



香港大學

THE UNIVERSITY OF HONG KONG



# Policy Scenarios of Zero Carbon Building for Hong Kong: To Survive or To Lead?

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International Co-owners:



Sustainable Buildings and Climate Initiative  
Promoting Policies and Practices for Sustainability



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# Introduction



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[http://www.emsd.gov.hk/filemanager/en/content\\_762/HKEEUD2016.pdf](http://www.emsd.gov.hk/filemanager/en/content_762/HKEEUD2016.pdf)



Organisers:

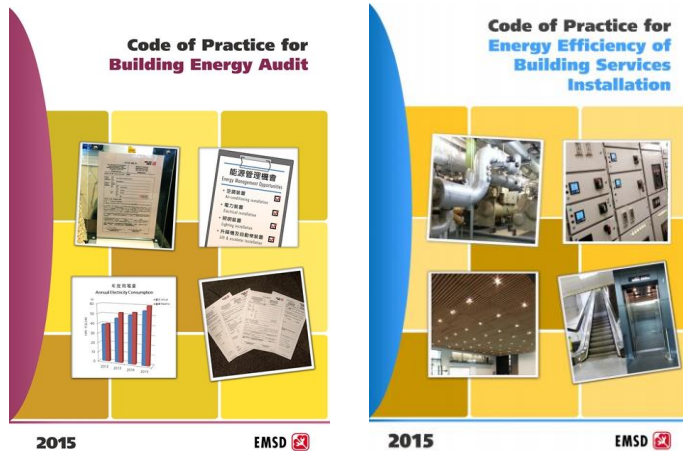


International Co-owners:



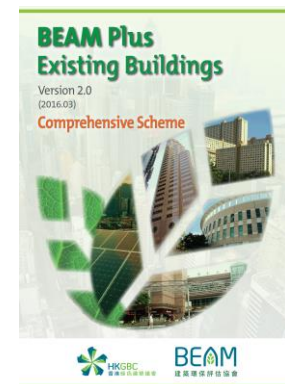
# Introduction

Years of efforts have been done on building energy policies, codes and regulations.



Practices on sustainable building development.

There is still no policy agenda of achieving possible zero carbon for buildings.



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Executive Order 13514

Equilibrium™  
HEALTHY HOUSING  
FOR A HEALTHY ENVIRONMENT

**ZERO CARBON FLUID**

ZERO CARBON HOMES AND NEARLY ZERO ENERGY BUILDINGS

UK Building Regulations and EU Directives

Energy Performance Certificates across Europe

From design to implementation

low carbon finland 2050

VTT clean energy technology strategies for society

Dutch Climate Policy: Local challenges supported by the national government

Sweden's Sixth National Communication on Climate Change

**EISA**  
Energy Independence and Security Act 2007

# The Hong Kong Model

## To Survive or To lead?



Hungary's National Energy Efficiency Action Plan until 2020

Mandatory reporting under Article 34(2) of Directive 2012/27/EU of the European Parliament and of the Council on energy efficiency

MASTER PLAN  
outlook & policies to 2035

January 2014

Klima-Ausweis

EnEV 2020: Energiesparverordnung auf dem Weg zu klimaneutralen Routen

Italy's National Energy Strategy: For a more competitive and sustainable energy

Energy efficiency action plan for France - 2014

Pursuant to article 24 of Directive 2012/27/EU of the European Parliament and of the Council of 25 October 2012 on energy efficiency

Australian Sustainable Energy Zero Carbon Australia Stationary Energy Plan

Japan's Climate Change Policies

Ministry of the Environment, Japan

18th Mar. 2014

# Introduction — Aim

To develop policy scenarios of zero carbon building (ZCB) for the high-rise high-density context of Hong Kong.



