

# Country Report: Thailand's Energy Efficiency Situation

Department of Alternative  
Energy Development and  
Efficiency (DEDE)

Bureau of Energy Regulation  
And Conservation



Department of Alternative  
Energy Development and Efficiency  
MINISTRY OF ENERGY



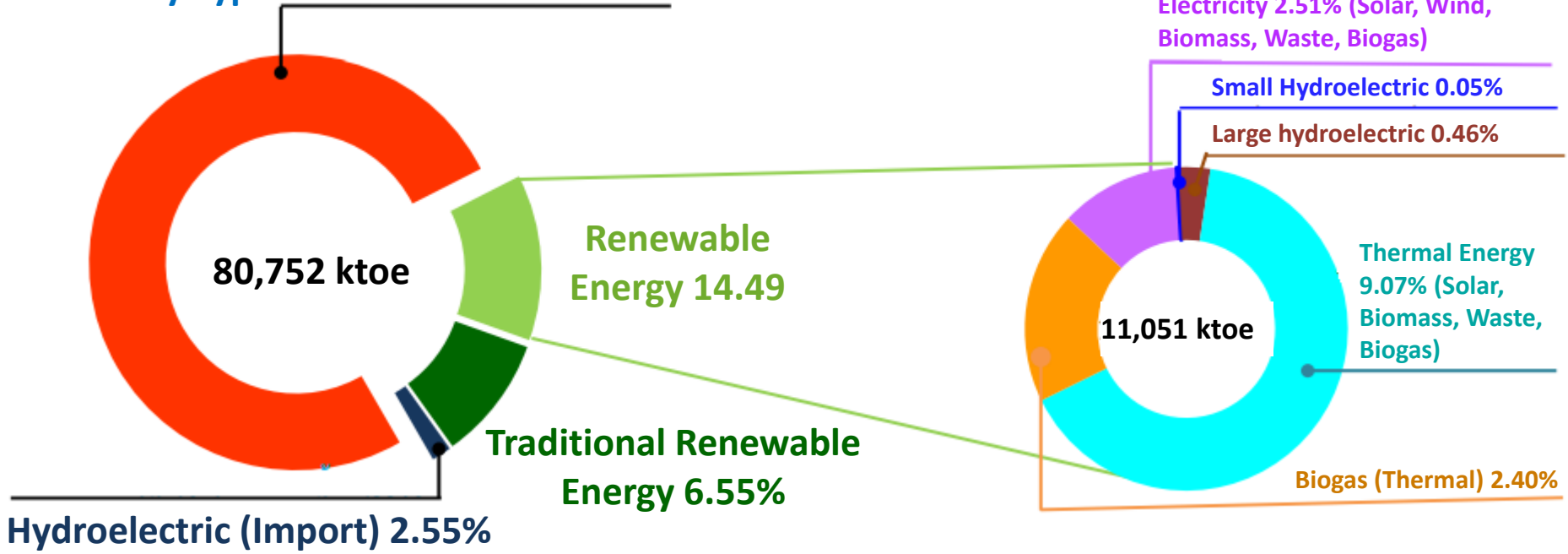
กระทรวงพลังงาน  
MINISTRY OF ENERGY

# Thailand Energy Situation 2017

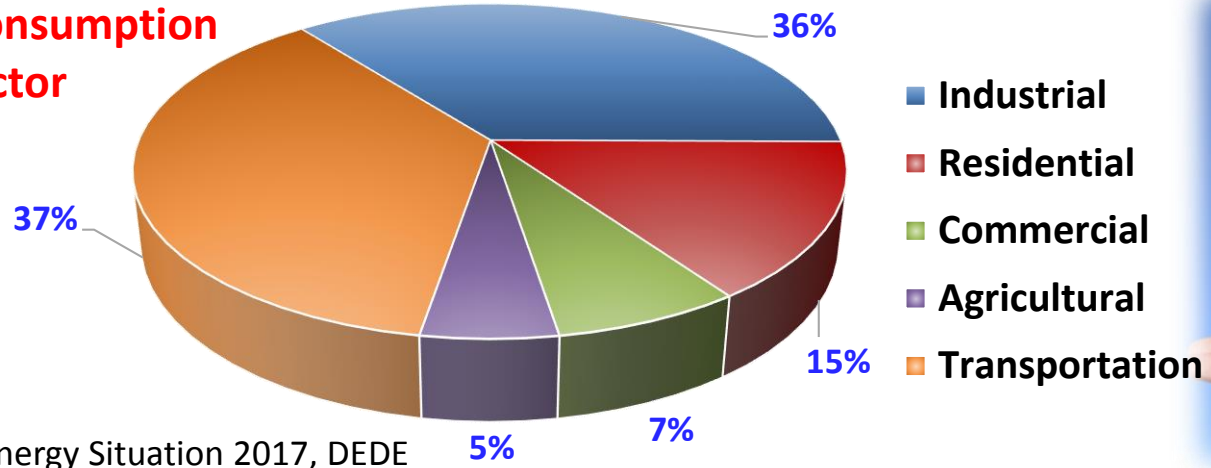
## Final Energy Consumption

By Type

**Fossil Fuel 76.41%**

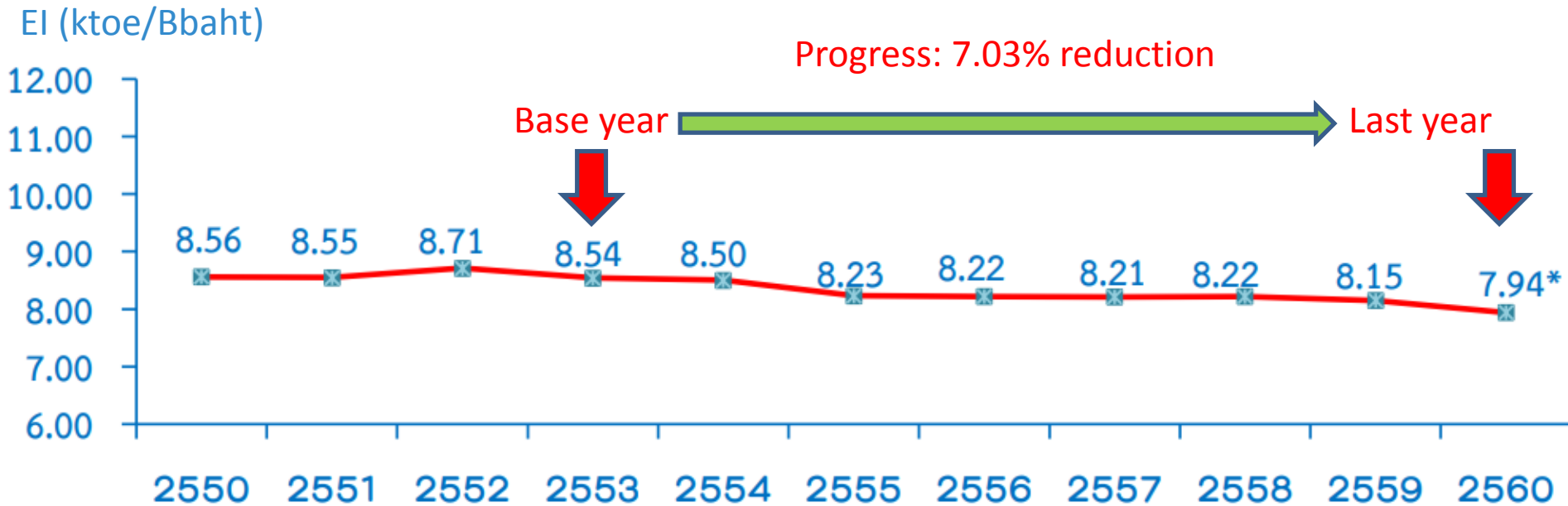


## Final Energy Consumption by Sector



# EEP 2015 and Current Status

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





