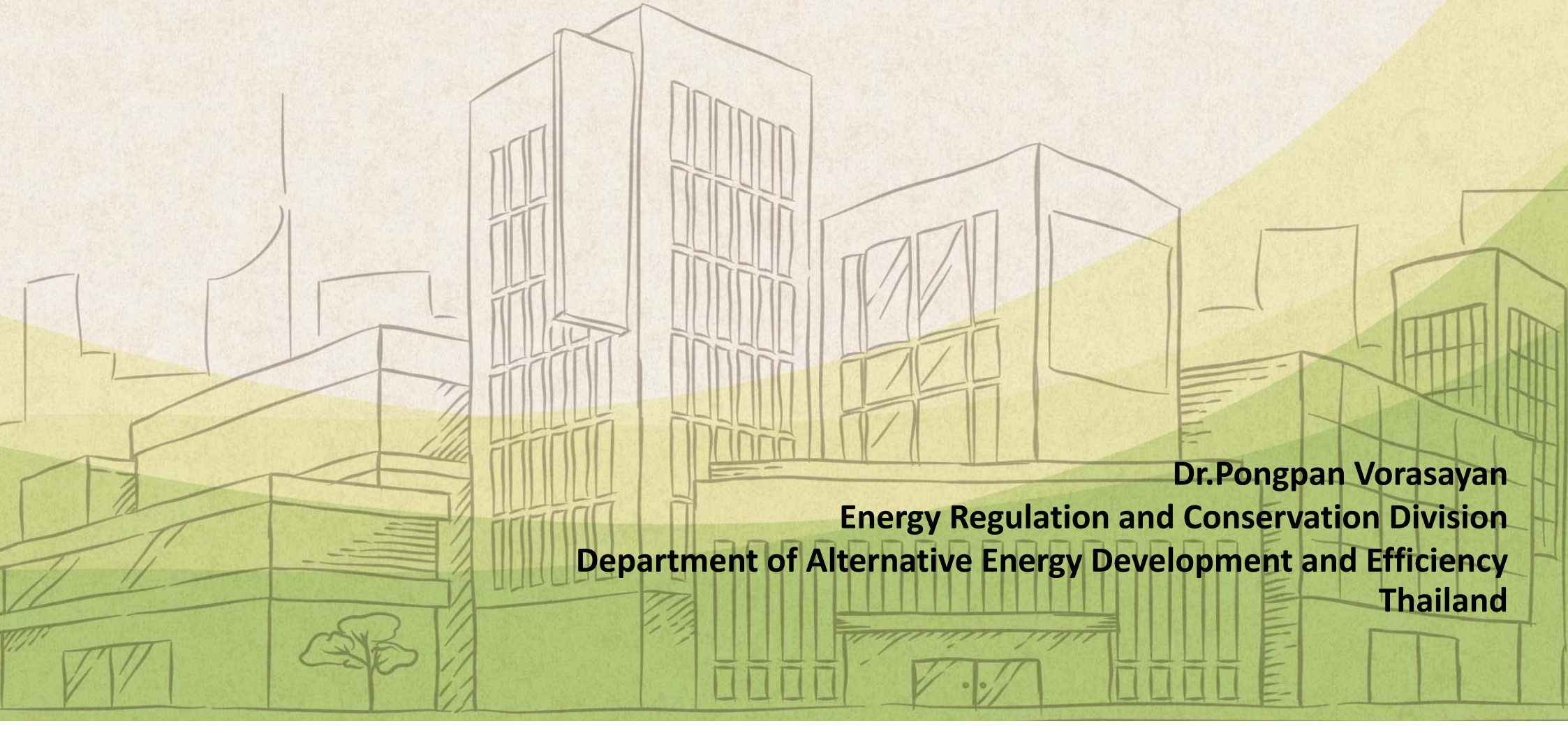
Energy Efficiency and District Cooling in Thailand



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Energy Regulation and Conservation Division
Department of Alternative Energy Development and Efficiency
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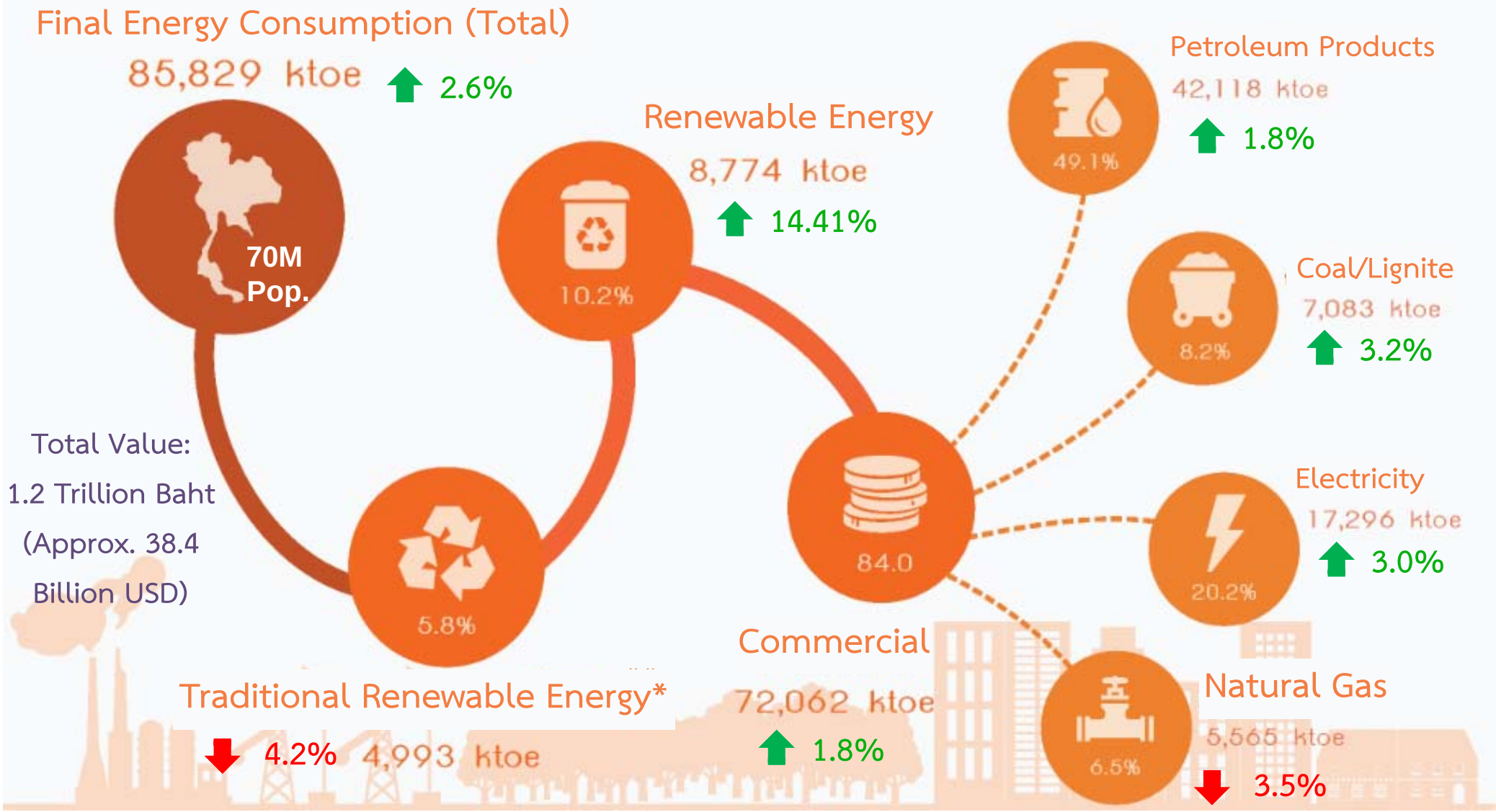
Thailand's Energy Situation 2019

