

# Low Carbon Construction Implementation in a Public Housing Development and the Implication to the Life Cycle Decision Making Tool

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Organisers:



International Co-owners:



# Introduction



Organisers:



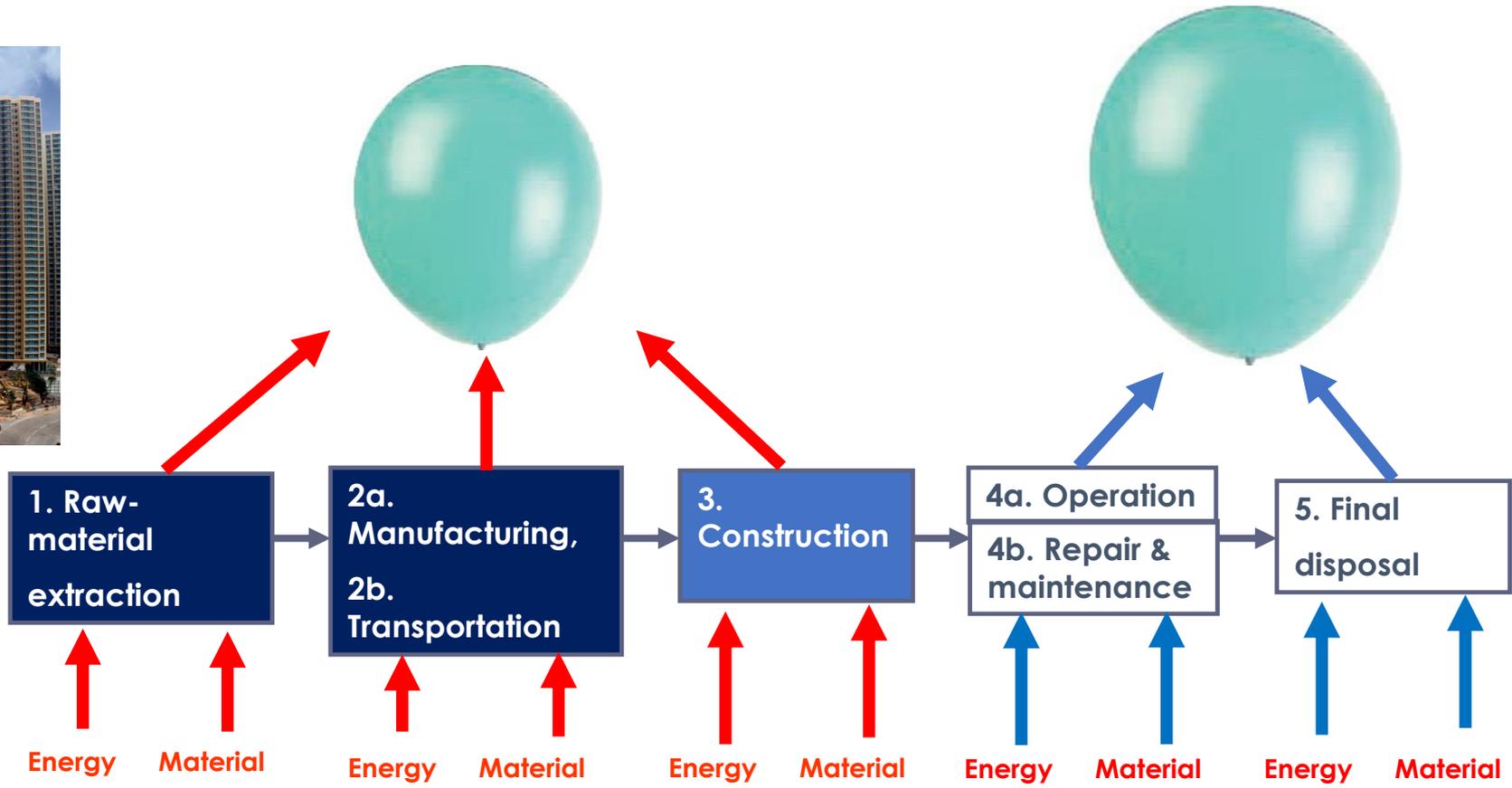
International Co-owners:



Sustainable Buildings and Climate Initiative  
Promoting Policies and Practices for Sustainability



# Greenhouse Gas Emissions Across Life-Cycle Stages



# Comparative Housing Study 2001 Combined LCA+LCC Study

1. Public Sector :  
HKHA standard block  
type (50-yrs lifecycle)



2. Private Sector :  
Typical residential  
block (50-yrs lifecycle)

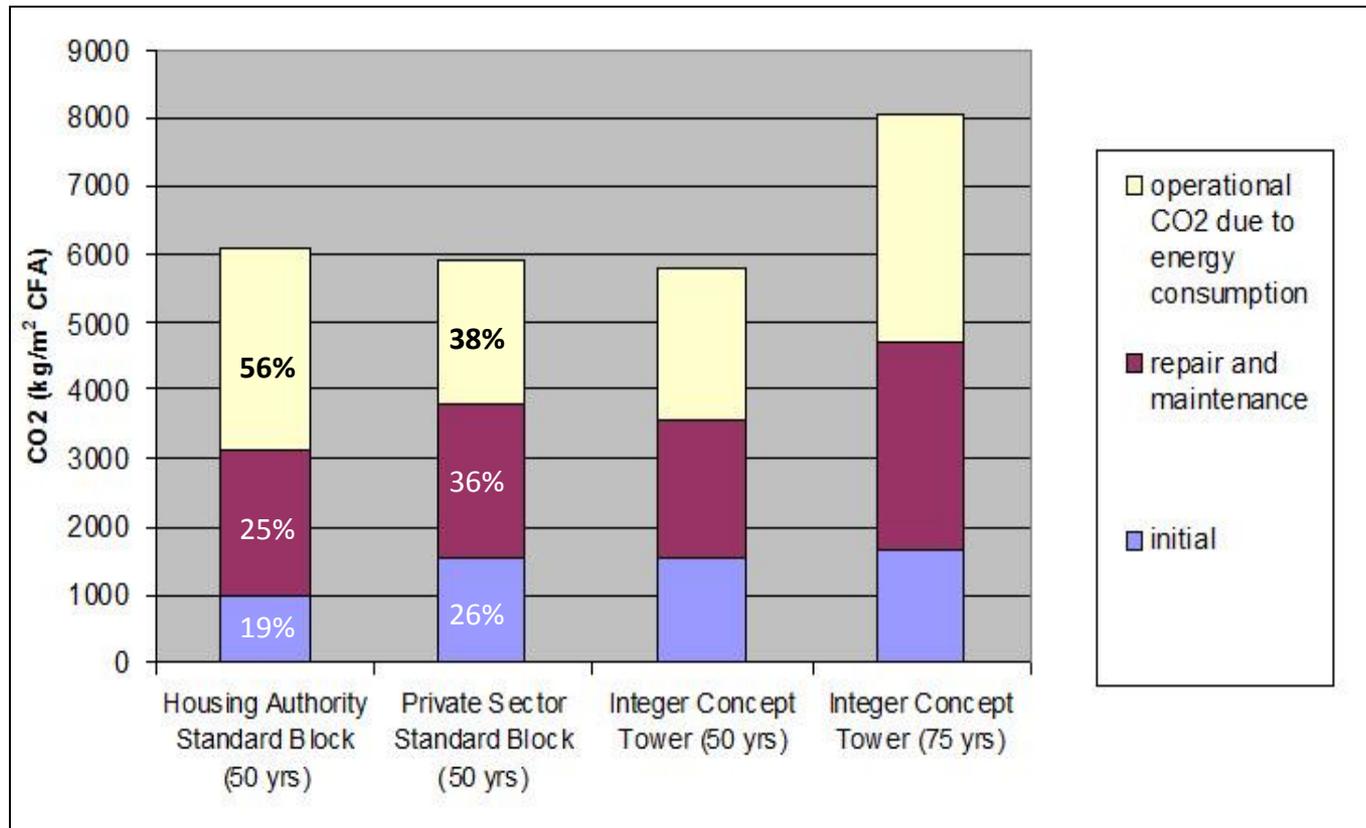


3. Generic Design : Integer  
40 storey block (50 yrs and  
75 yrs lifecycle assessed)

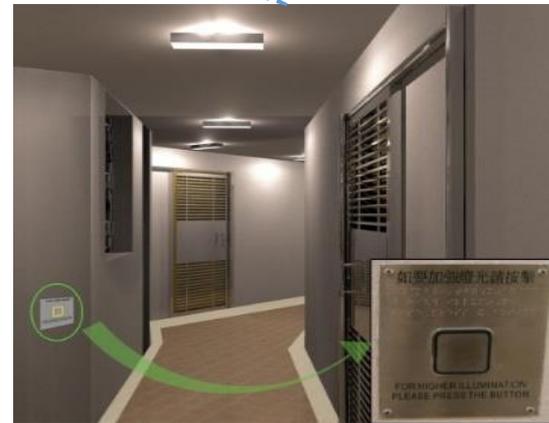


# Comparative Housing Study 2001

## Life-Cycle Greenhouse Gas Emission (kg/m<sup>2</sup> CFA)



# Public Housing Blocks Developed in 2010s



# Low-Carbon Construction Implementation in Public Housing Development **in 2013**



Organisers:

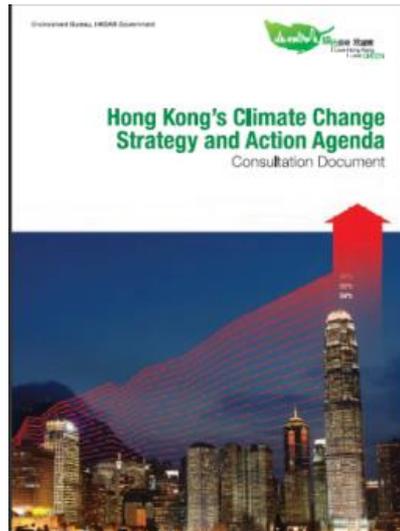


International Co-owners:



# Low-Carbon Construction Implementation in Public Housing Development **in 2013**

China State Construction Engineering (CSCE) proposed to develop a Study of **Low Carbon Construction Site Operation**



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# MATERIAL

## Low-Carbon Construction Measures

### 1. Low-carbon prefabrication plan



安裝預製組件及施工層的概況  
Overview of working floor  
construction with precast concrete  
components

9,070 ton  
CO<sub>2</sub>-e

394,348  
tree carbon  
absorption  
per year

### 2. Fabric reinforcement plan



### 3. Marine-mud plan



# ENERGY

## Low-Carbon Construction Measures

1,873 ton  
CO2-e

81,457  
tree carbon  
absorption  
per year

### 4. Electric vehicle plan



### 5. Solar hot water plan



### 6. Early electricity supply from grid

### 7. Low-carbon biodiesel plan



# OTHERS



2,401 ton  
CO2-e

104,404  
tree carbon  
absorption  
per year

# Low-Carbon Construction Measures

## 8. Hoarding Greening



## 9. Recycling plan



## 10. Computer Document Management System

## 11. Reused water for vehicle washing facilities and dust control

## 12. Food waste decomposer plan



# Low-Carbon Construction Implementation in Public Housing Development



**REDUCTION**  
**15.9%**



13,345 ton  
CO<sub>2</sub>-e

580,217  
tree carbon  
absorption per  
year



Organisers:



International Co-owners:



# Implication to Life Cycle Greenhouse Gas Emission of Housing Development



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Sustainable Buildings  
and Climate Initiative  
Promoting Policies and Practices for Sustainability



