# Future of Energy Efficiency in Thailand


Department of Alternative Energy Development and Efficiency (DEDE)

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Department of Alternative Energy Development and Efficiency
MINISTRY OF ENERGY

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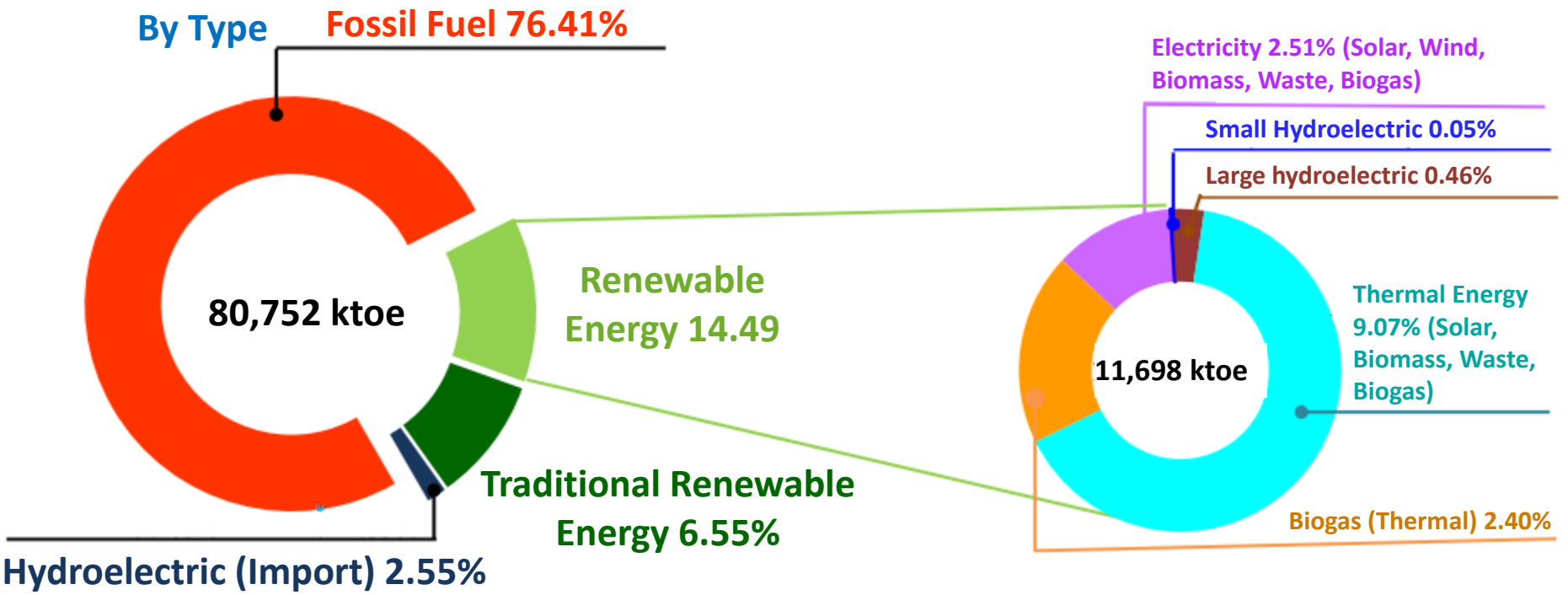
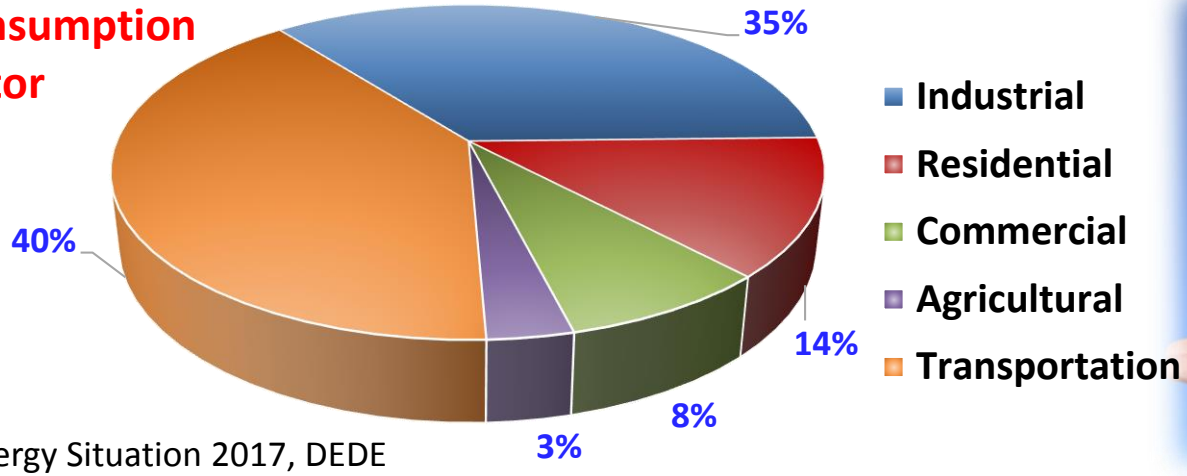
# Thailand Energy Situation 2017

