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# Auf in neue Märkte!

## Exportinitiative Energie

Dr. Jimmy Tong, 27. Juni 2017  
Baden-Baden



**Building Sustainability: Drivers and Trends for  
Energy Efficiency in Hong Kong's Green Buildings**



We are able to tackle the most challenging projects



and we have been delivering iconic design for over 60 years





so we are free to think differently





we shape a better world

We are a global firm of engineers, designers, planners and business consultants providing total design, planning, engineering and business solutions



Established in 1946  
Over 11,000 people  
Operating in more than 90 offices  
Across five regions  
18 businesses

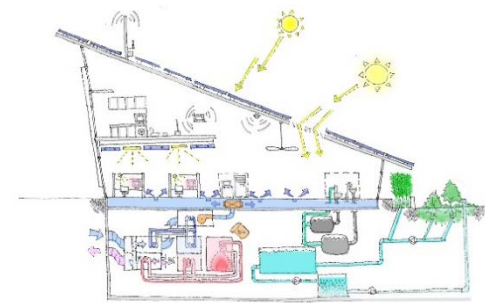
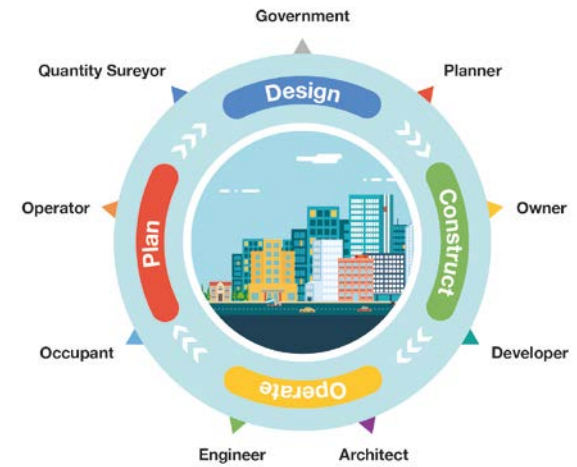
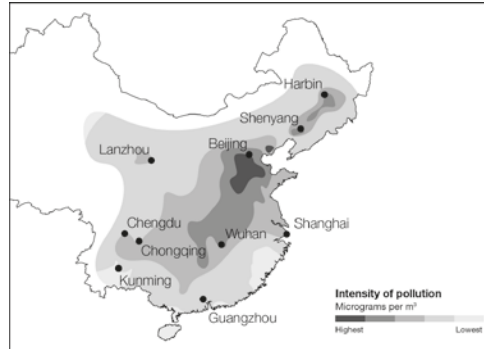
# Building Sustainability in East Asia

Policy, Design and People



Vincent S. Cheng and Jimmy C. Tong

WILEY Blackwell



Citation:

Cheng, V.S.Y., Tong, J.C.K. (2017). Building Sustainability in East Asia. Policy, Design and People. Wiley Blackwell, London.





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# On contexts





# Why Sustainability Matters



# Global Agreement on Climate Change



In Dec 2015, **193** countries signed at COP21 Paris

In Apr 2016, **175** countries rectified at UN

Government agreed:

- **100 billion dollar** scheme
- Avoid dangerous climate change by limiting global warming to well below **2°C**.
- Set more ambitious reductions **targets** every 5 years.