Final Energy Consumption (by type)

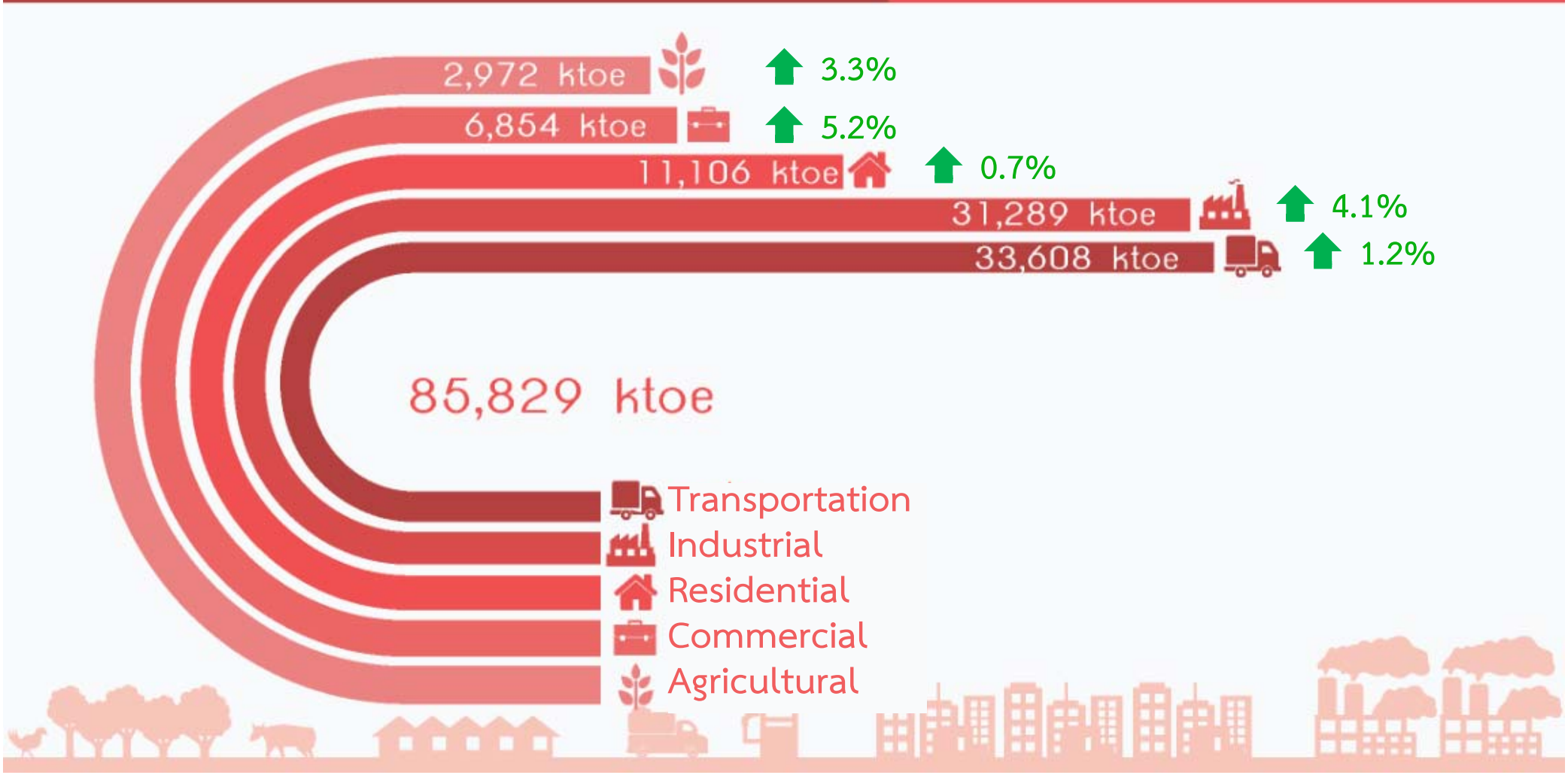


Source: Thailand's Energy Situation (Jan – Dec 2019), DEDE

* Fuel wood, charcoal, paddy husk, agricultural waste

Thailand's Energy Situation 2019

Final Energy Consumption (by sector)