# **Implementation and Progress of Energy Conservation Policies**

## Classification of designated factories/buildings

Criteria	Designated Factories/Buildings	
	Group 1	Group 2
Installed electric meter (total)	Between 1000 – 3000 kW	More than 3000 kW
Installed transformers (total)	Between 1,175 – 3,530 kVA	More than 3,530 kVA
Total annual energy consumption	Between 20 – 60 TJ/year	More than 60 TJ/year

## Legal responsibilities of designated factories/buildings

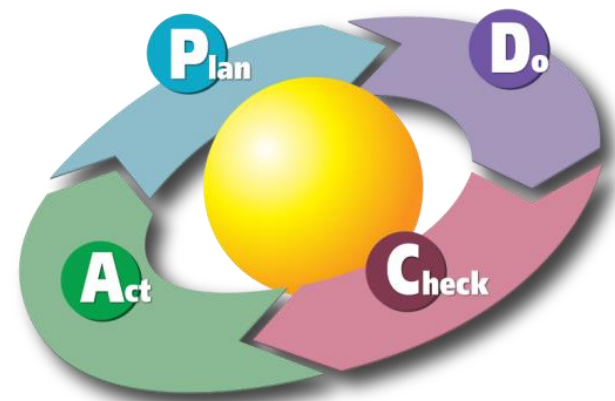
1. Conduct energy management system as described in regulation and submit an annual report to DEDE every March.

