regulations (Local)



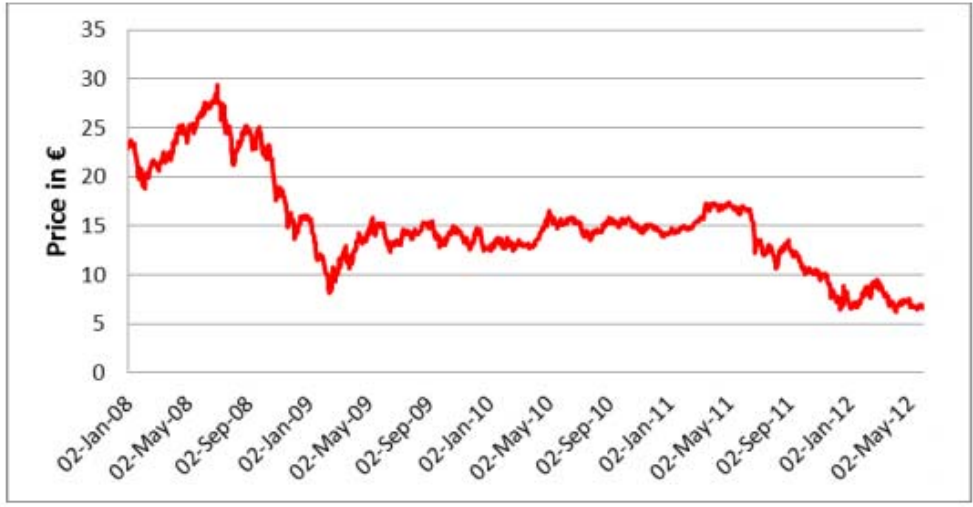
## Mandatory Energy Efficiency Labelling Scheme

Buildings Department	Practice Note for Authorized Persons, Registered Structural Engineers and Registered Geotechnical Engineers	APP-67	APP-130	
	Energy Efficiency of Buildings Building (Energy Efficiency) Regulation		APP-151	
	Lighting and Ventilation Requirements – Performance-based Approach			APP - 152
	Building Design to Foster a Quality and Sustainable Built Environment			
	Sustainable Building Design Guidelines			



# Drivers for change: The Market

- Carbon trading
  - Building/Product labelling
  - Market sustainability indices



EU Emission Trading System

### Energy Efficiency Rating

Rating	Current	Potential
A (92-100)		
B (81-91)		
C (69-80)		
D (55-68)	55	
E (39-54)		
F (21-38)		
G (1-20)		

UK 2005 Directive 2002/91

**ENERGY LABEL**  
能源標籤

more efficient 效益較高

Grade 1

less efficient 效益較低

Annual Energy Consumption (kWh/Cooling) 1106

Cooling Capacity (kW) 2.54

Refrigerant 製冷劑 R410A

Room Air Conditioner Brand: ABC

Model: HK1234

Reference Number / Year: C080123 / 2008

Information Provider: XYZ

機電工程署 EMSD

BEAM Plus  
New Buildings  
Version 1.2  
(2012.07)