## Final Energy Consumption By Type




## Final Energy Consumption by Sector




Source: Thailand's Energy Situation 2017, DEDE

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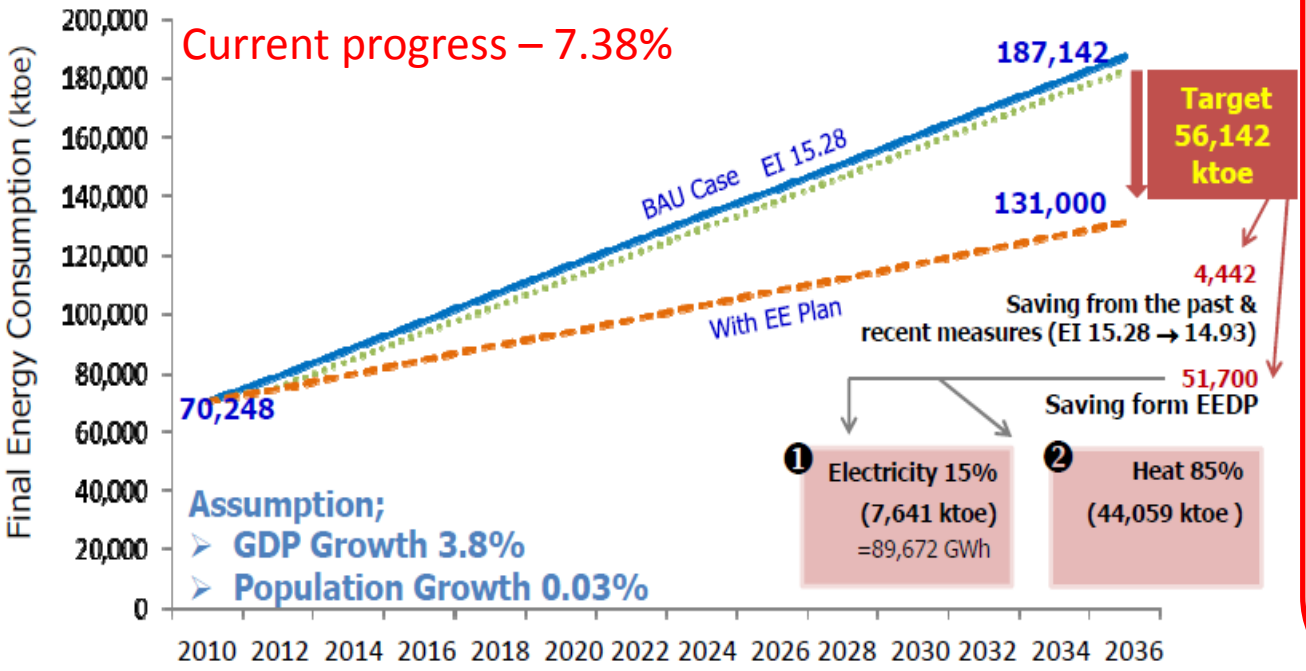
# EEP 2015 Overview