Source: Thailand's Energy Situation (Jan – Dec 2019), DEDE

* Industrial sector includes manufacturing, mining, and construction

Thailand Integrated Energy Blueprint


Integration


Harmonized Time Frame


Better Balanced Focus

Security Economy Ecology

กระทรวงพลังงาน
MINISTRY OF ENERGY

PDP EEP AEDP GAS OIL

TIEB

THAILAND INTEGRATED ENERGY BLUEPRINT

PDP POWER DEVELOPMENT PLAN
แผนพัฒนากำลังผลิตไฟฟ้าของประเทศไทย*

EEP ENERGY EFFICIENCY PLAN
แผนอนุรักษ์พลังงาน*

AEDP ALTERNATIVE ENERGY DEVELOPMENT PLAN
แผนพัฒนาพลังงานทดแทนและพลังงานทางเลือก

GAS GAS PLAN
แผนบริหารจัดการก๊าซธรรมชาติ

OIL OIL PLAN
แผนบริหารจัดการน้ำมันเชื้อเพลิง

Energy Efficiency Plan 2018

Long-term Energy Efficiency Implementation 2018 - 2037

To reduce energy intensity (EI) by 30% within 2037 (Base year 2010)

Energy consumption reduction target: 49,064 ktoe via 3 main strategies

Compulsory

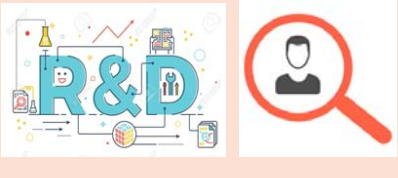
- Energy Management Standards
- Energy Codes (Industrial, Buildings, Residential)
- Energy Efficiency Resource Standard (EERS)

Promote

- Equipment Standards and Labeling
- Financial Supports
  - Grants and Subsidy / Soft loan
  - Tax incentive / Credit Guarantee
- **Innovations** (IOT, Smart Building, Big Data)
- **Energy Efficiency in Agricultural Sector** (Smart Farming, Switch to Machinery)
- **Energy Efficiency in Transportation Sector** (Mode shifting, Smart transport)

Complementary

- Human Resources Development (HRD)
  - Energy Manager / Auditor
  - Technologies
- Public Relation/Awareness
- Research and Development



