ASEAN-IEA Webinar: Regulatory Frameworks and the Role of Governments in Buildings Policy Development

Friday, 4 June 2021 (14.00 - 16.00 GMT +7)

Participants should ensure a convenient environment and reduce background noises such as turn-off cell phones and etc.

Participants should mute their microphone and only unmute if they wish to present/speak.

Participants should only turn on their video camera when presenting or making an intervention as turning on the video may impact the quality of the connections and voice quality.

For Q&A session:

- Those who wish to ask or speak may use the chat room by typing their country and name and send it to *everyone*. The Moderator will acknowledge the requests to speak and determine the speaking order. Once the Moderator acknowledged, they may turn on the video.
- Only unmute the microphone once you are called by the Moderator to speak.

Opening Remarks

Mr. Rio Jon Piter Silitonga

Research Analyst, ASEAN Centre for Energy

Moderator & Panelists

Moderator

Dr. Ian Hamilton
Associate Professor, UCL Energy Institute & International Energy Agency

Panelists

Dr. Kate Wilson
Executive Director, Climate Change and Sustainability, Government of New South Wales, Australia

Dr. Michael Waibel
Department of Human Geography, University of Hamburg

Dr. Dirk Schwede
Institute for Building Energetics, Thermotechnology and Energy Storage, University of Stuttgart

Mr. Sokhai Nop
Deputy Director Department of Green Economy, Ministry of Environment, Cambodia

Dr. Xiaodong Wang
World Bank

Webinar Agenda

TIME (Jakarta)	ACTIVITIES
14:00 – 14:05	Introduction and Webinar Overview Mr. Rio Jon Piter Silitonga, Research Analyst, ASEAN Centre for Energy
14:05 – 15:55	Moderator: Dr. Ian Hamilton, UCL Energy Institute and IEA Panellists: 1. Dr. Kate Wilson,, "**NSW Government Approaches to Making Buildings More Sustainable"** 2. Dr. Michael Waibel, **" Build 4 People Project"** 3. Dr. Dirk Schwede, "**Climate-Adapted Material Research for the Socio-Economic Context of Vietnam"** 4. Mr. Sokhai NOP,, "**The Development of Cambodia's Guidelines and Certification for Green Buildings"** 5. Dr. Xiaodong Wang, "**Improving Building Energy Efficiency in Southeast Asia"** 10-minute presentations each, followed by a Q&A Session.
15:55 – 16:00	Webinar Closing Remarks Mr. Rio Jon Piter Silitonga, Research Analyst, ASEAN Centre for Energy ASEAN Centre for Energy
16:00	End of Webinar

Programme Area No. 4: Energy Efficiency and Conservation, ASEAN Plan of Action for Energy Cooperation (APAEC) Phase 2

‘ To Reduce Energy Intensity at 32% by 2025’

Outcome-Based Strategies and Programmes

Harmonised EE Standard

- Roadmap for Harmonised standard for AC and Lighting (existing).
- Expansion plan to cover refrigerator, electrical motor, TV , etc.,.
- Green Procurement and database system

More Innovative EE Finance

- Energy Efficiency Fund, ESCO Fund, Tax Incentives, Subsidy, Concessional Loan (GCF, IFIs), On-Bill Financing, Blockchain

Towards Net Zero Building

- Green Building Roadmap
- Urban Planning and Stock
- Roadmap Development
- Energy Audit and training
- EE and Net Zero Award for building
- ASEAN Energy Management Gold Standard
- Enabling Policy

Industry – EMS technology uptake

- Energy Management Adoption
- Energy Manager training (AEMAS)
- ASEAN EE Award for Industry
- EE Pilot Projects

Transport - Fuel Efficiency and EV system

- E- Mobility Study
- ASEAN Fuel Economy Standard
- Demand Side Management & Demand Response
- Smart Energy Services,
- EV charging station

ASEAN Roadmaps on Sustainable and Energy Efficient Buildings and Cooling

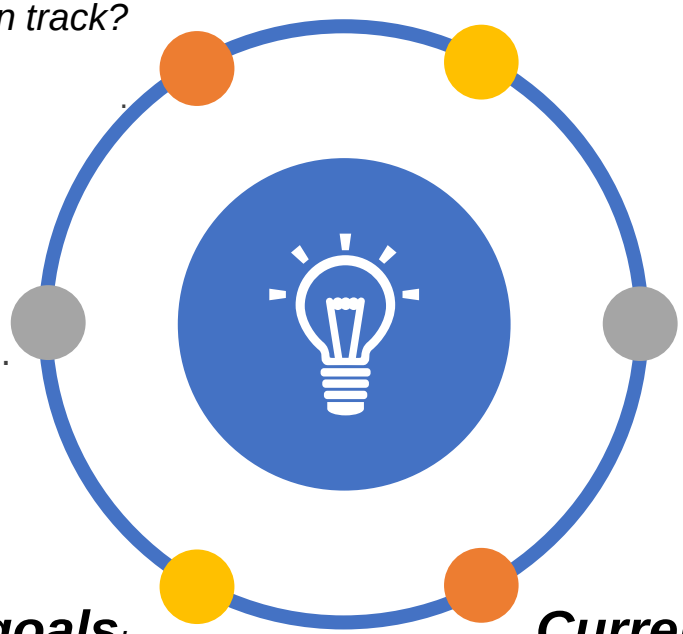
" The process of develop the roadmaps buildings, and cooling""

Actions and strategy and Tracking progress

How you get there and How you know you are on track?

Vision statement:

What a sustainable/low-carbon future looks like and aims to achieve.



Multiple benefits:

Why achieving these goals are beneficial?.

Assessment framework:

Describe the elements being assessed, focusing on the priority elements needed to secure a sustainable low carbon building and cooling stock.

Future goals:

Where we need to go?

Current status:

Using the above framework to evaluate the status across the AMS

Moderator

Dr. Ian Hamilton

Associate Professor, UCL Energy Institute & International Energy Agency

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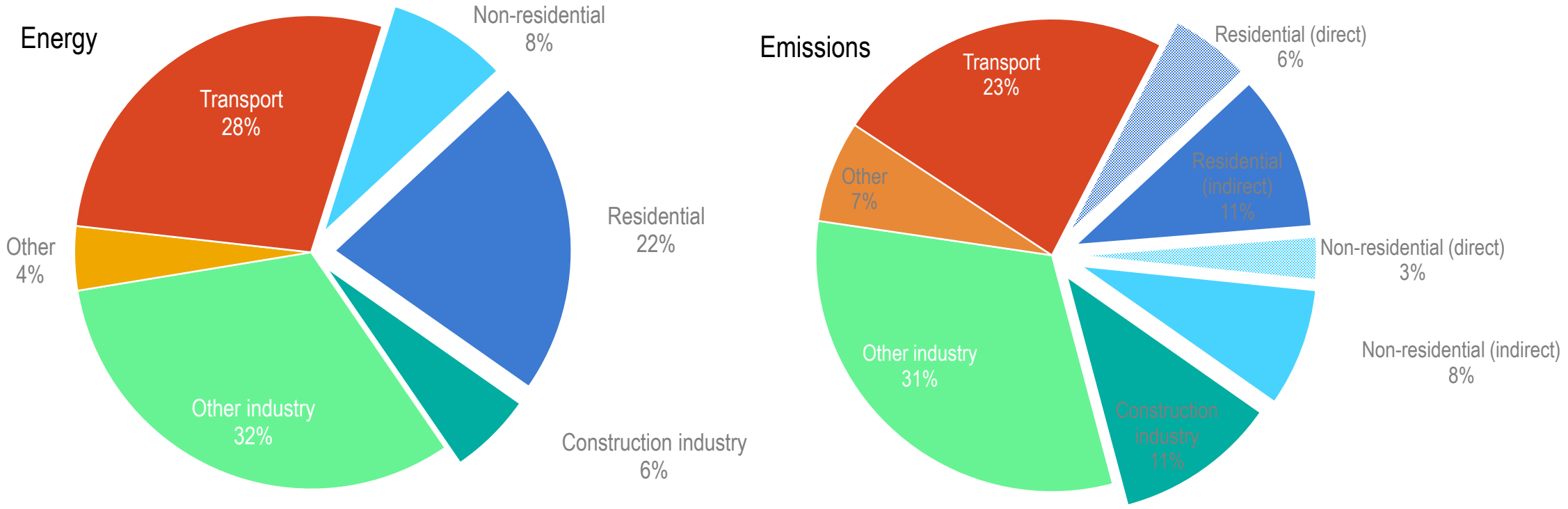
4th June 2021

International Energy Agency

Net-Zero Carbon

Why is buildings decarbonisation so critical?

Energy and emissions from buildings, globally

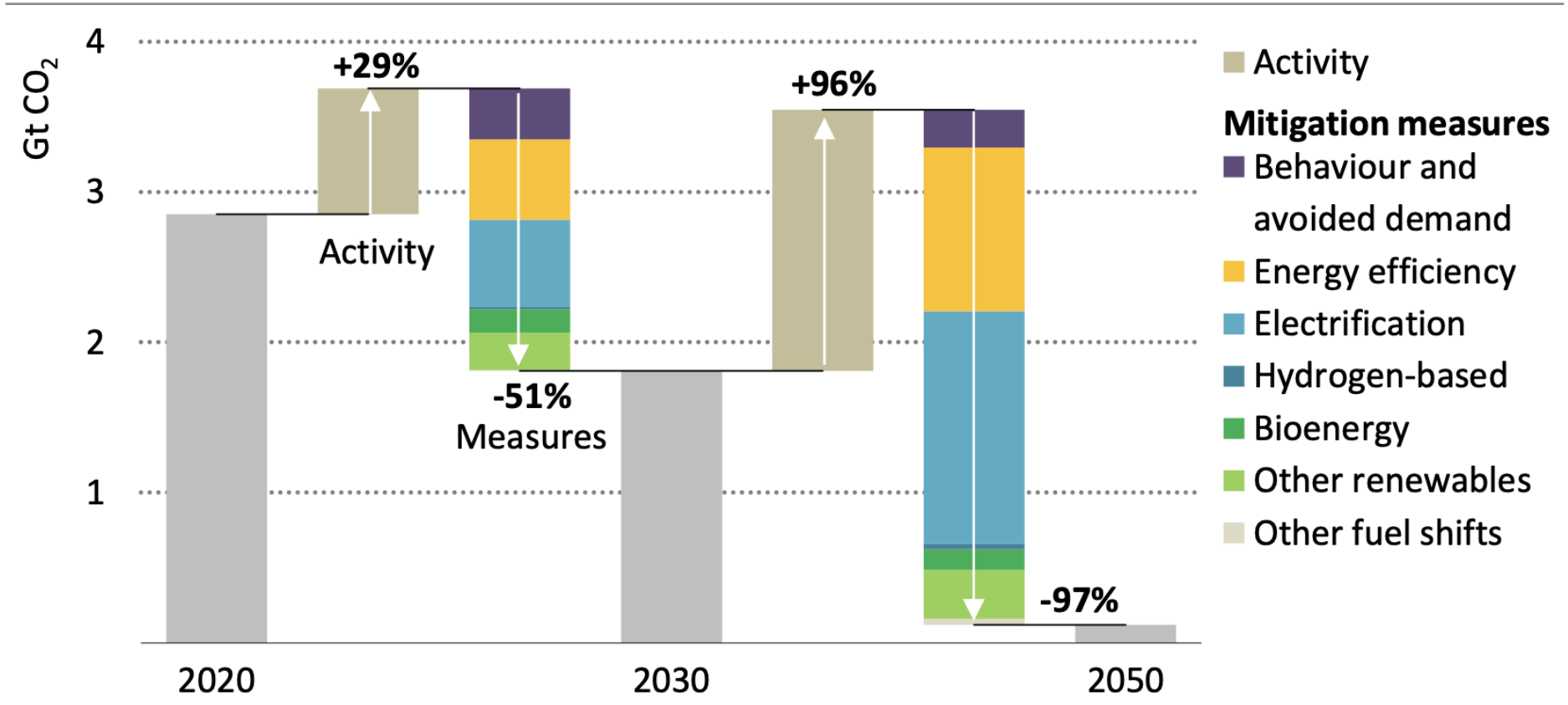


Source: GlobalABC/UNEP/IEA, (2019), *Global Status Report for Buildings and Construction 2019*

Buildings and construction are a key sector for the clean energy transition, and reaching the goals of the Paris Agreement

Global direct CO2 emissions reductions by mitigation in buildings in the NZE

Share of fossil fuels in energy demand in the buildings sector drop to 30% by 2030, and to 2% by 2050 in the NZE.

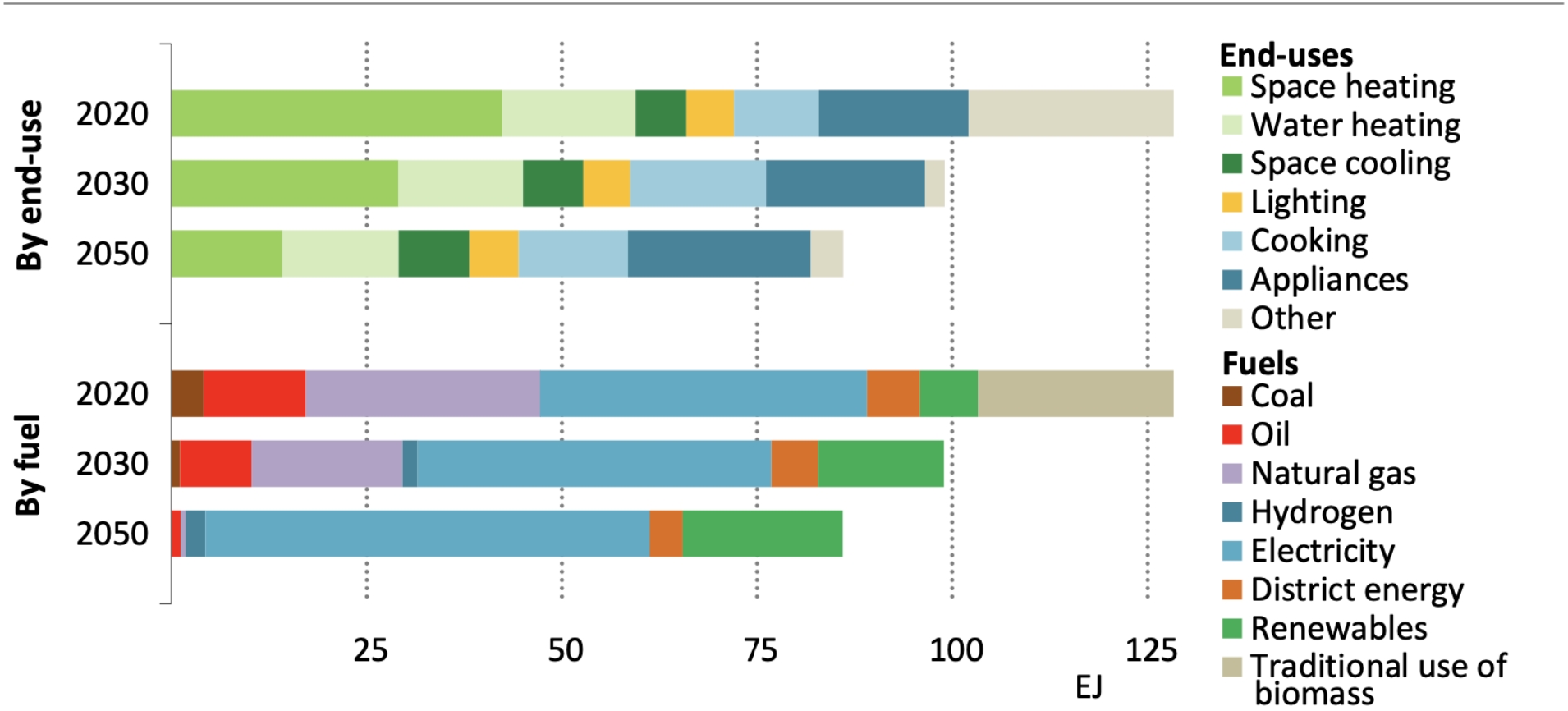


Electrification and energy efficiency account for nearly 70% of buildings-related emissions reductions through to 2050, followed by solar thermal, bioenergy and behaviour

Source: IEA (2021), Net Zero by 2050, IEA, Paris https://www.iea.org/reports/net-zero-by-2050

Global final energy consumption by fuel and end-use in buildings in NZE

Share of electricity in space heating, water heating and cooking increasing from less than 20% today to more than 40% in 2050.



Fossil fuel use in the buildings sector declines by 96% and space heating energy needs by two-thirds to 2050, thanks mainly to energy efficiency gains

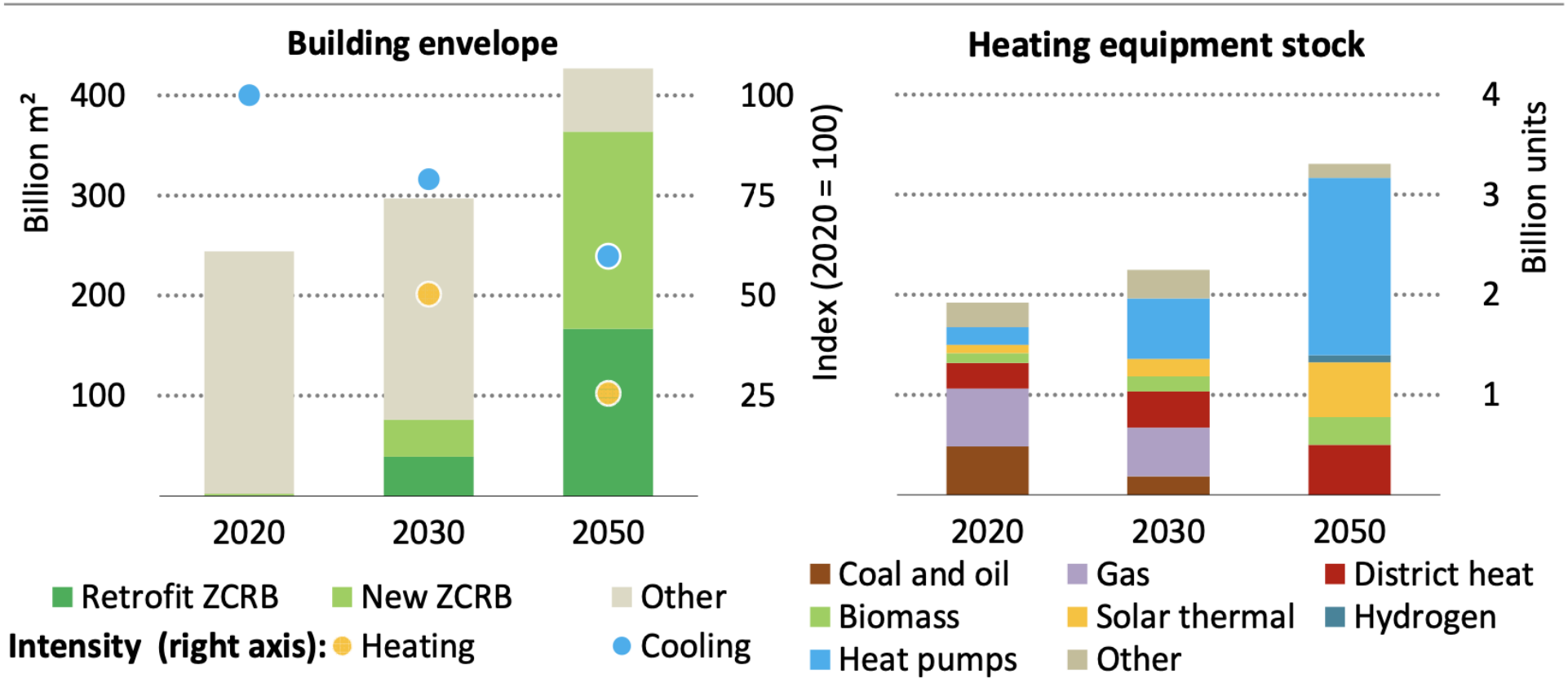
Source: IEA (2021), Net Zero by 2050, IEA, Paris https://www.iea.org/reports/net-zero-by-2050

Global final energy consumption by fuel and end-use in buildings in NZE

Space heating in homes is transformed.

