

# A FINANCING MODEL FOR RETROFITTING BUILDINGS

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THE HONG KONG  
UNIVERSITY OF SCIENCE  
AND TECHNOLOGY



Green Finance  
Research Project



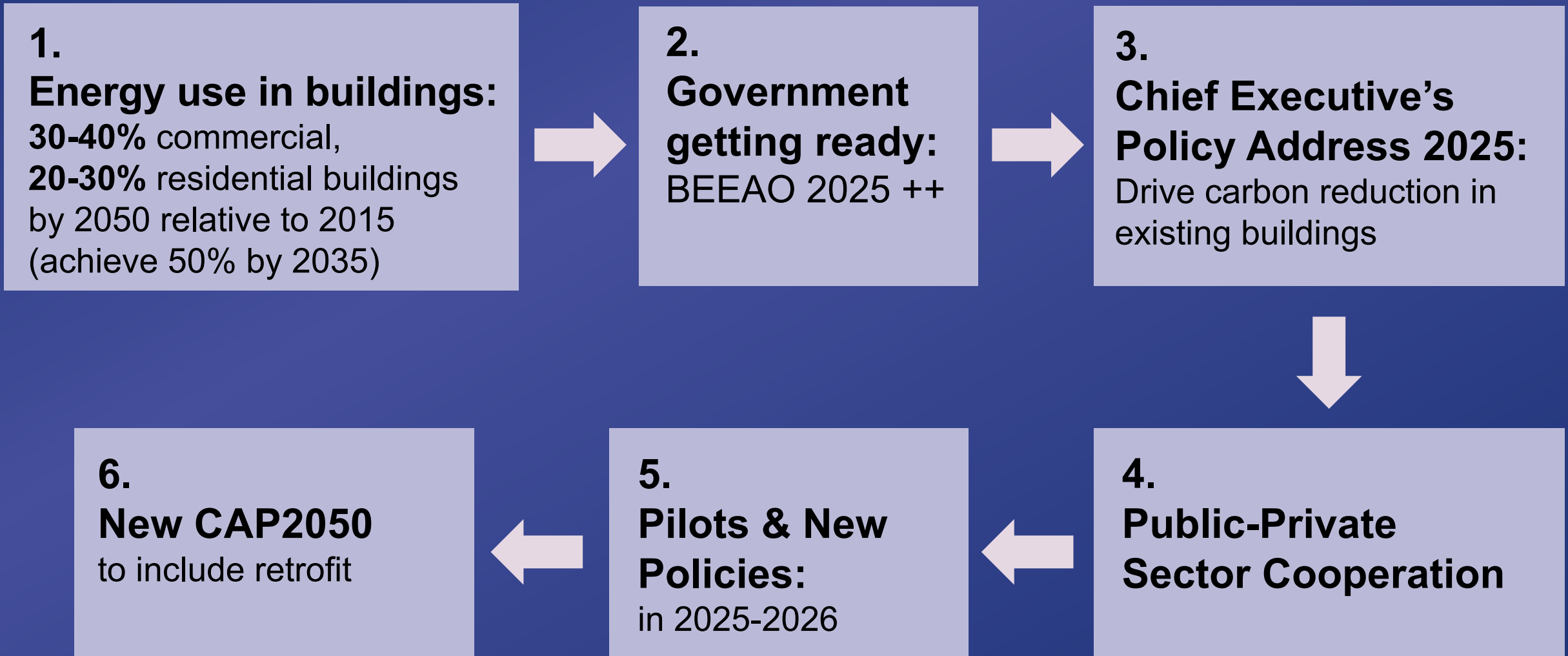


# 1 WHY RETROFIT MATTERS

1. Buildings: 90% of electricity use and 50% of carbon emissions.
2. Most of today's stock will still stand in 2050.
3. Retrofitting achieves carbon neutrality, control energy costs, and sustain competitiveness.
4. Stronger retrofit ecosystem will deliver climate, economic, and social resilience.