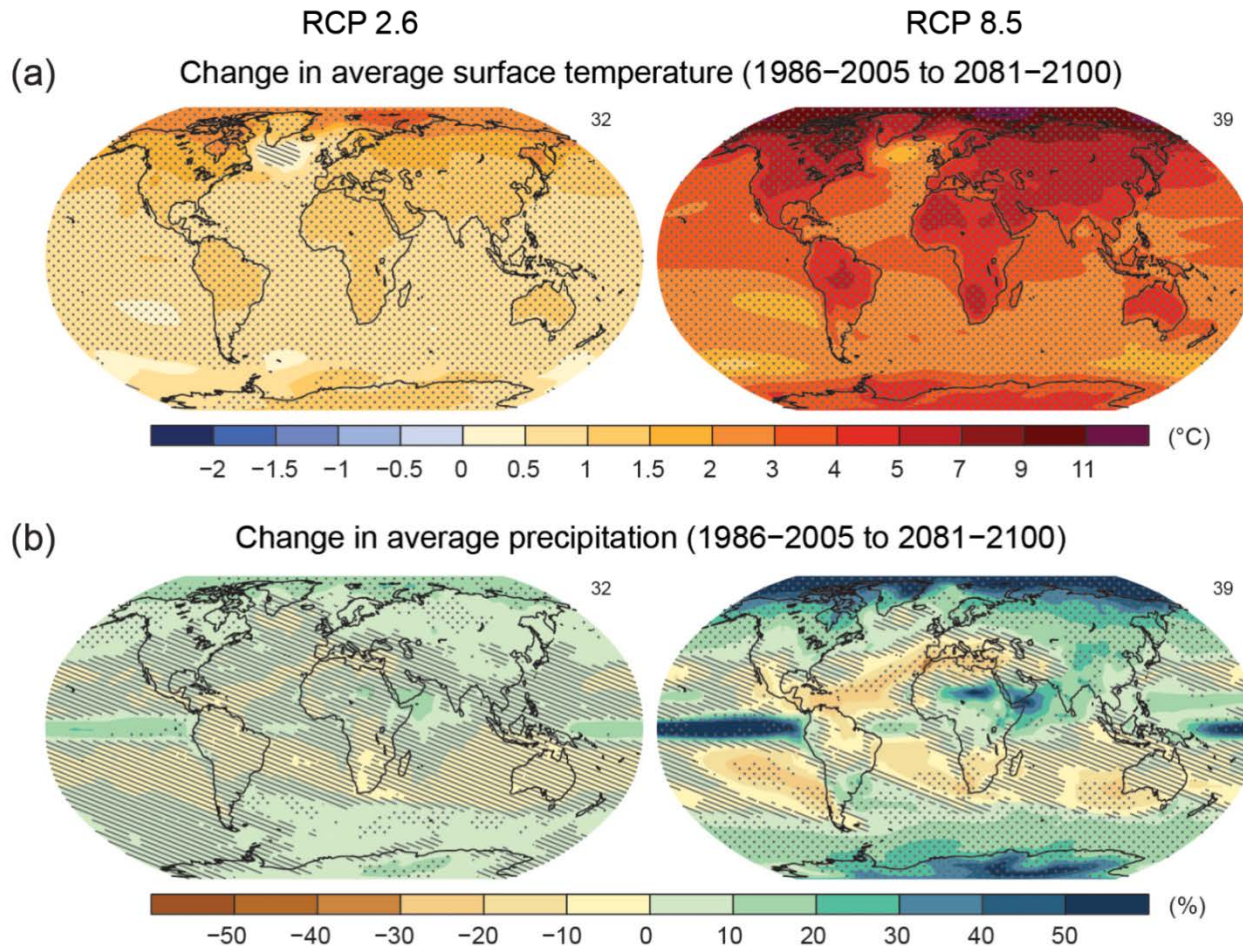


In Dec 2015, **C40 Forum** at COP21 Paris





# Climate Extreme



**More Extreme**  

Hotter  Hotter

Colder  Colder



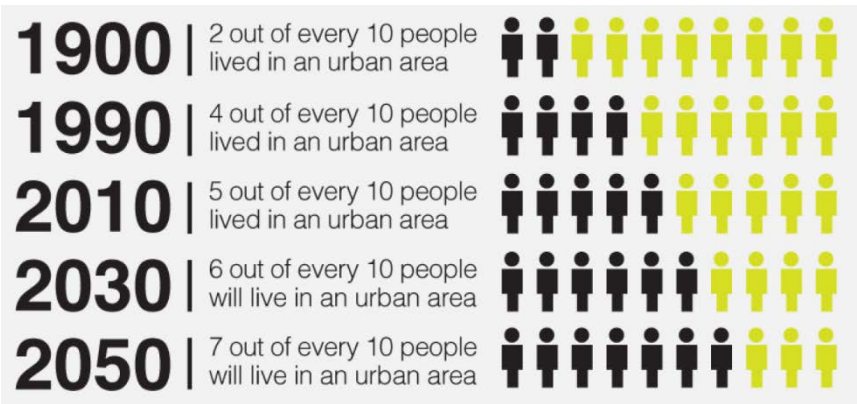
Drier  Drier

Wetter  Wetter

Source: Figure SPM.8a,b, Climate Change 2014: Mitigation of Climate Change, April 2014, Intergovernmental Panel on Climate Change.

# Urban Challenges

Scale	Challenges	Typical Issues	Causes
Global	Climate Change	CO2 Emission, Global Warming; Extreme Weathers	Mass-consumption Lifestyles
City / Regional	Environmental Degradation	Air, Water and Waster Pollutions; Energy and Resource Security	Rapid Urbanization
City / Local	Liveability Deterioration	Urban Heat Island; Urban Form	Urban Planning



Defined by UN HABITAT as a city with a population of more than 10 million

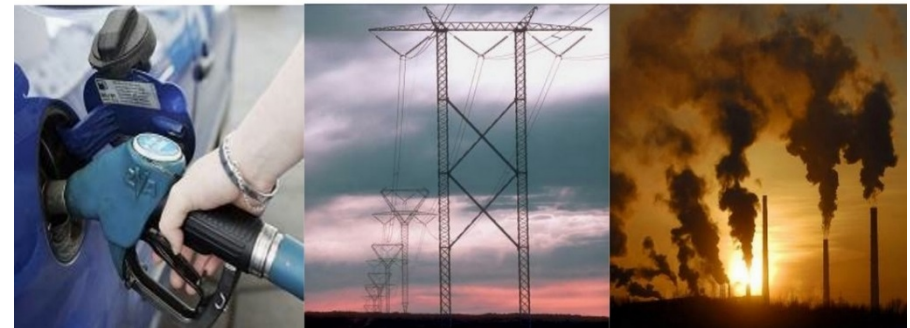
Energy Consumption % increased between 2000-2010

**195%**  
Oil consumption

**340%**  
Electricity consumption

**240%**  
CO2 Emission

\* Electricity consumption increased by 135% in 2012 compared to that in 2010





# Why East Asia Matters

Billion





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# Total Tonnes of CO<sub>2</sub> Emissions (Bn)

Energy Information Administration

Tons CO<sub>2</sub> Emissions (Bn)

12

CHINA

10

U.S.A.