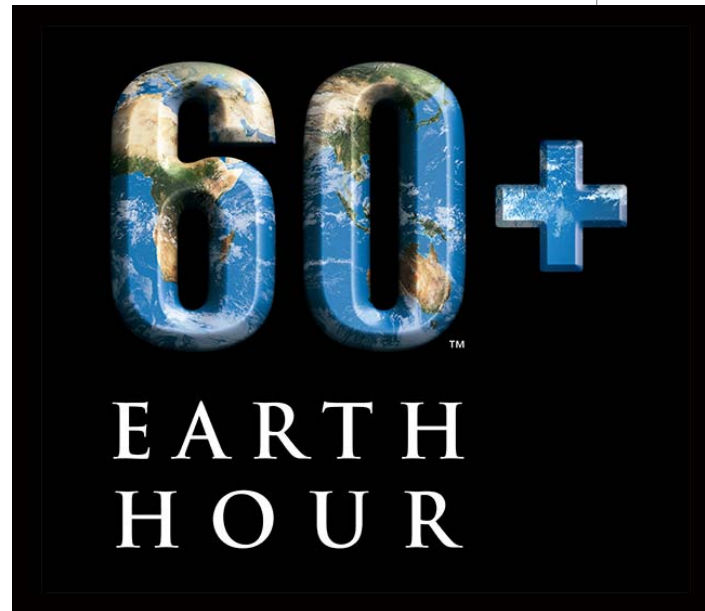
## FTSE4Good

Hang Seng Corporate Sustainability Indexes

**DOW JONES SUSTAINABILITY INDICES**

# Drivers for change: The Society

- *Green groups*
- *Social media*
- *Public concerns*
- *Corporate CSR policies*



SWIRE PROPERTIES



Light Pollution

South China Morning Post 南華早報

HONGKONG

NEWS • HONG KONG • ENVIRONMENT

## Light pollution in Hong Kong 'worst on the planet'

It's 1,200 times brighter over Tsim Sha Tsui than a normal dark sky, three-year study finds, posing a danger to health and wildlife

Cheung Chi-fai

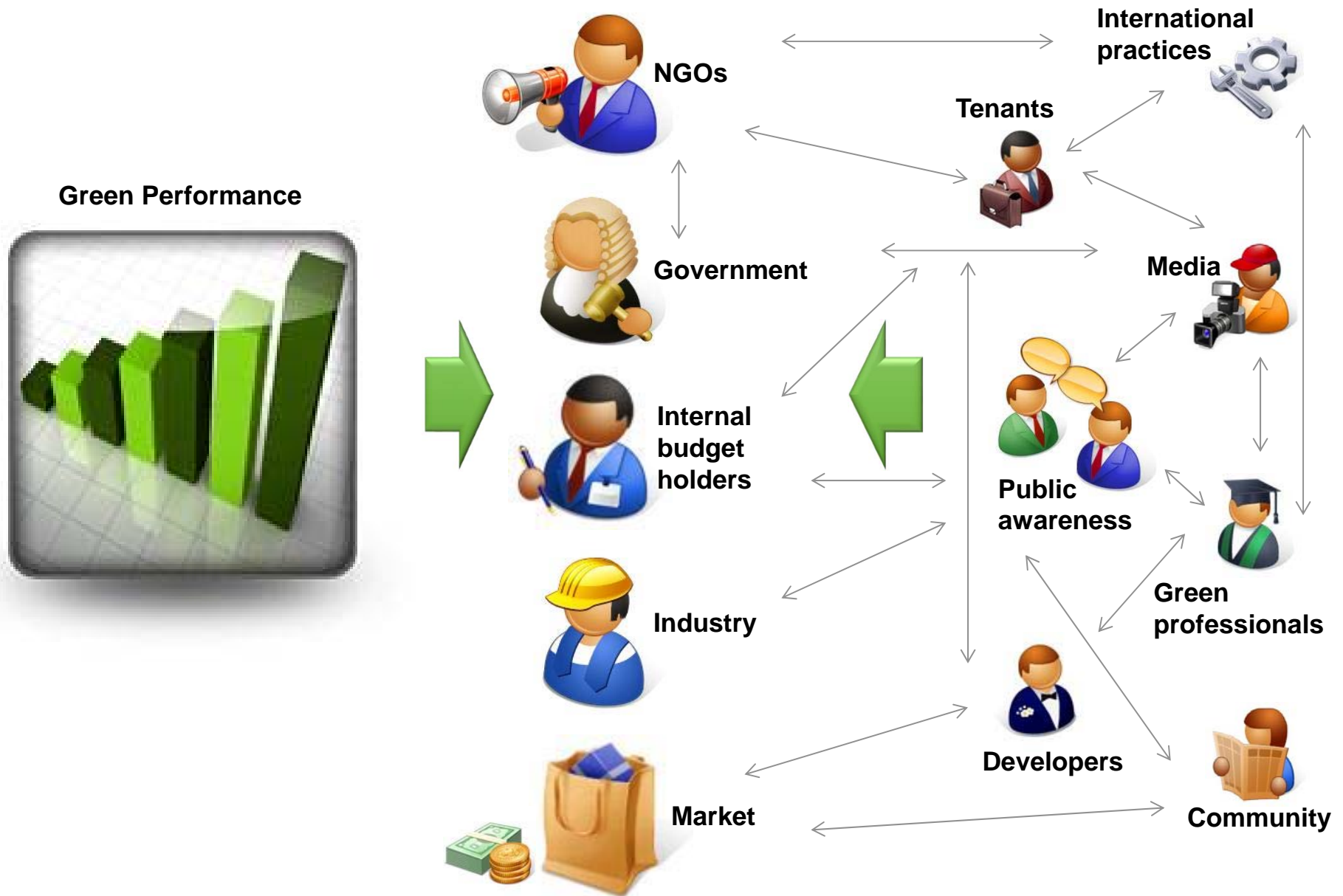
Wednesday, 20 March, 2013, 8:55am

Photo source: <http://www.ntn24.com/news/news/more-100000-protest-nuclear-po-15266>