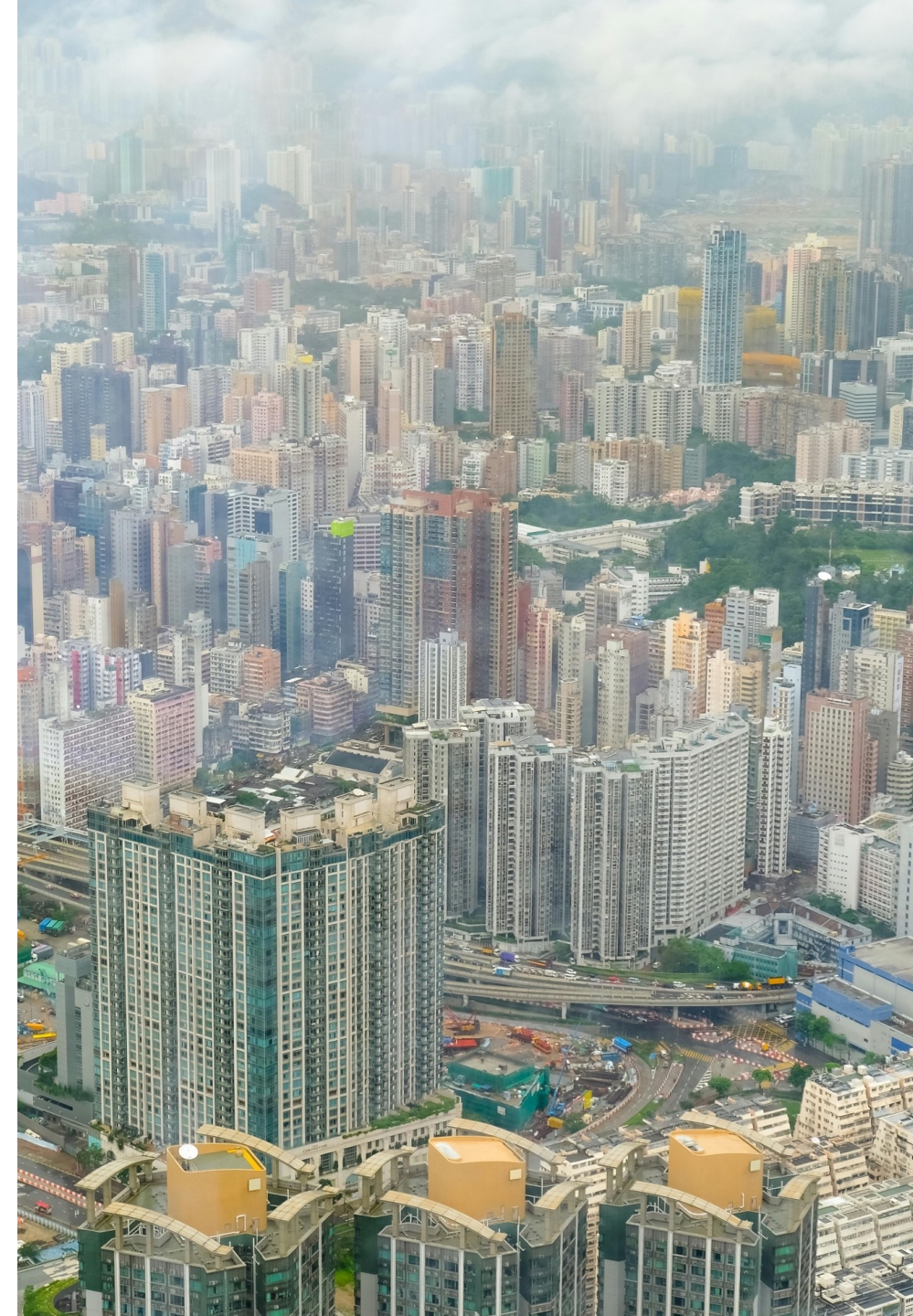


## 2 POLICY CONTEXT

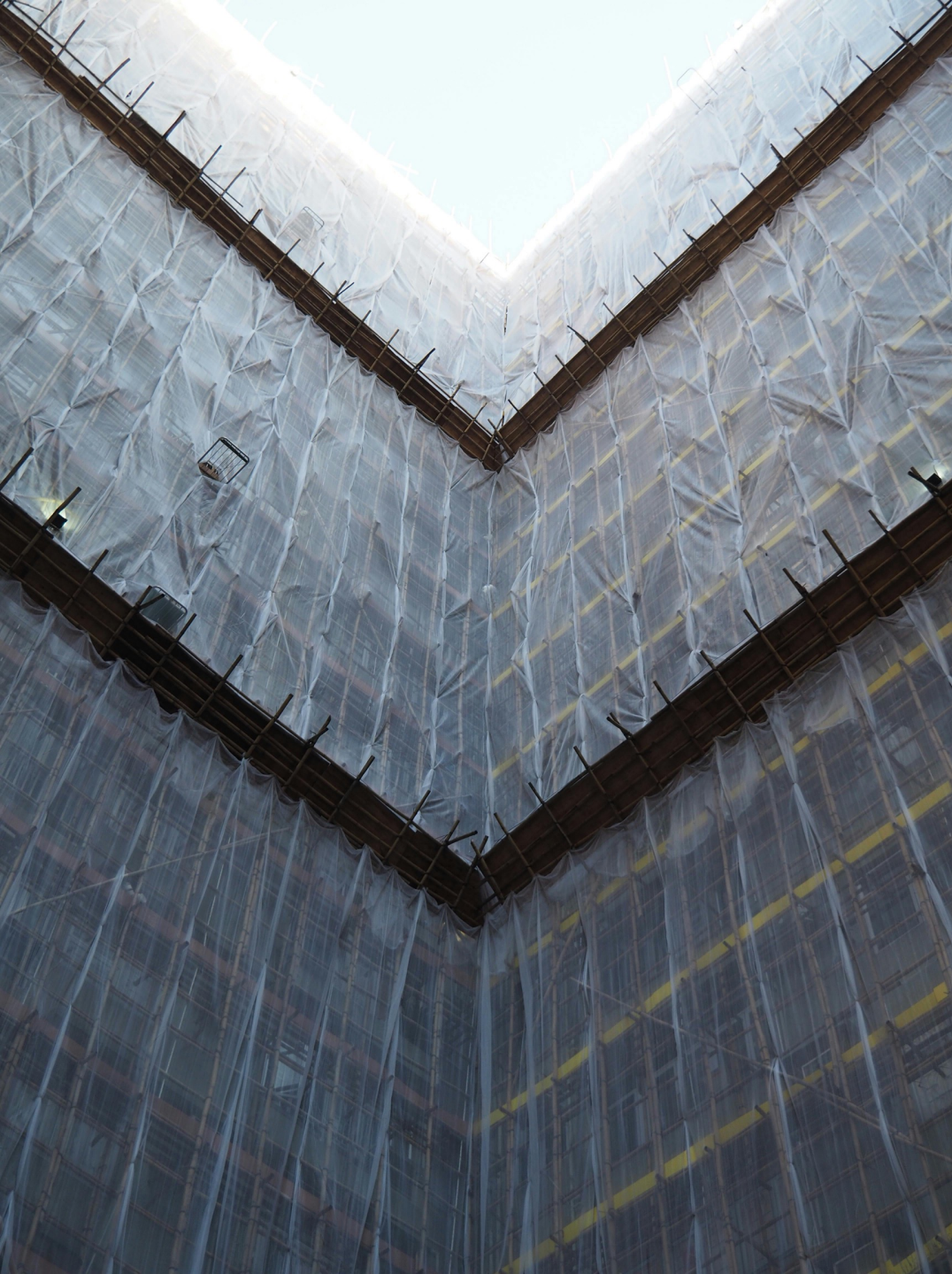


# 3 TRANSITION CHALLENGE

1. Technology is not the barrier – proven solutions exist.
2. Obstacles lie in **FINANCE**, **GOVERNANCE**, and **MARKET** design.
3. Challenges include fragmented ownership, upfront capex, and energy performance.