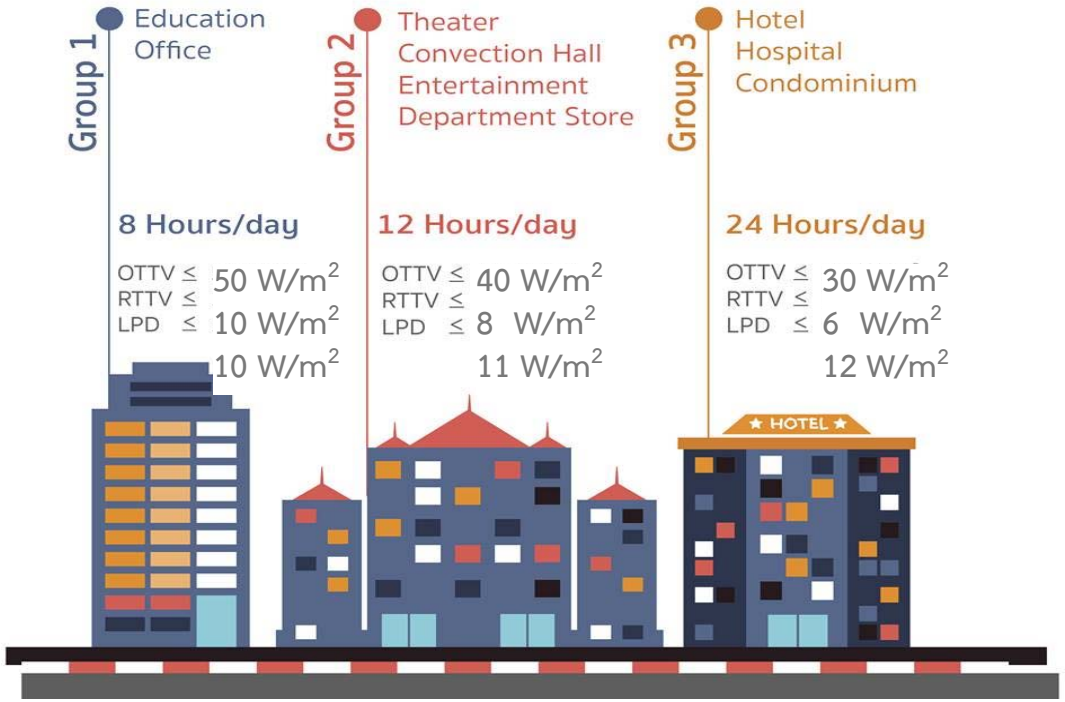
5 Economic Sectors

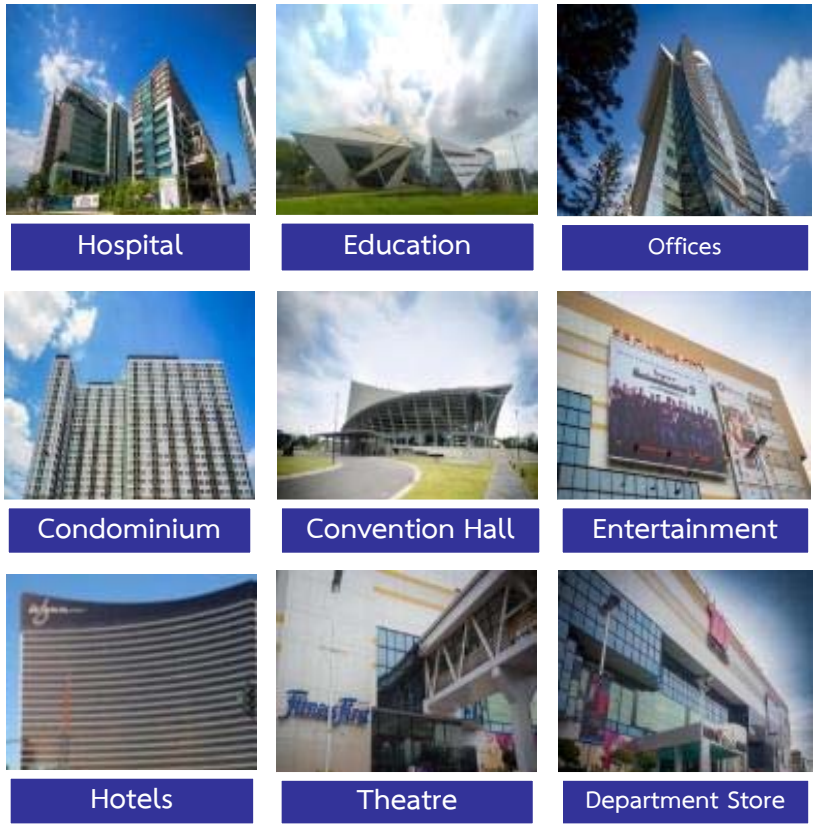
Industry **Building** **Household** **Agriculture** **Transport**

Building Energy Code

Requiring **9 types of new or retrofitted buildings** (total area (all floors combined) ≥ 2,000 m^2) must comply with building energy code

1. Building Envelope
2. Lighting System
3. Air-conditioning System
4. Water-heating System
5. Renewable Energy
6. Total Consumption

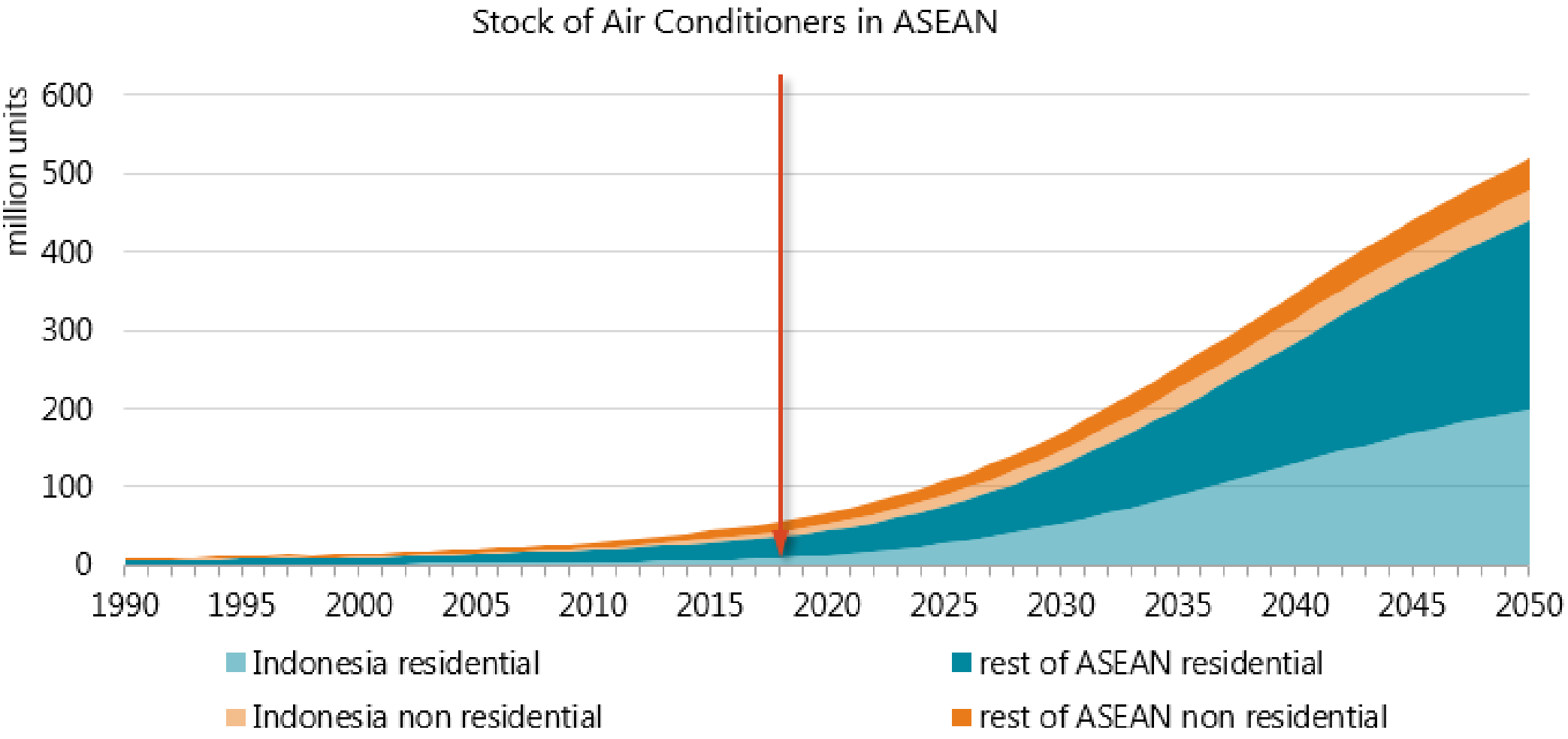




Ref. 2558	BEC 2562	HEPS 2568	ECON 2574	ZEB 2579
1. BEC Enforcement	• BEC Enforcement • Develop auditor system			
2. New buildings promotion		• Research, development to strengthening BEC and promoting EE building construction		
3. ZEB Promotion			• Promote and publicize construction of ZEB	