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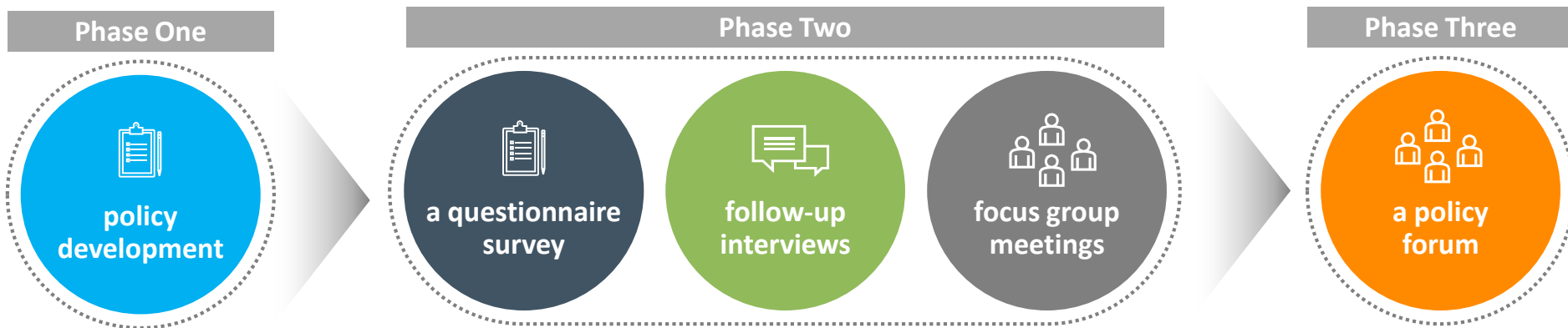


International Co-owners:



# Research Methodology

The research was conducted through the engagement with professionals and stakeholders in Hong Kong over a 15-month period.