# Inter-relationship between drivers



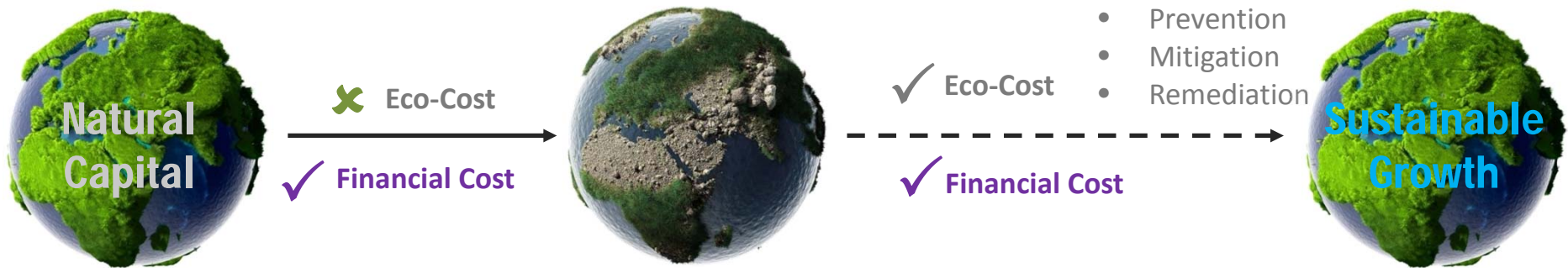
## Looking **Back** Moving **Forward**



Limitations of Green Building Assessment tools  
Future driving forces  
Knowledge and experience of the industry  
Technologies

....