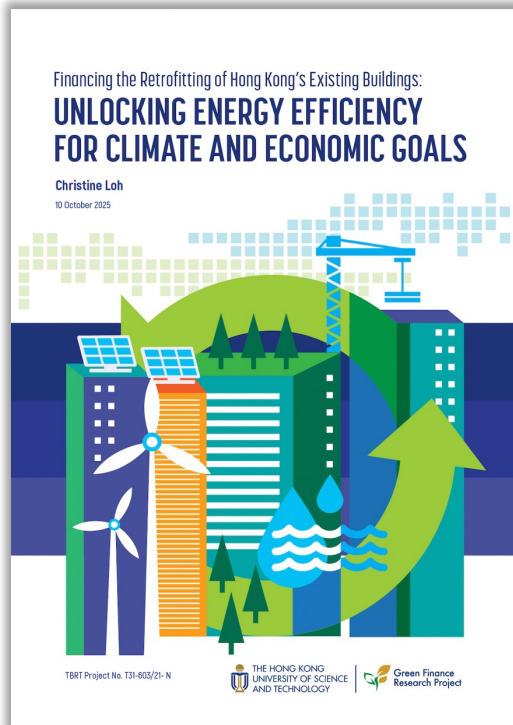


## 4 **SCALE OF OPPORTUNITY**

1. **Many studies converge:**  
large retrofit potential.
2. **Estimation modelling:**  
HK\$ >3 billion for office buildings.
3. **Economic opportunity:**  
Retrofit benefits multiple stakeholders.
4. **Government's role:**  
Public sector could kick-start market,  
upgrade assets, create jobs & improve well-being.



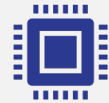
# 5 KEY POLICY FOCUS



Adopt PBC – a model that shares costs, risks & benefits of the low-carbon transition.



Do pilots – use public sector buildings & infrastructure to stimulate market.



Establish *Retrofit Finance Platform* – possibly use HKMA's CDI and EMSD's audit information.