Goal to reduce Energy Intensity by 30% in 2036, down to 5.97 ktoe/billion Baht

$EI^{base2010}$ = 8.54 ktoe/billion baht

$EI^{Actual2017}$ = 7.91 ktoe/billion baht

$EI^{Goal2036}$ = 5.97 ktoe/billion baht

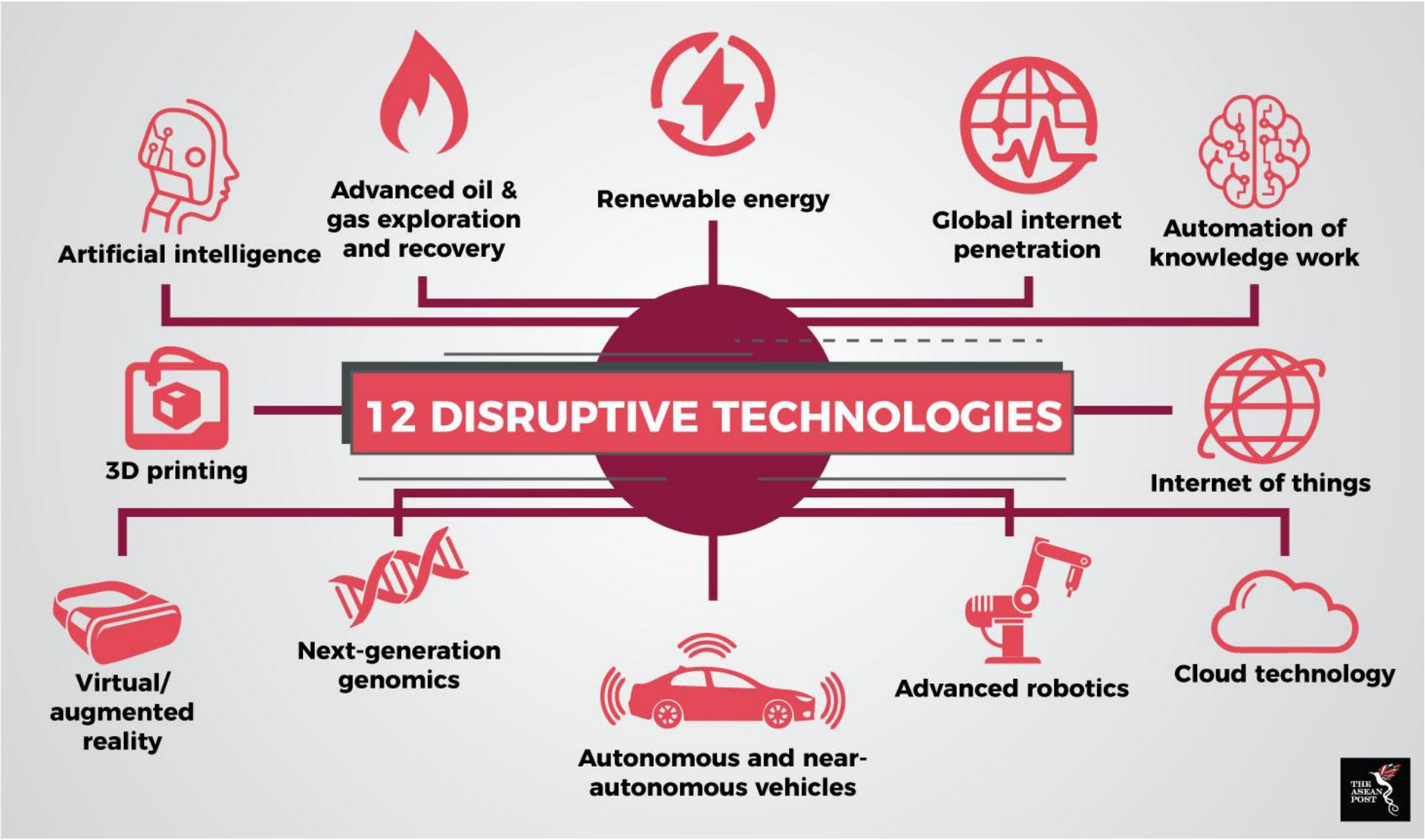



**Change in Energy Landscape: 3Ds**

- Decarbonization
- Decentralization
- Digitalization

Adapted from : Energy Efficiency Plan 2015, DEDE, Thailand Energy Efficiency Situation 2017