Global Alliance  
for Buildings and  
Construction

# Comparative Housing Study 2016

## LCA Study

**1. Public Housing Block in 2000s**  
**(50-yrs lifecycle)**



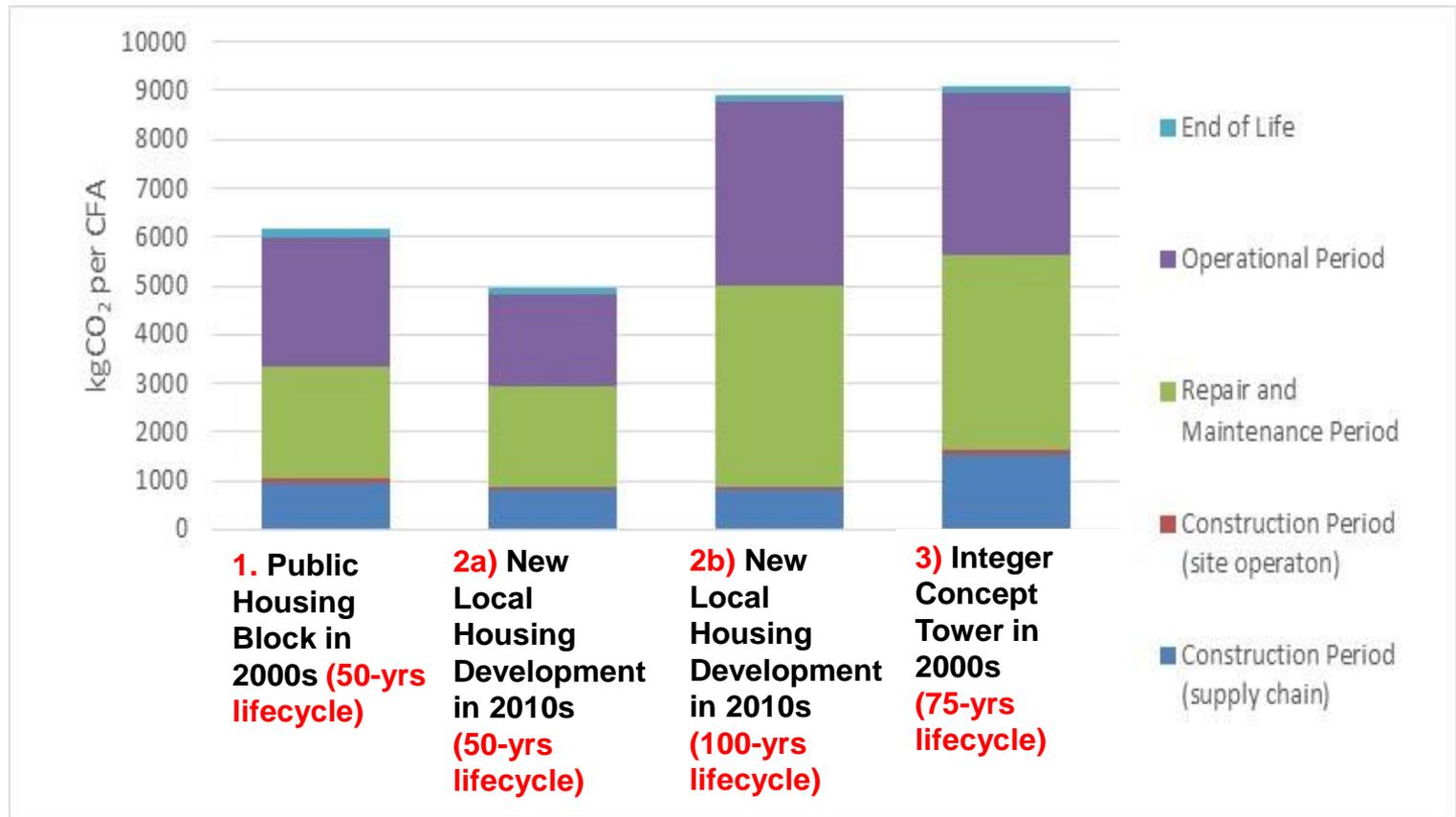
**2. New Local Housing Development in 2010s**  
**(2a) 50-yrs lifecycle**  
**(2b) 100-yrs lifecycle\***