8

6

EUROPE

4

2

0

1980

1990

2000

2010

2020

2030



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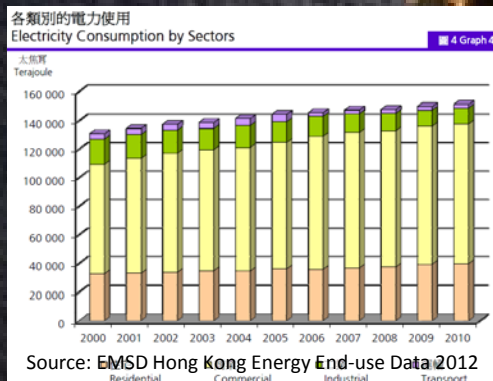
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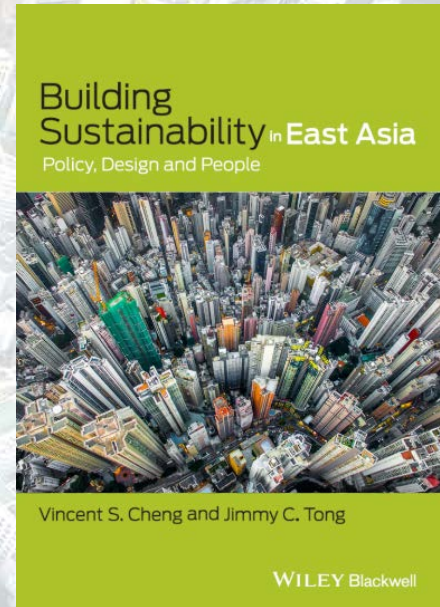
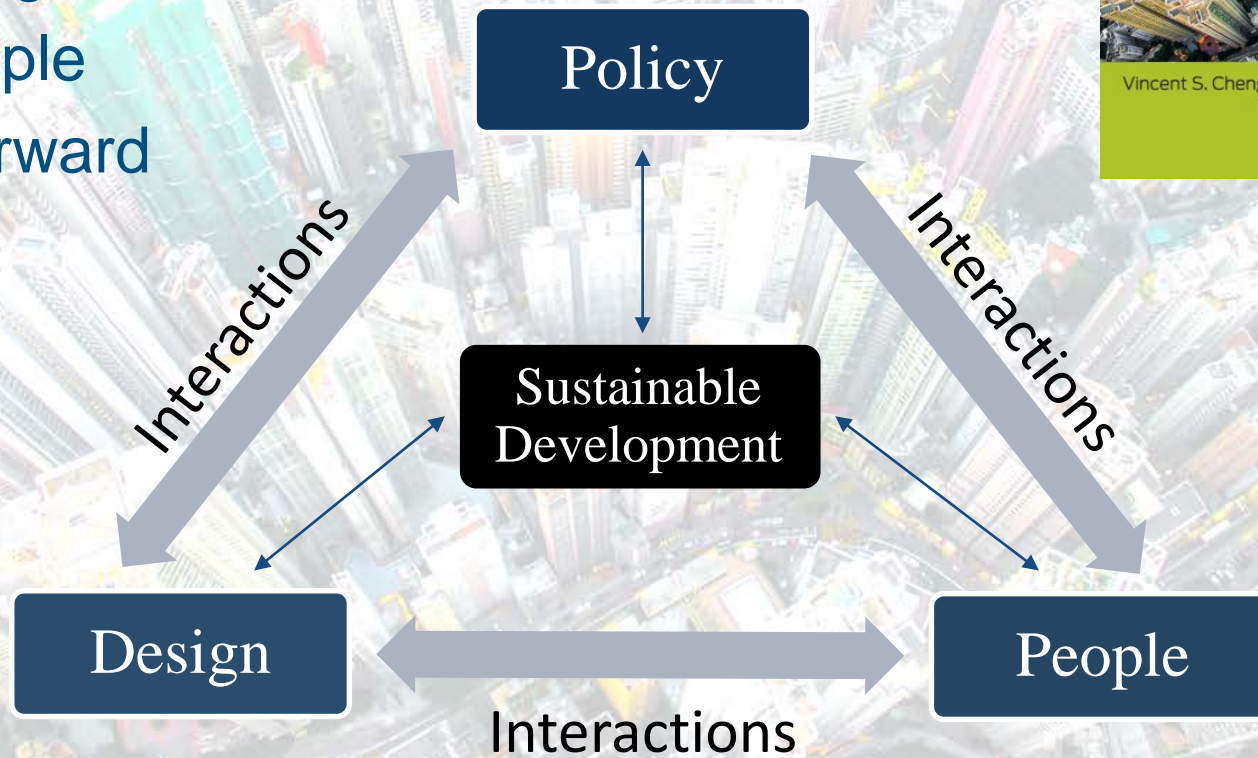


# Why Buildings Matter



# Quest for Solutions

- On contexts
- On policy
- On design
- On people
- Way forward







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# On policy



# Local Initiatives for Decarbonization



2017 January



A large quantity of ageing building stock



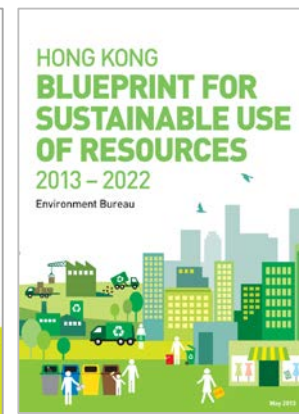
Innovation and technology and enabling education to increase productivity