Electricity Demand in ASEAN is growing

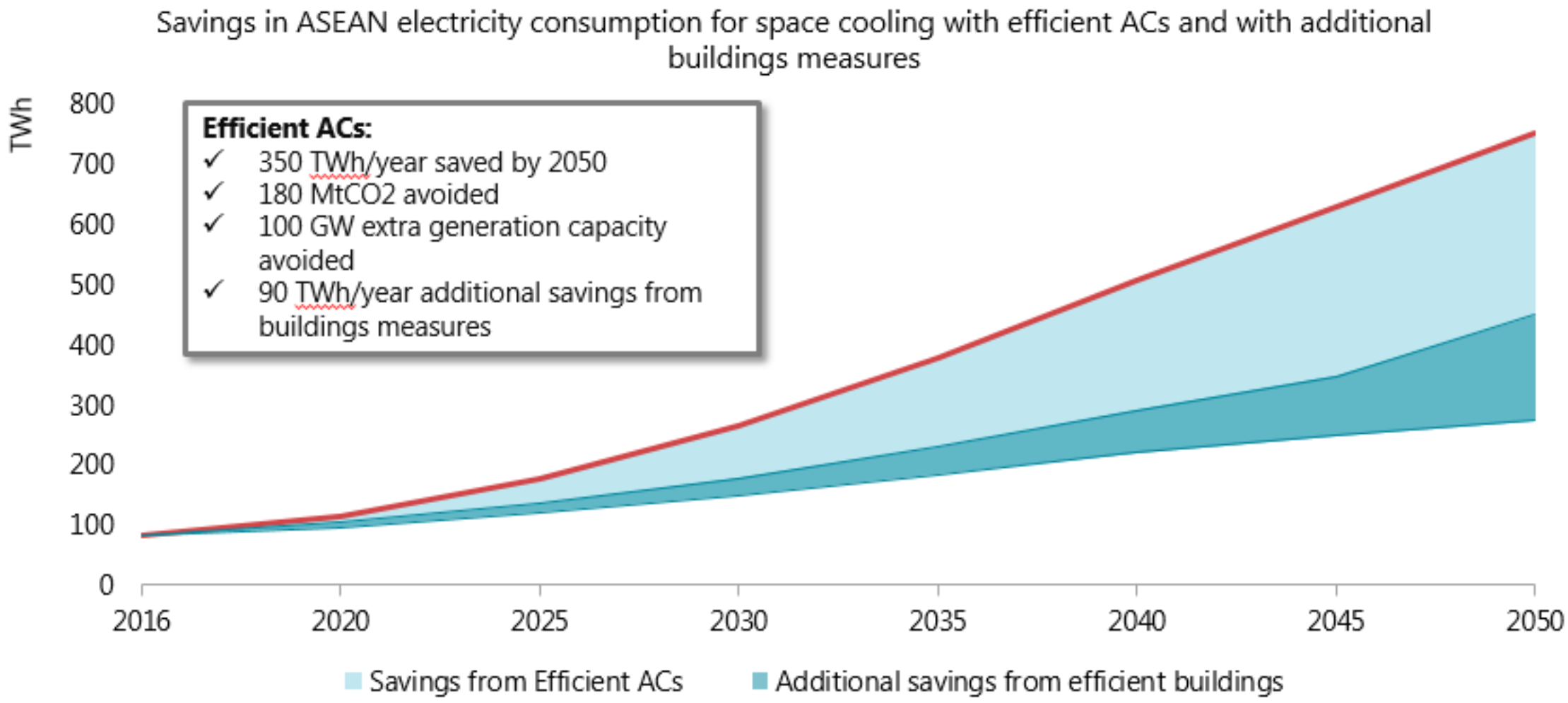
From Cooling System



Source: iea

Potential Energy Saving

From more efficient AC and Building



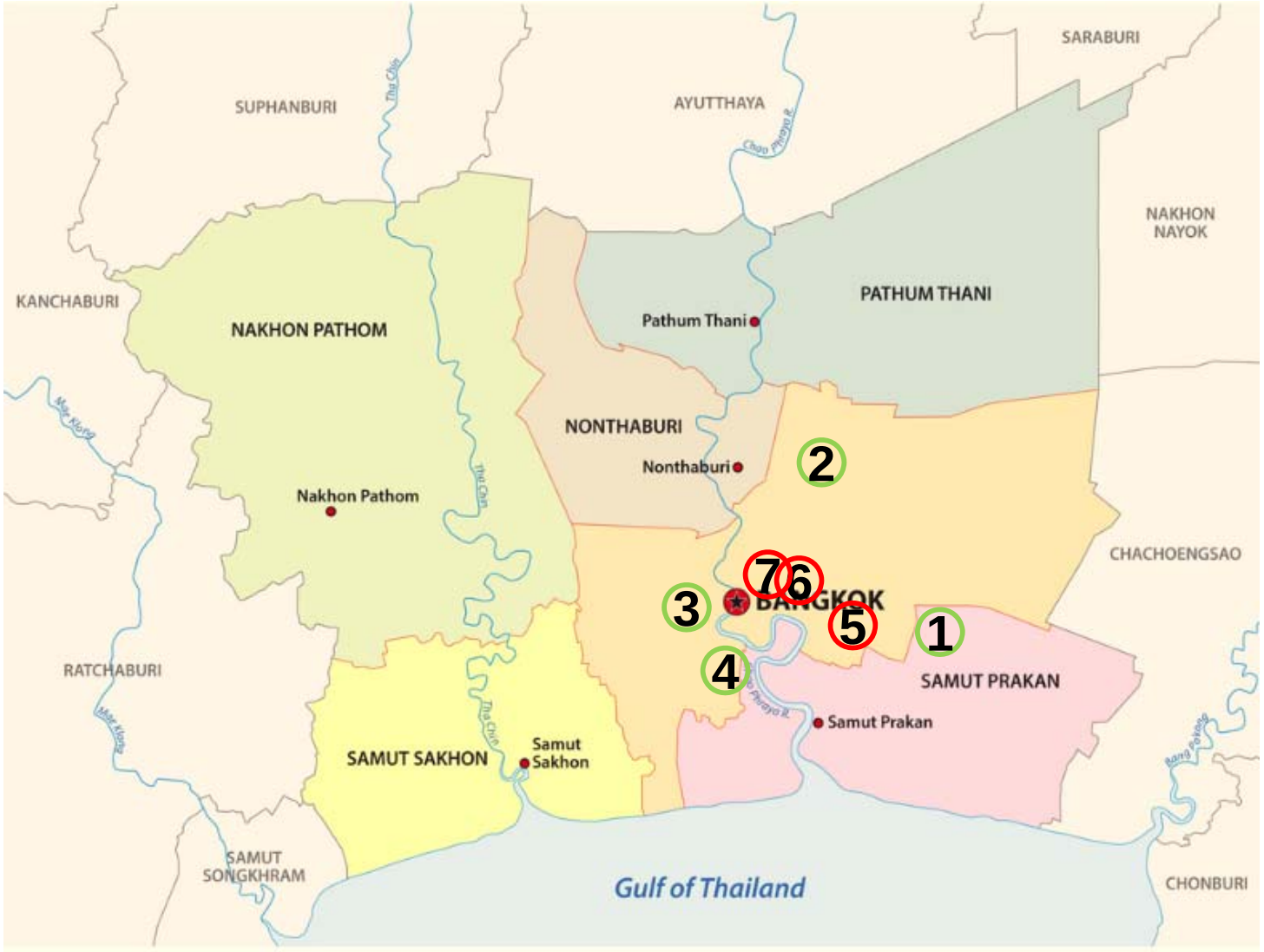
Source: iea

Introduction

District Cooling in Thailand

- District Cooling can be defined as the distribution of cooling from one or more sources to multiple buildings.
- District cooling systems produce chilled water at a central plant and then pipe that energy out to buildings in the district for air conditioning use.
- Individual buildings don't need their own chillers or air conditioners anymore. A district cooling system does that work for them.
- District Cooling has also proven to be a major contributor to Greenhouse Gas reduction in many cases.
- District Cooling has been specified as one of significant components in Thailand SMART City Criteria under Smart Energy category.
- District cooling in Thailand is now under development in most of large business districts and mixed-use complex.

HIGHLIGHTED
DISTRICT COOLING PROJECTS IN THAILAND



HIGHLIGHTED
DISTRICT COOLING PROJECTS IN THAILAND

1

DCAP

Status : Completed, in operation

Project : District Cooling System and Power Plant (DCAP)