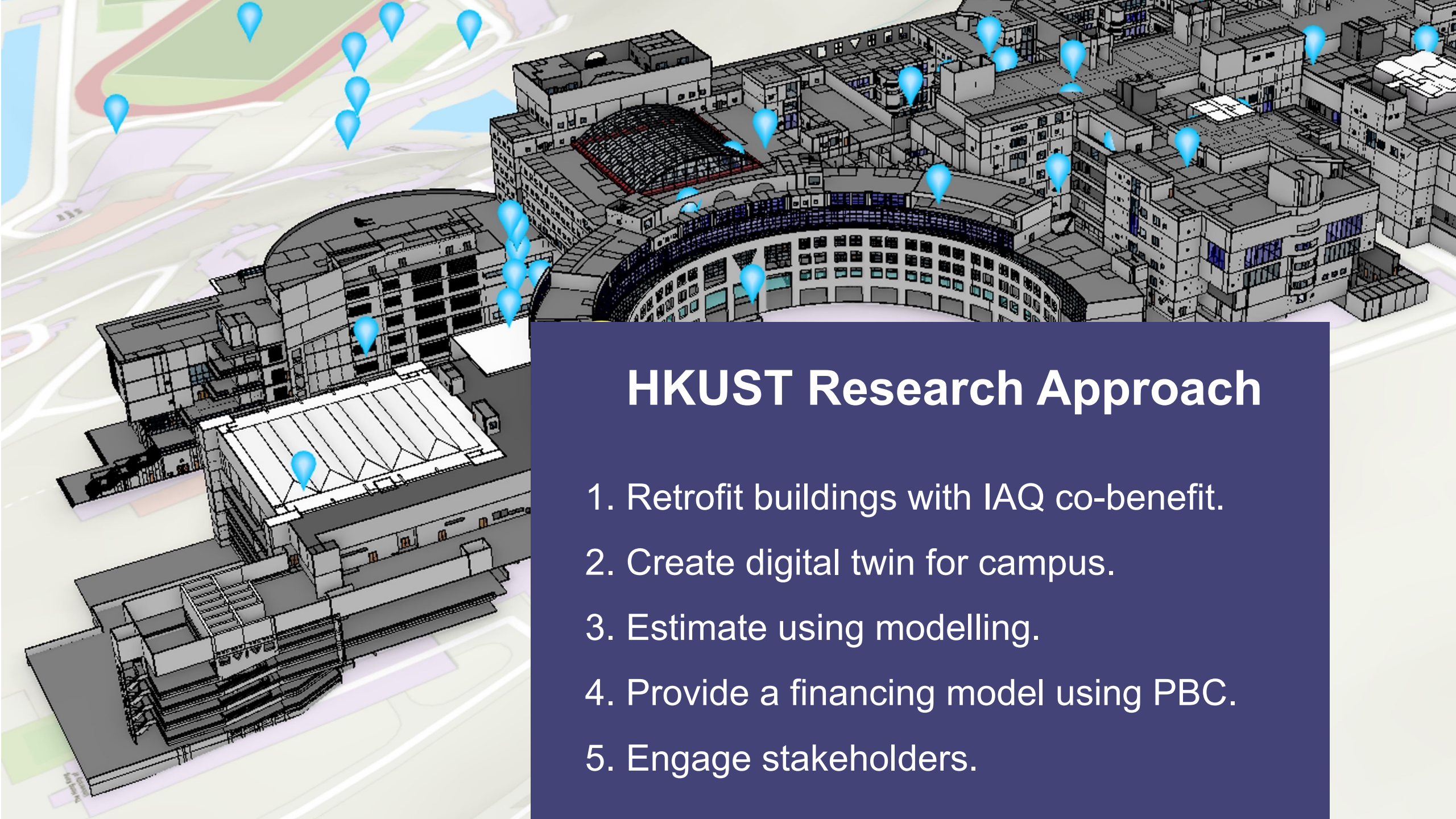


Consider policy to de-risk private investment e.g., guarantees, revolving funds etc.



Build trust – through raising awareness; promote standard contract terms, and transparency.





## HKUST Research Approach

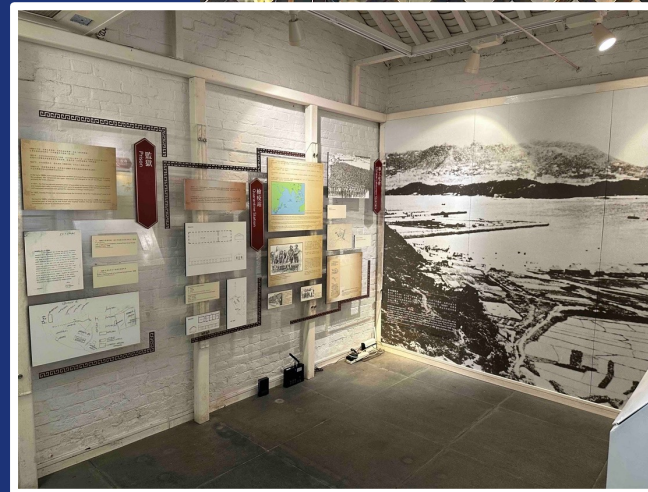
1. Retrofit buildings with IAQ co-benefit.
2. Create digital twin for campus.
3. Estimate using modelling.
4. Provide a financing model using PBC.
5. Engage stakeholders.