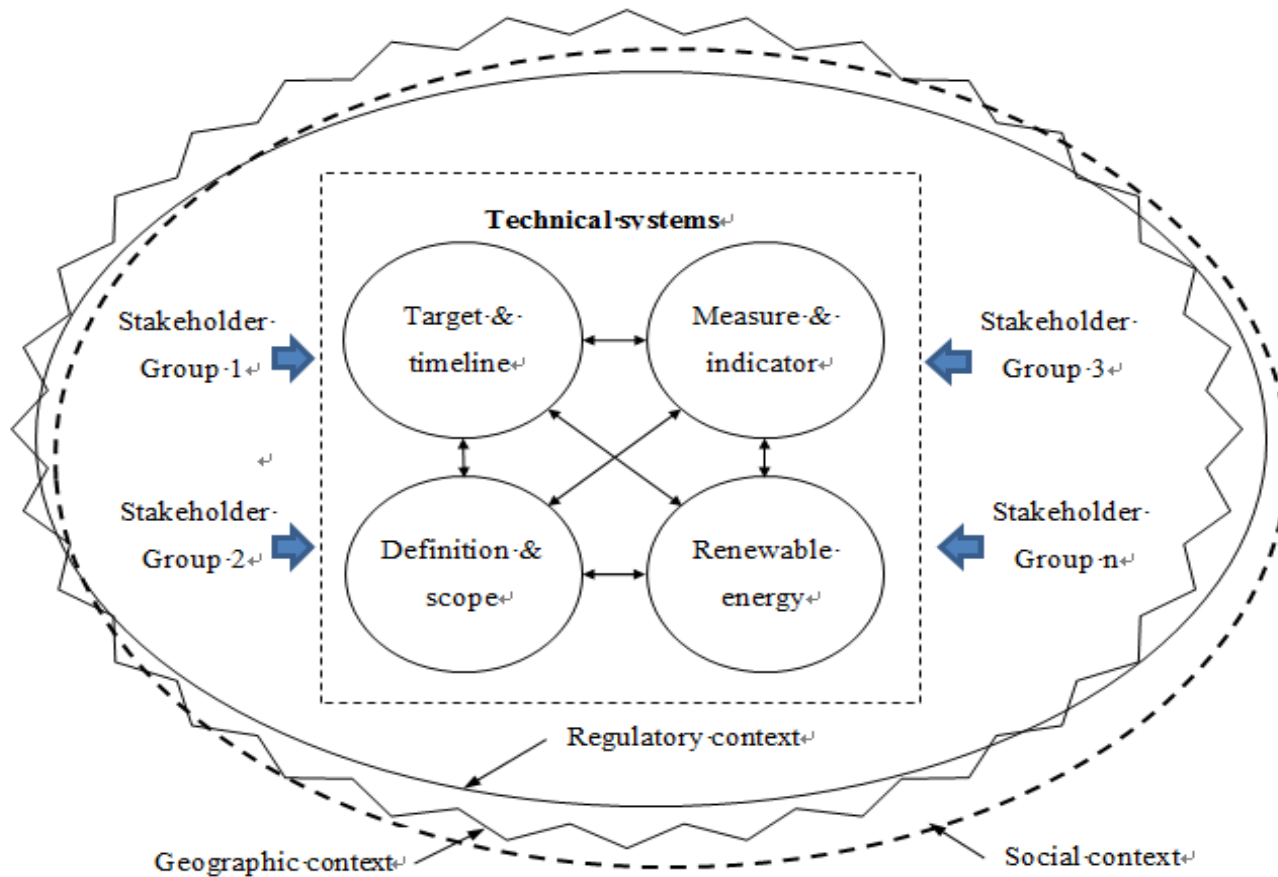


## Study Components and Number of Participants

Items	Questionnaire survey	Follow-up Interviews	Four Focus group meeting	Discussion forum
Number of participants	235	30	105	248

# Results and Analysis

The proposed ZCB policy for Hong Kong has drawn on the **socio-technical systems policy framework**, which highlights a ZCB policy as a complex socio-technical system.



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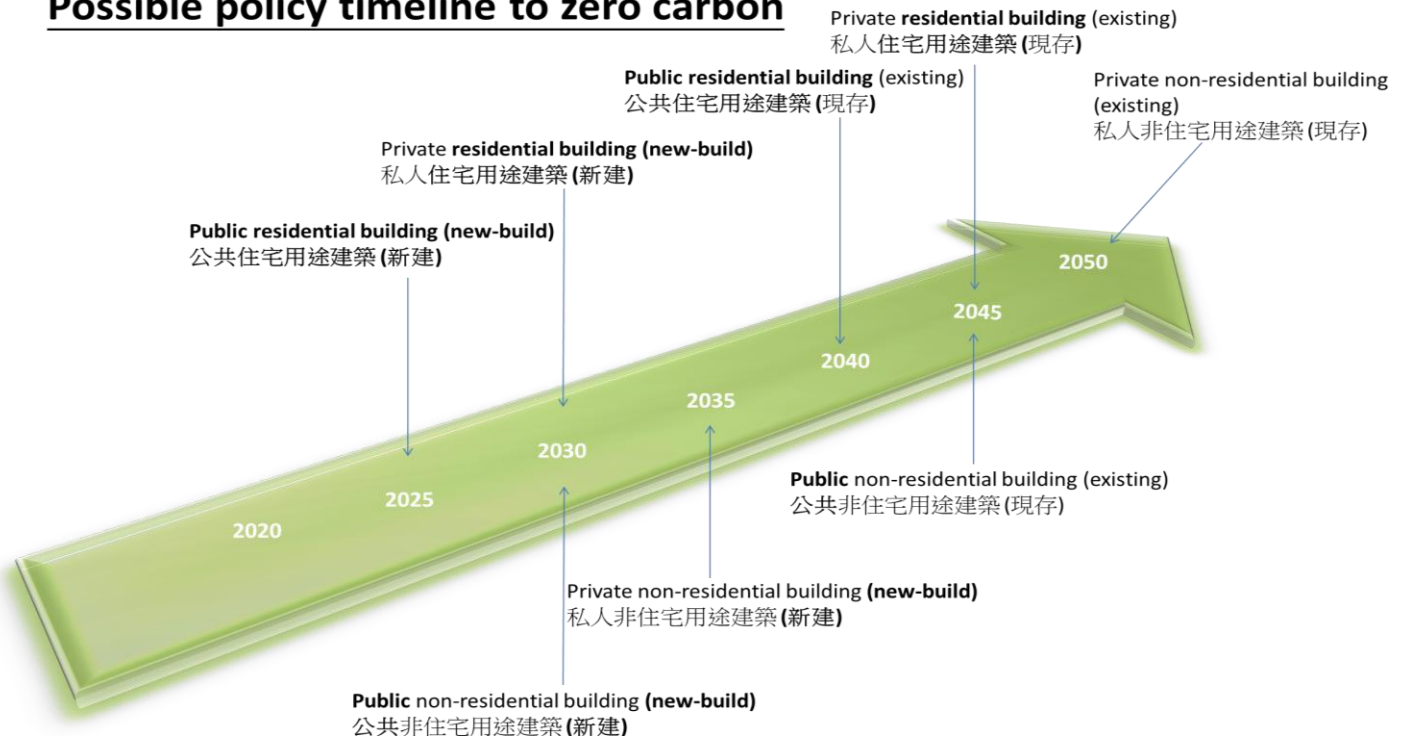
# Results and Analysis — Proposed Policy