Function: Supply Electricity, Chilled Water and Steam

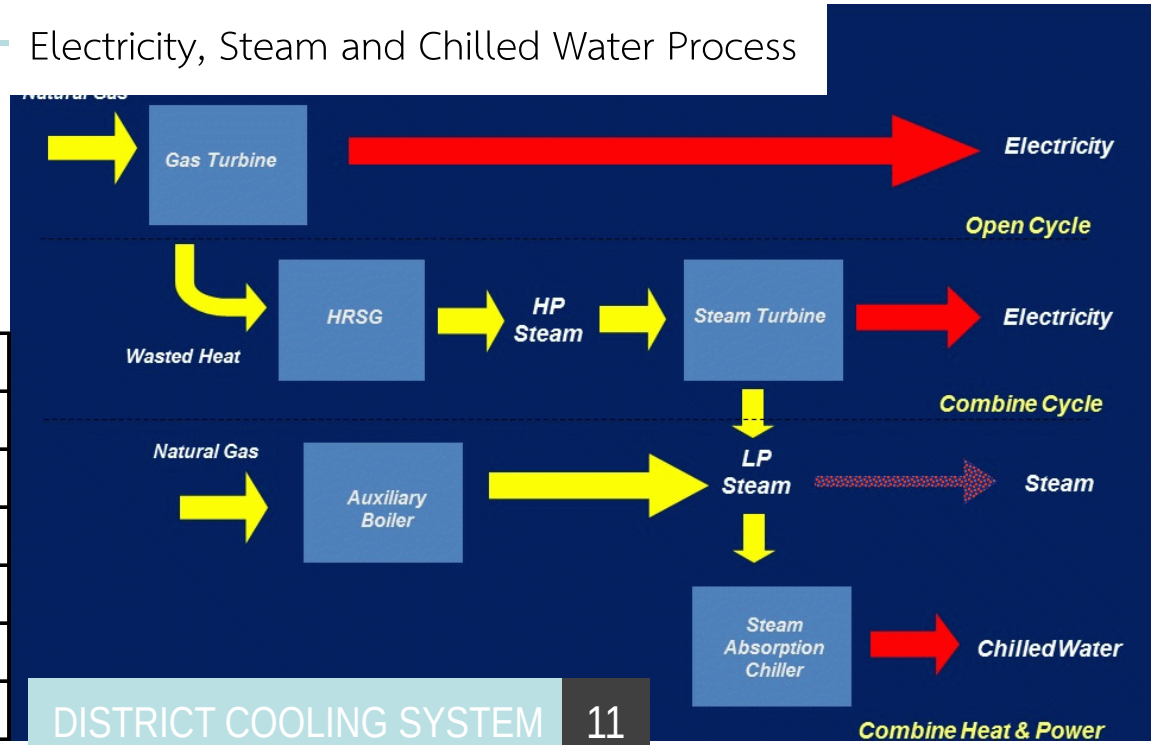
Technology: Co-Generation

Operation: 2006

Joint Venture Company
EGAT / PTT / MEA : 35 / 35 /30

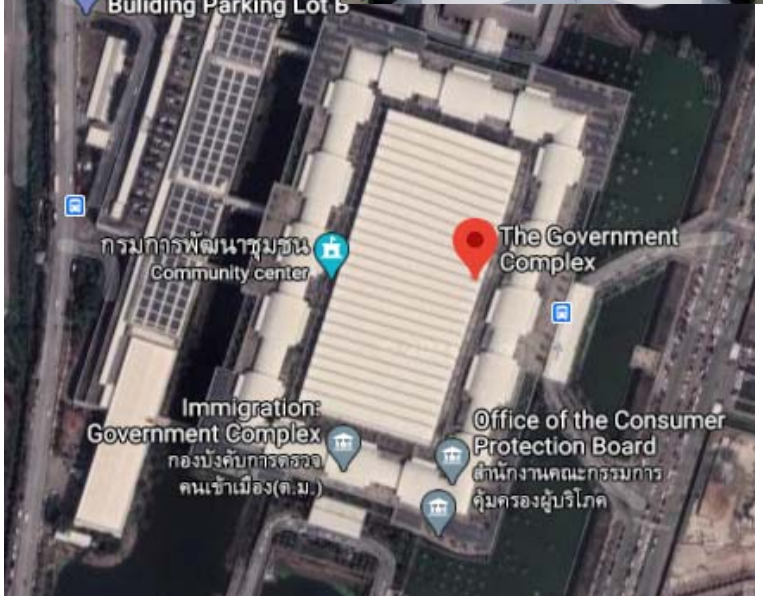
Customer	Electricity	Chilled Water	Steam
1. AOT	38 MW	11,026 RT	
2. EGAT	41 MW		
3. TG Catering		1,826 RT	5.03 Ton/Hr
4. Hotel		540 RT	0.45 Ton/Hr
5. SRT		356 RT	
Total	79 MW	13,748 RT	5.48 Ton/Hr

Electricity, Steam and Chilled Water Process



HIGHLIGHTED
DISTRICT COOLING PROJECTS IN THAILAND

SIRIRAJ PIYAMAHARAJKARUN Hospital



Status : Completed, in operation

Project : Government Complex – Chaengwattanna, Bangkok

Function: Multi Office Buildings, Convention Center

Operation: 2009

Area : GFA 975,200 sqm

Cooling Capacity : 12,000 RT

Status : Completed, in operation

Project : Siriraj to Medical Excellence in South East Asia (SIME)

Function: Multi Buildings Hospital Campus

Operation: 2012

Area : GFA 238,000 sqm

Cooling Capacity : 6,000 RT

