


Mathematics for Future Prediction:

The case of Thailand

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Today Topics

- Current Status of Energy in Thailand
- Bringing Energy into Thai Curriculum
- Effective Plan for Bringing Energy into Secondary Mathematics Classroom in School Using Lesson Study and Open Approach in Thai Context

Current Status
of Energy in Thailand

Current Status
of Energy in Thailand

Introduction

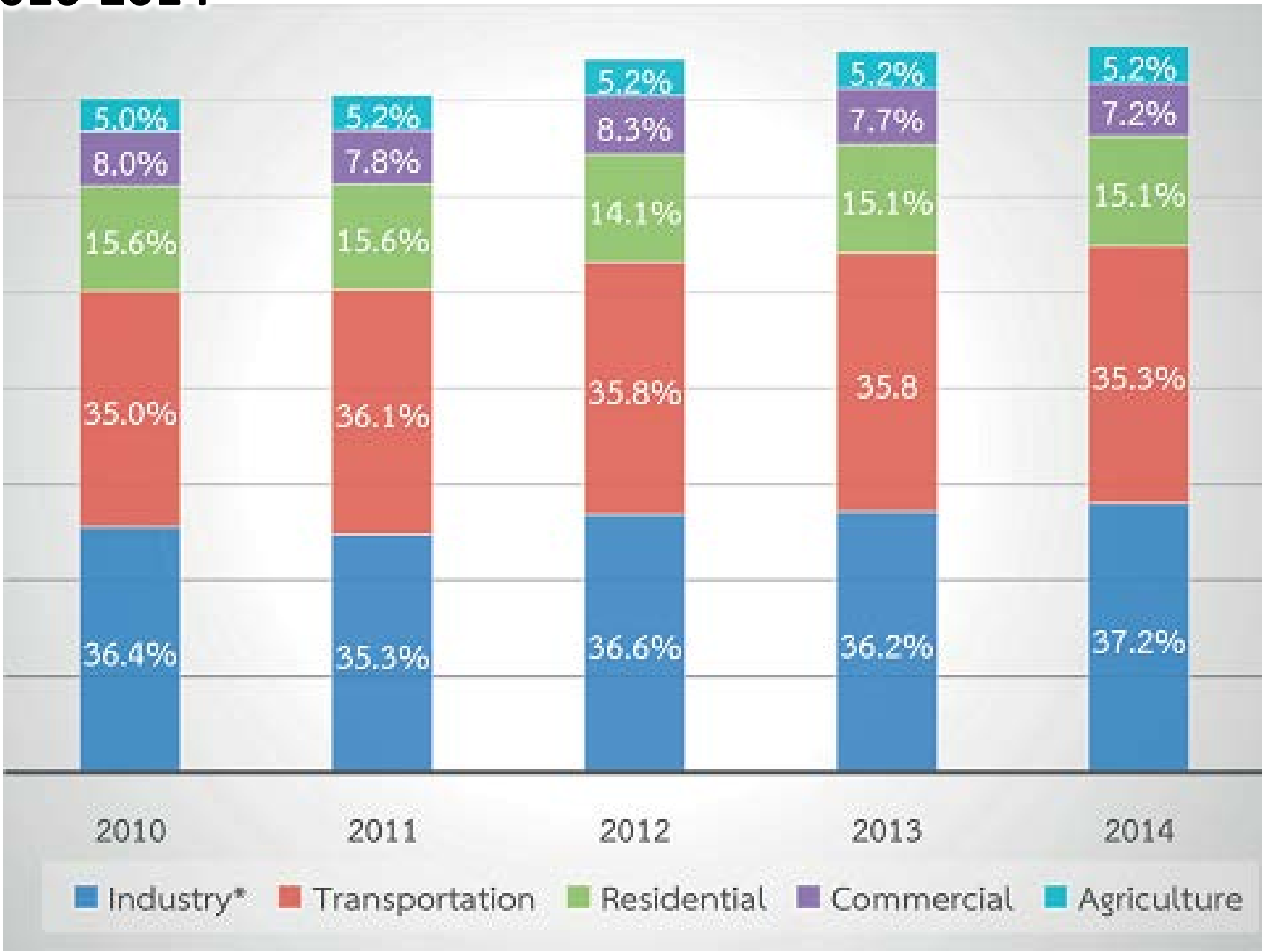
According to the government policies of electricity, the framework of the Thailand Power Development Plan 2015-2036 (PDP2015) formulated in line with the Energy Efficiency Development Plan (EEDP) and the Alternative Energy Development Plan (AEDP) was approved by the National Energy Policy Council (NEPC) on December 17, 2014 as the following:

Current Status
of Energy in Thailand

Introduction

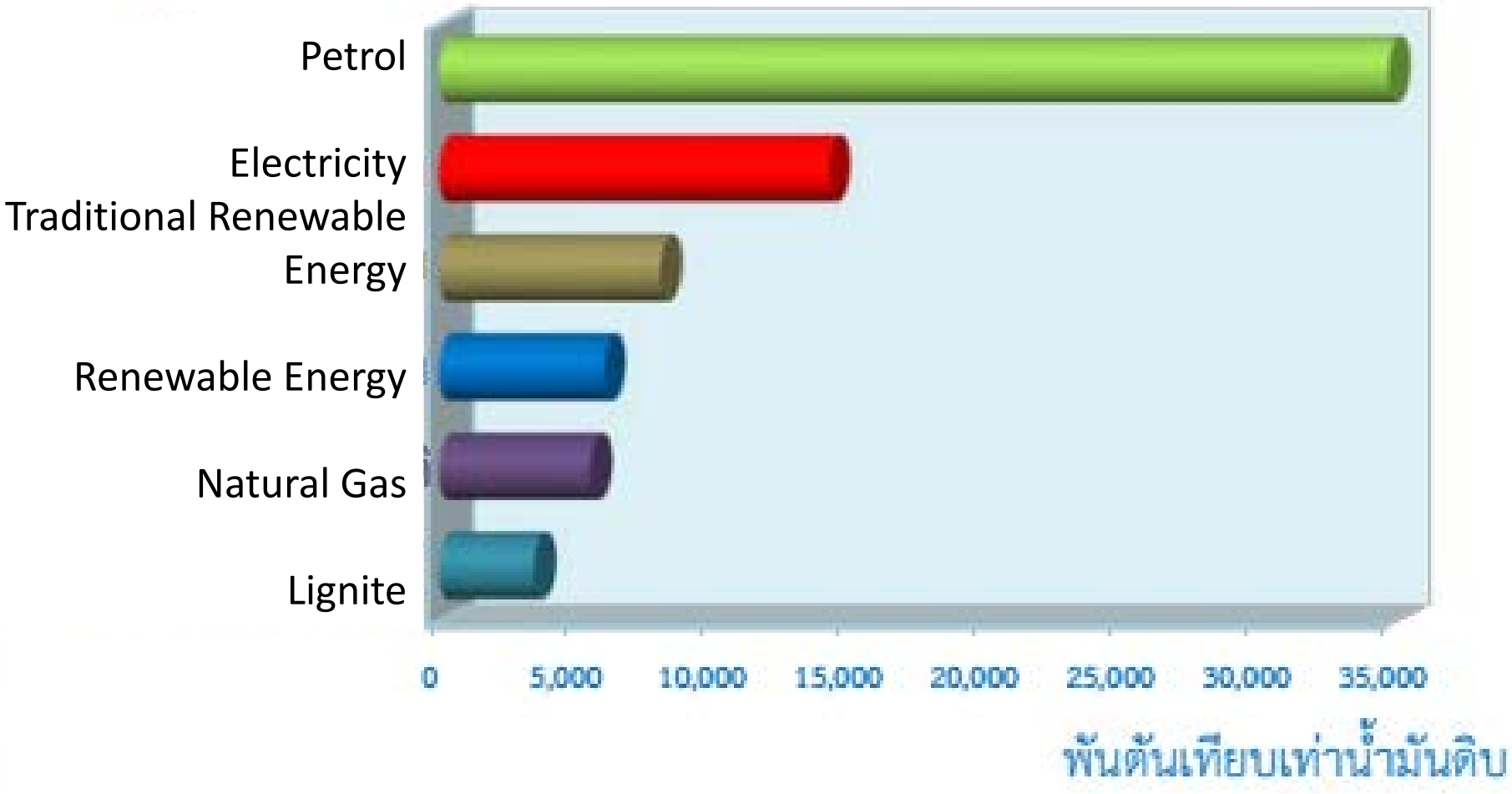
1. Energy Security: dealing with an increase in power demand taking into account fuel diversification to lessen the dependency of one particular fuel
2. Economy: maintaining an appropriate cost of power generation and implementing energy efficiency
3. Ecology: reducing environmental and social impacts by lessening carbon dioxide intensity of power generation

Thailand's Energy and Energy Efficiency Situation 2010-2014



Thailand’s economic growth for the year 2014 grew by 0.9% due to expansion in both domestic demand and external sector. This resulted in an increase of final energy consumption by 0.8% and increasing of energy consumption in economic sectors. Industrial and transportation sectors consumed energy more than other economic sectors, share of energy consumption in industry sector was 37.2% of the total final energy consumption, followed by transportation, residential, commercial and agriculture were 35.3%, 15.1%, 7.2% and 5.2% respectively.