# Considering Eco-Cost.....



Capitalism

GDP Growth

Consumerism

Profit Maximization

Business Case

# What is Eco-Cost?



to prevent, mitigate or remediate  
the burden caused to



## DEFINITION

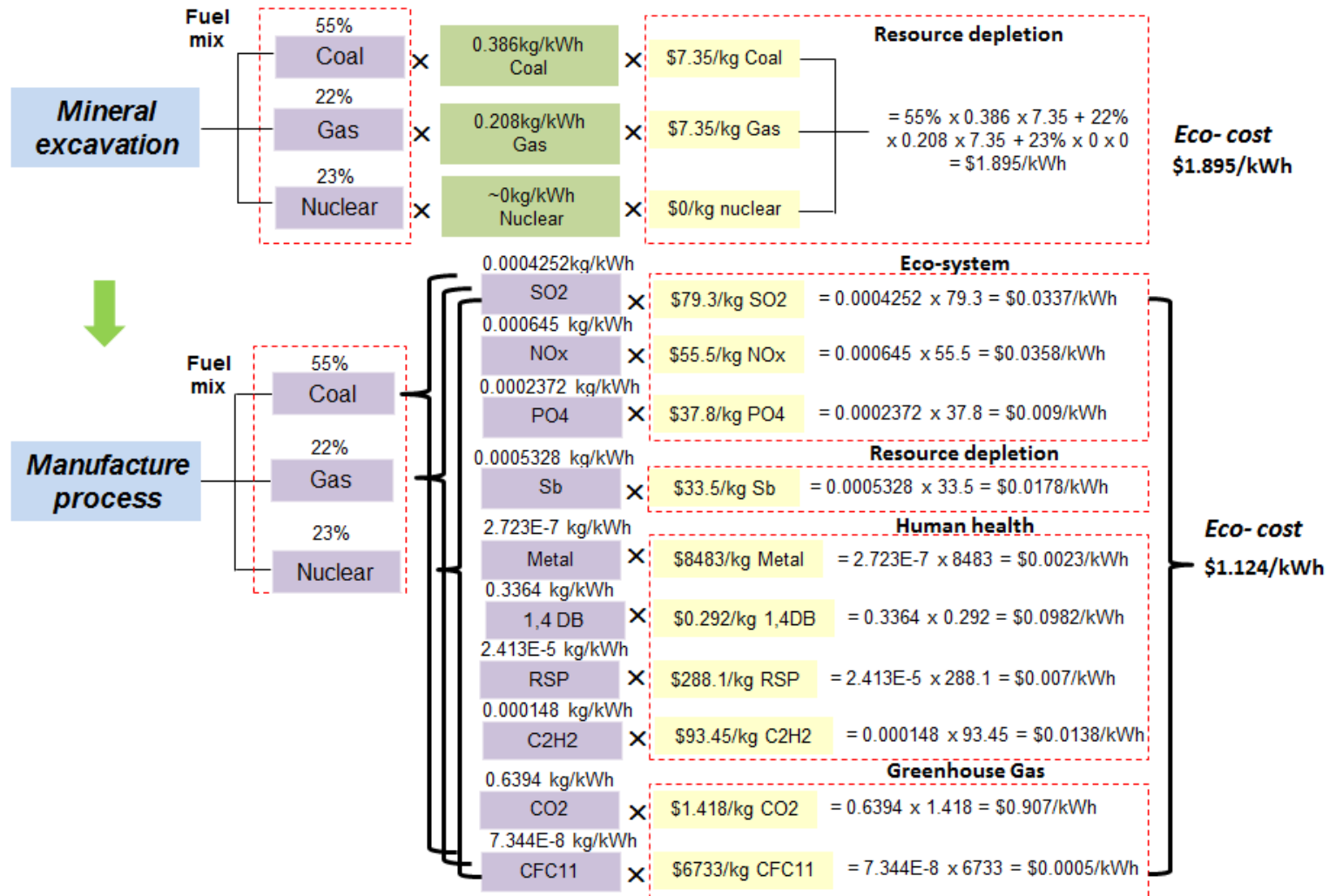
Eco-cost is a measure to express the amount of **environmental burden** of a product on the basis of prevention of that burden. This is the cost which should be made to reduce the **environmental pollution** and **materials depletion** in our world to a level which is in line with **the carrying capacity of our earth**.