3

HIGHLIGHTED
DISTRICT COOLING PROJECTS IN THAILAND


อาคารสำนักงานใหญ่ ราษฎร์บูรณะ

Status : Completed, in operation

Project : Kasikornbank – Head Office
Ratburana Office

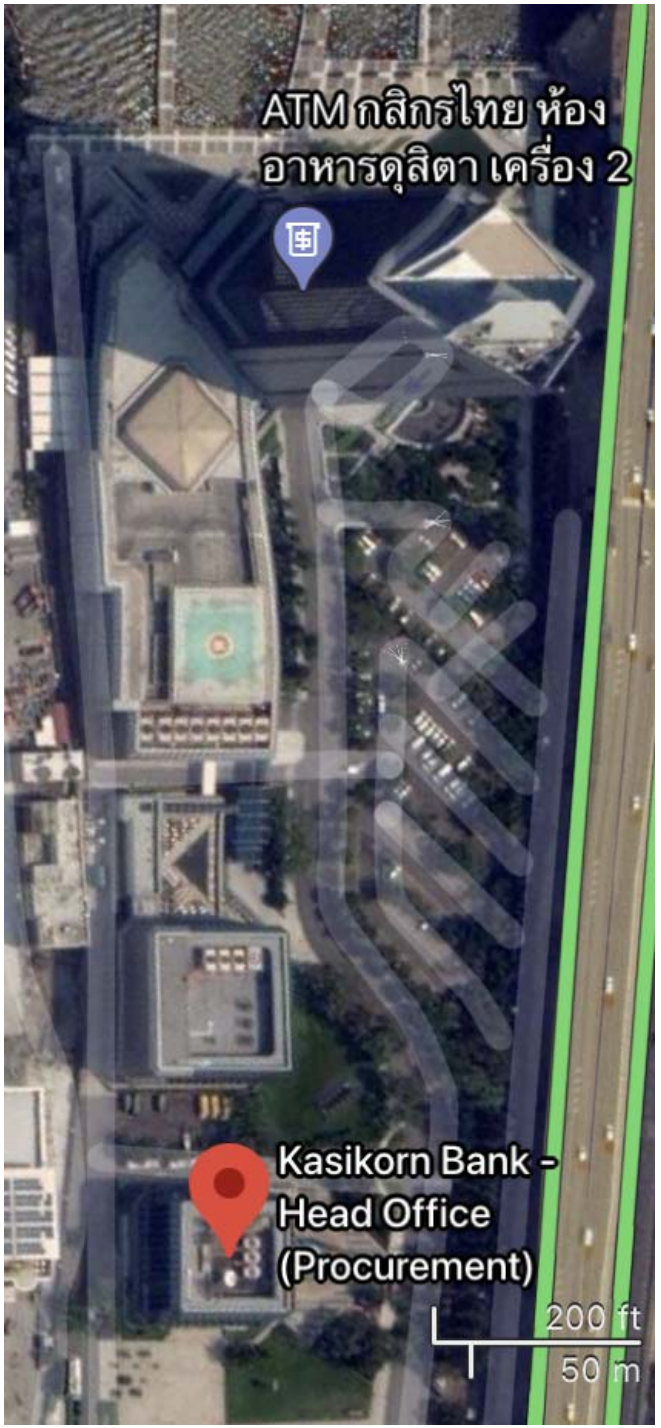
Function: Office Building

Area : GFA 163,000 sqm

Cooling Capacity : 4,000 RT

4

ธนาคารกสิกรไทย
开泰银行 KASIKORNBANK



HIGHLIGHTED
DISTRICT COOLING PROJECTS IN THAILAND

5

Status : Design Development / Construction

Project : THE FORESTIAS

Function: Mixed Use Complex (Hotel,Office,Condo, Hospital,Retail, Residential)

Area : GFA 750,000 sqm

Cooling Capacity : 10,000 RT

Status : Design Development / Construction

Project : ONE BANGKOK

Function: Mixed Use Complex (Hotel,Office,Condo, Hospital,Retail)

Area : GFA 1,830,000 sqm

Cooling Capacity : 38,000 RT

6

HIGHLIGHTED
DISTRICT COOLING PROJECTS IN THAILAND

Status : Concept Development

Project : CU Smart City

Function: Mixed Use Complex
(Hotel,Office,Condo,
Hospital,Retail,Residential)