Readiness for climate change



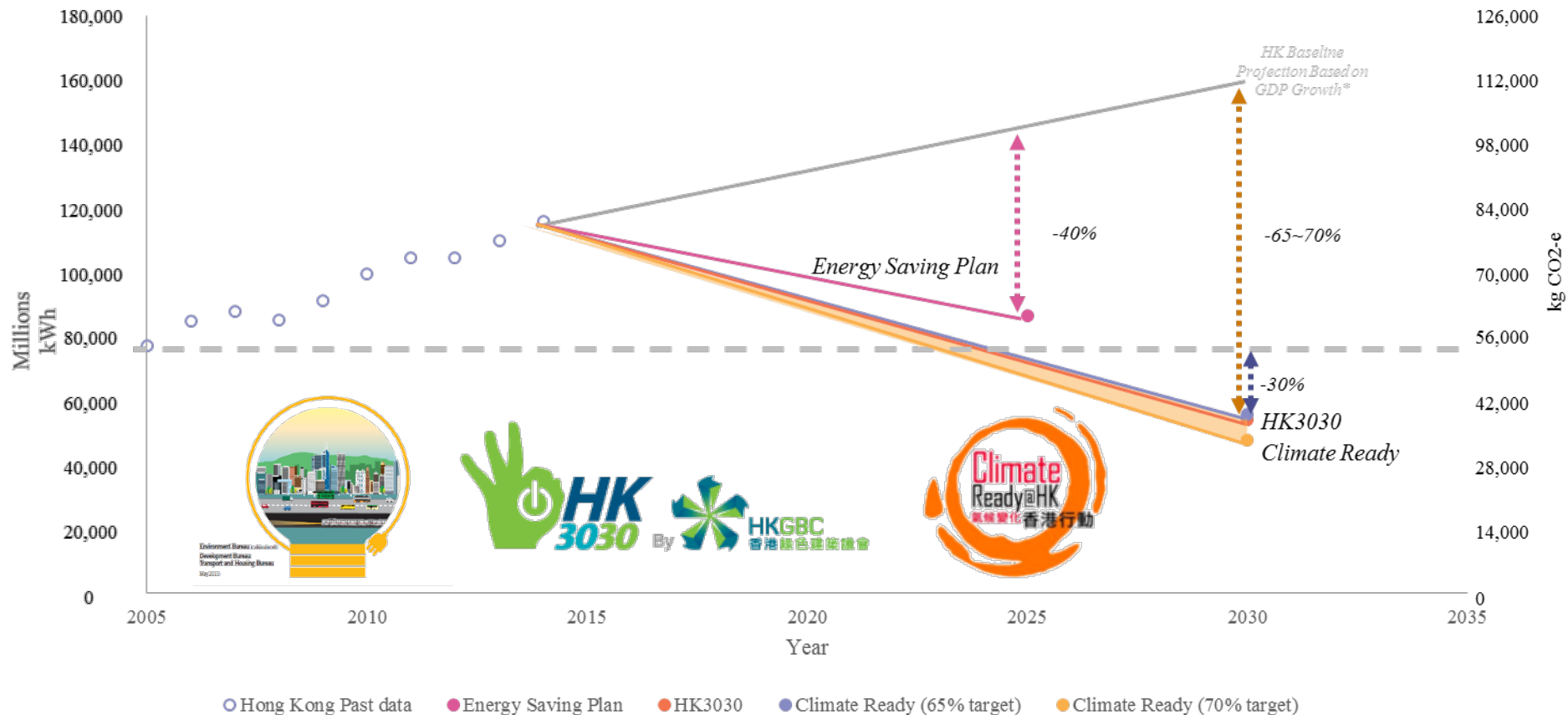
Keen competition in the global and regional economy



HK Gov actions plan from Environment Bureau and Departments



# Hong Kong Energy Reduction Projection

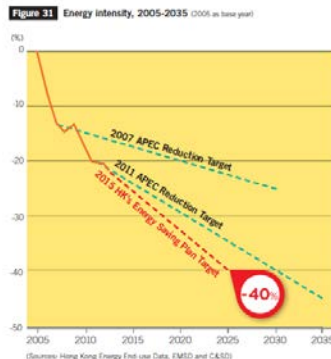
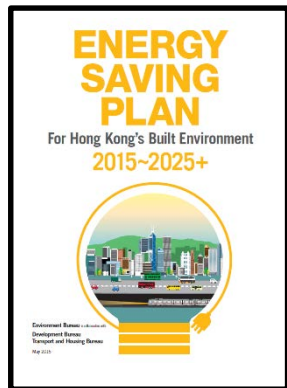


# Hong Kong Contexts



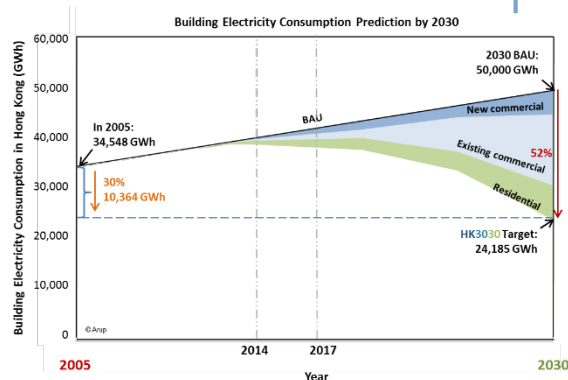
ENERGY SAVING PLAN For Hong Kong's Built Environment 2015-2025+ is a top down master plan to lead the society for a greener future.