Natural gas falls from nearly 30% to less than 0.5% in 2050

Electricity for heating rise from nearly 20% of the total today to 35% in 2030 and about 55% in 2050



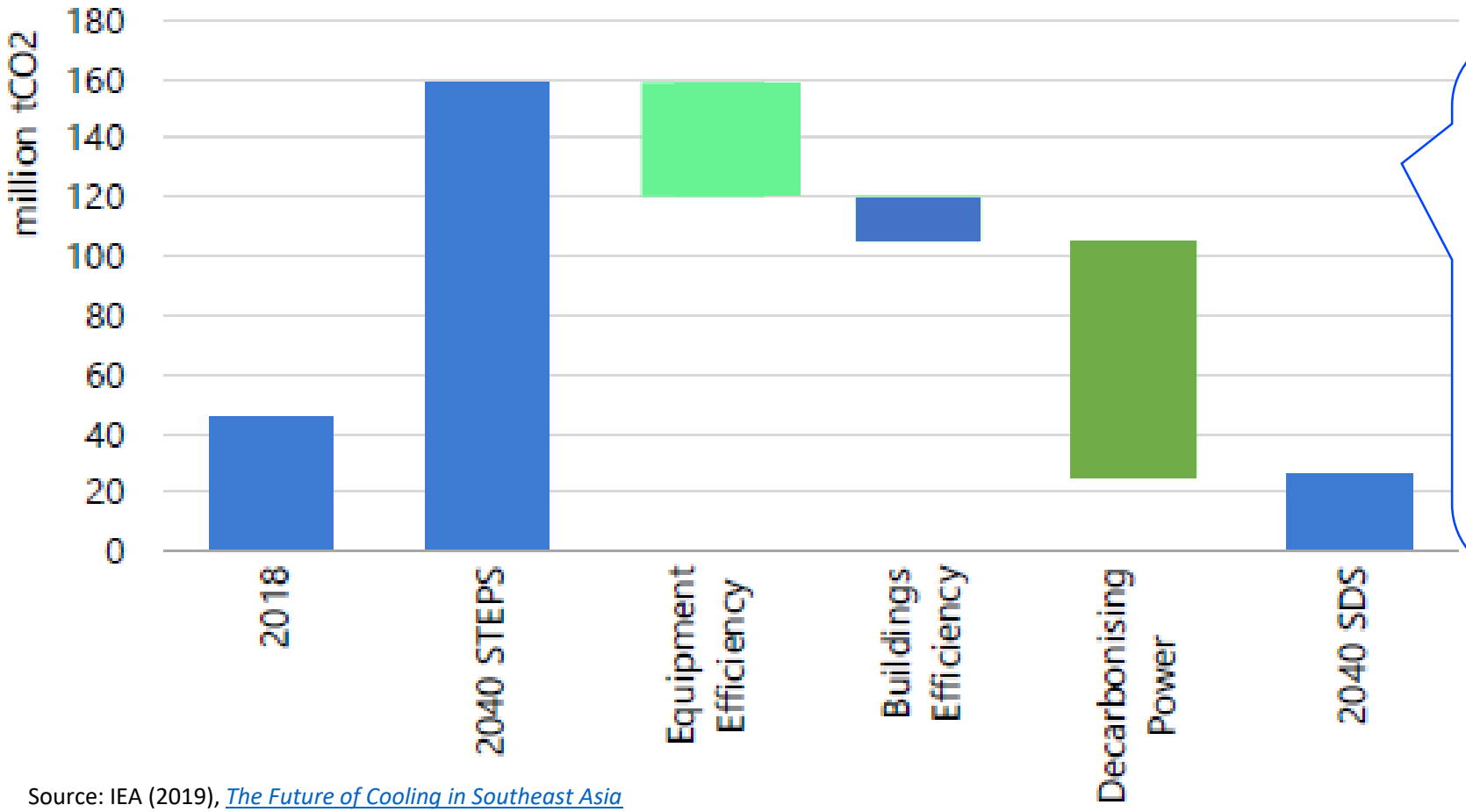
By 2050, over 85% of buildings are zero-carbon-ready, reducing average useful heating intensity by 75%, with heat pumps meeting over half of heating needs

Source: IEA (2021), Net Zero by 2050, IEA, Paris https://www.iea.org/reports/net-zero-by-2050

Building energy efficiency in Southeast Asia

The path towards net-zero emission buildings

Decomposition of factors for reduction of CO_2 emissions between STEPS and SDS in Southeast Asia



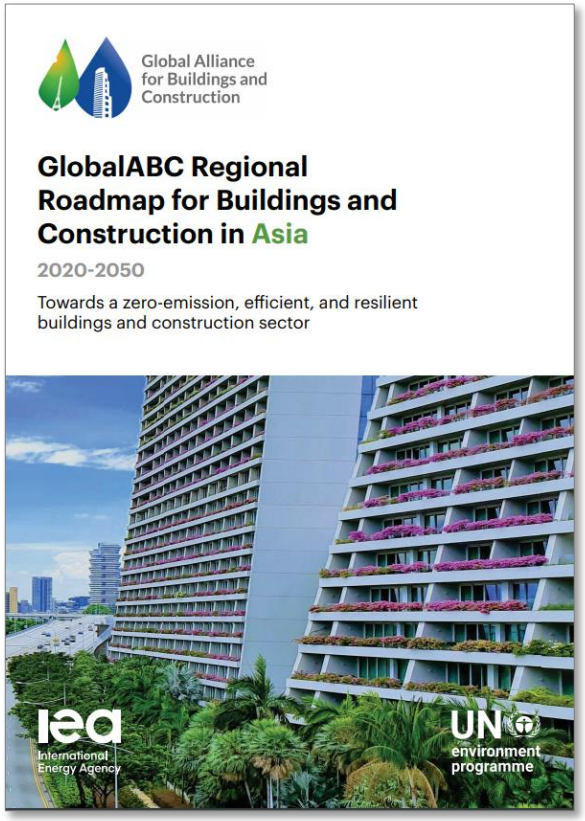
Source: IEA (2019), *The Future of Cooling in Southeast Asia*

8 Roadmap themes:
- **New buildings**
- **Existing buildings**
- **Systems**
- **Operations**
- **Clean Energy**
- Urban planning
- Materials
- Resilience

Decarbonising buildings requires reducing energy demand, embodied carbon, and decarbonising heat and electricity.

ASEAN Roadmap for Sustainable Buildings and Construction 2020-2050

Building on the Regional Roadmap for Asia



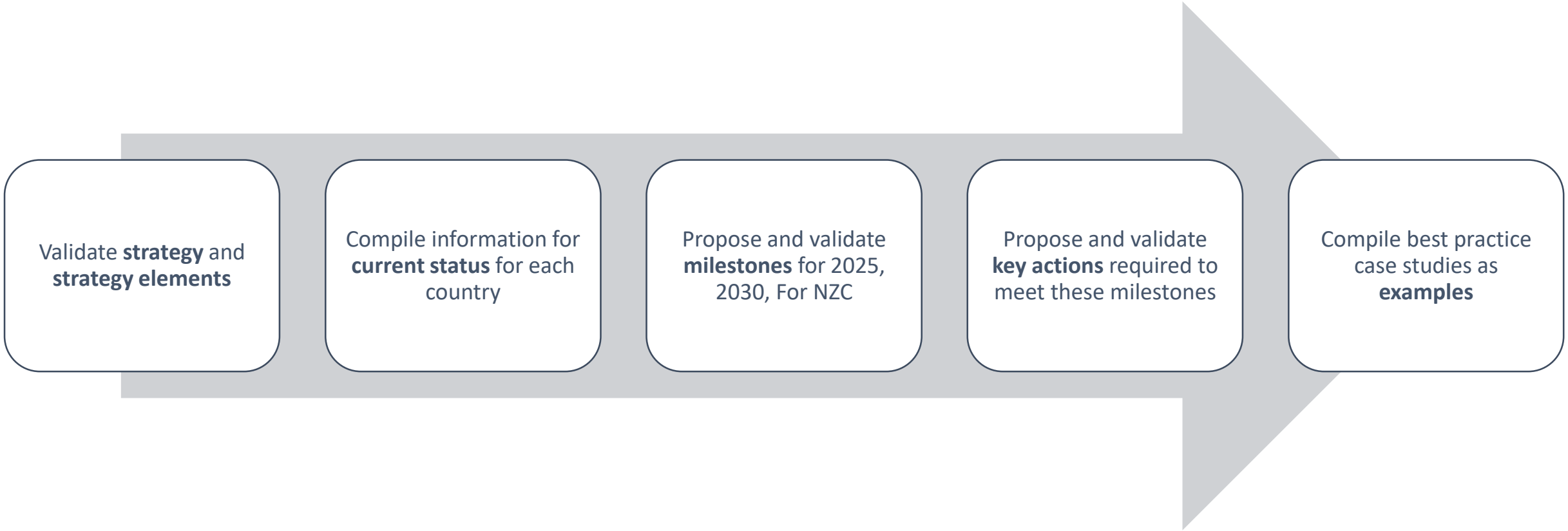
Regional Roadmap for Asia

- Provides a comprehensive framework
- Contains info on “current status”
- Contains many examples and responses from ASEAN countries
- Network of key stakeholders (approx. 200 respondents/ participants/ reviewers)
- Highlights where the biggest data and ambition gaps are

Opportunity for ASEAN Roadmap

- More differentiation between member states or groups of member states
- Will be more specific in terms of which actions for which context, and about **how** to implement the recommended actions
- Integrate “enabling” actions on capacity building and finance with other actions
- **More targeted and specific actions**

The ASEAN Roadmap development process



In parallel: data collection, survey, stakeholder mapping, identification of best case studies

ASEAN Roadmap - Draft vision and strategies, per theme

NEW BUILDINGS

New buildings are designed such that they enable higher levels of thermal comfort and energy efficiency, resulting in comfortable, affordable and low carbon buildings.

- Strengthen the adoption and compliance of mandatory building energy codes
- Boost market demand for efficient, low carbon buildings
- Boost capacity in delivery of efficient, low carbon buildings

EXISTING BUILDINGS

Existing buildings are retrofit to achieve an appropriately high level of energy performance to reduce fuel costs and improve thermal comfort.

- Promote the uptake of high performance fabric systems
- Boost the rate of energy efficiency retrofits
- Boost the quality of energy efficiency retrofits
- Promote the adoption of building performance standards and codes

SYSTEMS AND OPERATIONS

To promote the adoption of energy efficient systems and modes of operations that reduce energy bills and emissions, and increase comfort

- Improve quality, availability and efficiency of appliances and systems
- Encourage uptake of clean, smart and efficient devices and systems
- Improve efficiency of building operation
- Promote the recognition of good system and operational energy performance

MATERIALS

To mainstream the use of materials and construction techniques that lower embodied carbon and improve energy performance

- Promote new design and construction practices for greater material efficiency
- Decarbonise production of carbon intensive materials
- Collect data and promote disclosure of embodied carbon
- Governments leading by example

RESILIENCE

Cities are planned to limit construction in risk areas, ensuring critical urban infrastructure services, including vulnerable populations, and integrating resilience attributes in building materials.

- Improve adequacy and reliability of built environment resilience
- Foster a whole-of-government approach to resilience
- Integrate resilience in building codes and materials
- Increase and monitor data and information on disaster risks

URBAN PLANNING

Cities are developed using integrated approaches and policies to be more sustainable, resource-efficient, compact, connected, and liveable.

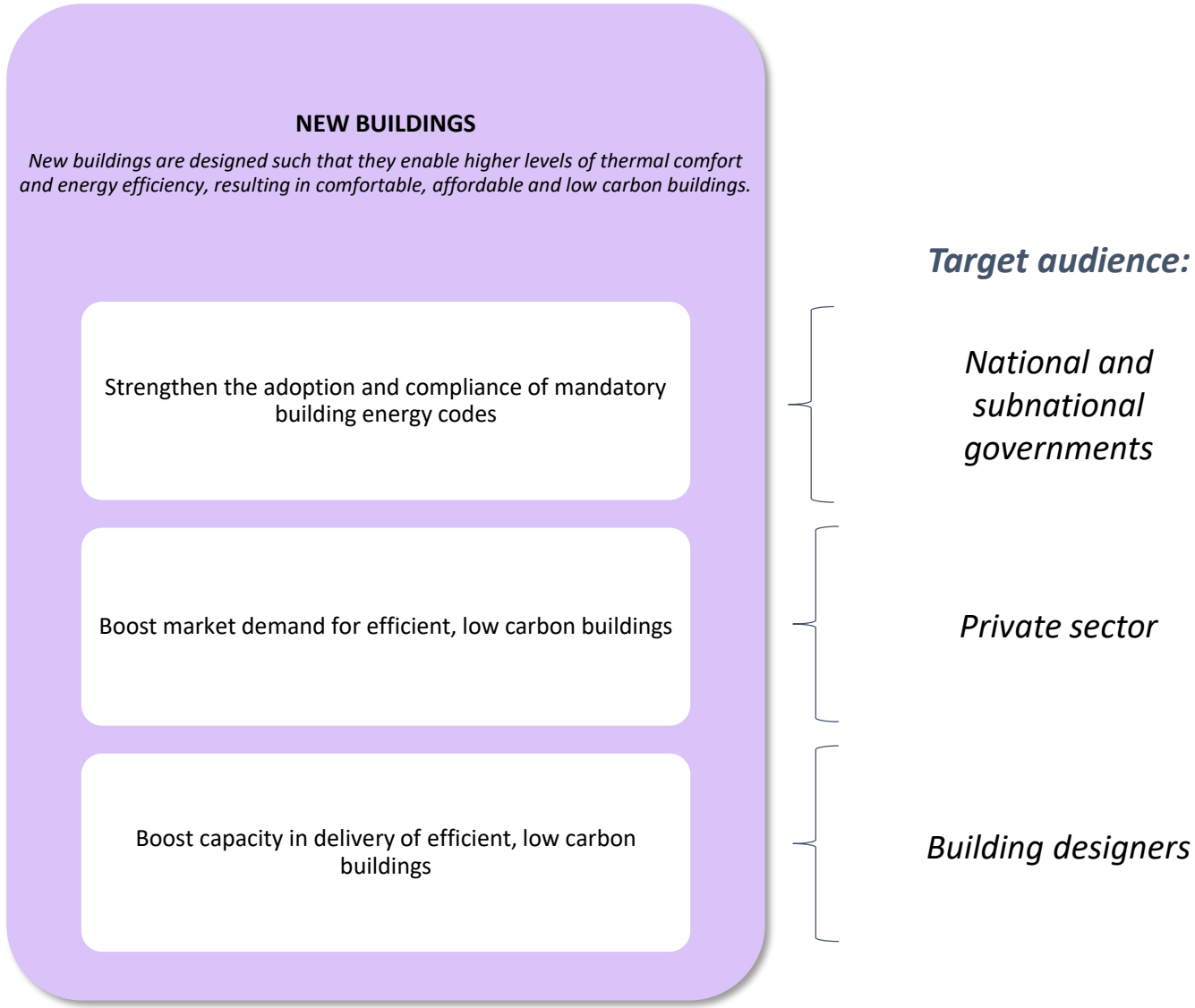
- Improve coordination and policy alignment for low-carbon development
- Boost low-carbon urban infrastructure and construction
- Expand capacity to deliver low-carbon urban development

INTEGRATION OF CLEAN ENERGY

Cities are powered by clean, integrated energy systems enabling buildings to provide flexibility to the power system with the right policies and regulations.

- Make commitments to net-zero carbon buildings over whole life-cycle
- Foster the uptake of clean and renewable energy
- Support clean and renewable energy through regulatory frameworks
- Promote grid interactive efficient buildings

New buildings draft vision and strategy



Example timeline: New buildings

Strategy elements to meet desired outcome eg. NB1

NB1: Strengthen the adoption of mandatory building energy codes

Timeframes:

	Current status	By 2025	By 2030	For net-zero carbon
NB.1.1 Increase strength and coverage of building energy codes	Across ASEAN, only Singapore has mandatory building energy codes covering all sectors (residential, commercial and public). Others have voluntary or mandatory codes for certain parts of the sector, often for buildings above a certain floor area, and others are still in development	All countries have mandatory building energy codes covering all sectors Most countries have a national standard for net-zero carbon buildings	Include requirements for embodied carbon, urban planning, resilience, RE in codes All countries have a national standard for net-zero carbon buildings	All countries and jurisdictions with net-zero carbon compatible codes
NB.1.2 Strengthen implementation capacity	Low implementation capacity at municipal level a barrier to adoption and enforcement of mandatory building codes. Low adoption of voluntary standards.	Tools developed to facilitate compliance checking and implementation Training programmes rolled out within government Most states/provinces adopt mandatory building code for State/provincial buildings	Continuation of capacity building and accreditation programmes to support the roll-out of building energy codes All states/provinces adopt mandatory building code for State/provincial buildings Most local/municipal authorities adopt building codes into byelaws	Ongoing capacity building at all levels of implementation chain. Full enforcement and compliance with building codes across all jurisdictions

Define milestones vs dates, to serve as indicators for tracking progress

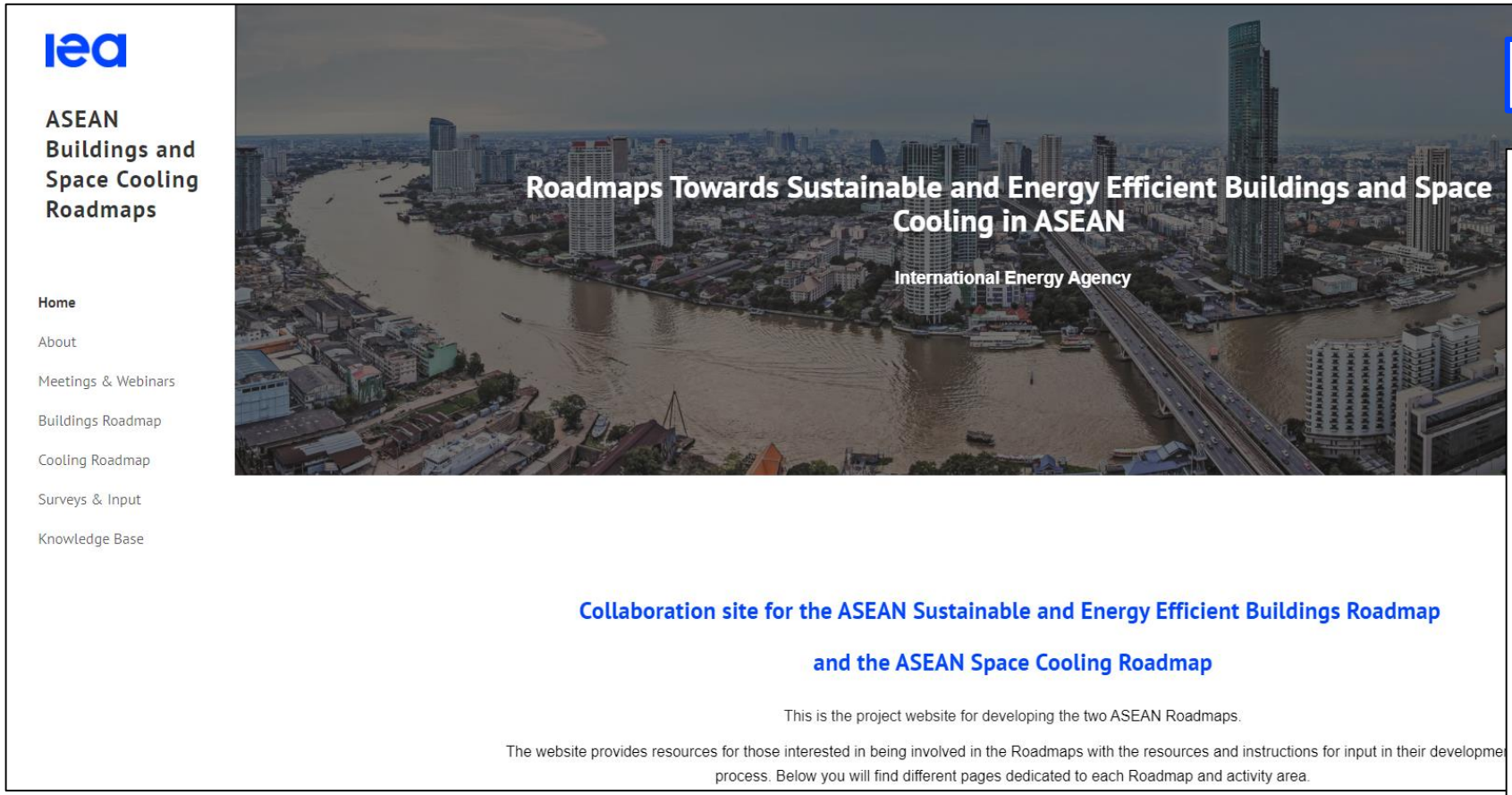
<Examples of proposed actions, examples, indicators for tracking progress>