## Definition and Scope

The generic definition of a ZCB (or a LCB) is a building within its defined systems boundaries with net-zero (or very low) carbon emissions on an annual basis during the operational stage of the building.

## Target and Timeline

### Possible policy timeline to zero carbon



# Results and Analysis — Proposed Policy

## Measures and indicators

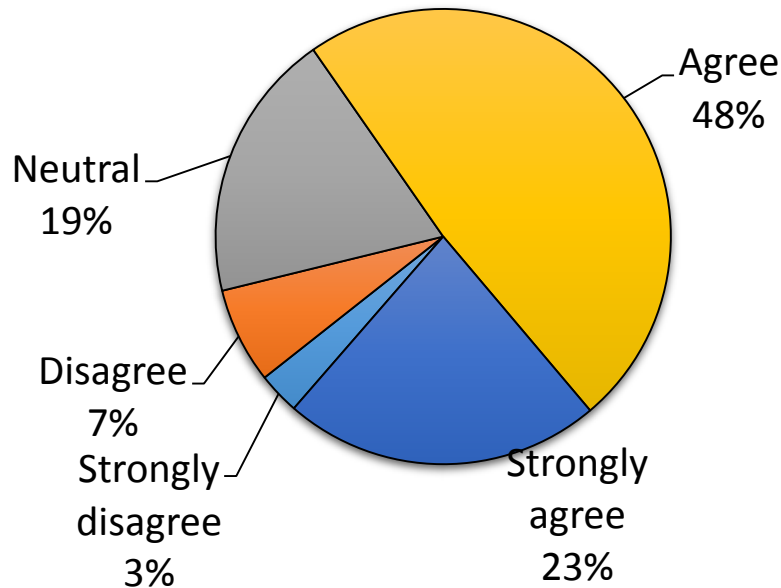
carbon emission intensity (CEI) :  $\text{kgCO}_2\text{e}/\text{m}^2/\text{year}$   
energy use intensity (EUI):  $\text{kWh}/\text{m}^2/\text{year}$

## Use of Renewable Energy

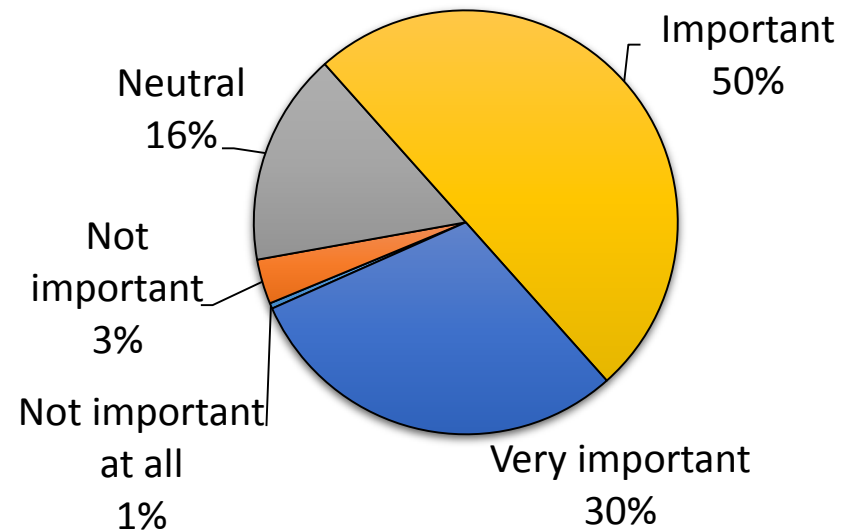
on- or off-site and directly connected with the building  
and/or  
off-site and indirectly connected with the building

# Results and Analysis —— Perceptions

Q: How would you appraise the statement: “Hong Kong is lacking a strategic policy leading to zero carbon”? (n=235)