**Target:** -40% in energy intensity; BEAM Plus Gold for Government Buildings and Public Housing



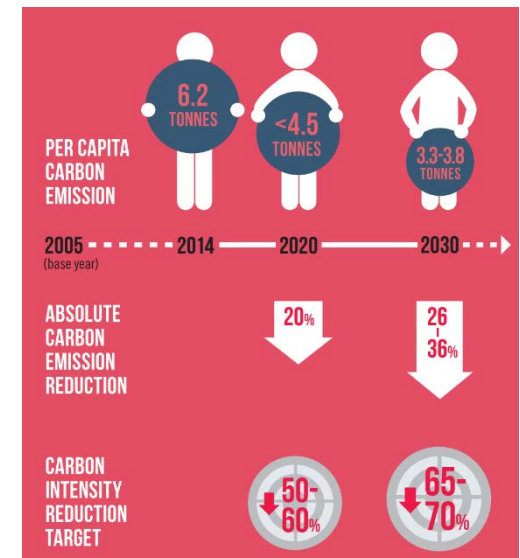
Buildings take up over 90% of electricity consumption in Hong Kong and account for 60% of the GHG emitted citywide. HKGBC has launched the HK3030 Campaign, an initiative to focus and coordinate the demand-side management approach to electricity consumption

**Target:** -30% absolute from 2005 level, Equivalent to 52% reduction from Business as Usual Scenario



CLIMATE READY, Hong Kong Climate Action Plan 2030+ published by the Environment Bureau is an action plan that respond to the Paris Agreement

**Target:** reduce the carbon intensity by 65% to 70% using 2005 as the base.





# Actions on Existing Buildings

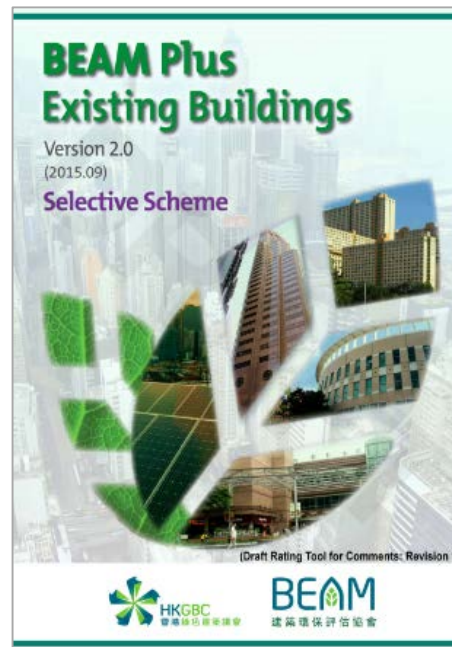
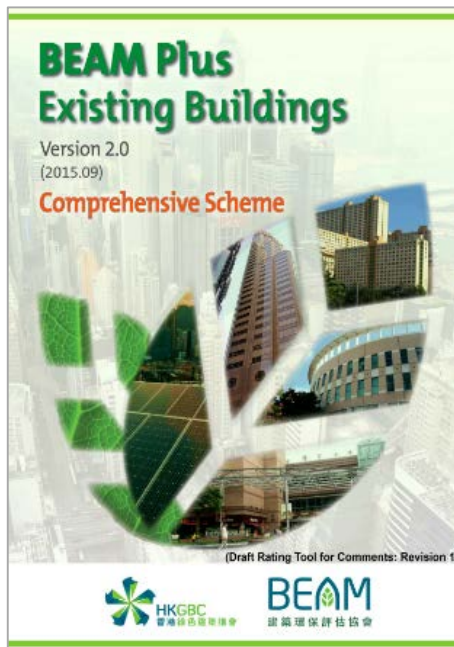
## Importance of enhancing

- EMSD Energy Auditing 2015
- HKGBC BESTCOM
- BEAM Plus EB
- Retro-Commissioning and Enhanced Energy Management

### Code of Practice for Building Energy Audit



EMSD



EMSD



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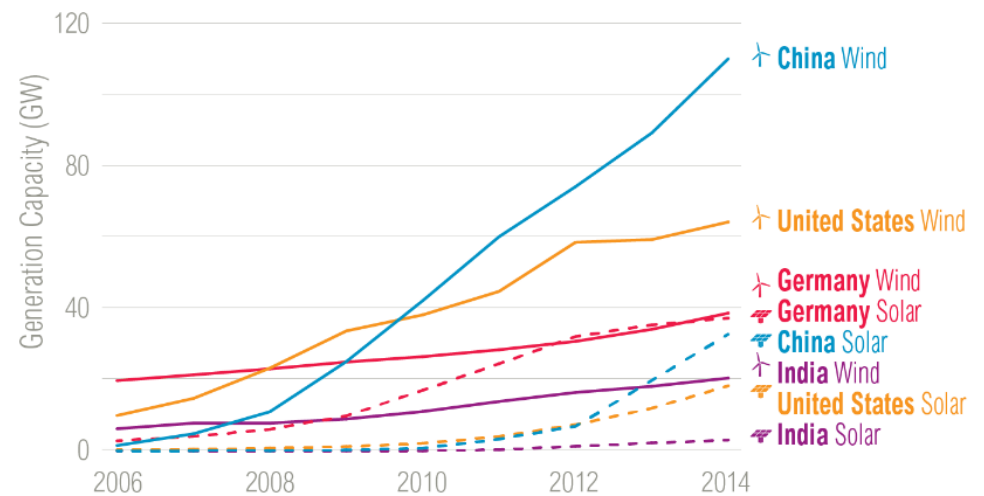
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# On design



# Opportunity

## Renewable Energy Growth in Major Economies



Source: Bloomberg New Energy Finance;

FIND OUT MORE AT: [www.chinafaqs.org](http://www.chinafaqs.org)