Targeted actions to support strategy element, by group of countries where relevant

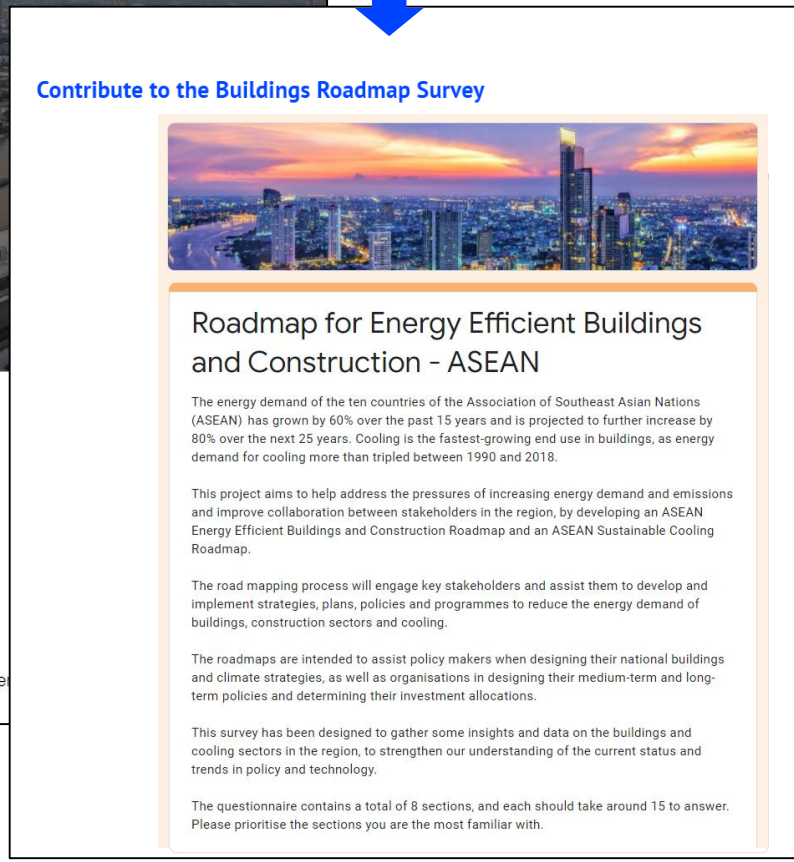
Examples of current good practice, from ASEAN or elsewhere

Contribute and keep in touch!

- ASEAN Roadmaps collaboration website: access here



Please answer our survey here:



Buildings Roadmaps – next steps

- Seek feedback and input from AMS on policy mapping and available data sources to inform the roadmap.
- Continue analysis and research to inform and improve next drafts of roadmap alongside feedback from ASEAN.
- Continue to plan and deliver the webinar and workshop series with ACE
- if you have good case studies, reports, or datasets to support our roadmap on zero-emission, efficient and resilient buildings and construction in Southeast Asia, please get in touch!
- Project timeline:

Thank you for your engagement!

Keep in touch at
emily.mcqualter@iea.org
i.hamilton@ucl.ac.uk

1st Presentation

NSW Government Approaches to Making Buildings More Sustainable

Dr. Kate Wilson

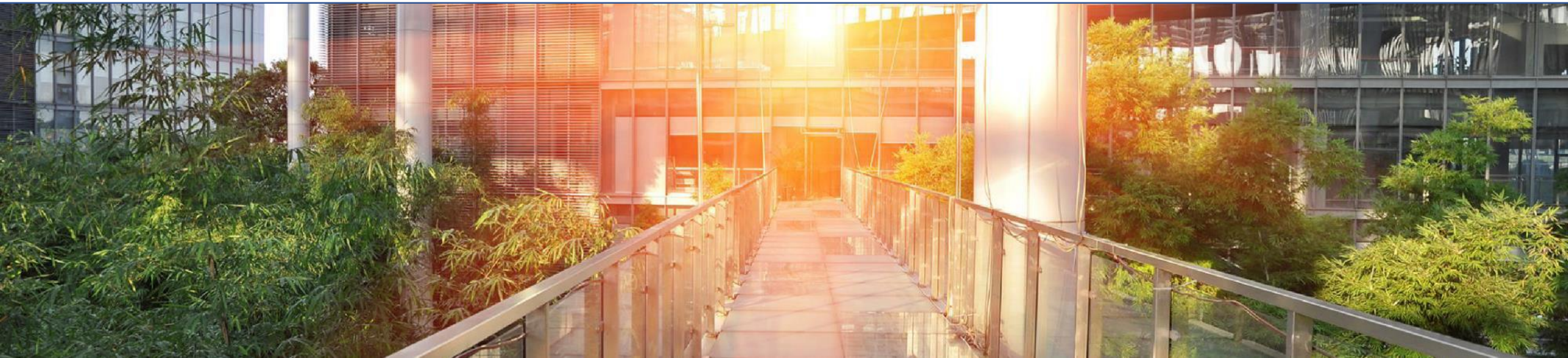
Executive Director, Climate Change and Sustainability, Government of New South Wales, Australia

NSW Government approaches to making buildings more sustainable

Kate Wilson, Executive Director, Climate Change & Sustainability, NSW

Department of Planning, Industry and Environment

4 June 2021



Climate Change and Sustainability

Our purpose and impact

To make NSW a **thriving, sustainable** and **resilient** place that transitions to net zero emissions by 2050.

We deliver programs and partnerships in **metro, regional and remote** NSW that:

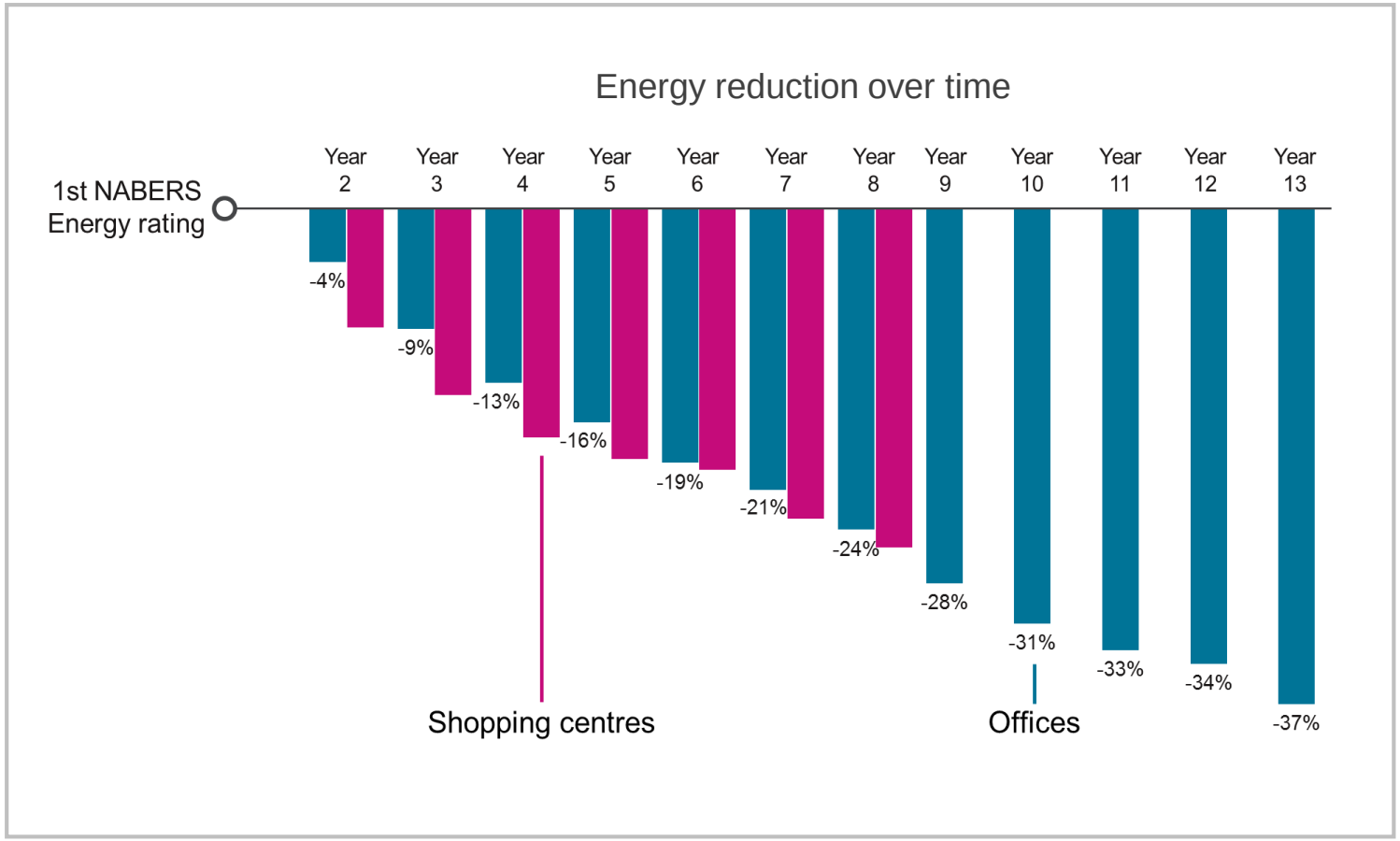
- ✓ reduce carbon emissions
- ✓ drive innovation in sustainability
- ✓ help communities, business and ecosystems become more resilient to a changing climate.
- ✓ helps transition to a circular economy through better management of our resources

Improving the performance of existing buildings

NSW GOVERNMENT

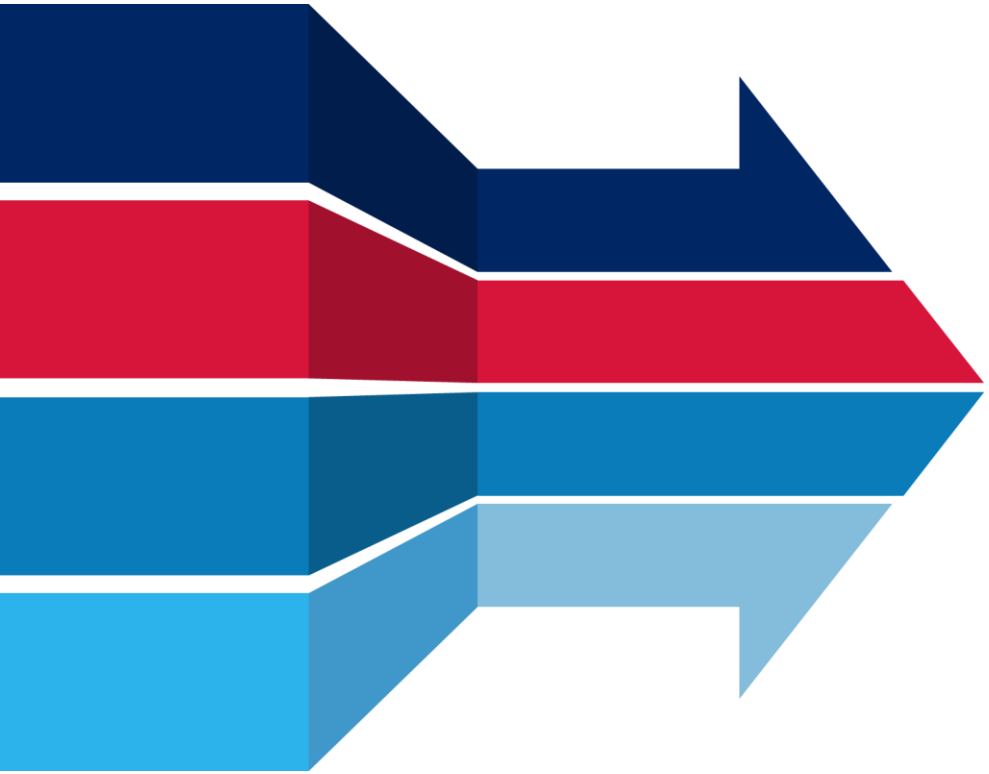
Department of Planning, Industry and Environment

NABERS – The National Australian Built Environment Rating System



- **Drives the fastest rate of energy efficiency** improvement (even in non-mandated sectors)
- **Encouraging a race to the top** (Sustainable Portfolios Index and Carbon Neutral ratings)
- Is **expanding**:
  - Ratings are available in New Zealand and the UK
  - Introducing new sectors to cover all major building types

Driving market change with an Energy Savings Scheme



- **Delivered 32,500 GWh of energy savings** (that's 1,625 times the average annual energy consumption of a NSW small business)
- Driven change in **commercial lighting markets**.
- **It's agile! Supports emerging technologies** and ways to earn incentives for energy efficiency improvements in buildings.
- **Extended to 2050** with increasing targets and new fuels and activities.

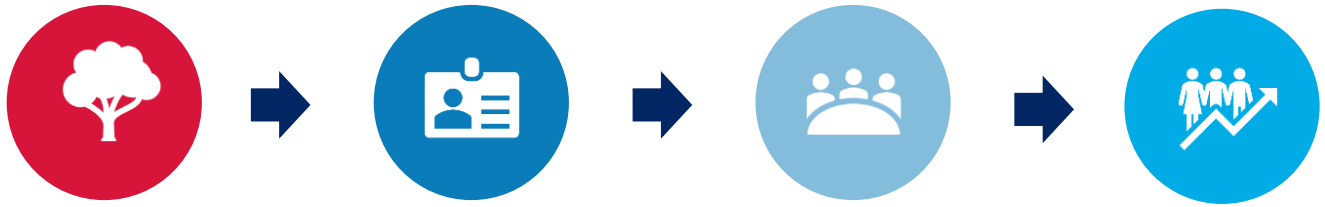
NSW GOVERNMENT

Improving the performance of future buildings

NSW GOVERNMENT

Department of Planning, Industry and Environment

Low Emissions Building Materials



Identify and engage business and government that influence construction

Jointly develop business case for change

Support stakeholders to incorporate LEBM into design through to asset delivery

Increase demand for LEBM across the construction supply chain

Taking action

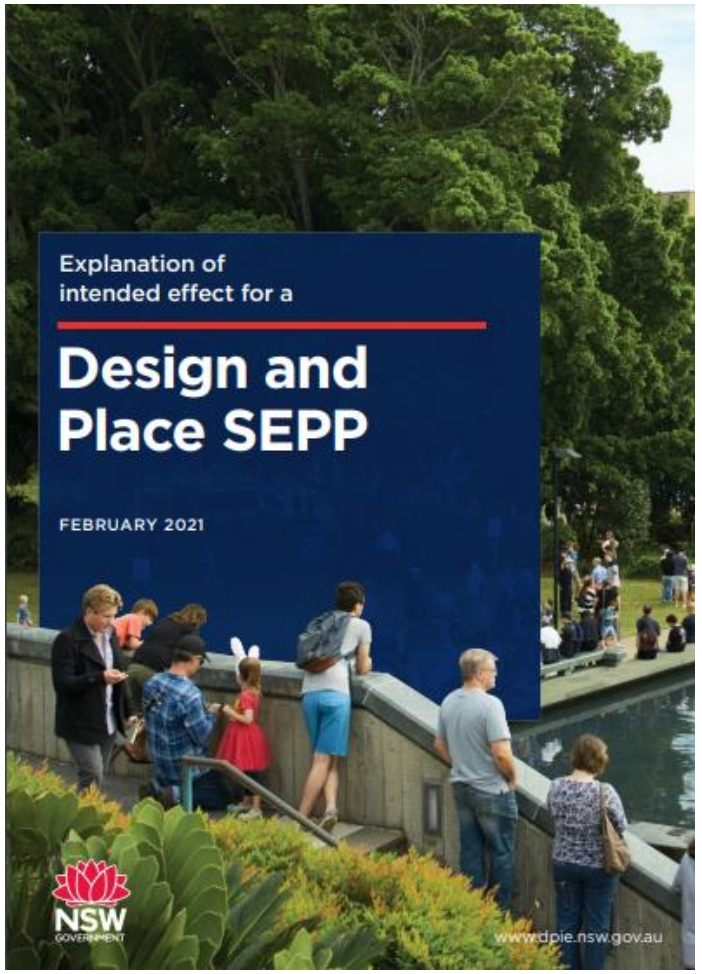
1. Market research to understand problem
2. Partnering with industry
3. Engaging across government
4. Supporting improvement of infrastructure ratings
5. Investing in innovation to unlock opportunities

NSW GOVERNMENT

New planning policy to guide design from buildings to precincts

Five overarching principals must be considered:

1. Design places with **beauty and character** that people feel proud to belong to
2. Design **inviting public spaces** to support engaged communities
3. Design **productive and connected** places to enable thriving communities
4. Design **sustainable and greener** places for the wellbeing of people and the environment
5. Design **resilient and diverse** places for enduring communities



Summary

Existing buildings:

- Market mechanisms and disclosure have been used successfully to improve energy performance of existing buildings
- Both NABERS and the Energy Savings Scheme have led to progressive improvements in energy efficiency
- These mechanisms have created jobs across the supply chain

Future buildings

- Collaboration is critical for considering materials and technology to improve future buildings
- Good planning policy can ensure energy use and other sustainability measures are fully considered in the design phase

Thank you

Contact Kate with any questions:

Kate.Wilson@environment.nsw.gov.au

Build4People Project

Dr. Michael Waibel
Department of Human Geography, University of Hamburg

Build4People Project

Enhancing Quality of Life through Sustainable Urban Transformation in Cambodia

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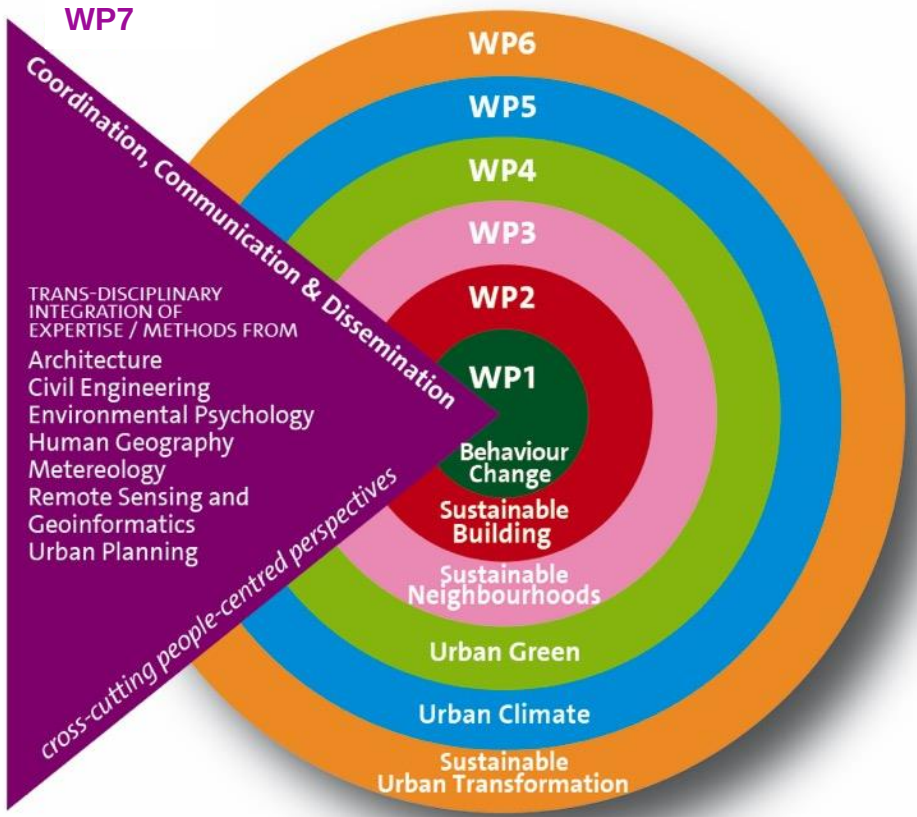