# Disruptive Technologies




Source: The ASEAN Post

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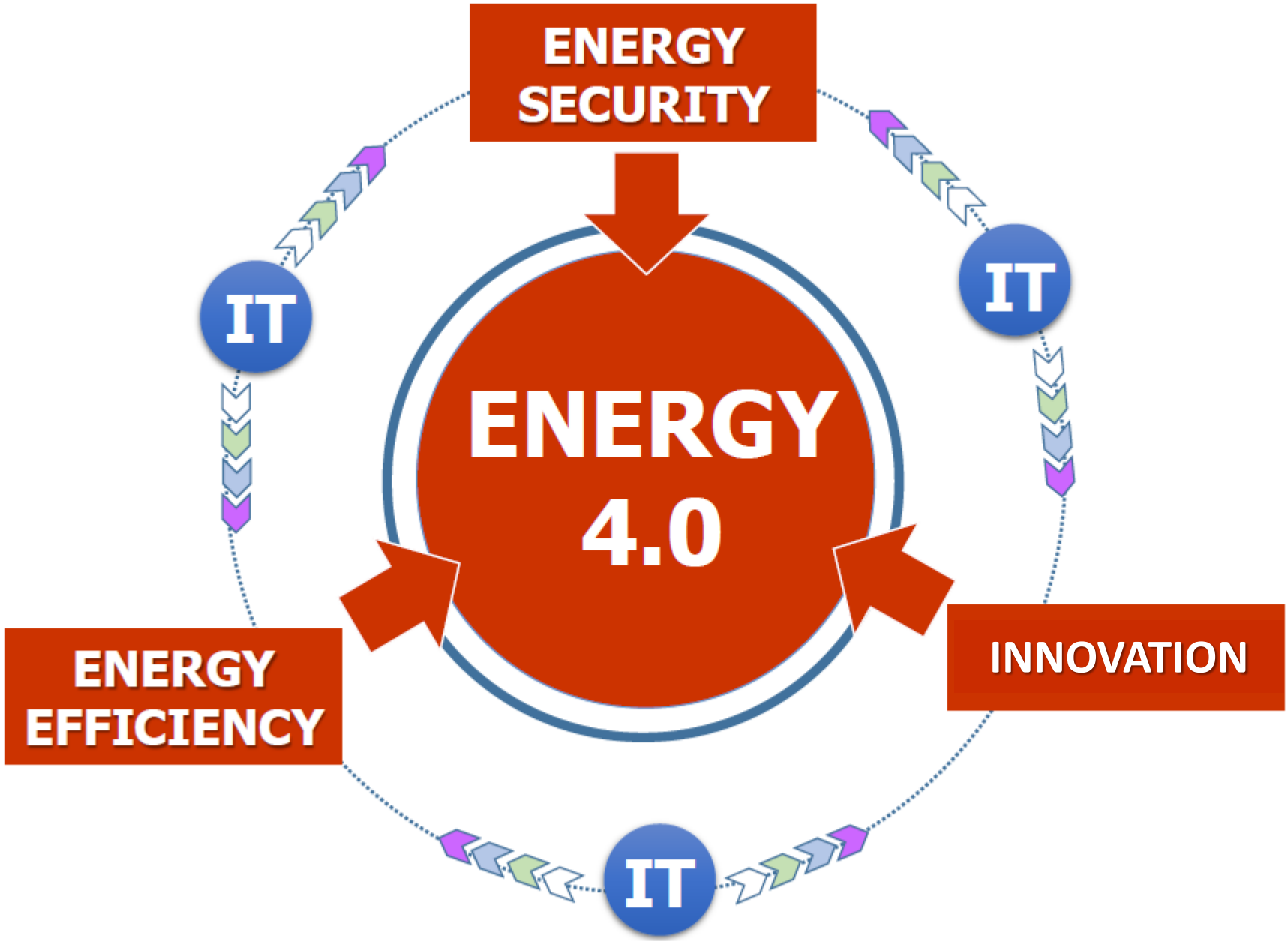
# Thailand's Energy 4.0