**- The report can now be submitted online, which reduces the paperwork required and allows more sophisticated data analysis**

**- The data includes energy consumption (thermal and electrical), equipment, energy conservation measures implemented and more**

### Current status (as of August 2018):

5,898 designated factories  
 3,083 designated buildings  
 8,981 in total





## Building Energy Code (BEC) Regulation

### Description

New or retrofitted buildings being constructed which have total area of all stories equal to 2,000 m<sup>2</sup> or more must be designed under the energy conservation requirements.

- Formerly mandatory for public buildings and voluntary for private sector

- Enforcement on private sector approved by the cabinet, to be ratified by the Council of State

- Start from 10,000 m<sup>2</sup> and down to 2,000 m<sup>2</sup> over 3 years



1.Hospital



2.Education



3.Office



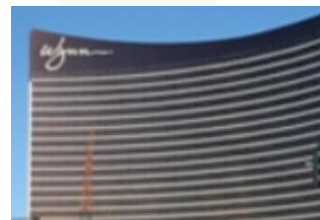
4.Condominium



5.Convention Hall



6.Theater



7.Hotel



8.Entertainment



9.Department Store

## BEC Standard

- ✓ 9 types of new buildings
- ✓ Total area  $\geq 2,000 \text{ m}^2$

**OTTV**  
OVERALL THERMAL TRANSFER VALUE

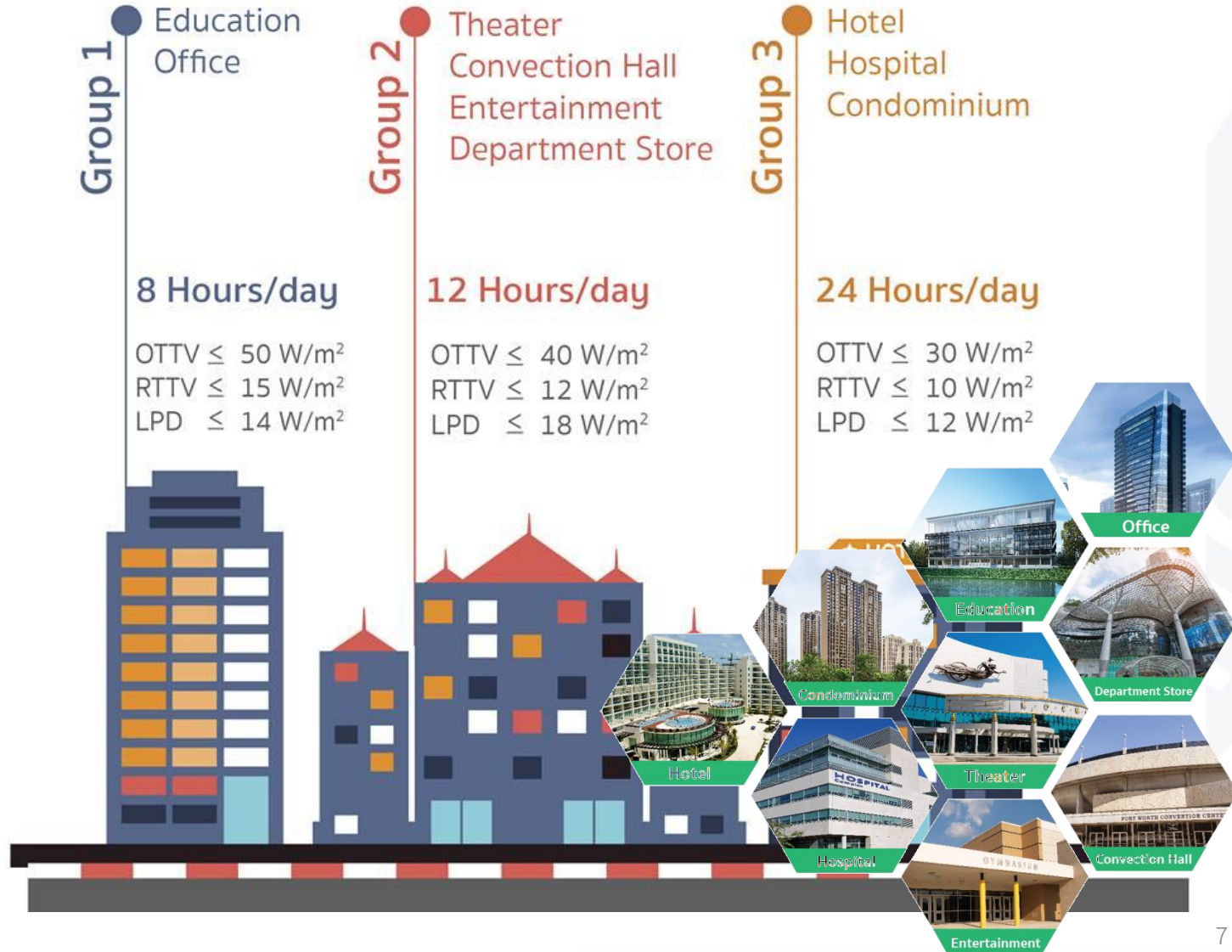
**RTTV**  
ROOF THERMAL TRANSFER VALUE

**A/C**  
AIR CONDITIONER

**LPD**  
LIGHTING SYSTEM

**RENEW**  
RENEWABLE ENERGY

**WHOLE**  
BUILDING ENERGY



# BUILDING ENERGY EFFICIENCY IN THAILAND

Designated Buildings > 1,175 kVA

## NEW BUILDING (As Design)

Building Energy Code (BEC)



Mandatory

CERTIFICATE

PARTICIPATION