ASEAN-IEA Webinar, 4th June 2021: Regulatory Frameworks and the Role of Governments in Buildings Policy Development

Michael Waibel, Hamburg University

Build4People Consortium

Universität Hamburg
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Work Package #7
Work Package #6

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Cambodian Institute for Urban Studies
Local Project Management Partner

Otto von Guericke Universität Magdeburg
Work Package #1

University of Stuttgart
Germany
Work Package #2

EBLE MESSERSCHMIDT PARTNER
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Work Package #3

Eberswalde University for Sustainable Development
Work Package #4

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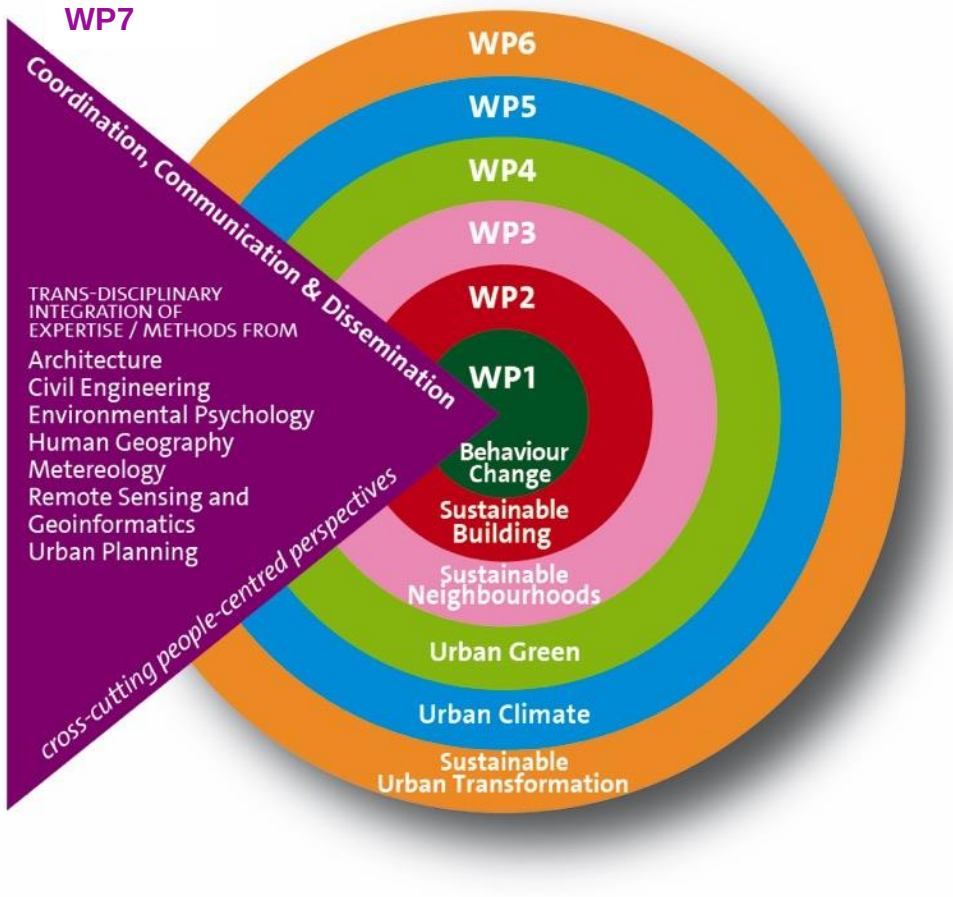

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Work Package #4

INKEK institute for climate and energy strategies
Work Package #5

Build4People Leader

Universität Hamburg
DER FORSCHUNG | DER LEHRE | DER BILDUNG
Department of Geography
Dr. Michael Waibel

Funding volume

- 3.17 mill. Euro (total, including own investments)
- 2.95 mill. Euro (BMBF funding total)
- 1.40 mill. Euro (funding of Hamburg University)

Funding duration

- 01 April 2021 – 31 March 2025 (four years)

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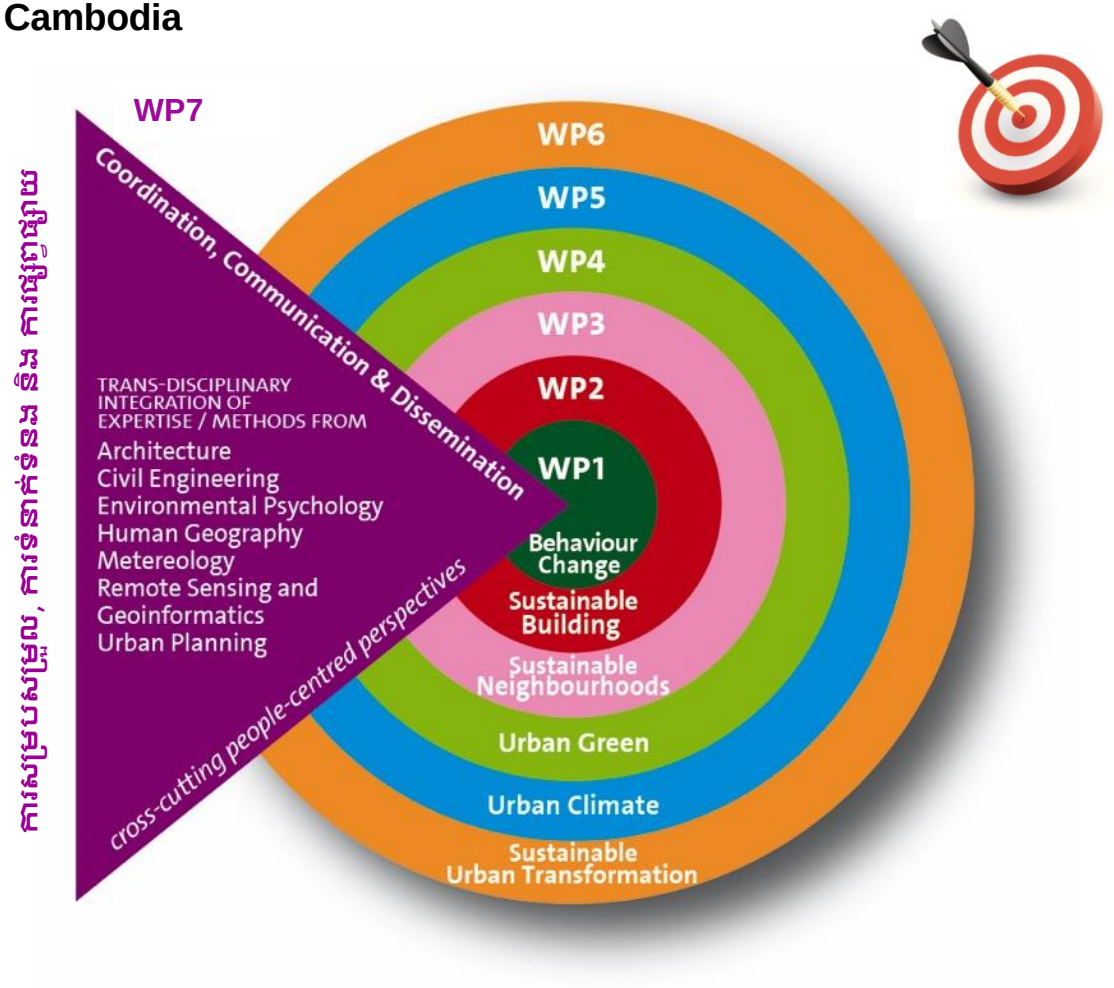

Work Packages កញ្ចប់ការងារ

WP1: Behaviour Change
ការផ្លាស់ប្តូរឥរិយាបថ

WP2: Sustainable Building
អគារដែលមាននិរន្តរភាព

WP3: Sust. Neighbourhoods
សហគមន៍ដែលមានចីរភាព

WP4: Urban Green
ទីក្រុងបៃតង

WP5: Urban Climate
អាកាសធាតុទីក្រុង

WP6: Sust. Urb. Transformation
ការផ្លាស់ប្តូរទីក្រុងដោយនិរន្តរភាព

➢ **The Build4People project follows a people-led, cross-cutting and transdisciplinary approach**

Research Partners

Implementation Partners

Dissemination Partners

Build4People Project

Enhancing Quality of Life through Sustainable Urban Transformation in Cambodia

គម្រោងសាងសង់សម្រាប់ប្រជាជន
ការលើកកម្ពស់ គុណភាពជីវិត របស់
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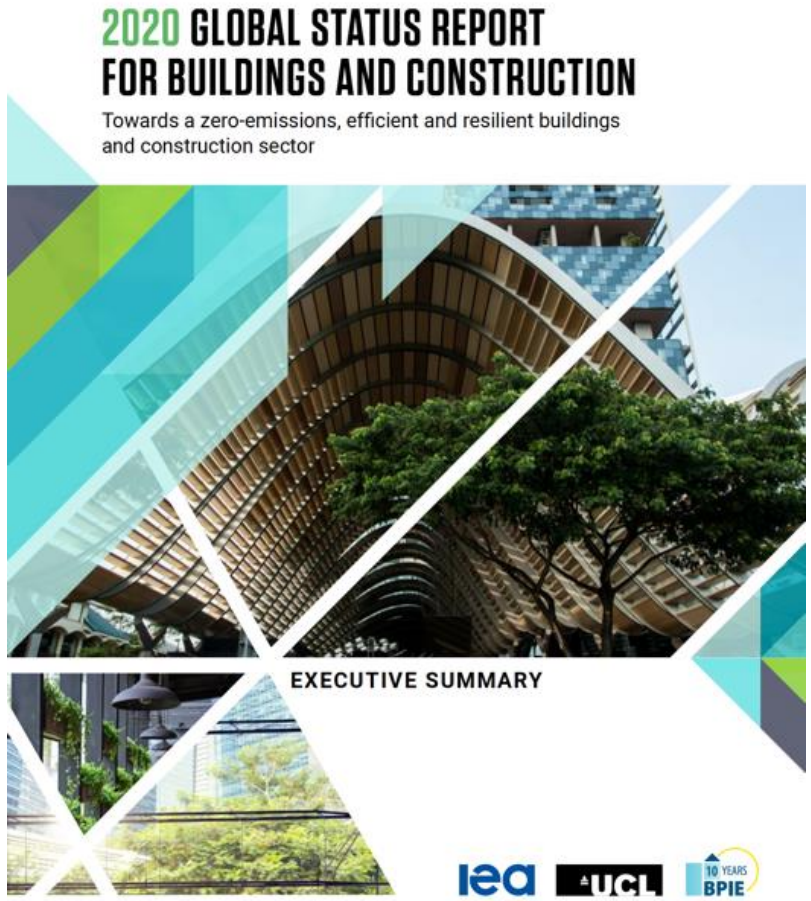
RELEVANCE OF BUILDINGS



UNEP-REPORT 2020
Emissions in the global building sector

- ✓ **Building sector in total: 38% of carbon emissions worldwide**
- ➢ Sector is currently moving away from the targets set in the Paris Agreement to keep average global warming well below two degrees Celsius
- ➢ A quick transition from conventional construction methods to more sustainability is required
- ➢ *Operation of buildings* is particularly problematic, e.g. in the case of mechanical cooling (use of AC), issue of *user behaviour*
- ➢ **"Green buildings – the sleeping giant in climate protection"**

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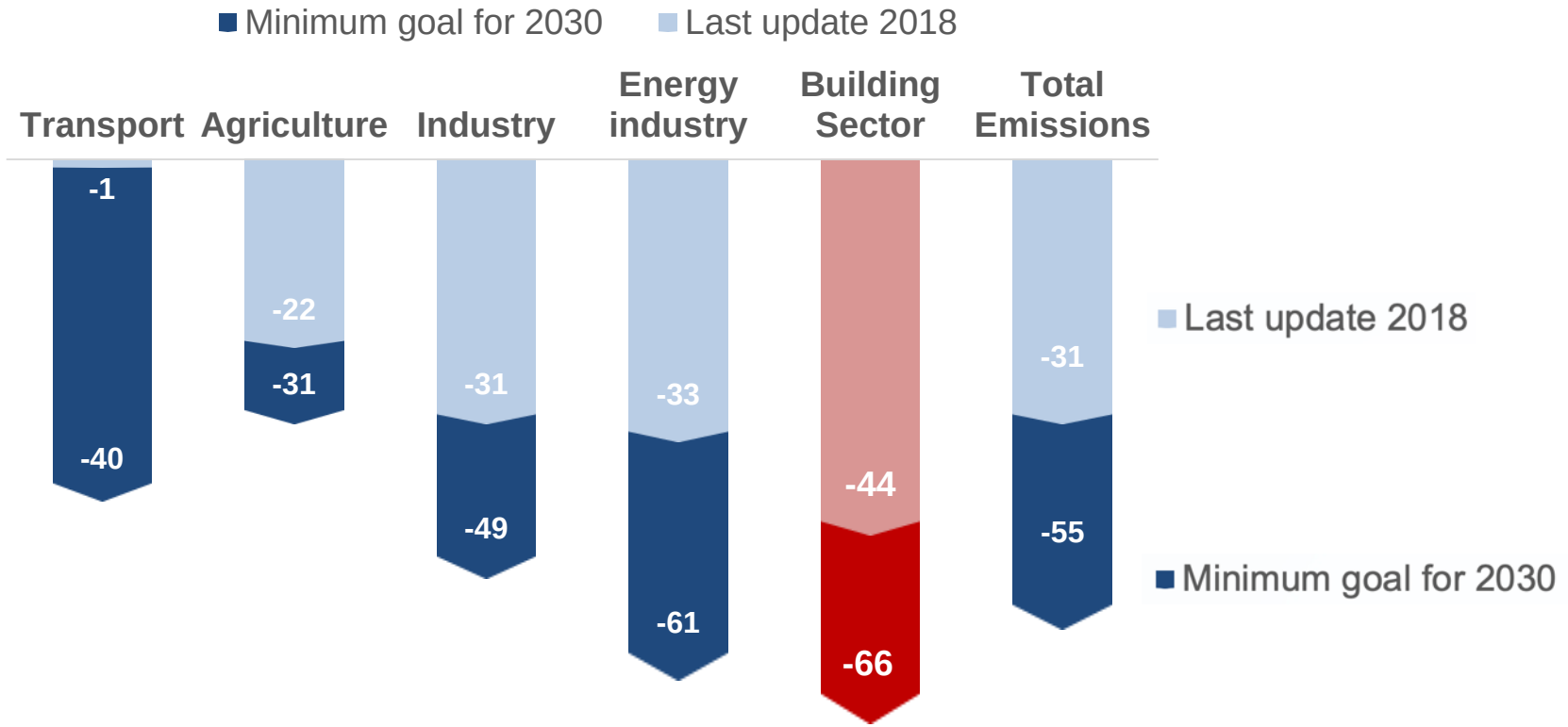
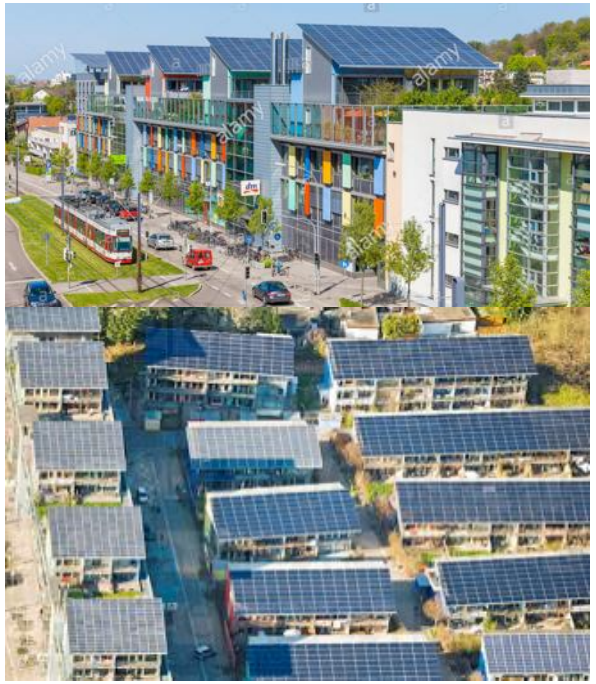
RELEVANCE OF BUILDINGS

Reduction of GHG Emissions versus the Level of 1990 in Germany





Sustainable eco-settlement Vauban in Freiburg, Germany

Source: own design based on: BMU 2019

➢ **The building sector is currently the most successful policy field of the Germany's national agenda to promote sustainability**

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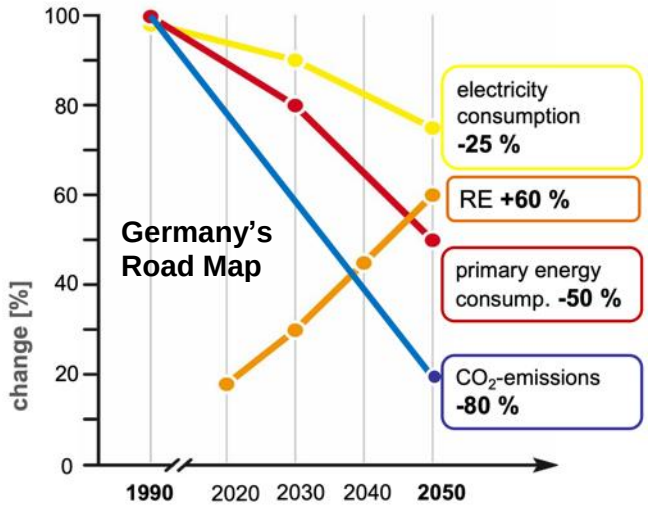

Information, Awareness and Consulting / Certification

dena

KFW

Energy-efficient construction and rehabilitation

Promotional Programs (economic incentives)

Federal Ministry of Transport, Building and Urban Development

German Energy Conservation Ordinance **(Energieeinsparverordnung – EnEV)**

and further regulations

Why Germany has been so successful in promoting sustainable buildings?

- Germany's clear road map: Specific targets set till 2050
- Germany follows a comprehensive approach involving various stakeholders
- The promotion of energy-efficient buildings goes back several decades and has developed step by step
- Huge knowledge capacities are now available (auditors / energy experts)
- Interplay between research progress and legal context: German Energy Conservation Ordinance with increasing demands
- Financial incentives based on energy performance of buildings
- High energy prices secure short payback times and acceptance

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Enhancing Quality of Life through Sustainable Urban Transformation in Cambodia

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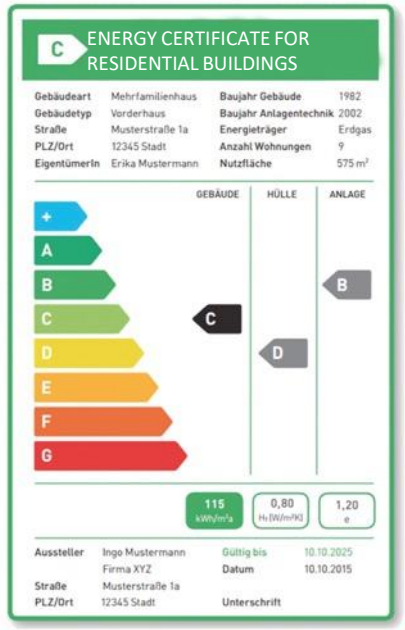
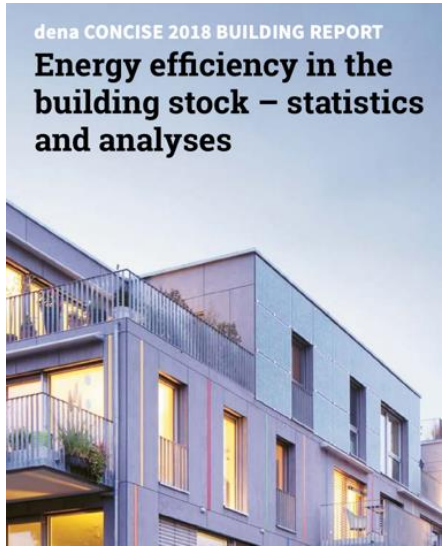
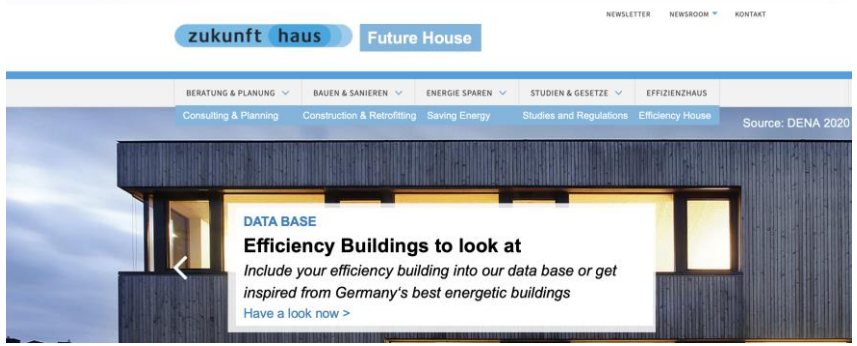


dena
Deutsche Energie-Agentur





Why Germany has been so successful in promoting sustainable buildings?