# Future of Energy Efficiency: Policies

## Buildings

1. Building Energy Codes (BEC)

2. Energy Service Companies (ESCOs) for public buildings

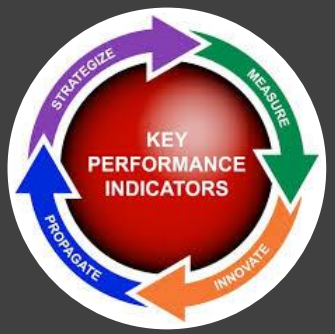
## Appliances

1. EE Financing for Internet of Things Technologies

## Transports

1. Development of transportation infrastructure

2. Demonstration project/Subsidy for charging station, electric buses, etc.




## Indicators

1. Data collection from multiple organization – Big Data

2. Development of new Energy Performance Indicators

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**New or retrofitted buildings** being constructed which have total area of all stories equal to **2,000 m²** or more must be designed under the energy conservation requirements. Expected to be enforced very soon.

# Buildings

## 1. Building Energy Codes (BEC)


1.Hospital

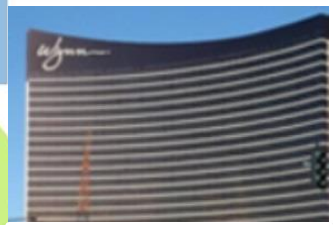
2.Education

3.Office

4.Condominium

5.Convention Hall

6.Theater



7.Hotel

8.Entertainment

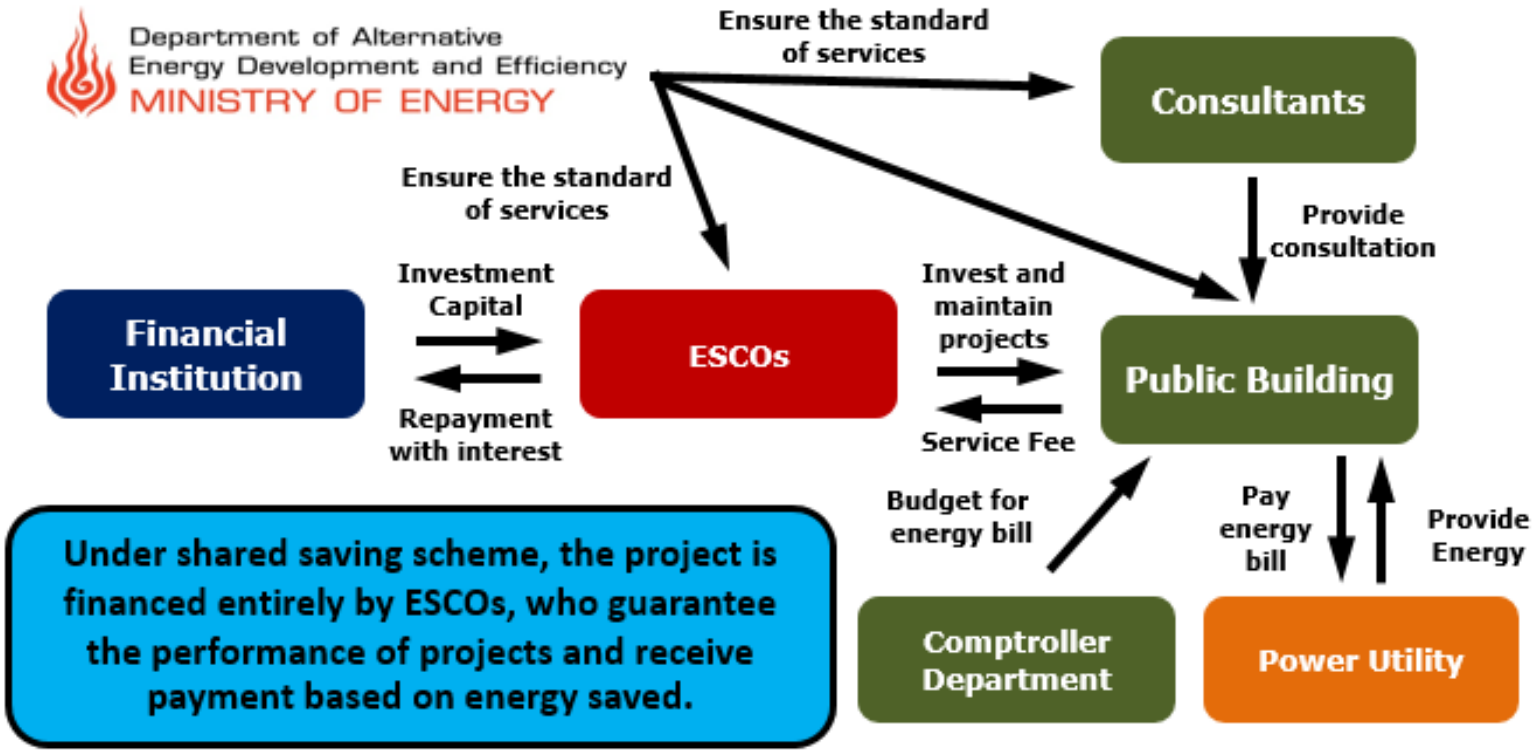
9.Department Store

# Buildings

## 2. Energy Service Companies (ESCOs) for public buildings

**ESCO must provides Energy Performance Contract – guaranteeing the result of project implemented – and provides suitable M&V for determining energy saved.**

**Major barriers: Procurement regulation restriction + streamline the process for all parties**



# Policies : Internet of Things

## Appliances

**1. EE Financing for Internet of Things Technologies**

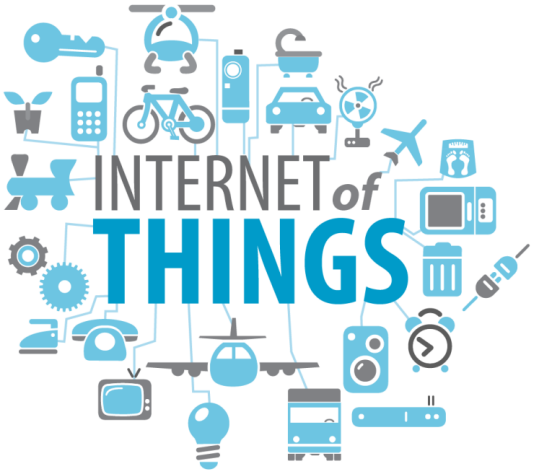