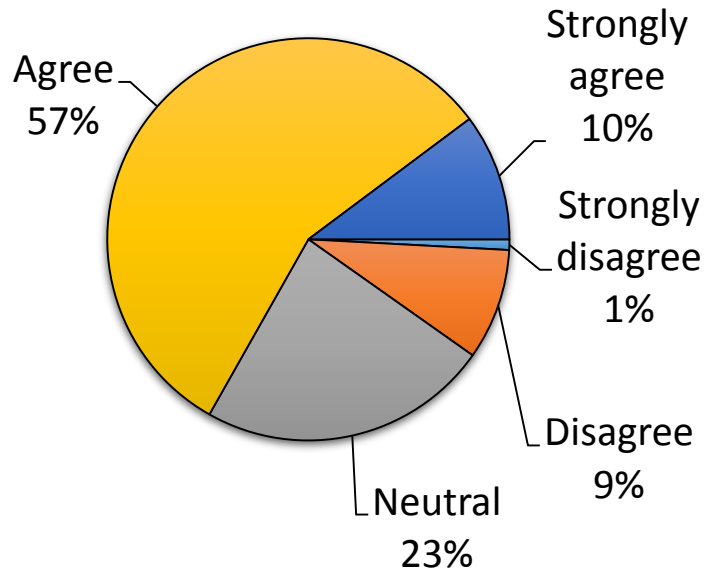
Q: How important do you view the need for a zero carbon building (ZCB) policy for Hong Kong? (n=235)



Interview Q: Why would you think Hong Kong needs, or does not need, a ZCB policy?

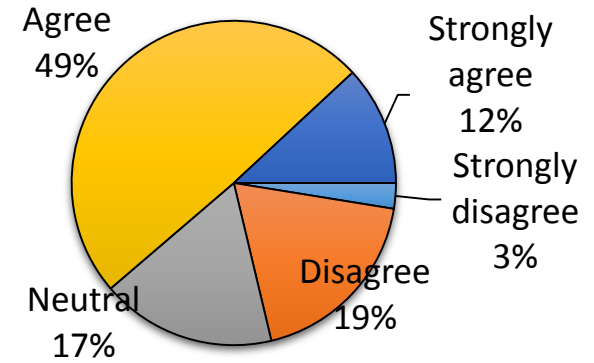
From interview survey, most believe such policy is required, but maintain an uncertain of its feasibility.

# Results and Analysis — Perceptions

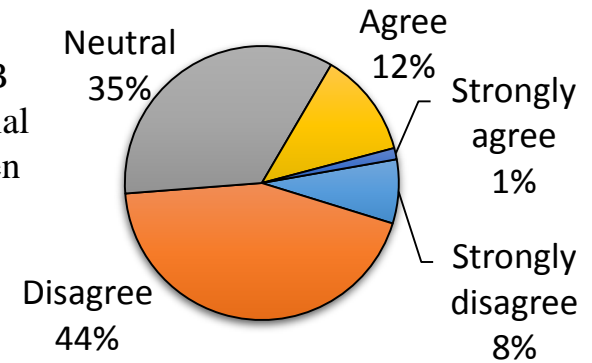


Appraisal of the proposed ZCB definition (n=235)

Appraisal of the ZCB policy target: public buildings first and then private ones (n=235)



Appraisal of the ZCB policy target: residential buildings first and then non-residential ones (n=225)



65% of the questionnaire respondents perceived that implementing the possible ZCB policy in Hong Kong would be difficult.

# Results and Analysis — Opportunities, risks and recommendations

## Opportunities

- ❑ Raising public awareness of sustainable living
- ❑ Promoting strategic urban planning for long-term city development
- ❑ Cutting building energy consumption