 WORLD RESOURCES INSTITUTE



# Zero Carbon



Project: CIC ZCB



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# Innovations

## High-performance Envelope: Solar PV



Project: Hanwha Headquarters Building, Korea



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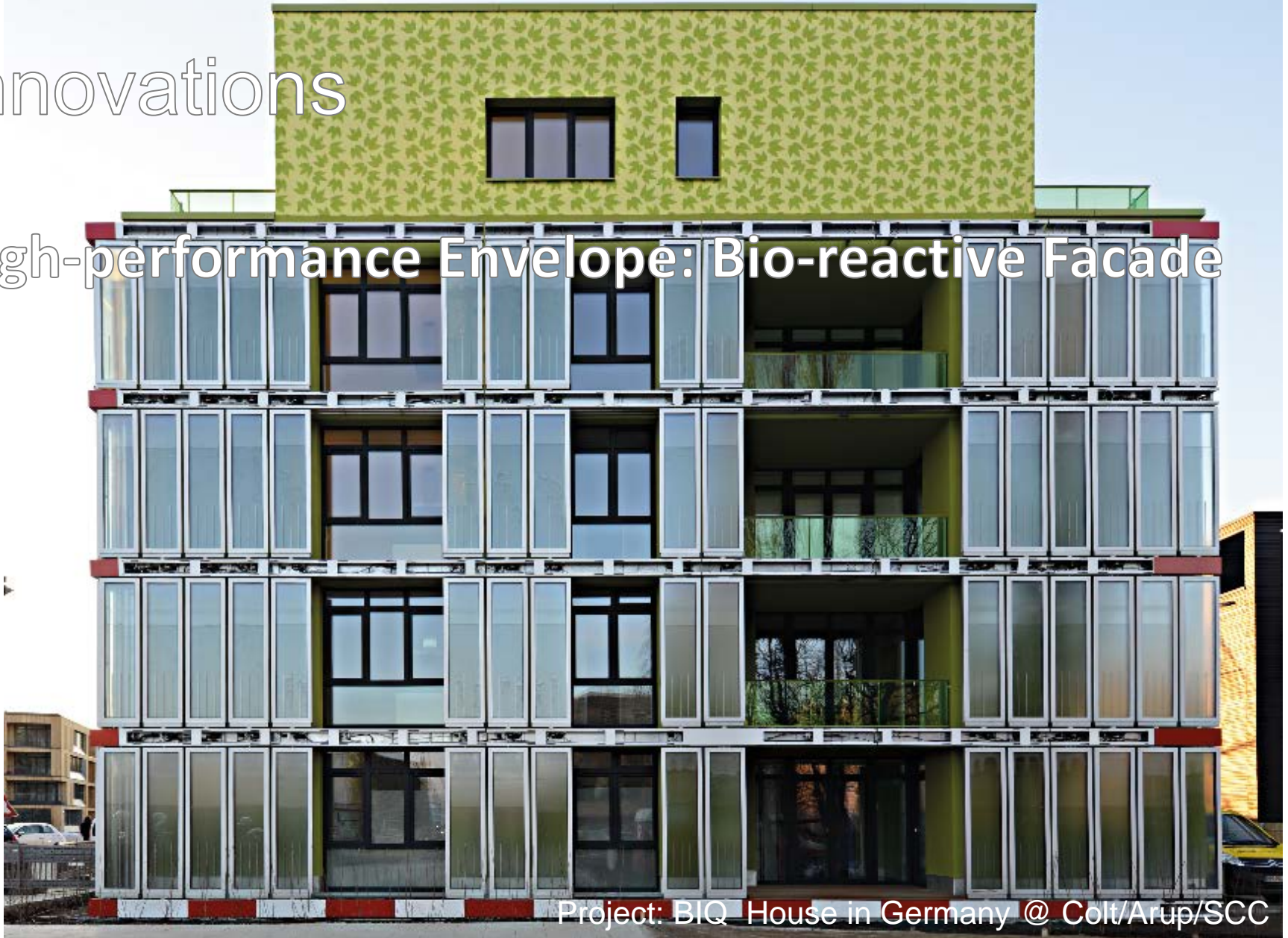
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# Innovations

## High-performance Envelope: Bio-reactive Facade



Project: BIQ House in Germany @ Colt/Arup/SCC



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# Innovations

- Eco-shelter
- Green accomplishments
- Anti-quake designs
- Fire protection
- Green pyramid