*Source: Delft University of Technology*



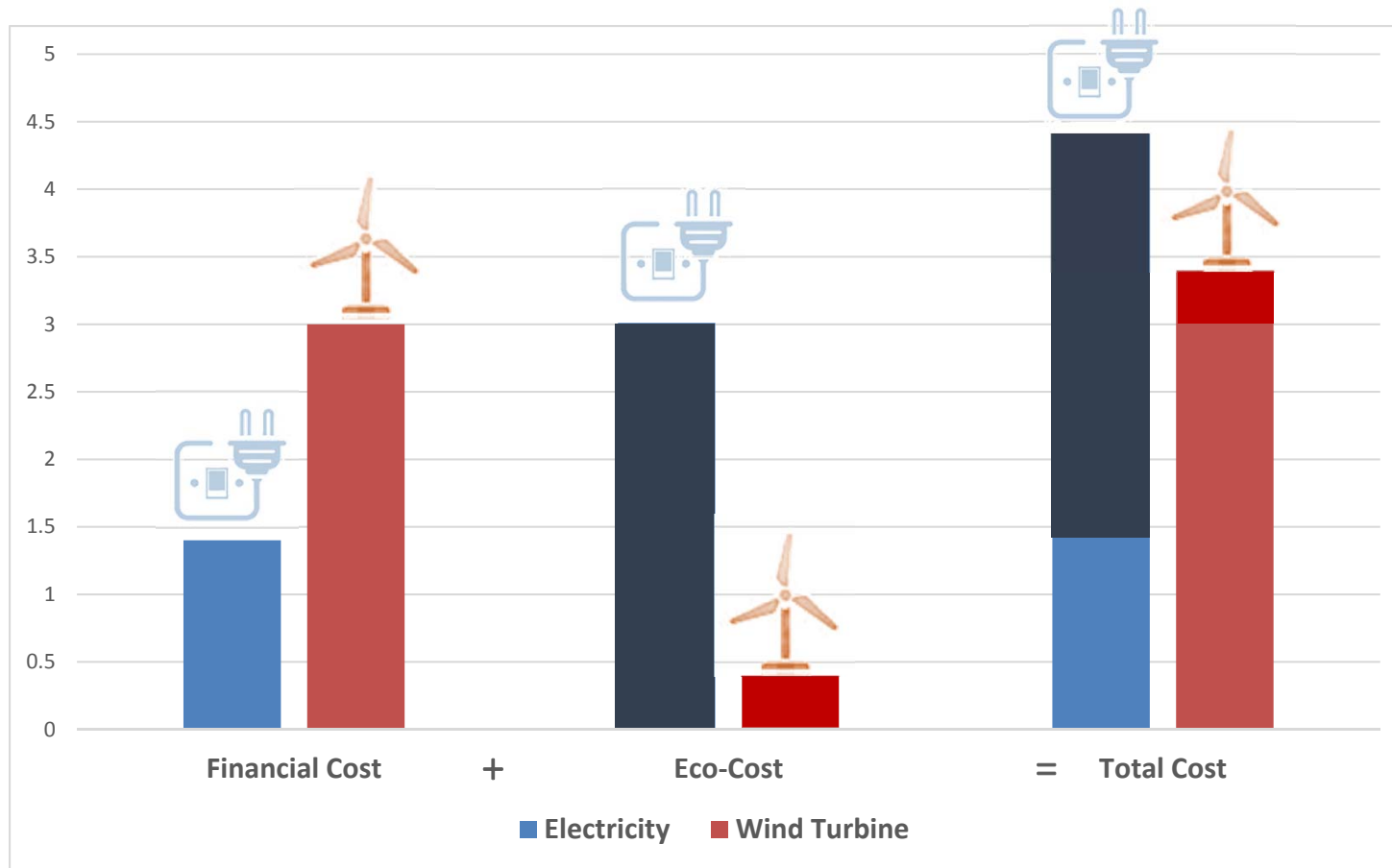
# Eco-Cost of Electricity (per kWh)