- Energy Pass for buildings as important market instrument given high energy prices which secure short payback times
- Foundation of institutions at the interface between state, research & the corporate sector: e.g. German Energy Agency
- Initiation of pilot projects that confirm the practical utility of energy efficiency measures
- Developing and managing communication platforms and strategies: Massive awareness campaigns
- Highly successful in terms of new construction, but still potential in terms of refurbishment of existing buildings (rate only 1% per year)

- ***Germany follows a comprehensive governance approach involving various stakeholders***

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Enhancing Quality of Life through Sustainable Urban Transformation in Cambodia

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PRELIMINARY INSIGHTS FROM CAMBODIA
from WP#6 Sustainable Urban Transformation (SUT)

- ✓ Deficiencies of technical knowledge, but more important general lack of actionable / implementation knowledge
- ✓ Major problems related to institutional fragmentation
- ✓ Informal power structures and the entanglement of the private interests of political elites –> ambiguity of government's de-facto role

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Enhancing Quality of Life through Sustainable Urban Transformation in Cambodia

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- ✓ Major problems related to institutional fragmentation
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Factors in favour of a SUT in the building sector

- ➢ Experimental pilot or demonstration projects
- ➢ Promotion of cooperative and multi-stakeholder platforms
- ➢ Governmental incentive schemes

Barriers of a SUT in the building sector

- ➢ Assumed cost increases
- ➢ Deficiencies of local capacity
- ➢ Lack of market readiness

Source: R. Jayaweera (WP6)

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Enhancing Quality of Life through Sustainable Urban Transformation in Cambodia

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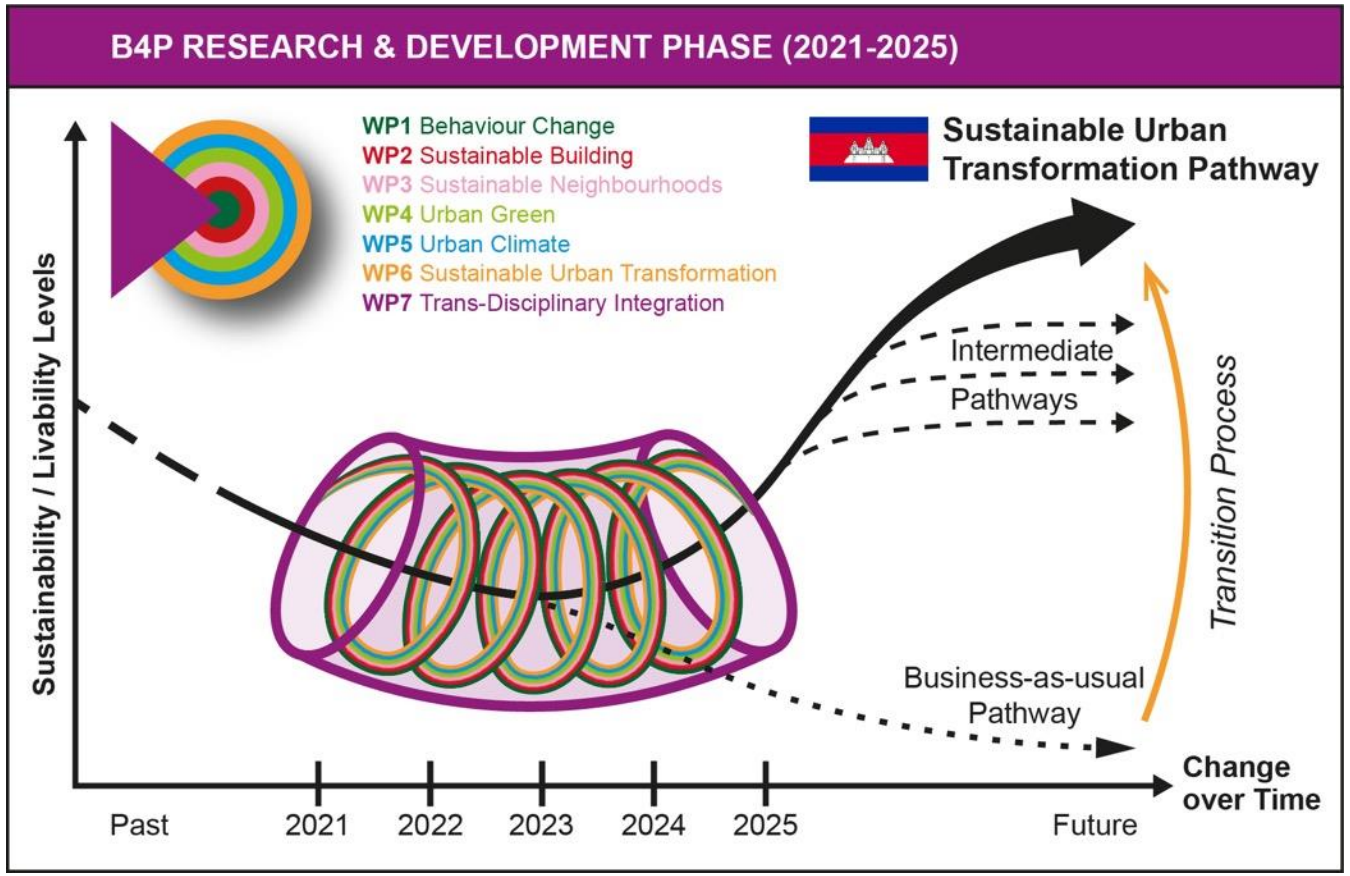
THE OVERALL AIM OF THE BUILD4PEOPLE PROJECT (IDEAL SCENARIO)



RATIONALE

Sustainable Urban Transformation is not only a technological challenge but also a social, cultural, economic and political one (Rohracher, 2001; Rink et al., 2018).

GENERAL APPROACH

- ✓ Systemic to support a transition process
- ✓ People-led
- ✓ Cross-cutting
- ✓ Trans-disciplinary
- ✓ Action research
- ➢ Integrated urban development

➢ **To successfully support a more sustainable urban transformation pathway by means of B4P interventions and action research**

Build4People Project

Enhancing Quality of Life through Sustainable Urban Transformation in Cambodia

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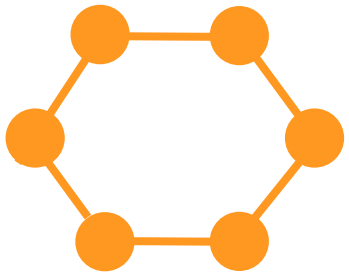
BUILD4PEOPLE'S SUSTAINABLE URBAN TRANSFORMATION APPROACH

Transition Management Instruments

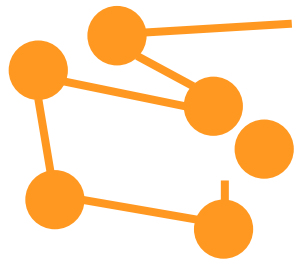
Ecocity Transition Lab
Sustainable Building Incubator
Sustainable Building Arena
Roadmap Development
[…]

WP1
WP2
WP3
WP4
WP5
WP6
WP7

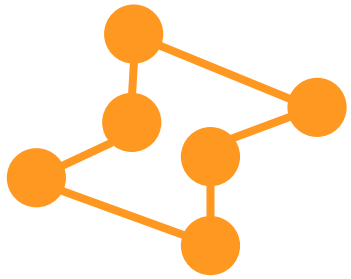
Analysis



Destabilisation



Reconfiguration



Phnom Penh's shift towards a more sustainable and liveable recon-figuration of its urban development regime

Transition Management Approaches

Co-Design
Facilitation of Experiments
[…]
Capacity Development
Strategic Niche Management

Source: Own design based on Geels 2002

Build4People Project

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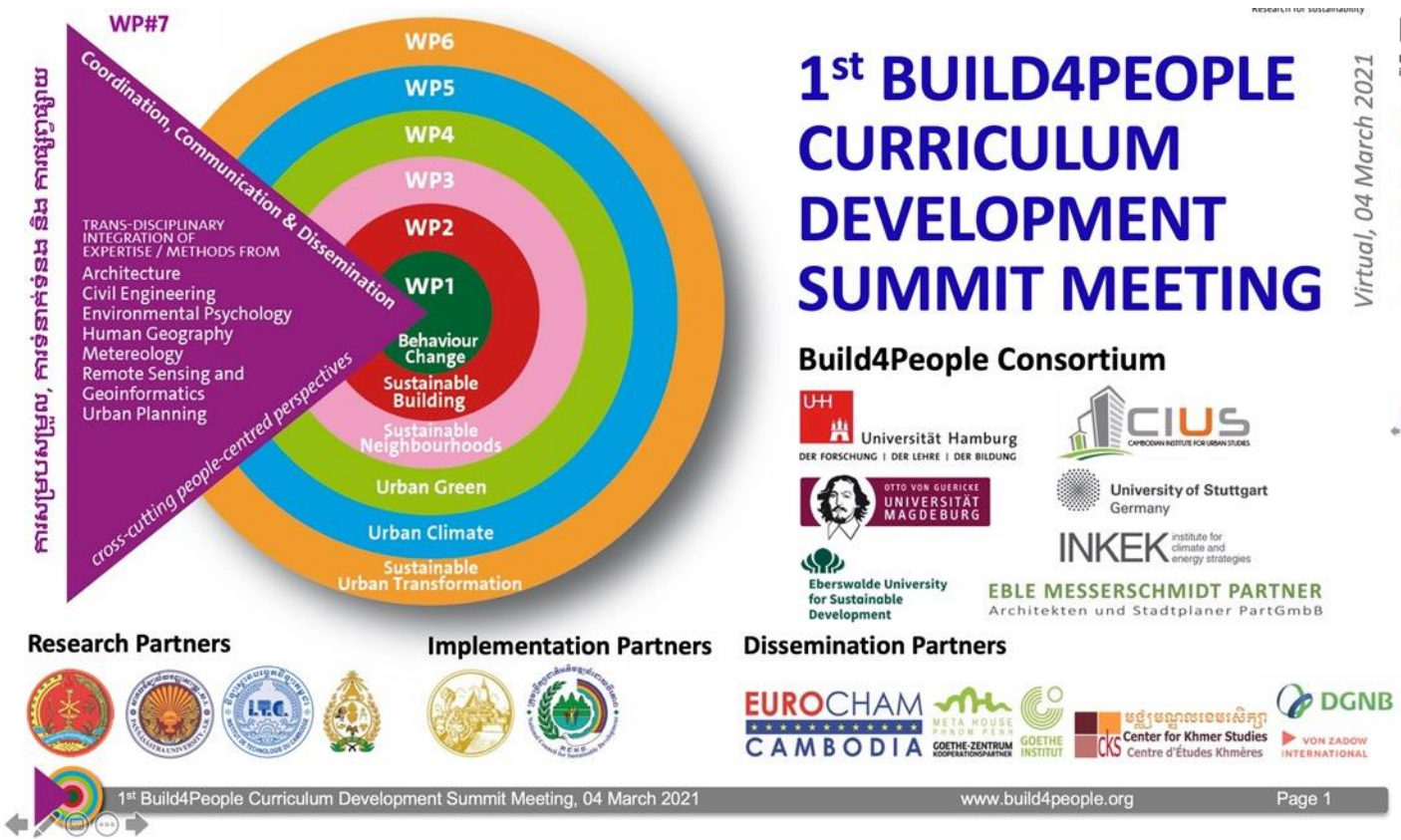
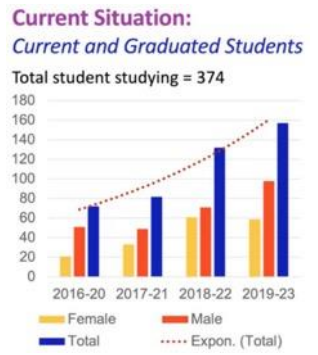
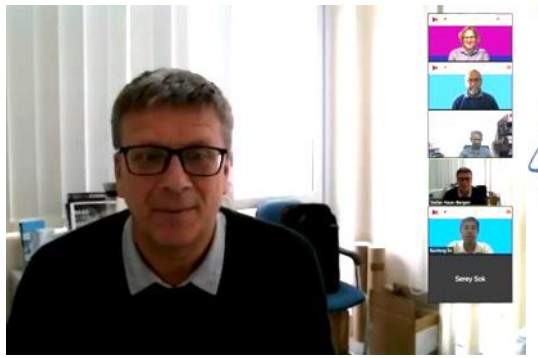
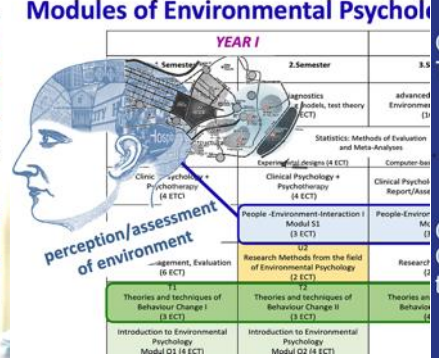
CAPACITY DEVELOPMENT ACTIVITIES

Curriculum Development at our research partners









Curriculum Review

Curriculum Development

Curriculum Testing

Curriculum Certification

Build4People Project

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DISSEMINATION ACTIVITIES / OUTREACH

Build4People Exhibition "Green Buildings & Sustainable Neighbourhoods" – ENG / KHMER

ផ្នែកទី ១
ផ្នាំងរូបភាពវិទ្យាសាស្ត្រ

ណែនាំគោលការណ៍ទូទៅនៃនិន្នភាពពីក្រុមពហុវិស័យ ដែលផ្នែកលើវិស័យគោលនយោបាយផ្សេងៗគ្នាដូចជា ទីក្រុងបៃតង អាកាសធាតុទីក្រុង អគារ ការអភិវឌ្ឍ សហគមន៍ឬការផ្លាស់ប្តូរទីក្រុង។

ផ្នែកទី ២
ផ្នាំងរូបភាពវិទ្យាសាស្ត្រ

ការតាំងបង្ហាញ Build4People លើក ទី ១ ណែនាំអំពីករណីសិក្សាដែលមានការ អនុវត្តល្អបំផុតពីប្រទេសអាឡឺម៉ង់និងអឺរ៉ុប។

ផ្នែកទី ៣
ការណែនាំពី DGNB

ទំនាក់ទំនងធំបំផុតរបស់សហភាពអឺរ៉ុប សម្រាប់អគារដែលប្រកបដោយនិន្នភាព

DGNB
Deutsche Gesellschaft für Nachhaltiges Bauen
German Sustainable Building Council

EBLE MESSERSCHMIDT PARTNER
Architekten und Stadtplaner PartGmbB

flickr

YouTube DE

https://www.youtube.com/watch?v=RFzlZqbBb2g

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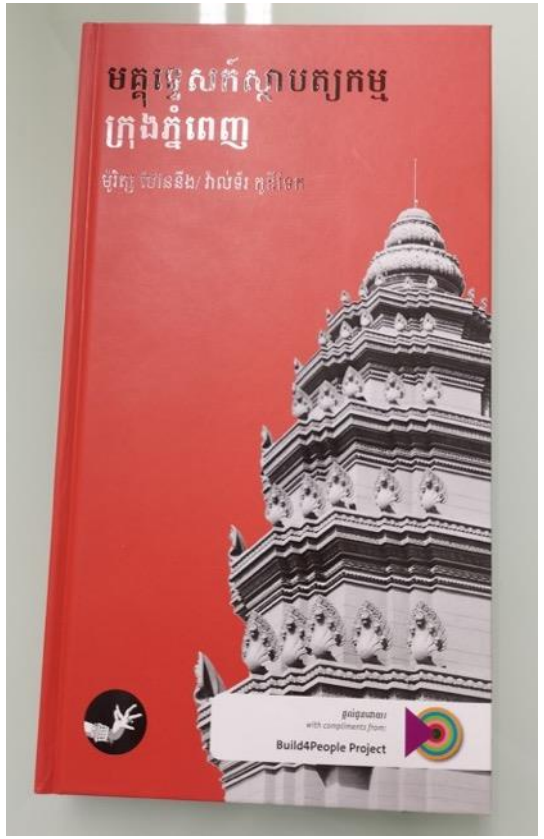
DISSEMINATION ACTIVITIES / OUTREACH

Architectural Guide to Phnom Penh – ENG / KHMER



CONCLUSION

Analysing and supporting a sustainable urban transformation in Phnom Penh

- The entry points for Build4People's research are the building and neighbourhood planning sectors.
- Sustainable urban transformation will be encountered by a systemic and cross-cutting approach.
- Supporting the shift from technocratic top-down decision-making based on designing urban master plans to a planning culture which is more integrated, people-led and rather understood as a process and dialogue.
- Highlighting the role of the urban citizens, in regard of 1) sustainable behaviour, 2) supporting their decisions to buy environmentally-friendly products, 3) supporting their role as environmental activists to influence policies)

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- Highlighting the role of the urban citizens, in regard of 1) sustainable behaviour, 2) supporting their decisions to buy environmentally-friendly products, 3) supporting their role as environmental activists to influence policies)
- Build4People's overall normative aim is to improve people's subjectively perceived urban quality of life while matching objective urban sustainability criteria
- To maximize impacts, Build4People's approach will be actively communicated, disseminated and made visible.
- **Tackling sustainability is a cross-cutting challenge which requires holistic governance / sustainable urban transformation approaches**

Build4People Project

Enhancing Quality of Life through Sustainable Urban Transformation in Cambodia

គម្រោងសាងសង់សម្រាប់ប្រជាជន
ការលើកកម្ពស់ គុណភាពជីវិត របស់អ្នកទីក្រុង ដោយ ការ បង្ហែង ទៅជាក្រុង មានចីរភាពនៅកម្ពុជា

DEF 2019-2021

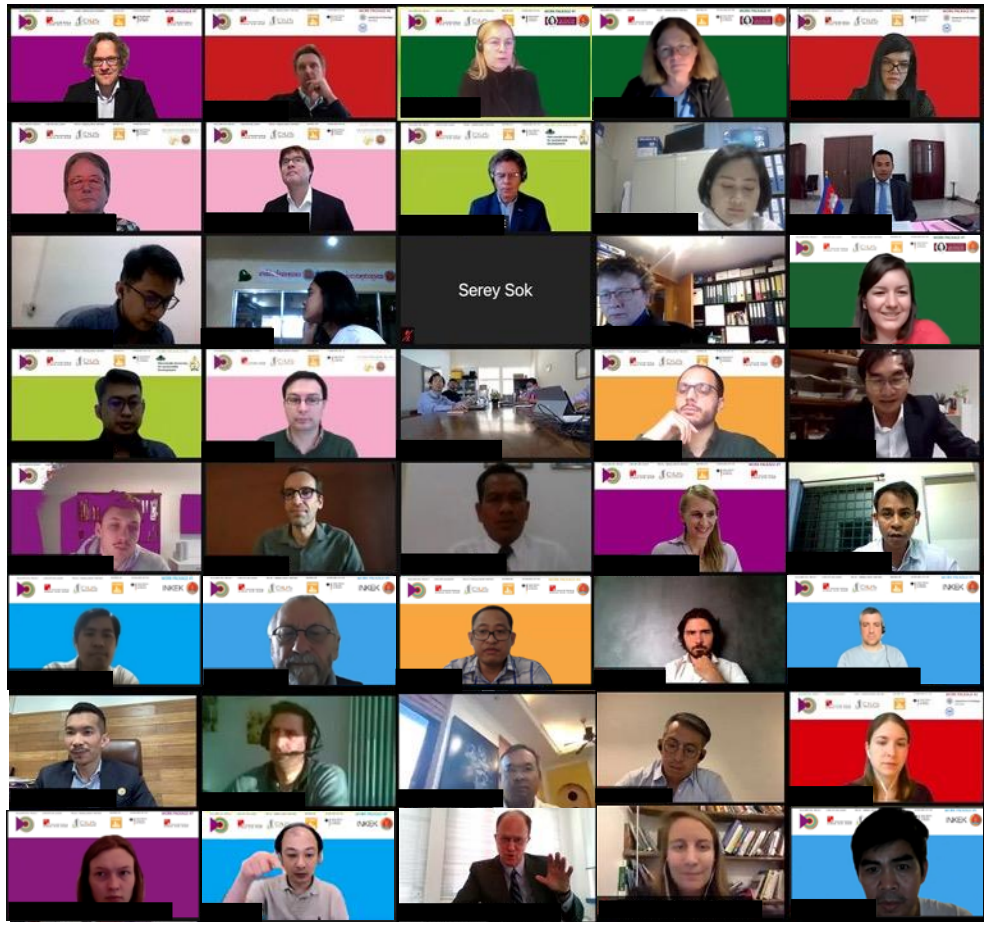
R&D 2021-2025

IMP 2025-2027

SPONSORED BY THE

Federal Ministry of Education and Research

FONA
Research for sustainability



Thanks so much for your attention!