## Internet of Things (IoT) Subsidy Program

**Target group:**

IoT technologies implementation (either with new or existing system) in designated buildings and factories

**Program detail:**

- Subsidize 20% of total cost but no more than 2 million Baht (around46,000 USD) per entity, with a minimum of 50,000 Baht ( around 1,600 USD)
- Payback period no longer than 7 years
- Must include BOTH monitoring and control




**Currently in implementation phase**

# Double-track Railway: 2030

## Transports

1. Development of transportation infrastructure

2. Demonstration project/Subsidy for charging station, electric buses, etc.

| | | Completion | km |
|---|---|---|---|
| Immediate Phase<br>7 sections<br>993 km | Chachoengsao-Khlong19-Kaeng Khoi | 2019 | 106 |
| | Jira Junction-Khon Kean | 2019 | 185 |
| | Prachuap Kiri Khan-Chumphon | 2020 | 167 |
| | Lopburi-Pak Nam Pho | 2020 | 148 |
| | Mab Kabao-Jira Junction | 2020 | 132 |
| | Nakhon Pathom-Hua Hin | 2020 | 165 |
| | Hua Hin-Prachuap Kiri Khan | 2020 | 90 |
| Medium Phase<br>7 sections<br>1,392 km | Khon Kean-Nong Kai | 2024 | 174 |
| | Chumphon-Surat Thani | 2024 | 167 |
| | Pak Nam Pho-Den Chai | 2025 | 285 |
| | Jira Junction-Ubonratchathani | 2025 | 309 |
| | Hat Yai-Padang Besar | 2025 | 48 |
| | Sriracha-Map Ta Phut | 2025 | 70 |
| | Surat Thani-Hat Yai-Song Kha | 2026 | 339 |
| Long term Plan<br>2 sections<br>392 km | Den Chai-Chiang Mai | 2029 | 217 |
| | Klong19-Aranyaprathet | 2030 | 175 |