# RETROFIT & IAQ CO-BENEFIT EXAMPLE

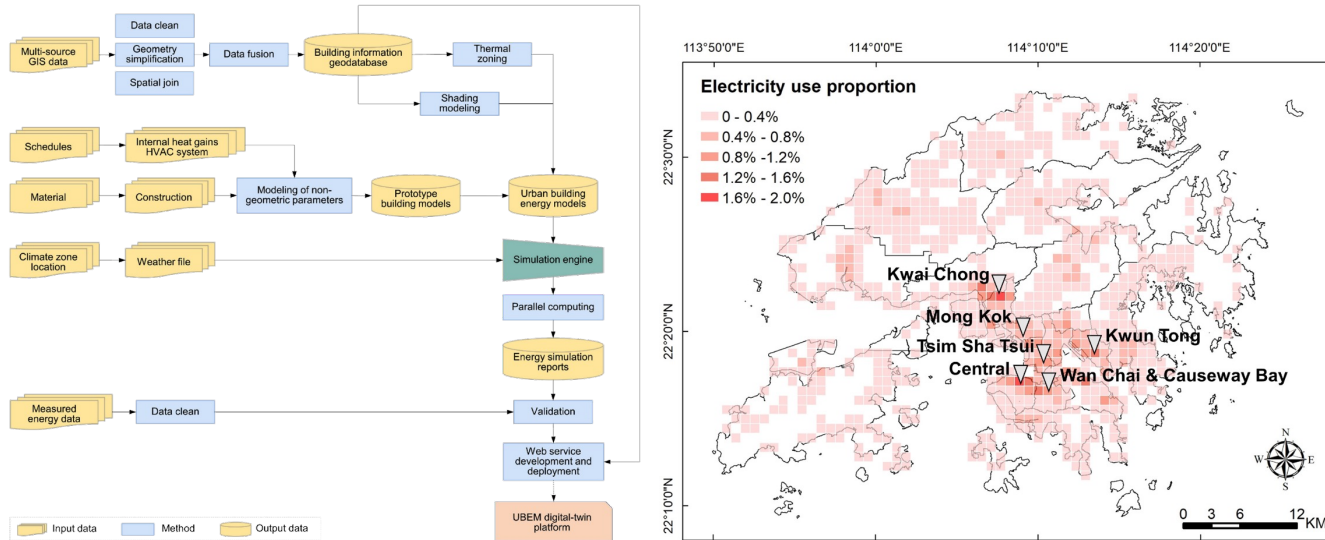
## Case Study – Jao Tsung I Academy (Exhibition Hall)

- Reduced relative humidity by 25%; maintained at 65%.
- IAQ met local & international standards.
- ~30% electricity savings with 2-year payback.





# ENGINEERING & DATA RESEARCH



## (a) Baseline modelling with GeoBEM

Developed first of its kind urban scale building energy models for Hong Kong, able to simulate more than 190,000 buildings.

## (b) Retrofit and financial potential analysis for buildings in Hong Kong:

- Lighting and chiller retrofits; highly cost-effective.
- PV retrofits offered moderate returns with substantial potential under relaxed IRR thresholds.
- Façade and window retrofits also assessed.





# WORKING WITH STAKEHOLDERS



Great Eagle Centre Visit in Aug 2023



TAL Building Visit in Aug 2023



Meeting with DEVB in July 2024



Visit to JTIA in July 2024



French Consortium's Visit to UST in May 2025



Team France MOU Signing Ceremony in Sept 2025





**French Team of Contractors visited HKUST  
several times to assess retrofitting buildings  
with intention of signing an MOU  
using PBC/EPC method**



# HKUST & HKSAR GOVERNMENT DIALOGUE



HKUST had multiple meetings with HKSAR Government



香港特区

# 行政长官 2025年 施政报告



## CHIEF EXECUTIVE POLICY ADDRESS 2025

HKSAR Government will be  
“driving the market to  
accelerate carbon reduction  
in existing buildings”.

# SUMMARY

## A FINANCIAL MODEL THAT CAN SCALE RETROFITS

- PBC/EPC + Variants share risks and benefits.
- Government policy could de-risk private sector capital & scale retrofits.
- Retrofit has positive economic and social outcomes.
- Cooperate across government, built environment & finance.



# SUMMARY

## ONE PROJECT, TWO PURPOSES

- Retrofit one or more buildings on campus as Demonstration of the PBC model



- Using Demonstrations to help create a Retrofit Market in Hong Kong



- Cooperate to support retrofits through promotion and collaboration, including in finance