Project: Parkview Green



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# On people





# Liveable space



Hong Kong



Singapore



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# Liveable space



Project: South Beach, Singapore



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# Community Making



Project: NWD Green Atrium at Park Signature



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# LOHAS Lifestyle

- Health
- Wellness
- Sustainability



Project: Huilanwan Sunrise Village @ TIDC



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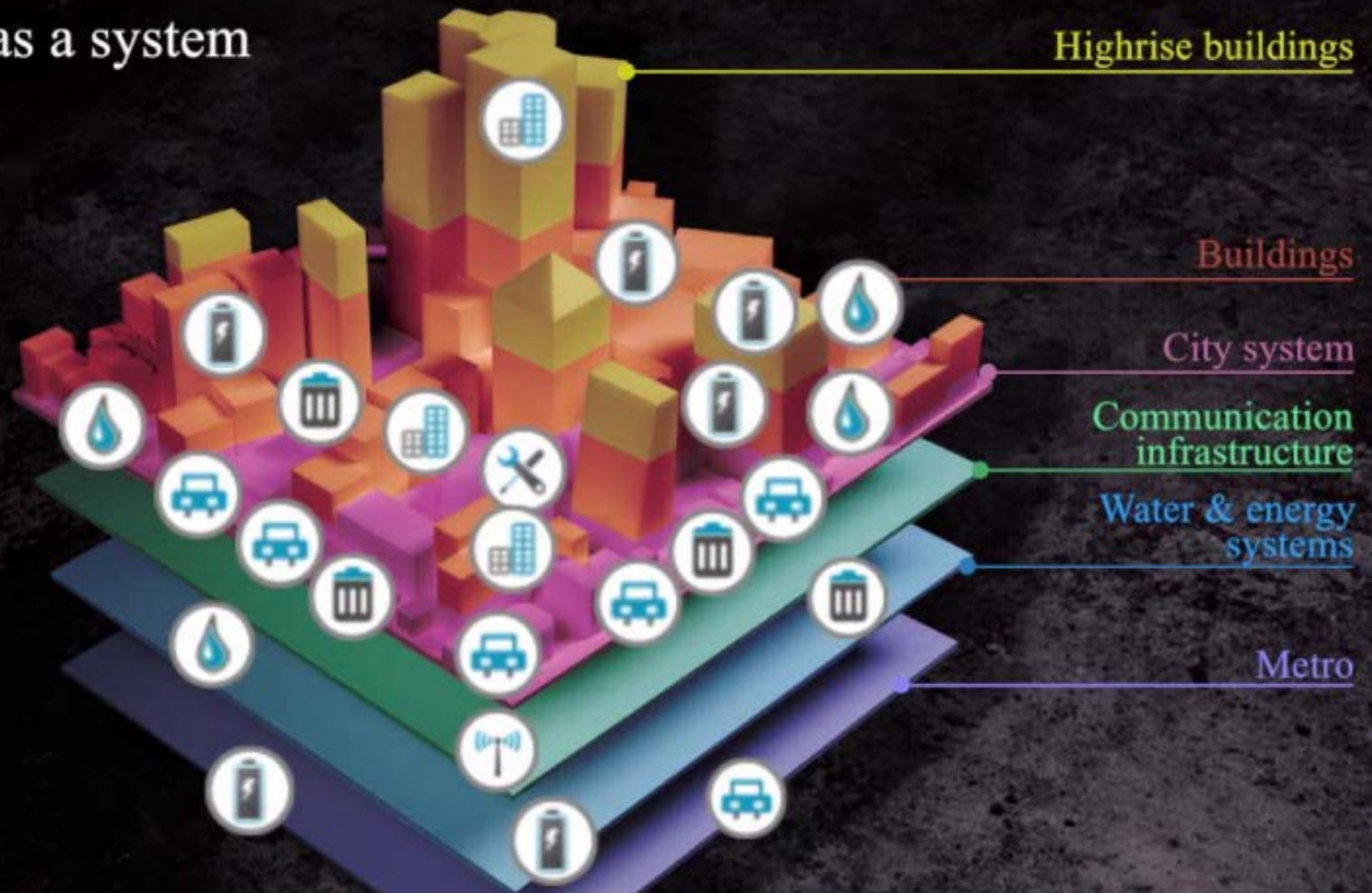


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# Way Forward



# City as a system



# Step Change

Behavior Change of  
People...



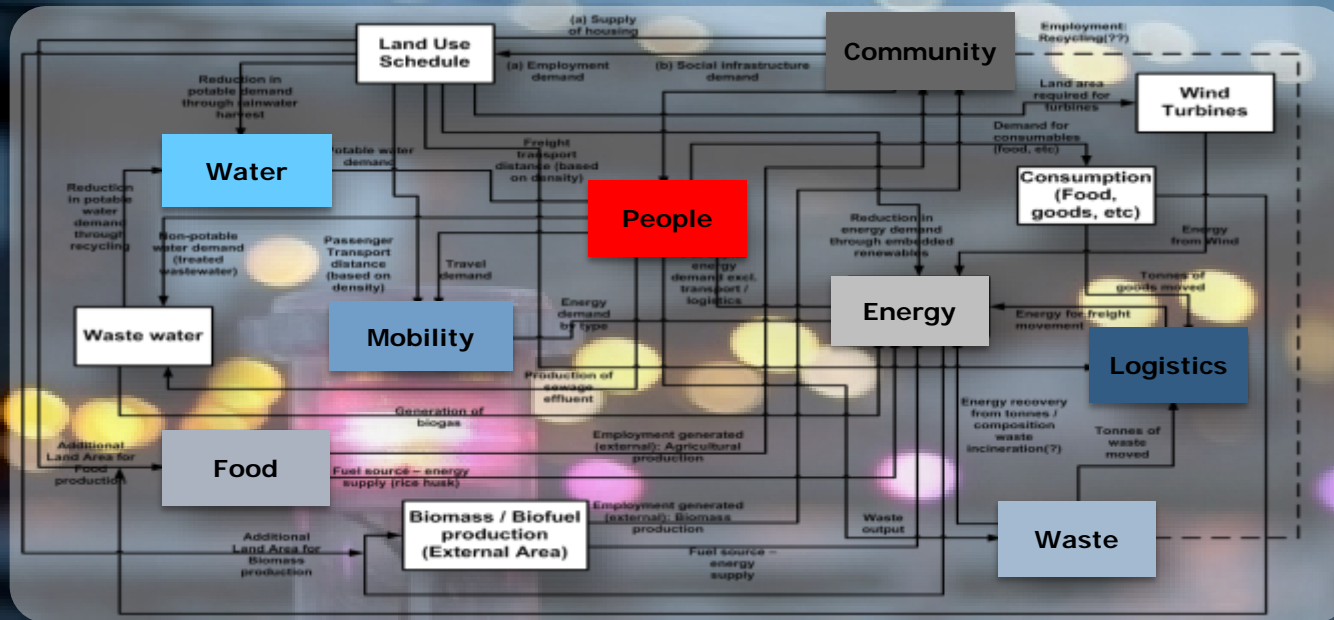
@ work



@ home



# “Smart” is the new “Green”



## Smart Cities

Enabling cities to optimise operations, engage with citizens to co-create better places and conserve resources