Source: Mega Projects to drive Thailand's Economic Growth, Ministry of Transport

# EV: Infrastructure Development

## Transports

**2. Demonstration project/Subsidy for charging station, electric buses, etc.**



- Develop rules and regulations related to EV e.g. guidelines for charging station registration
- Pilot projects for electric buses, electric Tuk-Tuk (3-wheeled vehicle), and more.
- Subsidy programs – subsidize 30% of the cost of establishing a charging station (Quick charge/Normal Charge)

# DEDE Platform Model: @CODE


## Indicators

**1. Data collection from multiple organization – Big Data**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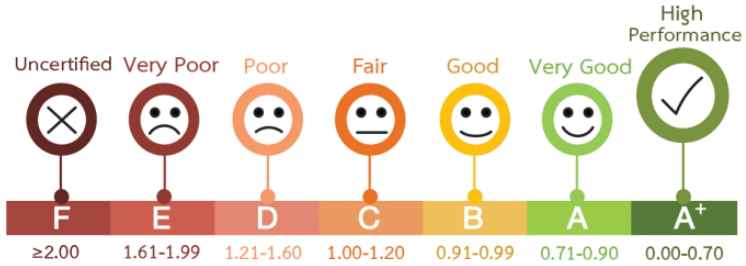
# Energy Efficiency Indicator: BEEinO

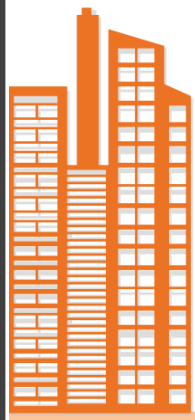

## Indicators

**2. Development of new Energy Performance Indicators**

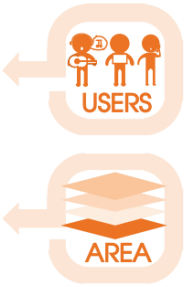
## EXISTING BUILDING (In Operation)

### Building Energy Efficiency in Operation (BEEinO)

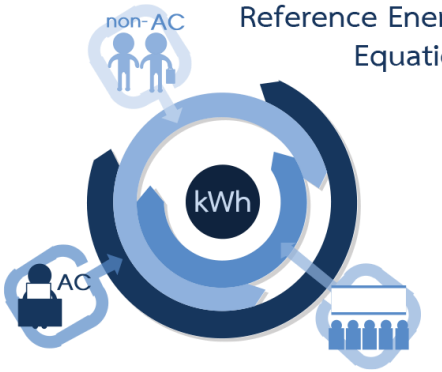



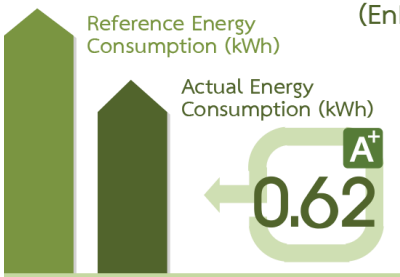
Data Analysis to Calculate Reference Energy Consumption




Reference Energy Equation




Building Energy Performance Indicator (EnPI)




**Related Parameters**

1. Air conditioning system
   - Air conditioned area
2. Lighting system
   - Total ulitized area
3. Machine and equipment
   - Number of building users

Apply actual parameters of the building into reference energy equation.

5 specific equations for :

1. Office building
2. Hotel building
3. Hospital building
4. Department store building
5. Educational building

Comparing the reference energy consumption from reference energy equation with actual energy consumption to find EnPI by using equation

Building Energy Performance Indicator (EnPI) =

$$\frac{\text{Actual energy consumption (kWh/y)}}{\text{Reference energy consumption (kWh/y)}}$$

Apply the EnPI to get energy efficiency rating (BEEinO).


Thank You