More info: build4people.org

អរគុណសម្រាប់ការយកចិត្តទុកដាក់!

WORK IN PROGRESS!

Research Partners

Implementation Partners

Dissemination Partners

3rd Presentation

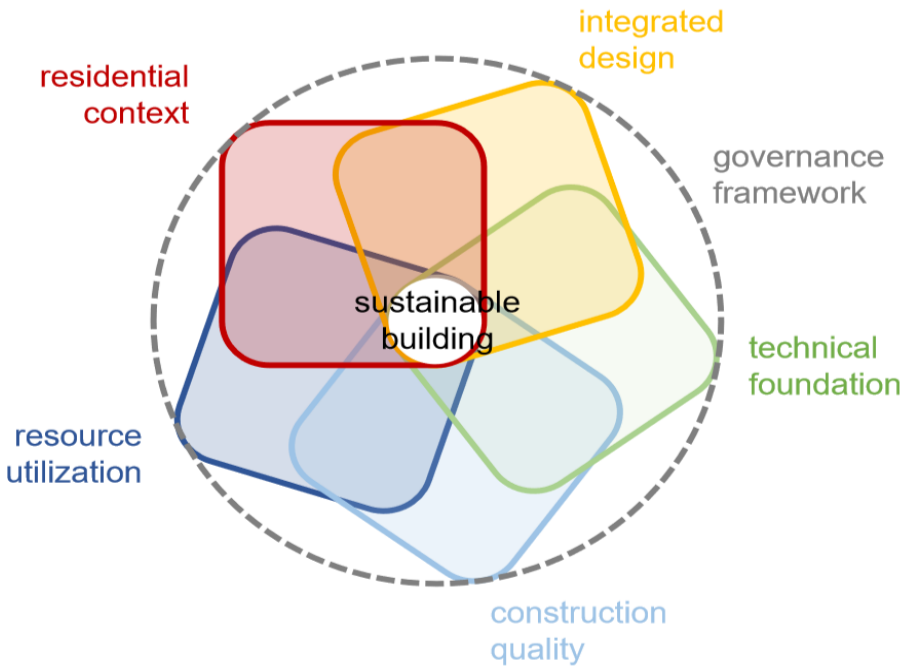
Climate-Adapted Material Research for the Socio-Economic Context of Vietnam

Dr. Dirk Schwede

Institute for Building Energetics, Thermotechnology and Energy Storage, University of Stuttgart

Climate-Adapted Material Research for the Socio-Economic Context of Vietnam (CAMaRSEC) - CLIENT II

Enabling Research and Development for Sustainable Buildings
in the socio-economic context of Vietnam



ASEAN-IEA Webinar:

Regulatory Frameworks and the Role of Governments in Buildings Policy Development

4. June 2021

research consortium:

University of Stuttgart
Germany

Universität Hamburg
DER FORSCHUNG | DER LEHRE | DER BILDUNG

Fraunhofer IBP

BAU BILDUNG SACHSEN

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Hanoi, Vietnam

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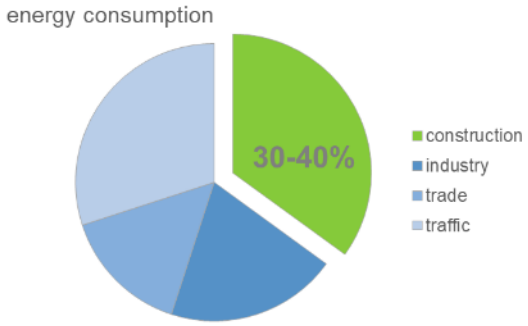
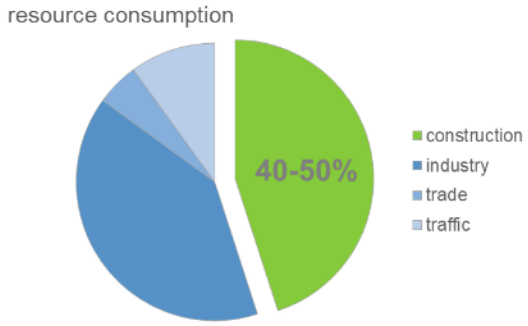
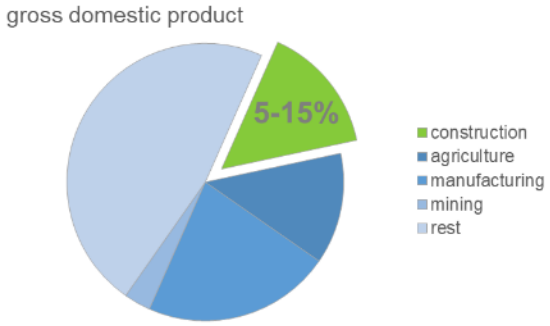
College of Urban Works and Construction
Hanoi, Vietnam

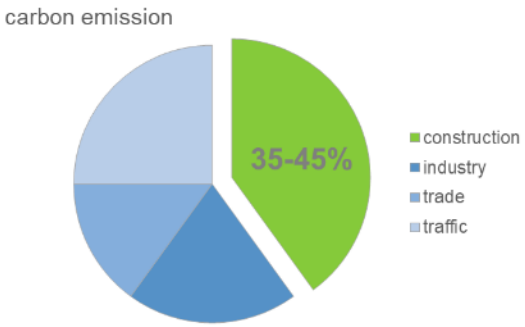
Roadmap to 2050:
Necessary steps towards climate neutrality

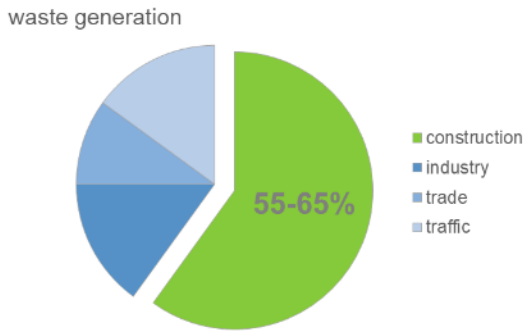
importance of the construction sector for sustainable development

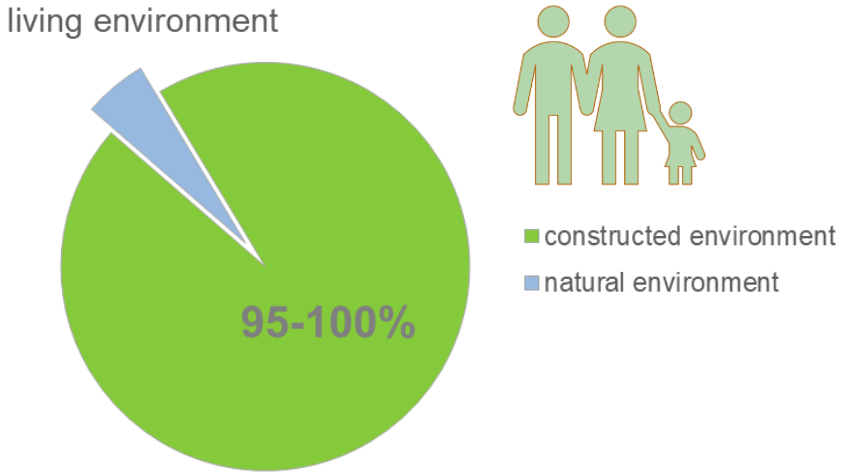






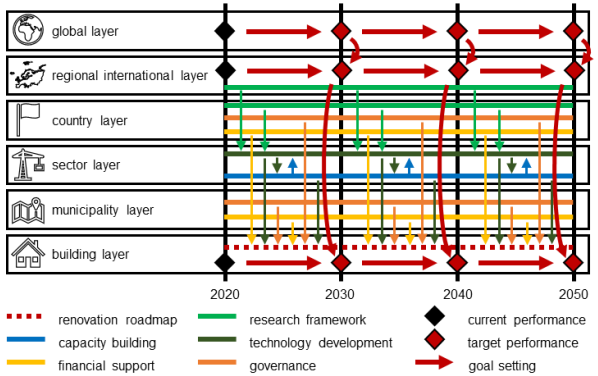


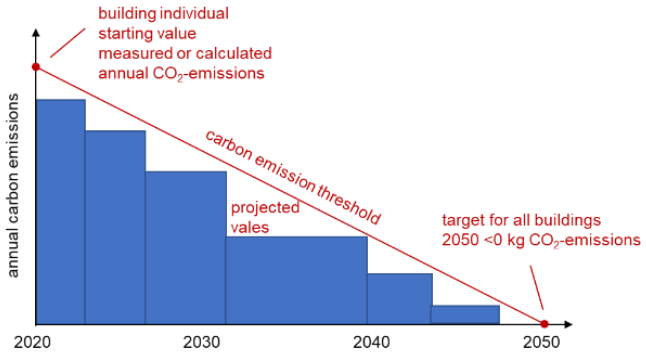




Roadmap to 2050:
Necessary steps towards climate neutrality

road mapping towards low carbon performance

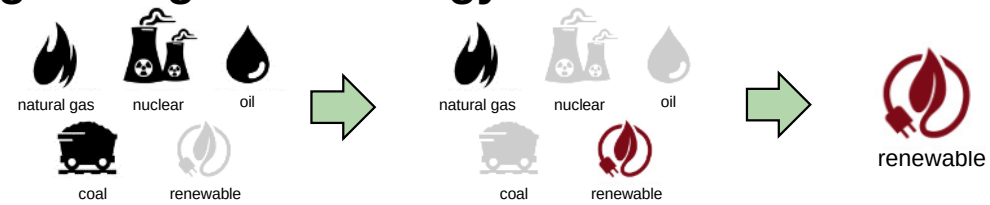




roadmap to the climate-neutral building stock. reproduced from DGNB “Framework for carbon-neutral buildings and sites”

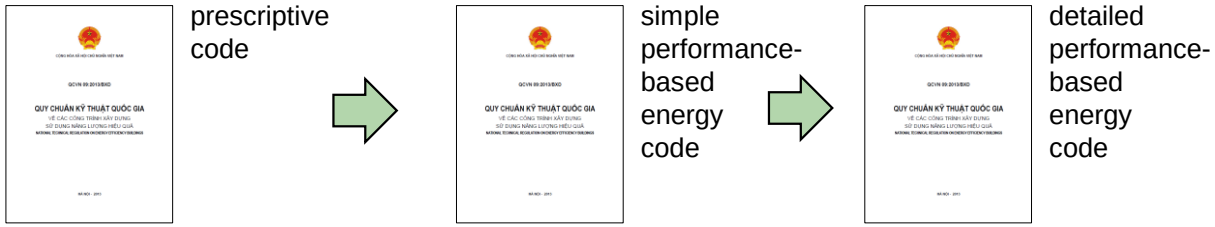
Braune A, Geiselmann D, Lemaitre C, Oehler S (2018): “Framework for carbon-neutral buildings and sites”, German Sustainable Building Council (DGNB)

greening of the energy mix



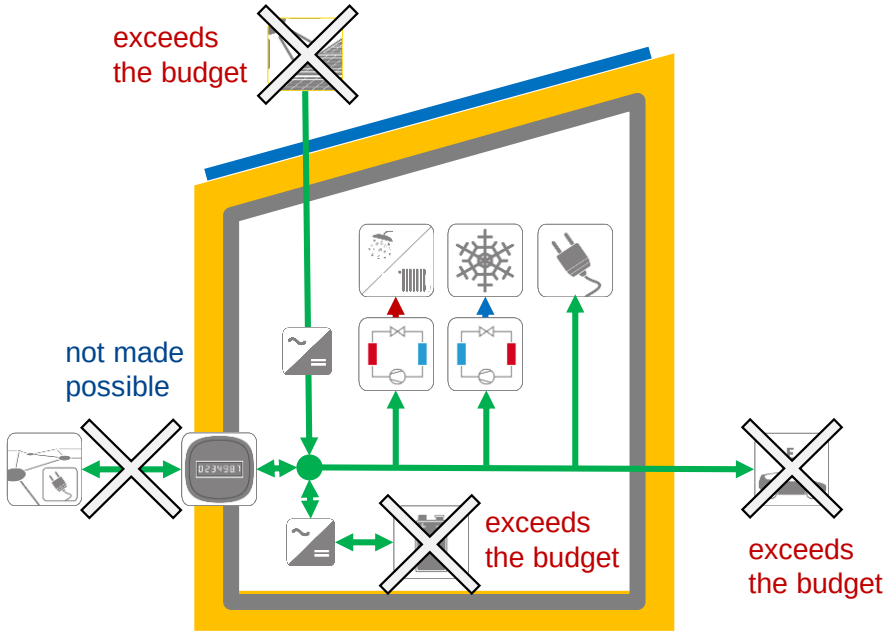
development of key technologies

policies development and research

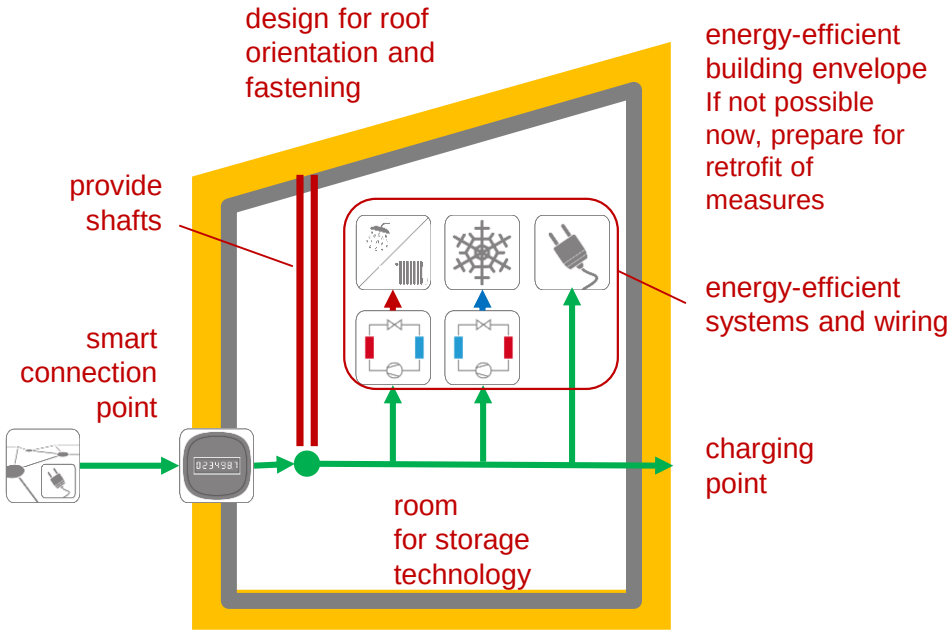


Roadmap to 2050:
Necessary steps towards climate neutrality

future-ready buildings



in many places it is not the right time for BIPV yet



preventing lock-in effects by foresightful design planning for future opportunities

Climate-Adapted Material Research for the Socio-Economic Context of Vietnam (CAMaRSEC) - CLIENT II

Enabling Research and Development for Sustainable Buildings
in the socio-economic context of Vietnam







CỘNG HÒA XÃ HỘI CHỦ NGHĨA VIỆT NAM

QCVN 09:2013/BXD

QUY CHUẨN KỸ THUẬT QUỐC GIA

VỀ CÁC CÔNG TRÌNH XÂY DỰNG
SỬ DỤNG NĂNG LƯỢNG HIỆU QUẢ

NATIONAL TECHNICAL REGULATION ON ENERGY EFFICIENCY BUILDINGS

HÀ NỘI - 2013

project duration

1.7.2019 – 30.6.2022

research consortium:

University of Stuttgart
Germany

Universität Hamburg
DER FORSCHUNG | DER LEHRE | DER BILDUNG

Fraunhofer IBP

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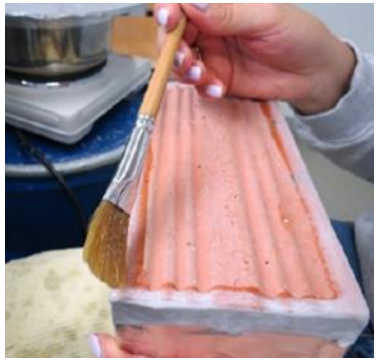
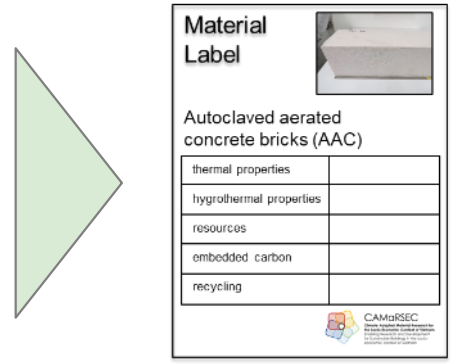
building-up research facilities for material research and characterisation
for reliable material labelling and design information





Climate-Adapted Material Research for the Socio-Economic Context of Vietnam (CAMaRSEC) - CLIENT II

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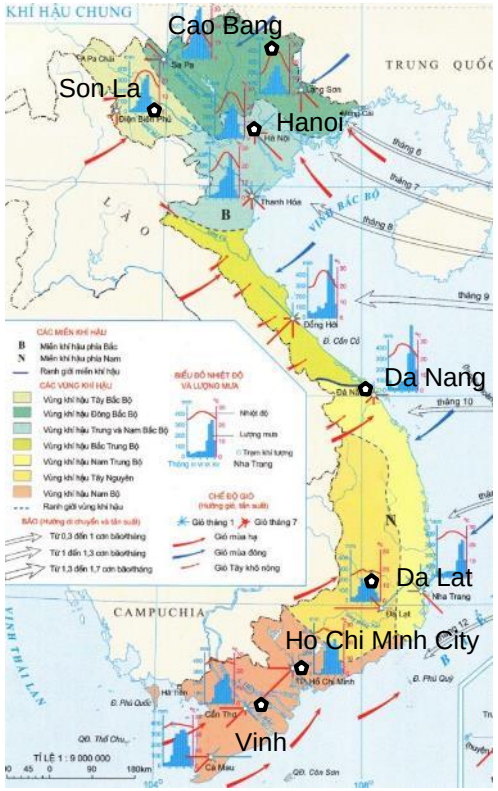
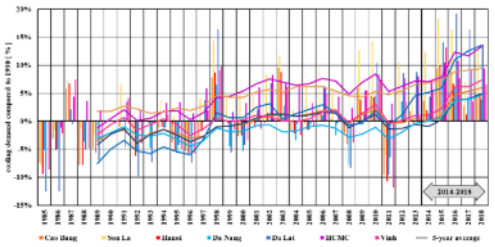
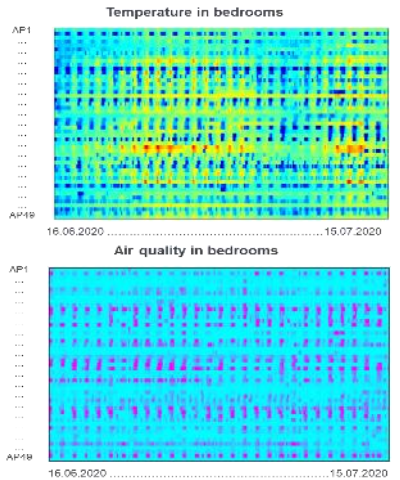
development of a basis for advanced design and development of sustainable solutions



weather datasets
ERA5 climate reanalysis datasets



development of the cooling demand in an apartment in seven cities in Vietnam over 34 years (1985-2018)



measured indoor climate conditions

reference simulation datasets for thermal simulation studies and hygro-thermal simulation studies