Design Performance (Regulation)

INDICATOR

Whole Building Energy Consumption



OTTV  
RTTV



Performance of A/C



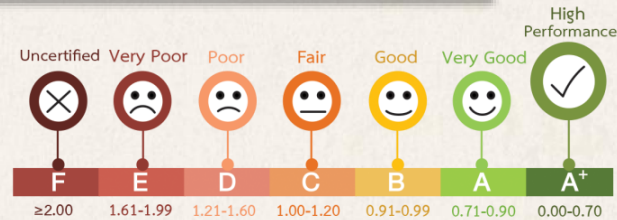
Lighting Efficiency

YEAR 2009

ENFORCEMENT

## EXISTING BUILDING (In Operation)

Building Energy Efficiency in Operation (BEEinO)



Voluntary (toward mandatory)

Energy Performance Indicator (EnPI)

Data Analysis to Calculate Reference Energy Consumption



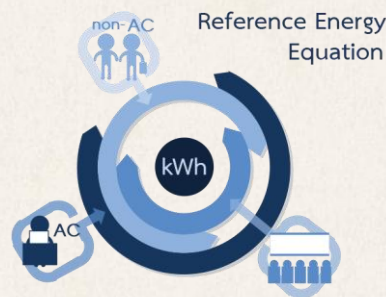
USERS



AREA

Related Parameters

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

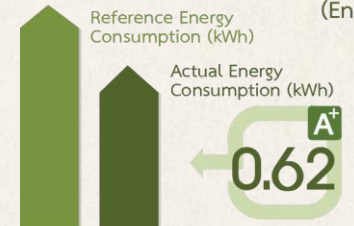


Apply actual parameters of the building into reference energy equation.

5 specific equations for :

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

Building Energy Performance Indicator (EnPI)



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).

Testing & Demonstration



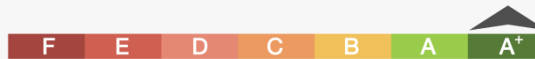
# BUILDING ENERGY EFFICIENCY in OPERATION

AWARD and CERTIFICATION



## THAILAND

Building Energy Efficiency : In Operation



2018

— BUILDING TYPE —

“ BUILDING NAME ”





1. Household LPG Gas Stoves
2. High Pressure Gas Stoves
3. Small Gasoline Engines (Air Cooled)
4. Small Diesel Engines (Water Cooled)
5. Three-Phase Induction Motors
6. Fiberglass Insulators
7. Flat Plate Glasses
8. Variable Speed Drives
9. Heat Pump
10. Air Compressor
11. Building Paint
12. Adhesive Film for Glasses
13. Lightweight Concrete
14. Single-Phase Induction Motor
15. Infrared Gas Stoves
16. Ceramic Roof
- 2018**
17. Electric Welding Machine
18. Deep Fat fryer
19. Cooker Hood