Current Status of Energy in Thailand 2015



thousand ton equivalent to crude oil

Bringing Energy into

Thai Curriculum

Bringing Energy into Thai Curriculum

From Thai basic educational curriculum Science and Mathematics is found that science has 8 contents and main standards, and energy is one of them. Main content of Science in grade 1-12 is energy and living, energy form transformation, property and phenomena of light, sound and circuit, electromagnetic wave, radioactivity, nuclear reaction, interexchange between essence and energy, energy reservation, effects to life of energy use and environment.

Bringing Energy into Thai Curriculum

Contents of energy are started in grade 2 until grade 12. In primary level is learning about energy and electricity, light, and sound. These topics are aimed to let students understand sources, meaning, relation between energy and living, and easy energy transformation.

Bringing Energy into Thai Curriculum

In junior high school science, contents are thermal energy, radiation, reflection, refraction, light absorption, potential and kinetic energy, electric power calculation of any electric equipment, meaning and daily live.

Moreover, energy for transportation in additional contents is about analysis and experiment of compositions and kinds of petroleum, source stone, and petroleum storage.

Bringing Energy into Thai Curriculum

Science in high school is divided into 3 main contents; chemistry, physics, and biology, but energy almost is in physics. There are other learning of energy and more abstraction, description of property of mechanical wave, relation among speed, frequency, wave length, intensity of sound and electromagnetic wave, radioactivity, nuclear reaction, interrelation between substance and energy.

Bringing Energy into Thai Curriculum

From curriculum studies are found that almost energy learning is contained in only science. There is no appeared in other subjects such as mathematics.

But Thai has an idea to bring energy integrated with other subjects by project such as project of developing teachers and educational staffs in integrating energy in primary and secondary school in which take 2 years long.

Bringing Energy into Thai Curriculum

Curriculum making of contents in each grade of the Basic Education Core Curriculum 2008 of the Ministry of Education has considered energy in which teachers have to know a basic knowledge teach and integrate in every subjects, and to let students understand and has a right basic knowledge of energy, realize the country energy problems, and can apply to use in daily life by emphasized training model teachers in energy for teachers in every subjects. These training is divided 3 levels of depth of contents.

Bringing Energy into Thai Curriculum

- Content Depth level 1

For teachers who teach in grade 1-6 has a knowledge and understand a basic knowledge of energy for teaching energy around oneself including home, school, and community, by emphasize on safety and effect of using energy.

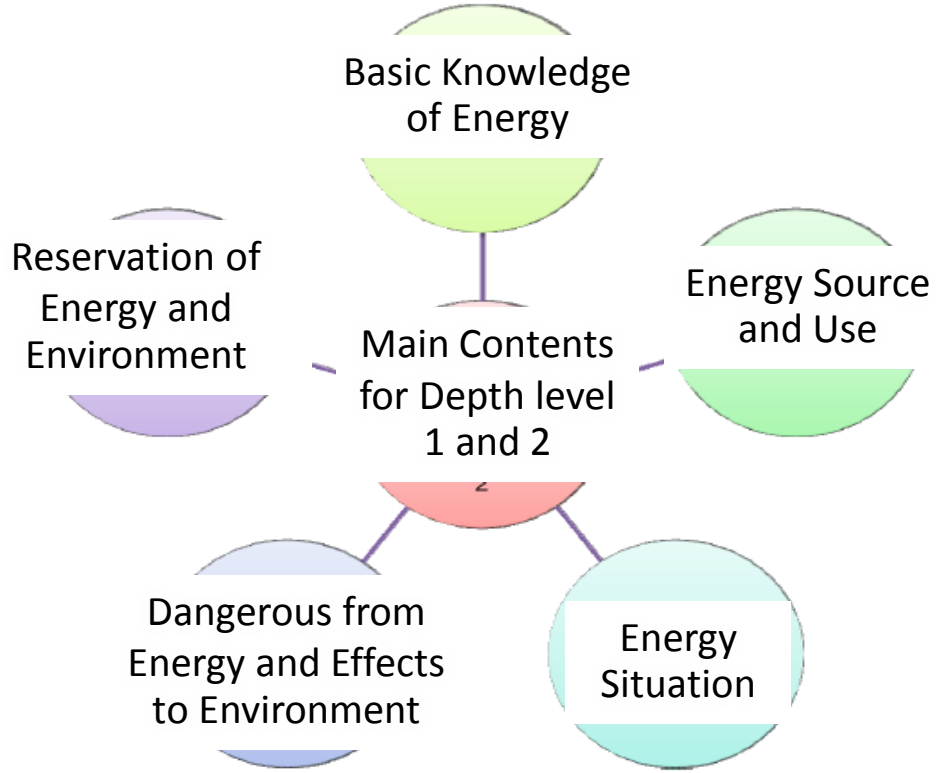
- Content Depth level 2

Knowledge of energy teaching and learning in country and ASEAN by emphasizing energy situation, effect of using energy that would be aware, and energy reservation in which could be done by oneself.