WUFI®

EnergyPlus

CAMaRSEC

Adaption of research results for Vocational Education and Training, Capacity Building

WP 5.3
Local adapted trainings for construction workers

- analyzing existing curricula
- transferring research results into existing or new curricula and into practical trainings for vocational education and further training courses for Vietnamese construction workers
- developing training material and practical training facilities





subproject partners

contact: Mr Michael WIECZOREK
email: m.wieczorek@bau-bildung.de

Competence Centre for Sustainable Building (CCSB-VN)

Supporting Establishment of CCSB-VN

- Aim to develop CCSB-VN as Vietnam's *leading think tank in terms of sustainable building*
- CCSB-VN to *bundle trans-disciplinary expertise* in sustainable building in Vietnam and to *transfer this knowledge* to the diverse areas of *scientific application*
- CCSB-VN as *cross-cutting institution* over-coming prevalent silo mentalities
- CAMaRSEC aims to develop CCSB-VN's vision, a *mission statement*, strategy and *business plan* including future activities

Climate-Adapted Material Research for the Socio-Economic Context of Vietnam (CAMaRSEC) - CLIENT II

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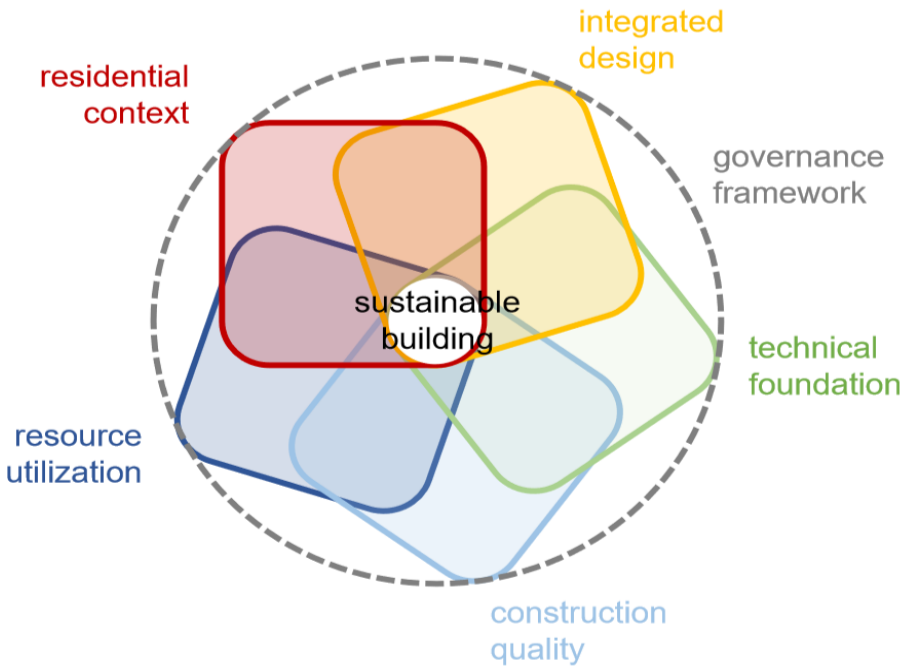

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College of Urban Works and Construction
Hanoi, Vietnam

4th Presentation

The Development of Cambodia's Guidelines and Certification for Green Buildings

Mr. Sokhai Nop

Deputy Director Department of Green Economy, General Secretariat of National Council for Sustainable Development (NCSD), Ministry of Environment, Cambodia

The Development of Cambodia's Guidelines and Certification for Green Buildings

By Sokhai Nop

Deputy Director, Department of Green Economy

General Secretariat of the National Council for Sustainable Development

Ministry of Environment, Cambodia

Contents

- Current Development of Cambodia's Guidelines and Certification for Green Buildings (Cam's GCGB)
- Policies and actions addressing buildings and energy
- Challenges to achieve buildings and energy (green buildings)
- Opportunities to support buildings and energy (green buildings)
- Way forward

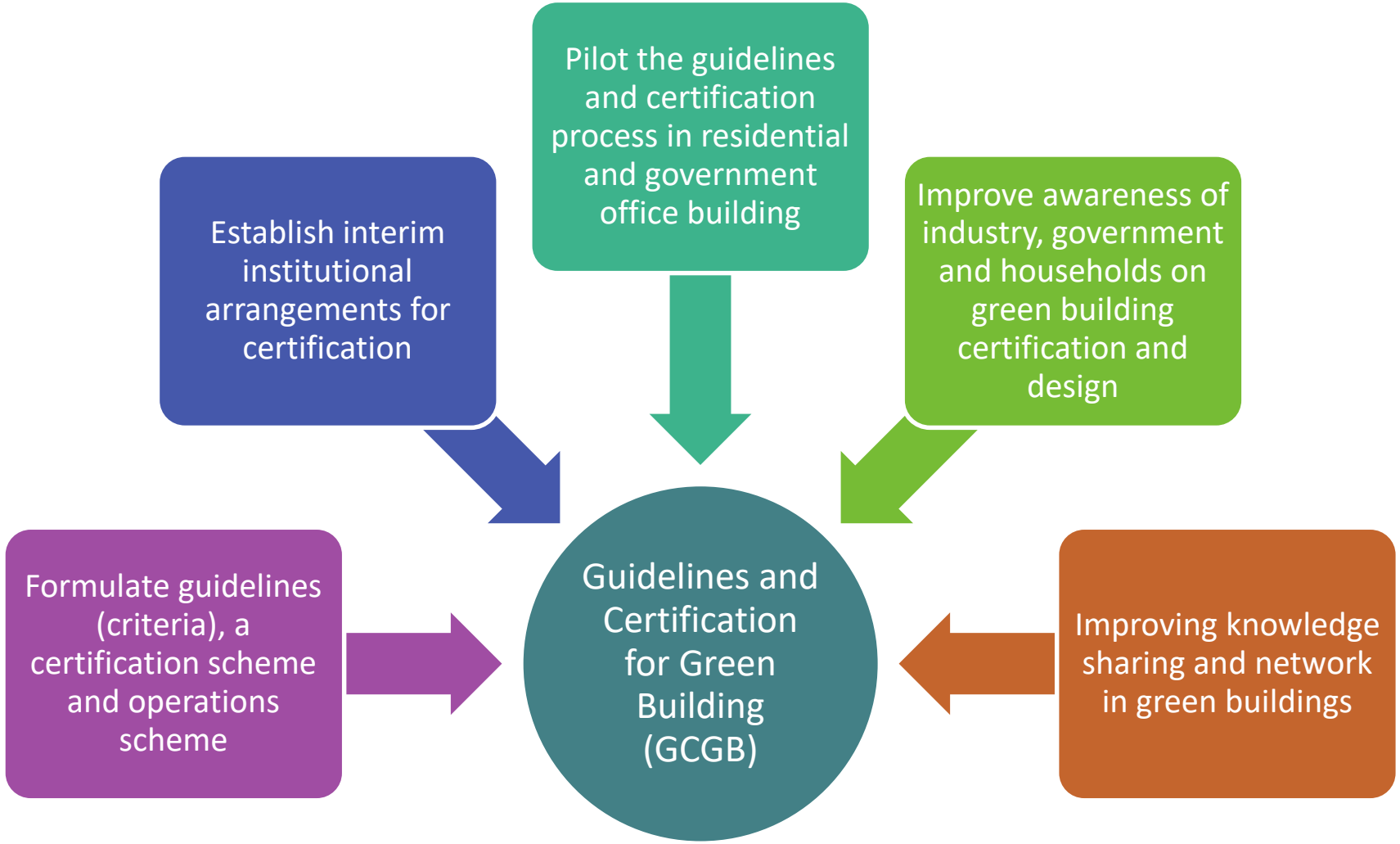
Cam’s GCGB (Background)

- Cambodian construction industry is one of the drivers of economic growth in the country with average growth of 18.1% during 2014-2019
- The building sector was the largest final energy consumer in 2017, accounting for 52% of total consumption, or 3.5Mtoe. Residential and commercial buildings consumed 77% of total final electricity (IEA, 2020). Building’s energy consumption will more than double by 2040 according to national forecasts.
- The economic growth of 7% and increasing urban population construction results in increasing house demands, infrastructure development and urban space
- Buildings with low energy performance are a drag on improving energy productivity and increasingly lock the country into a trajectory for high carbon intensity and a high rate of energy infrastructure investment.
- Cooling of buildings presents a significant challenge because air temperatures become more extreme
- Current urban population is 27% and by 2050, 52% of the population live in urban areas

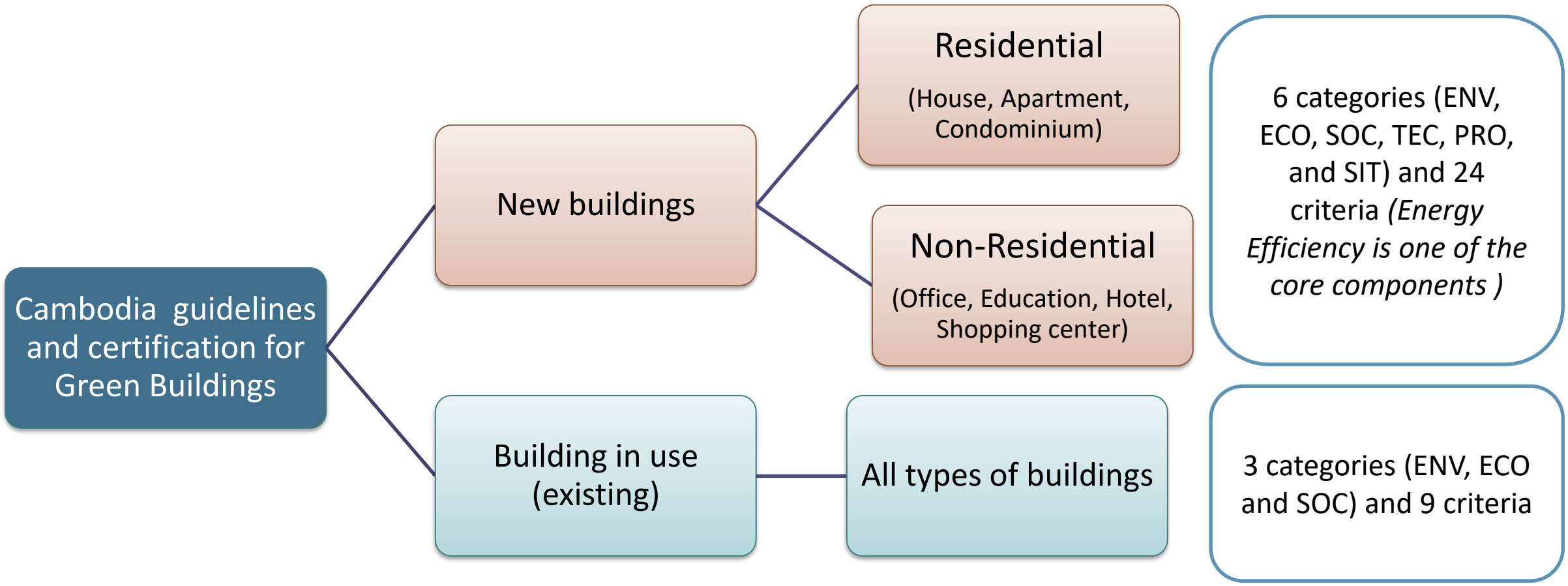
Cam’s GCGB (Background)

- The Guidelines and Certification for Green Buildings in Cambodia is implemented by NCSD/MoE with technical support from Korean Institute of Civil Engineering and Building Technology (KICT), funded by Republic of Korea via Mekong-Rok Cooperation Fund (MKCF).
- The project aims to develop guidelines and certification standards for constructing green buildings (residential and commercial) in Cambodia.
- The guidelines and certification scheme involving green building components including energy, water, and materials will be promoted through industry-specific training and awareness raising workshops, particularly for architects and construction companies in Cambodia.
- The Guidelines for a Green Building Design and the Certification can Help contributing Cambodia’s commitment in reducing its carbon emissions, under its Nationally Determined Contribution (NDC) to the UNFCCC, and under its National Green Growth Policy (2013) and National Green Growth Strategic Plan (2013-2030).

Cam's GCGB (Outputs)



Cam's GCGB (Overview)



Cam's GCGB (Overview)

Environmental Sustainability
1 Energy Efficiency Assessment
2 Sustainable resource extraction
3 Potable water demand and waste water volume
4 Land use and urban planning
5 Biodiversity at the site

Economic Sustainability
1 Life cycle cost assessment
2 Flexibility and adaptability

Socio-cultrual and functional Sustainability
1 Indoor air quality
2 Visual comfort
3 Quality of indoor and outdoor spaces
4 Design for all

Technical Sustainability
1 Fire safety
2 Ease of recovery and recycling
3 Ease of cleaning
4 Building evelop

Communication Sustainability
1 Comprehensive project brief
2 Construction site/construction process
3 Systematic commissioning
4 User Communication
5 Facility Management

Site Sustainability
1 Local environment
2 Influence on the district
3 Transport access
4 Access to amenities

Policies and actions addressing buildings and energy

- National Policy on Land Use (2011) aims to ensure the sustainable use of land and natural resources for socioeconomic development, food security, and balance of natural resources.
- Cambodia's Climate Change Action Plan for the Energy Sector (2021-2023) includes strategic objectives and action that support the sustainable production and consumption of energy, as well as greenhouse gas mitigation and low-carbon development
- Cambodia's Basic Energy Plan (2019) aims to supply energy to Cambodia with affordability and accessibility, and provide security, safety and transparency in the energy market
- The Energy Efficiency and Conservation Master Plan of Cambodia (2020) aims to inform the formulation of energy efficiency policies and programs
- Draft Environment and Natural Resources Code includes sustainable energy
- Draft law on urban planning (2021) suggests 30% of total area designated as green space for new urban areas and land use zooning and urban space development
- National Green Growth Policy and Strategic Plan (2013-2030) promote green and resource efficient production in industries, green investment and green jobs creation, green industry that encourages use of renewable energy, energy saving and efficiency, and effective use of raw resources,
- Draft National Energy Efficiency Policy2018-2035 includes the target at reduction of energy use 25% in building by 2035

Policies and actions addressing buildings and energy

- Localized Energy Efficiency Design Guideline for new residential and commercial buildings is led by Ministry of Mine and Energy (MME) to provide technical guidance to the real estate developers to increase energy efficiency in the buildings and contribute to Cambodia's commitment to climate change
- Building Technical Regulation is taking lead by Ministry of Land Management, Urban Planning and Construction
- Sub-decree On Energy Efficiency Standards And Labeling For Electrical Appliances And Equipment (draft) with the aim to manage energy consumption and improve energy efficiency by implementing the minimum energy performance standards and energy efficiency labeling on regulated electrical appliances and equipment
- NDC Roadmap for Low-Carbon, Climate Resilient Buildings and Construction 2050 in Cambodia (draft) by MLMUPC provides a guidance toward climate resilience and energy saving in buildings
- Draft Circular Economy Strategy and Action Plan (to be launched soon) promotes use of sustainable energy and materials and energy efficiency in building construction
- Sustainable Consumption and Production Roadmap (draft) identifies steps to promote sustainable energy sources, and energy efficiency, including through labelling systems for products, energy efficiency audits and awareness raising

Policies and actions addressing buildings and energy

- Phnom Penh Sustainable City Plan 2018-2030 (sub-national) supports sustainable building construction by including green buildings, energy reduction in existing building, low income housing)
- Cambodia Green Building Council has been established by non-profit group
- MME in collaboration with MLMUPC leads the development of the Building Energy Code
- MME's efforts with support from MoEYS, and the MLMUPC to develop education schemes about energy efficiency measures in the buildings sector will be supported by the.
- Policy measures for the improvement of end-user product energy efficiency, including the development of a labelling scheme and energy efficiency standards
- Joint effort of relevant ministries to carry out informational campaigns to increase the awareness about energy efficiency and aim at changing end-user behaviour.

Challenges to achieve buildings and energy (green buildings)

- Significant new investments in high-rise apartments, entertainment complexes, commercial buildings and satellite cities are energy intensive and not currently using energy efficiency measures
- Lack of systematic plan for sustainable infrastructure and services and unregulated urban growth remain challenges
- Many buildings are not resilient to climate change, particularly to increased temperatures and flooding
- Informal housing in Cambodia's cities is often made from recycled materials that are more vulnerable to urban flooding events
- Lack of awareness of energy efficiency opportunities in construction, despite the potential opportunity to reduce high electricity costs
- Lack funding for a dedicated Cambodian government program on building energy efficiency

Opportunities to support buildings and energy (green buildings)

- The benefits of green building include energy and resource conservation, cost efficiency, well-being, consistent quality and health and safety
- Develop green building guidelines (or building codes) for constructing or retrofitting energy-efficient and resource-efficient buildings (residential and commercial), enabling heat, energy and greenhouse gas emissions management, and pollution management
- Building energy-efficiency requirements are considering in building technical regulations (on going)
- Disseminate technical guidelines and regulations related to building and energy to developers and constructors
- New large construction projects should be required to dedicate sufficient space for green corridors and adhere to green building standards
- Require public buildings to be designed according to an established green building standard
- Implement building energy reporting systems, either voluntary or mandatory for large electricity consuming buildings
- Effective enforcement of green building regulations through independent assessors for compliance check and create a roster of professionals outside the public sector
- Pilot demonstration of low-cost energy and resource efficient housing
- Establish an energy manager program, whereby energy managers are trained and certified
- Education of architecture students in green building design; and education of architects and urban planners in green building design.

Way forward

- Piloting Guidelines and Certification for Green Buildings (commercial and residential buildings)
- Institutional arrangements, such as establishing a Green Building Council, led by Government or a public-private partnership
- Construction and real estate to implement energy efficiency, green building design, water use efficiency
- Industry to promote opportunities for the use of sustainable materials, energy efficiency, renewable energy, water use efficiency and environment pollution control in manufacturing
- Update building codes and construction regulations with minimum green building requirements
- Capacity building and awareness raising and partnership amongst architecture and planning professionals and the community on green buildings
- Promote energy efficiency through education and awareness raising for the public, residential and commercial sectors.
- Conduct energy efficiency audits across all government services and properties and establish energy management plans for Ministries

Thank you!