Image: Arup smart cities

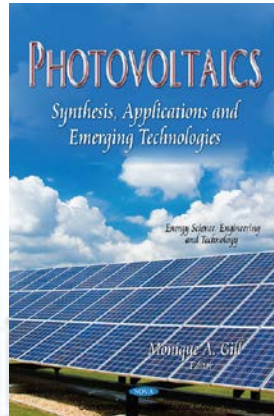
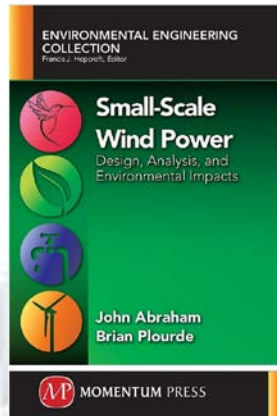
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Available for ordering at  
Wiley and Amazon.



# Vielen Dank!



**Dr. Jimmy Tong**

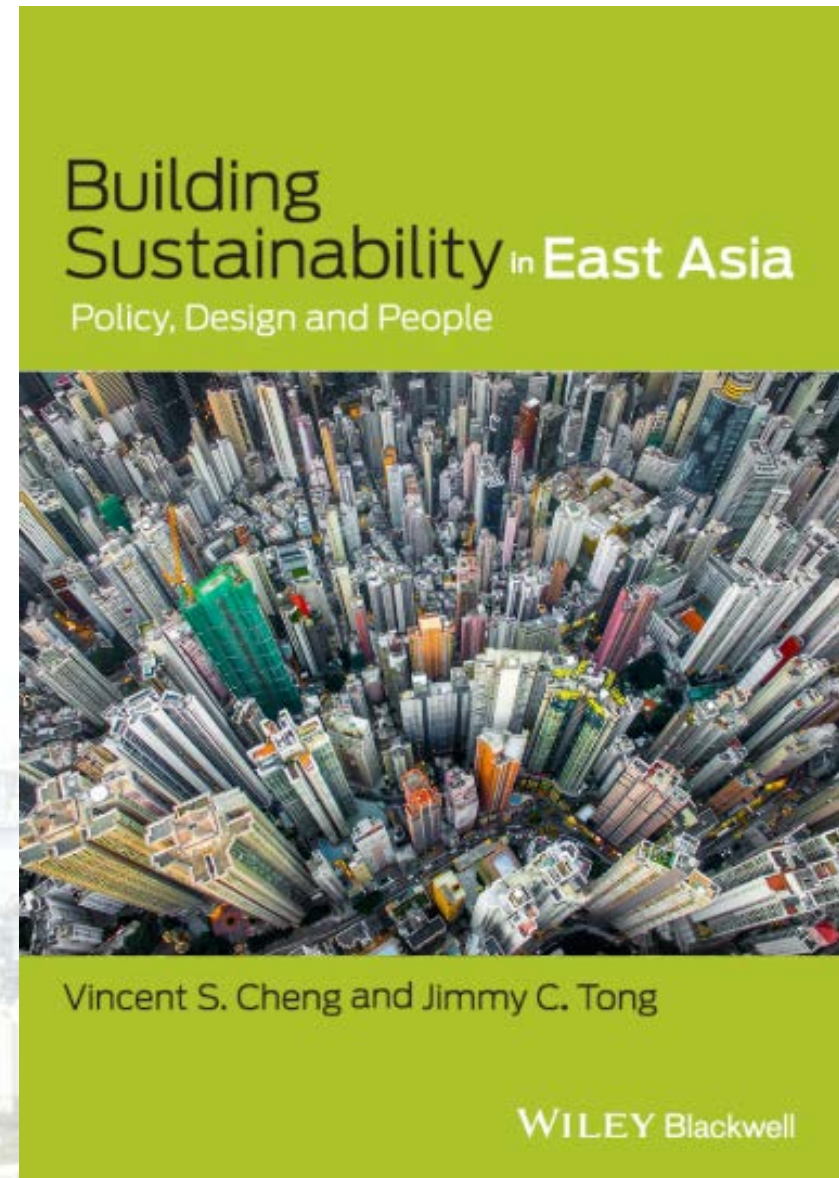
Associate | Building Sustainability | East Asia Energy Skill Leader  
PhD, PE, MHKIE, BEAM Pro

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# Biography

- Dr. Jimmy Tong is an Associate at Arup focusing on Building Sustainability. An industrial leader in the energy business, Dr. Tong has applied his expertise in energy systems in various sectors, including **wind and renewable energy, infrastructure and building services, and product and system development in the manufacturing of electronics, ventilation equipment, and filtration equipment** for more than 18 years. Dr. Tong's current focus is creating and transforming buildings toward a greener future. He obtained a Ph.D. specializing in **computational fluid flow and heat transfer** from the University of Minnesota.
- Prior to joining Arup, Dr. Tong was General Manager at Avantis Limited in Hong Kong leading wind projects around Asia, and has served as a subject-matter expert at Lockheed Martin Maritime Systems and Sensors, Thermal Analysis Partners LLC, Jacobs Civil Inc., Donaldson Company, and Xetex, Inc. in the U.S.
- He is also a guest lecturer at several universities in Hong Kong on the subject of energy and sustainability.



Donaldson.  
Filtration Solutions

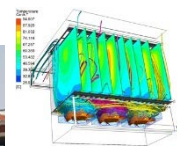
JE JACOBS

LOCKHEED MARTIN



Thermal  
Analysis  
Partners LLC

Xetex  
Heat-36-Change



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