## Risks

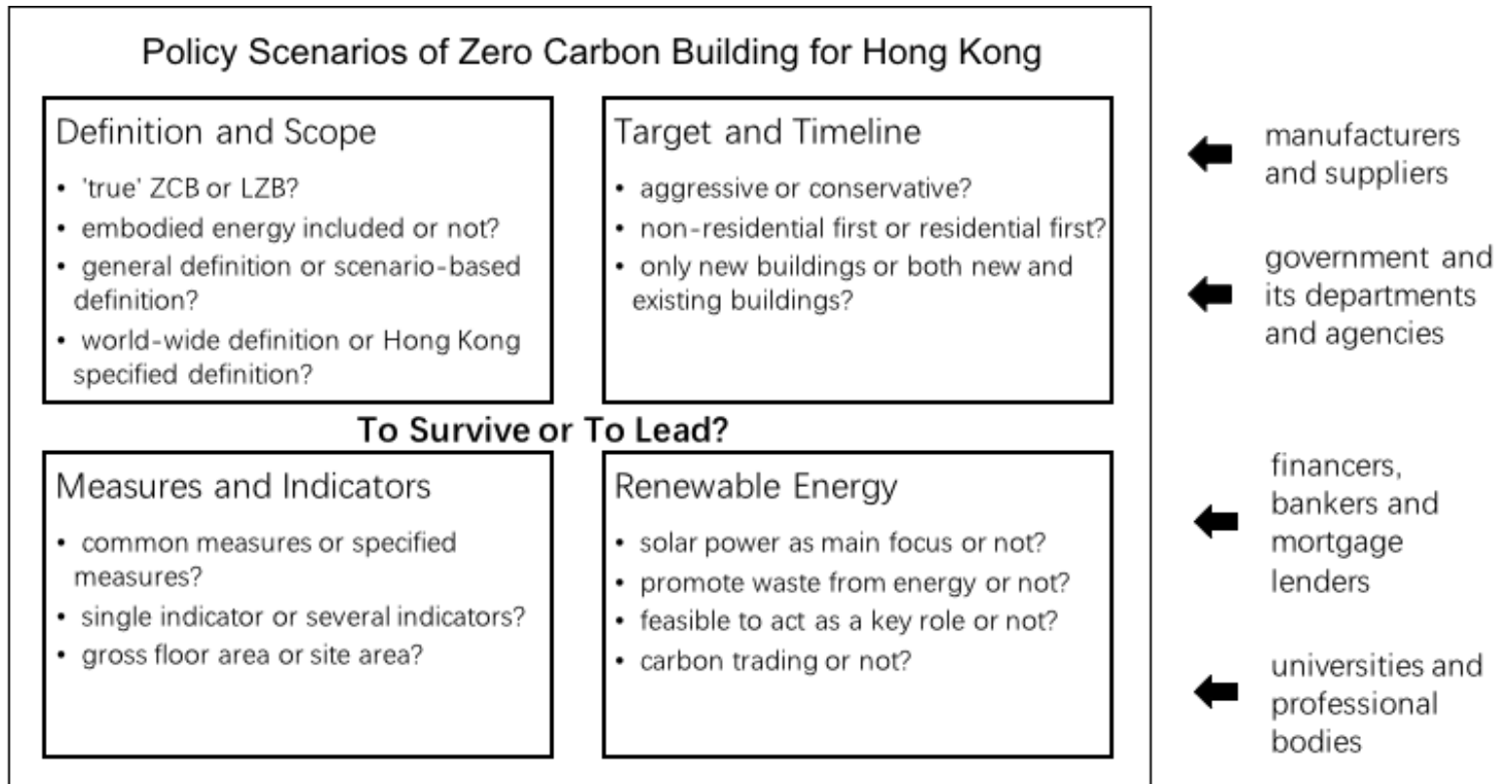
- ❑ Geographical difficulties for domestic renewable energy generation
- ❑ Heavy reliance on fossil fuels
- ❑ Resistance of practitioners to support the policy due to uncertain benefits



## Recommendations

- ❑ The encouragement of energy and carbon reduction through urban planning
- ❑ The demonstration of life cycle economies and cost benefits of ZCB
- ❑ Setting zero carbon/energy targets in public project procurement

# Discussion



Debate on details of policy scenarios of ZCB for Hong Kong

# Conclusions

- ❑ Possible ZCB Policy for Hong Kong as a socio-technical system is proposed.
- ❑ A L/ZCB policy is widely recognized as a necessity for Hong Kong.
- ❑ Debates are analysed on details of policy scenarios of ZCB for Hong Kong.
- ❑ Strengthening the partnership between different stakeholders is crucial.



# Acknowledgements

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Pursuing Progress and Profits for Sustainability



# Thank you



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