Contact: eversokhai@yahoo.com
General Secretariat of National Council for Sustainable Development/Ministry of Environment, Cambodia

5th Presentation

Improving Building Energy Efficiency in Southeast Asia

Dr. Xiaodong Wang
World Bank

Improving Building Energy Efficiency in Southeast Asia

Dr. Xiaodong Wang
The World Bank
June 4, 2021

Structure of the Presentation

- **The World Bank Group:** leader in climate and clean energy financing
- **Conducive policies drive business models and financing mechanisms**
- **Conducive policies:** essential driver for catalyzing clean energy investments
- **Building energy efficiency projects: business and financing models**

The World Bank Group: Committed to Climate Change and Leader in Climate Financing

- **The World Bank Group: the largest multilateral climate financier in the world, about $20 billion per year, and increased the target of climate financing from 28% to 35% lending portfolio**
- **The World Bank has a broad range of financing instruments**:
  - ***IBRD/IDA***: Long-term development financing
  - ***Climate Investment Funds ($8 billion):*** Long-term concessional financing
  - ***Grants from Global Environmental Facility and other trust funds***: Grant for policy advice, technical assistance, capacity building, and pilot innovative financing mechanisms
  - ***Carbon financing***: Enhance the revenue stream of mitigation projects
  - ***BioCarbon Fund***: Fill the funding gap to address deforestation
  - ***Green Bonds***: The world's leader and largest issuer of green bonds – the Bank issued $10 billion and IFC $7 billion green bonds

World Bank Energy Efficiency Projects

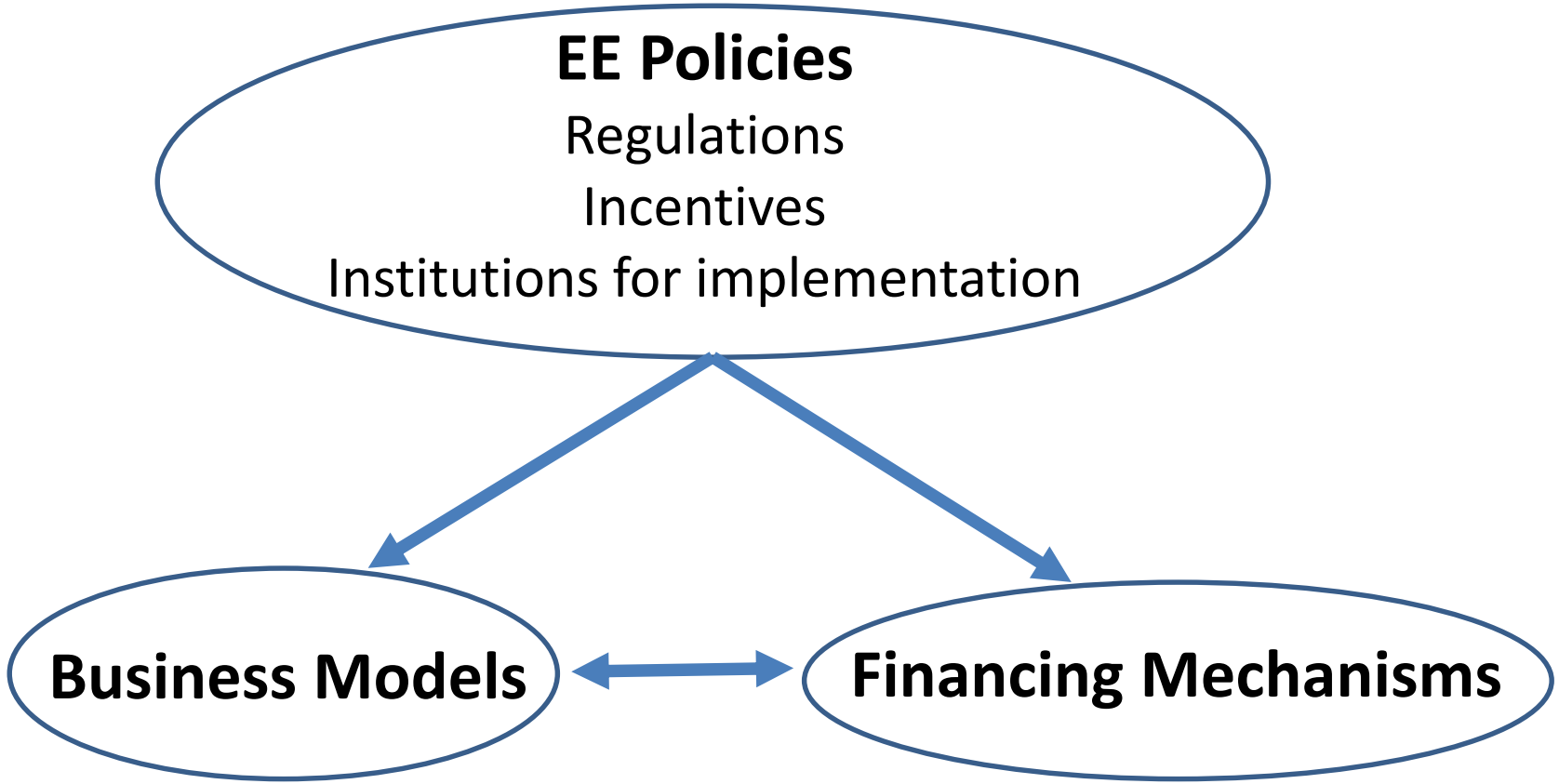
- Credit lines (China, Turkey, Vietnam)
- Partial risk guarantees (China, Hungary, Vietnam)
- Dedicated funds (Bulgaria)
- ESCOs (China, India, Armenia)
- Public buildings (Mexico, Romania)
- Commercial buildings (Shanghai, China)
- EE Lighting Initiative (India, Uganda, Ethiopia)
- Utility EE/Demand Side Management (South Africa, Thailand, Vietnam)
- Reduction in T&D loss (India, Vietnam)

Improving energy efficiency requires to overcome market barriers and failures

Energy Efficiency: Mostly financially viable, but facing **market barriers and failures:**

- ***Regulatory barriers:*** **Low or subsidized energy pricing --** fossil fuel subsidies
- ***Institutional barriers*:**
  - **Split incentives**: tenants typically pay energy bills, landlords have little or no incentive to spend on efficient appliances or insulation
  - **EE usually not a priority for consumers:** profit a priority for industrial users, product function and appearance a priority for end-users, energy costs usually represent a small share in operating costs
  - **A lack of institutional champion** due to the fragmented nature of EE
- ***Financing barriers***
  - **High upfront costs**
  - **Credit risks**: Most banks rely on credit rating criteria, while many EE developers and inefficient end-users are not creditworthy
  - **Performance risks*:*** Lenders are not sure the expected energy savings will be realized, and measurement and verification is not an easy task
  - **Banks lack expertise and interest** in EE financing
  - **Small deals with high transaction costs**
- ***Limited awareness and information***

Effective policies drive business models and financing mechanisms



Conducive Policies: Driver for Catalyzing Private Investments in Energy Efficiency

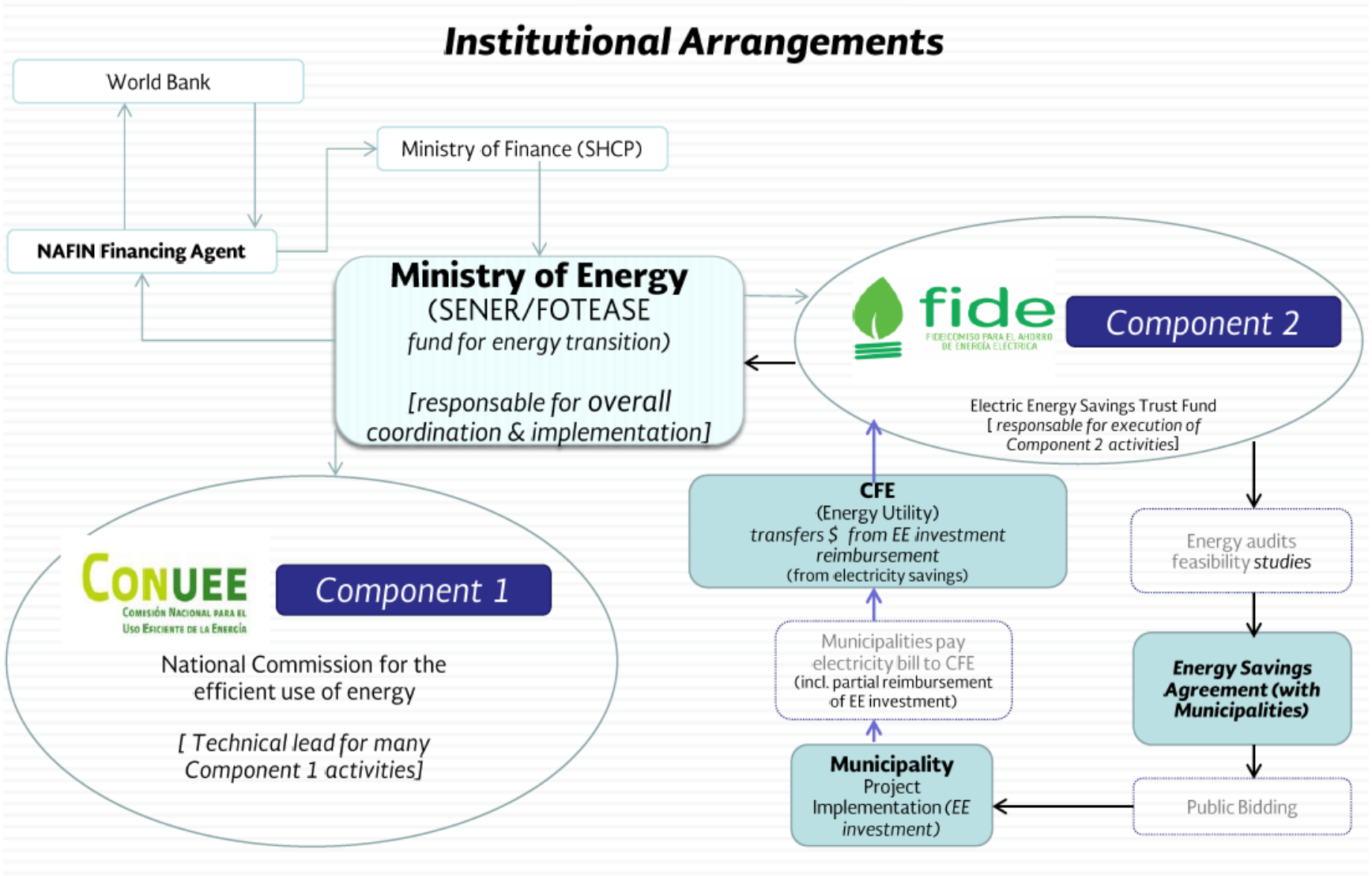
- **Regulations:** Effective at increasing market demand, but weak enforcement a concern
  - **Targets**: energy intensity reduction or energy savings
  - **Standards and codes**: appliance standards, **building codes**, industry performance targets, fuel economy standards
  - **EE Portfolio Standards, Obligations and White Certificates Trading**
- **Pricing instruments:** Suppress energy demand to increase market uptake for EE, but require strong political will
  - **Energy pricing reform**: removal of fossil fuel subsidies, time of use tariff
  - **Fuel and carbon taxes**
- **Financial incentives:** Help overcome high upfront cost and increase affordability, but require funding from taxpayers or ratepayers
  - **Financial incentives**: investment subsidies, tax credit, consumer rebate
  - **Output-based incentives**: Standard Offer $/kWh saving, or $/tce saving – more effective, but measurement and verification is the key

Mandatory, output-based policies far more effective than voluntary input-based approaches

Financing Building Energy Efficiency Projects

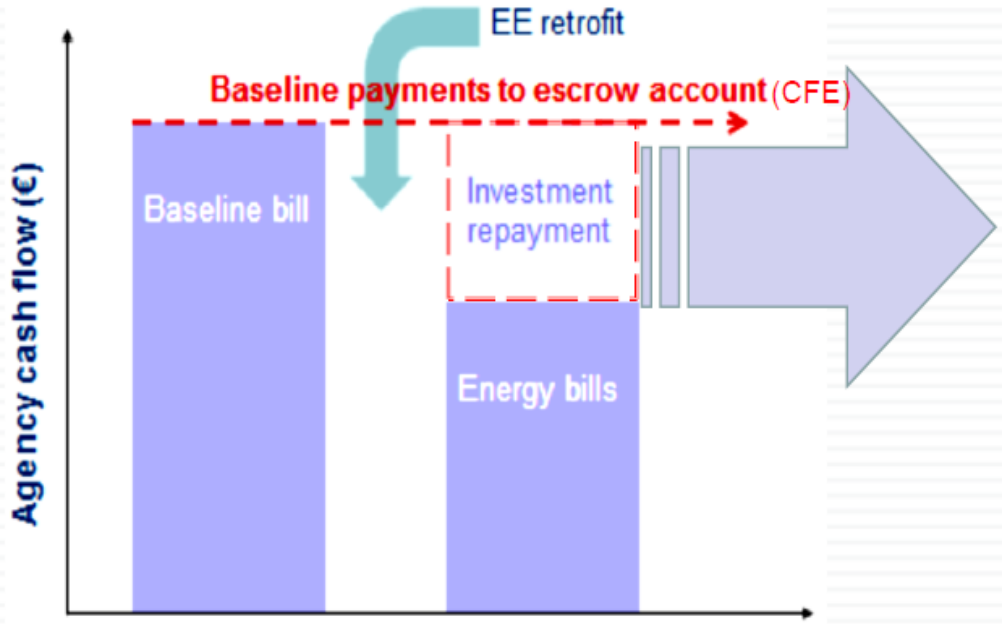
- **New buildings**
  - Building codes
  - Building net zero emission buildings
- **Retrofit government buildings**:
  - ESCOs
  - Energy service agreements
  - Reform public budget system needed
- **Retrofit commercial buildings**:
  - ESCOs: demand aggregation is the key – with the same ownership (hotels, retail chains, etc.), multi-ownership buildings the most difficult
  - Building owners
  - Financial incentives needed

Retrofit Public Buildings



Energy service agreements for public buildings

Sustainability of financing mechanism.
*Energy Service Agreements (ESA)**

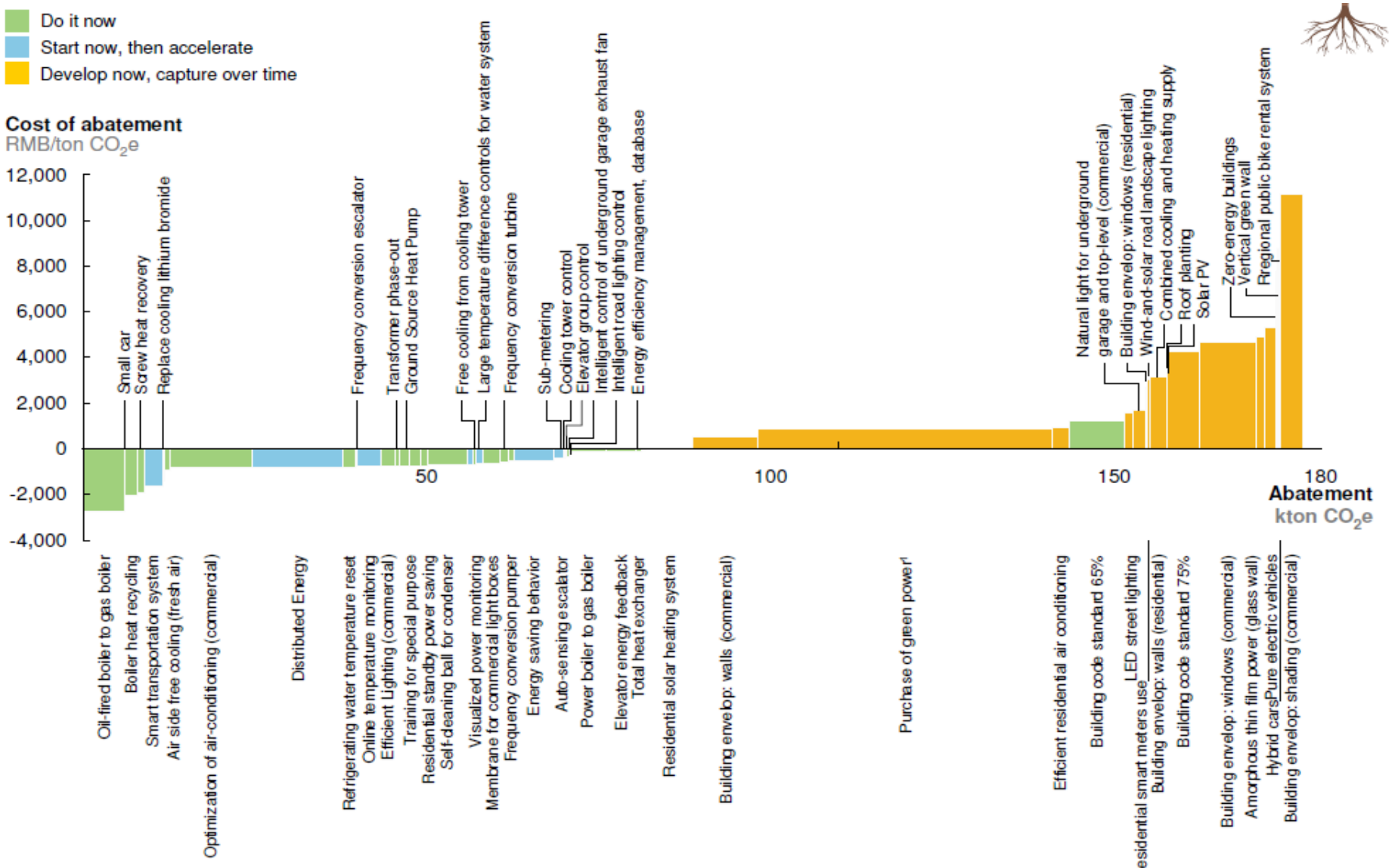


- Municipalities do not incur debt, but they pay for the energy service.
- The electricity savings are used to pay part of the investments via the electricity bill.

Part of the investments are covered by a subsidy from the federal government ($100 million WB loan)

* Service provision and not debt for local government

Abatement Cost Curve in Changning District, Shanghai



1 Purchase volume is forecast by surveys. Whether emissions reduction through purchasing green power counts is still under debatable

SOURCE: Team analysis

Green Energy for Low-Carbon City in Shanghai

- **Project Development Objective:** to support Shanghai's low-carbon city development by promoting green energy schemes, focusing on Changning district
- **Low-carbon investments: (**$200M: $100M IBRD): credit lines through local banks to scale up green financing
  - **Building retrofit**
  - **New buildings**: covering incremental costs above meeting municipal building codes
- **Technical assistance and near zero-emission building:** ($10M: $4.345M GEF): multi-sector to achieve low-carbon objective
  - **Green energy buildings**: developing policies and supporting online energy monitoring platform (MRV) for *building retrofit*; and piloting *new near zero-emission building*
  - **Low-carbon energy supply:** Supporting *distributed generation* and implementation of the pilot *carbon cap and trade* in Shanghai
  - **Green mobility:** Improving *public transport* and *non-motorized infrastructure*
  - **Capacity building:** Supporting due diligence of *low-carbon investments* and *building capacity*

Q&A Session

Moderator

Dr. Ian Hamilton
Associate Professor, UCL Energy Institute & International Energy Agency

Panelists

Dr. Kate Wilson
Executive Director, Climate Change and Sustainability, Government of New South Wales, Australia

Dr. Michael Waibel
Department of Human Geography, University of Hamburg

Dr. Dirk Schwede
Institute for Building Energetics, Thermotechnology and Energy Storage, University of Stuttgart

Mr. Sokhai Nop
Deputy Director Department of Green Economy, Ministry of Environment, Cambodia

Dr. Xiaodong Wang
World Bank

Closing Remarks

Mr. Rio Jon Piter Silitonga

Research Analyst, ASEAN Centre for Energy

Roadmap Survey

Roadmap for Energy Efficient Buildings and Construction - ASEAN

The energy demand of the ten countries of the Association of Southeast Asian Nations (ASEAN) has grown by 60% over the past 15 years and is projected to further increase by 80% over the next 25 years. Cooling is the fastest-growing end use in buildings, as energy demand for cooling more than tripled between 1990 and 2018.

This project aims to help address the pressures of increasing energy demand and emissions and improve collaboration between stakeholders in the region, by developing an ASEAN Energy Efficient Buildings and Construction Roadmap and an ASEAN Sustainable Cooling Roadmap.

The road mapping process will engage key stakeholders and assist them to develop and implement strategies, plans, policies and programmes to reduce the energy demand of buildings, construction sectors and cooling.

The roadmaps are intended to assist policy makers when designing their national buildings and climate strategies, as well as organisations in designing their medium-term and long-term policies and determining their investment allocations.

THANK YOU