Area : GFA 842,000 sqm

Cooling Capacity : 18,000 RT

โครงการ
เมืองจุฬาฯ อัจฉริยะ
CU Smart city

HIGHLIGHTED
DISTRICT COOLING PROJECTS IN THAILAND

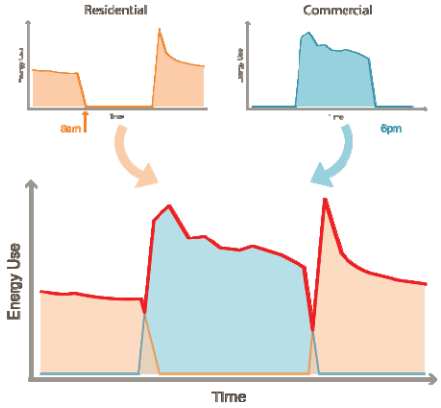
Other potential development projects in Thailand

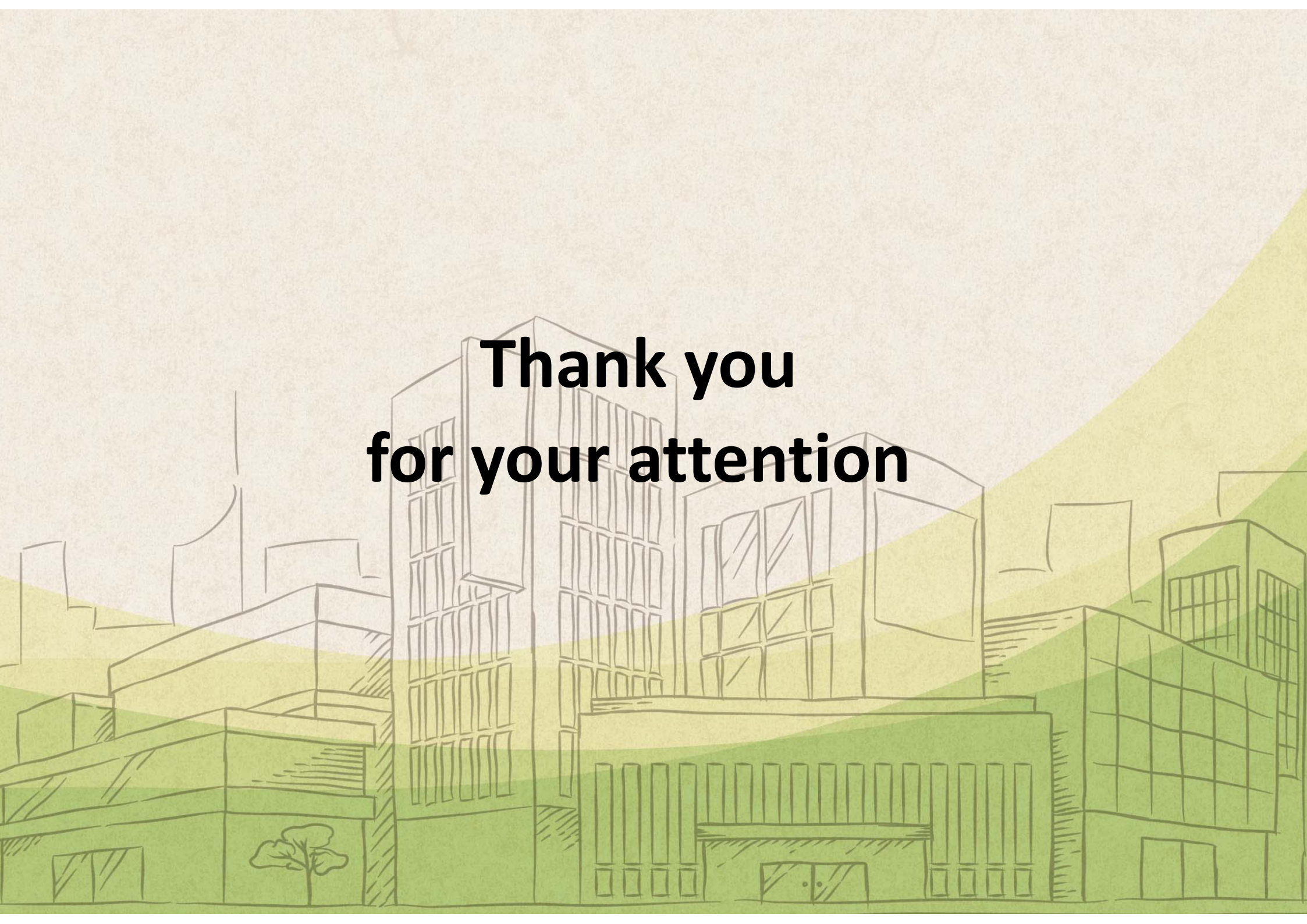
1. Makkasan Complex, Bangkok
2. Commercial Complex at U-Tapao International Airport, Chonburi
3. Transit Oriented Development (TOD) along High Speed Train Routing
4. Large scale – Mixed-use Complex – Private Development
5. Large scale Hospital Complex
6. SMART City Development Area (DCS is one of the significant components in smart energy criteria)

HIGHLIGHTED
DISTRICT COOLING PROJECTS IN THAILAND

Project	Owner	Joint - Venture			
		Owner Subsidiary	DCS Technology	Energy Related	Local Consultant
CY Smart City	Property Management of Chulalongkorn University (PMCU)		Keppel DHCS Pte Ltd, Singapore	BCPG PCL	TEAM Consulting Engineering and Management PCL
One Bangkok	TCC Group	One Power Services Co., Ltd One DCS Servcies Co., Ltd	Tokyo Gas Engineering Solutions Coporation (TGES) Mitsui & Co, Japan	Gulf Energy Development PCL	

- Joint Venture
  (Technology owner + Energy related Co + Local Consultant)
- Chilled Water & Electricity
- Long Term Contract
- Build, Own, Operate, Transfer
- Load Sharing allow efficient use




Thank you
for your attention