**\$3.01/kWh (\$1.89/kWh + \$1.12/kWh)**



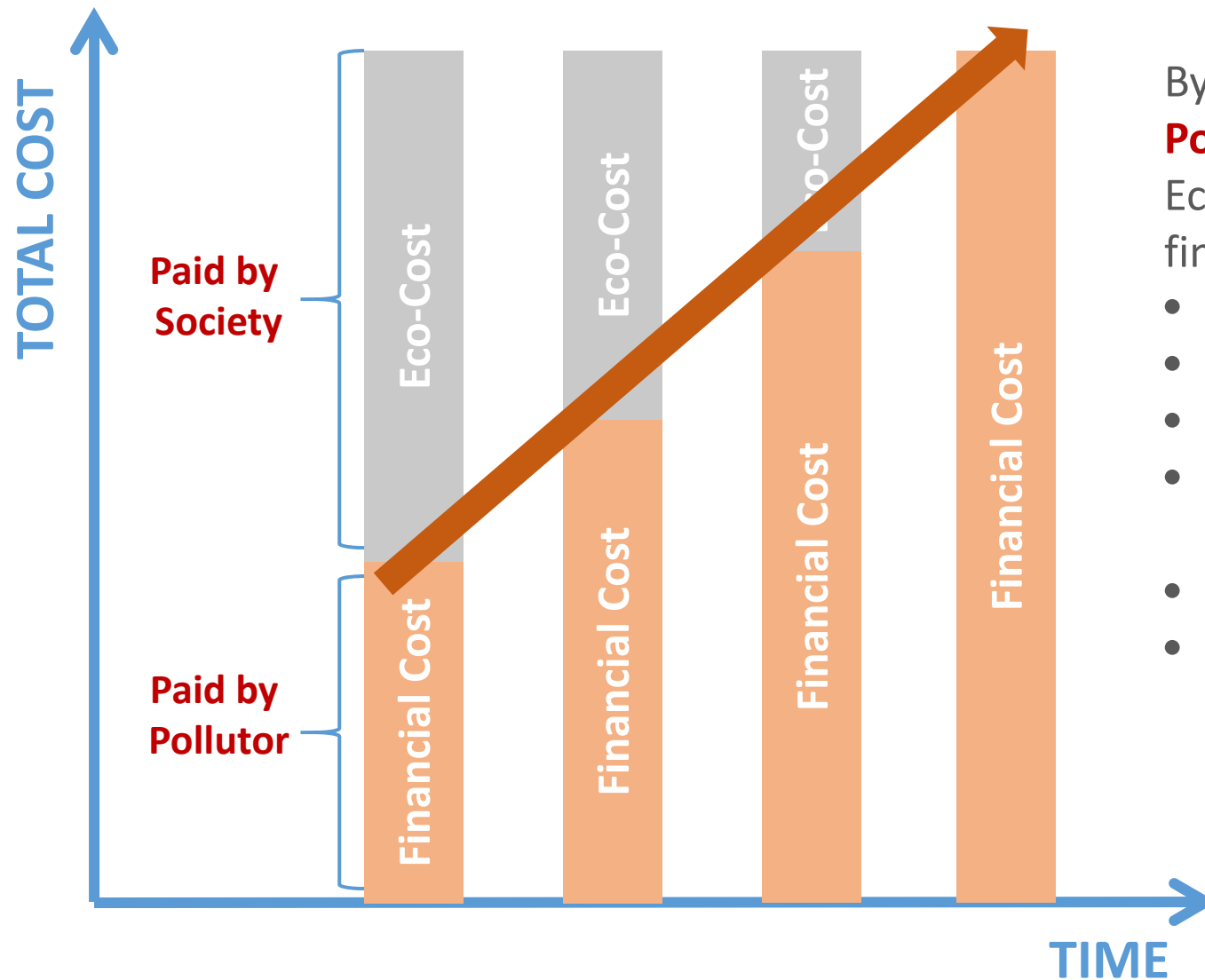
Source: Delft University of Technology

# A Change in Decision Making?



How much will you invest in wind turbine?

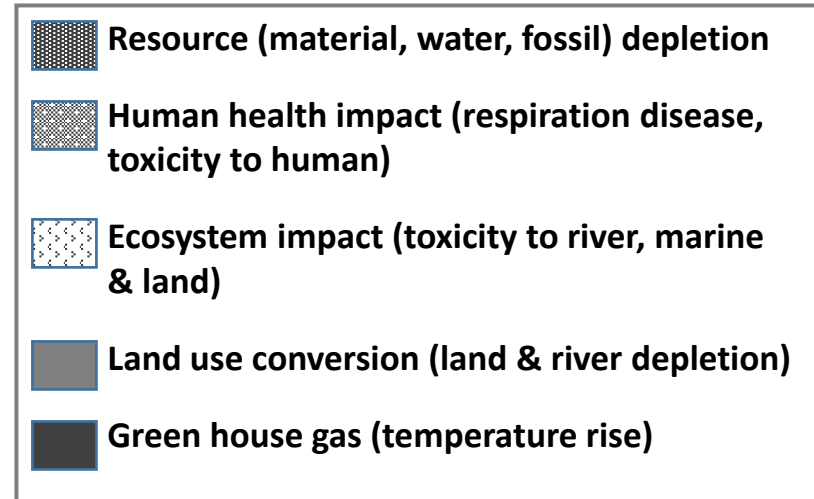
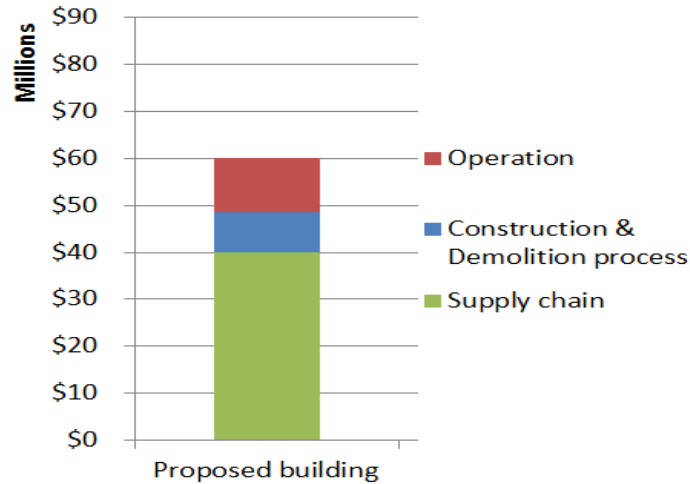