**3. Integer 40 storey block in 2000s**  
**(75-yrs lifecycle)**



# Life-Cycle Greenhouse Gas Emission (kg/m<sup>2</sup> CFA)



**123 kg per CFA per year**

**99 kg per CFA per year**

**89 kg per CFA per year**

**120 kg per CFA per year**

# Conclusions



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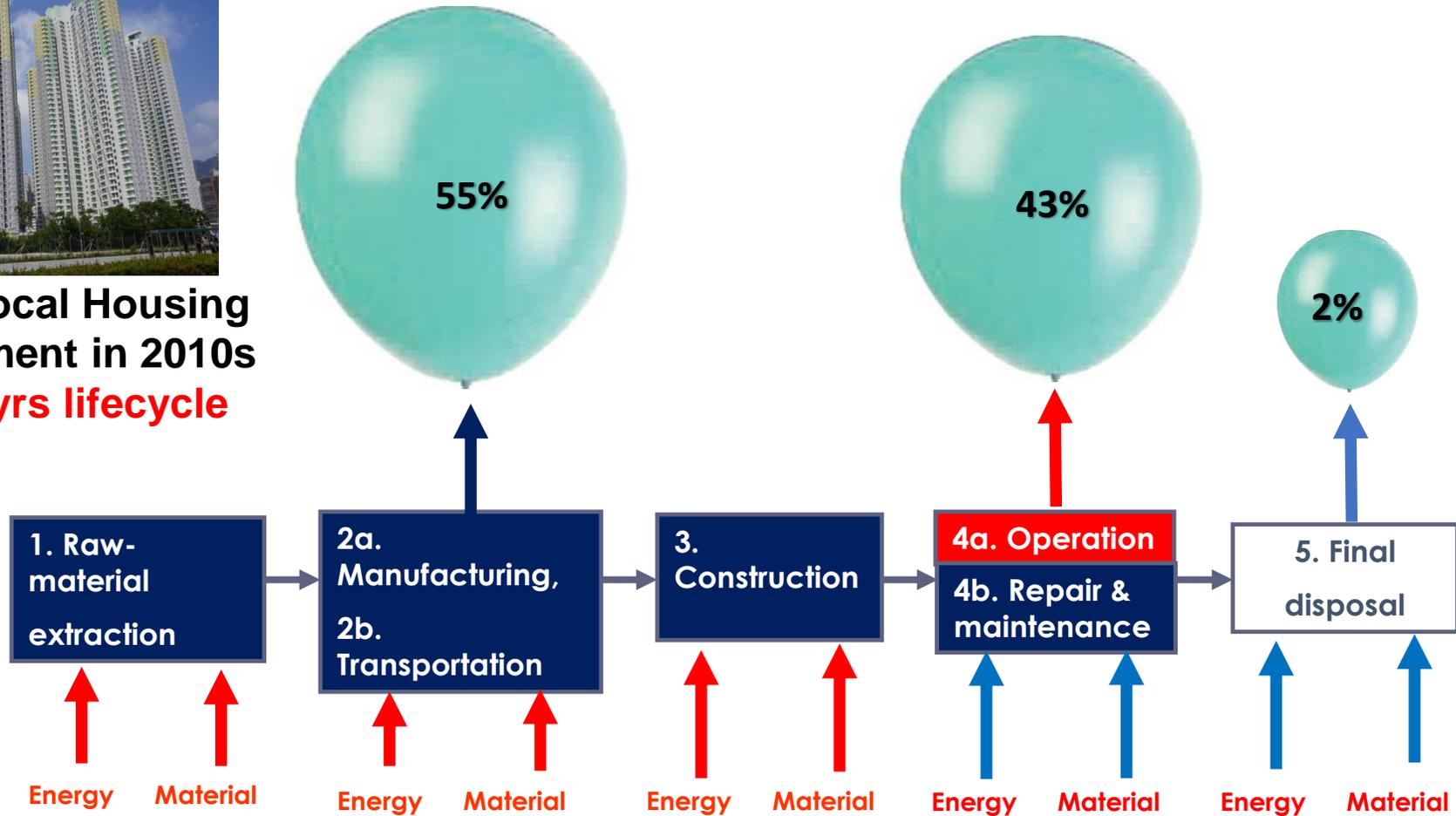
International Co-owners:



# Conclusions



## 2. New Local Housing Development in 2010s (2b) 100-yrs lifecycle



Organisers:



International Co-owners:



# Thank you

The study was supported by the  
China State Construction Engineering  
and Hong Kong Housing Authority.  
The support is gratefully acknowledged.



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