## 2007-2015



เตาแก๊สหุงต้ม

เตาแก๊สแรงดันสูง

เครื่องยนต์ดีเซลขนาดเล็ก

เครื่องยนต์แก๊สโซลีนขนาดเล็ก

มอเตอร์สามเฟส

ฉนวนใยแก้ว

กระจก

VSD

## 2016



ฮีตปั๊ม

เครื่องอัดอากาศ

สีทาผนัง

## 2017



ฟิล์มกรองแสง

ฉนวนมวลเบา

มอเตอร์เฟสเดียว

เตาอินฟาเรด

หลังคากระเบื้อง

## 2018



เครื่องเชื่อมไฟฟ้า

เครื่องทอดน้ำมันท่วม

เครื่องดูดควัน



# Ministry of Energy – Thailand Smart Grid Road Map

## Vision

“Promotion of Sufficient, Efficient and Sustainable Electricity Sources with Good quality service and the most benefit to the country”

by Integrating infrastructure investment in Smart Grid from all sectors in the direction of Thailand’s country development.





# Smart Grid Development

## Efficient and Stable Power System

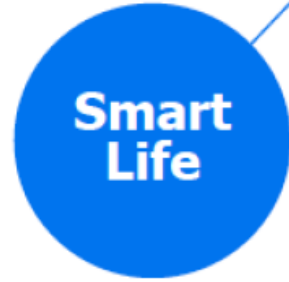


### Infrastructure Investment

- **ICT Integration (G&T&D)**
- **T&D Energy Management System (SCADA/EMS)**
- **Substation Automation (G&T&D)**
- **Distribution/Feeder Automation (DA/FA)**

### Government Support

- Set up steering committee for Smart Grid Policy
- Support tax incentive and other financial incentives
- Support research and pilot projects for Smart Grid



## Future Energy Technology

### Infrastructure Investment

- **Smart Meter + AMR/AMI**
- **Demand Response (DR)/Demand-Side Management (DSM) (G&T&D)**
- **EV Intelligent Charging System/V2G (G&T&D)**

### Government Support

- Promote/provide education - Smart Grid to all sectors
- Develop pricing structure to support Demand Response
- Promote technology HEMS/BEMS/FEMS

## Green Energy and Low Carbon Society



### Infrastructure Investment

- **Renewable Energy Forecast System**
- **Energy Storage System (G&T&D)**
- **Micro-grid Development**

### Government Support

- Amend Grid Code to support renewable energy
- Support Microgrid Development
- Establish Power Forecasting Center for Renewable Energy and Energy Storage Systems



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# **New Financial Incentive Program**

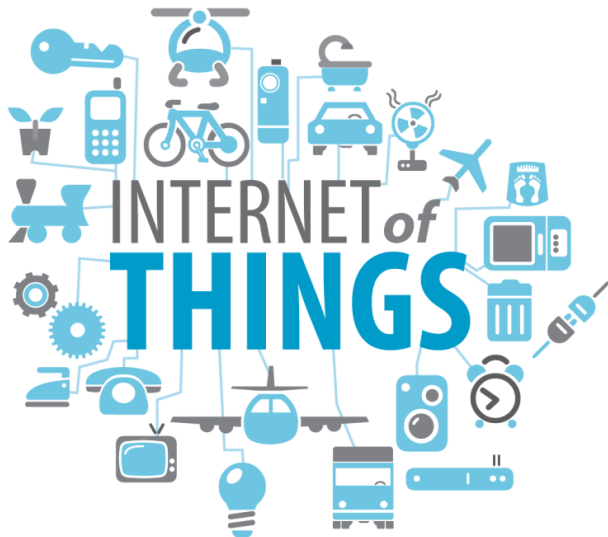
## Smart Farm Subsidy Program

### Target group:

Energy Efficiency and renewable energy projects in small size pig farm, dairy farm, poultry farm, fish/shrimp farm

### Program detail:

- Subsidize 40% of total cost but no more than 1.5 million Baht (around 46,000 USD) per entity
- Payback period no longer than 7 years



## 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 (around 46,000 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



**Thank You**