By applying  
**Pollutor-Pay Concept,**  
 Eco-cost is reflected in  
 financial cost via

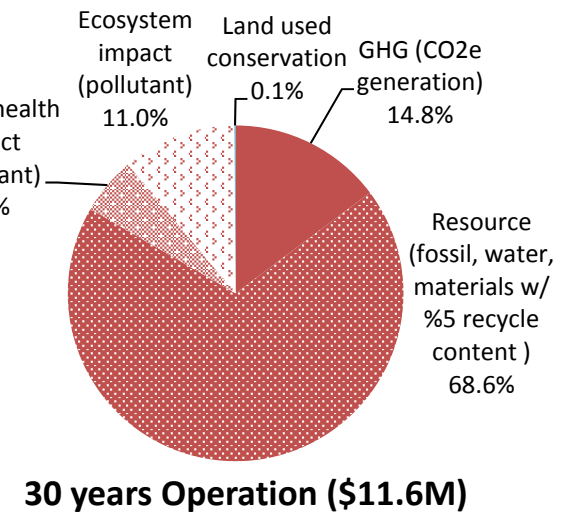
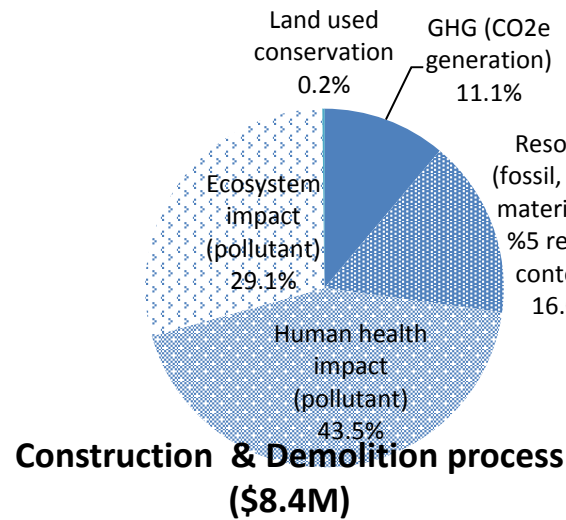
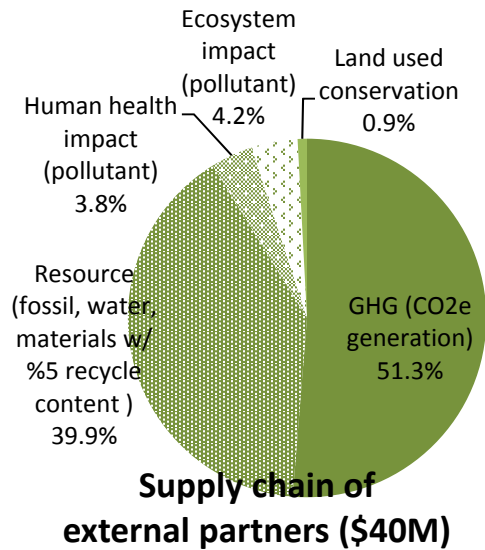
- Carbon tax
- Eco-tax
- Cap and Trade
- Trade effluent surcharge
- Plastic bag charge
- Fine for exceeding emission standard

# Swire Properties: Eco-cost breakdown of Swire Hostel



Total Eco-cost of Hostel: 60M

Total Financial Cost of Hostel: 180M



Source: Delft University of Technology



Can **Eco-Cost Accounting** be a  
future driver ?



**Total Cost**

**Re-assess Risks and Opportunities**

**Eco-Cost Accounting**

**Government Approval of New Technology Education**

**Financial Cost**

**Value Green Procurement Policy  
Product Labelling Disclosure**

**Eco-Cost**

**Polluter-Pay Policy**

**Government Intervention**

**Eco-Cost**



Source: Wessex Water/GENeco



Interested to get involved ?





**WORLD**  
Sustainable Built  
Environment Conference  
**2017** Hong Kong



Transforming Our Built Environment through  
**Innovation and Integration:**  
Putting Ideas into Action

[www.wsbe17hongkong.hk/](http://www.wsbe17hongkong.hk/)

**Register NOW!**

**Join Us!**

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[www.hkgbc.org.hk](http://www.hkgbc.org.hk)