- Content Depth level 3

Teachers will have knowledge of energy by emphasizing energy situation and effects to Thailand compared with other countries, effects that is global problem and emphasizing on energy technology and trends of technology will be happen in the future.

Bringing Energy into Thai Curriculum



Effective Plan for Bringing Energy into Secondary Mathematics Classroom in School Using Lesson Study in Thai Context

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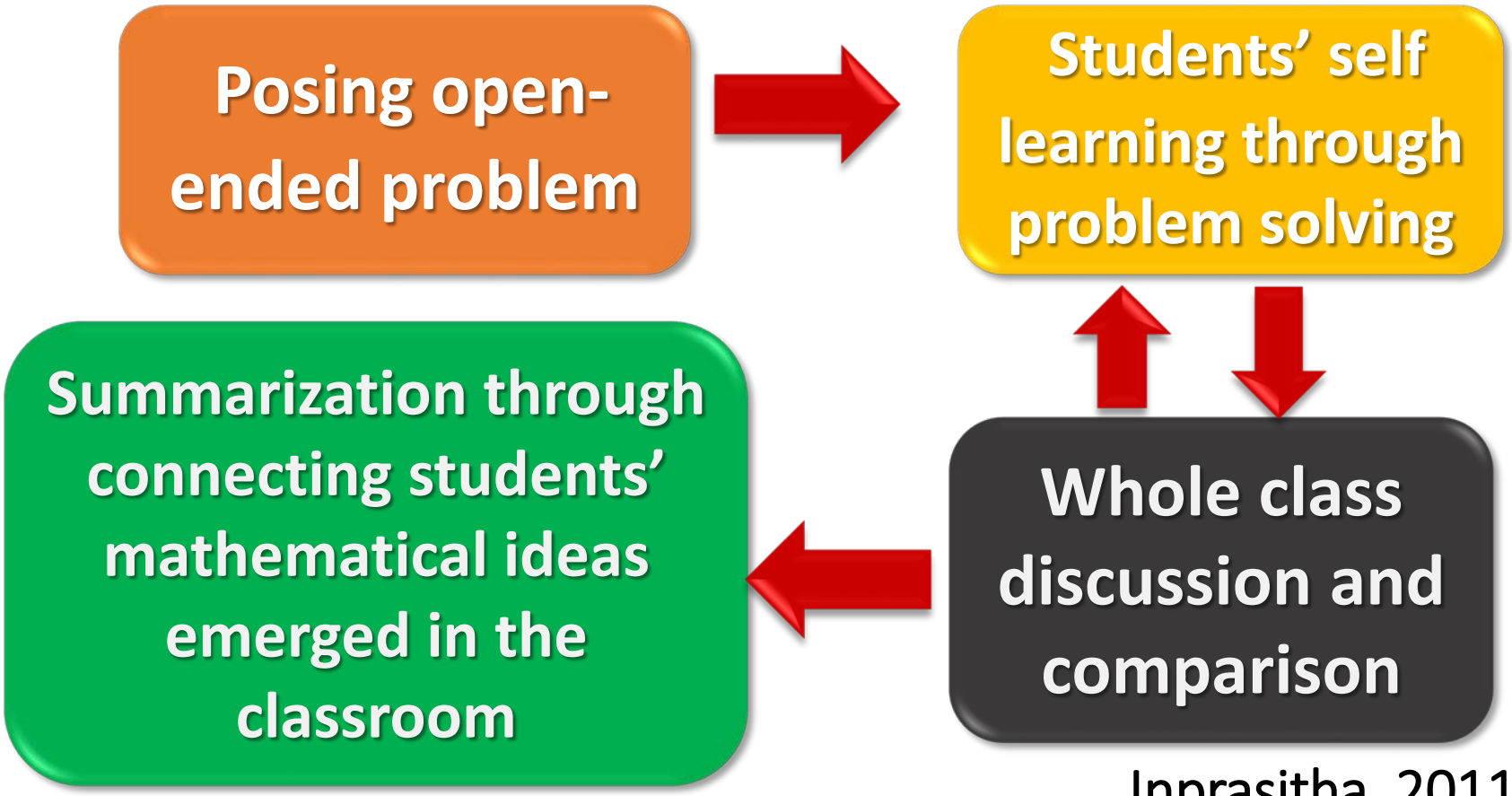
4 Phases of Open Approach as a teaching approach in Thailand



Inprasitha, 2011

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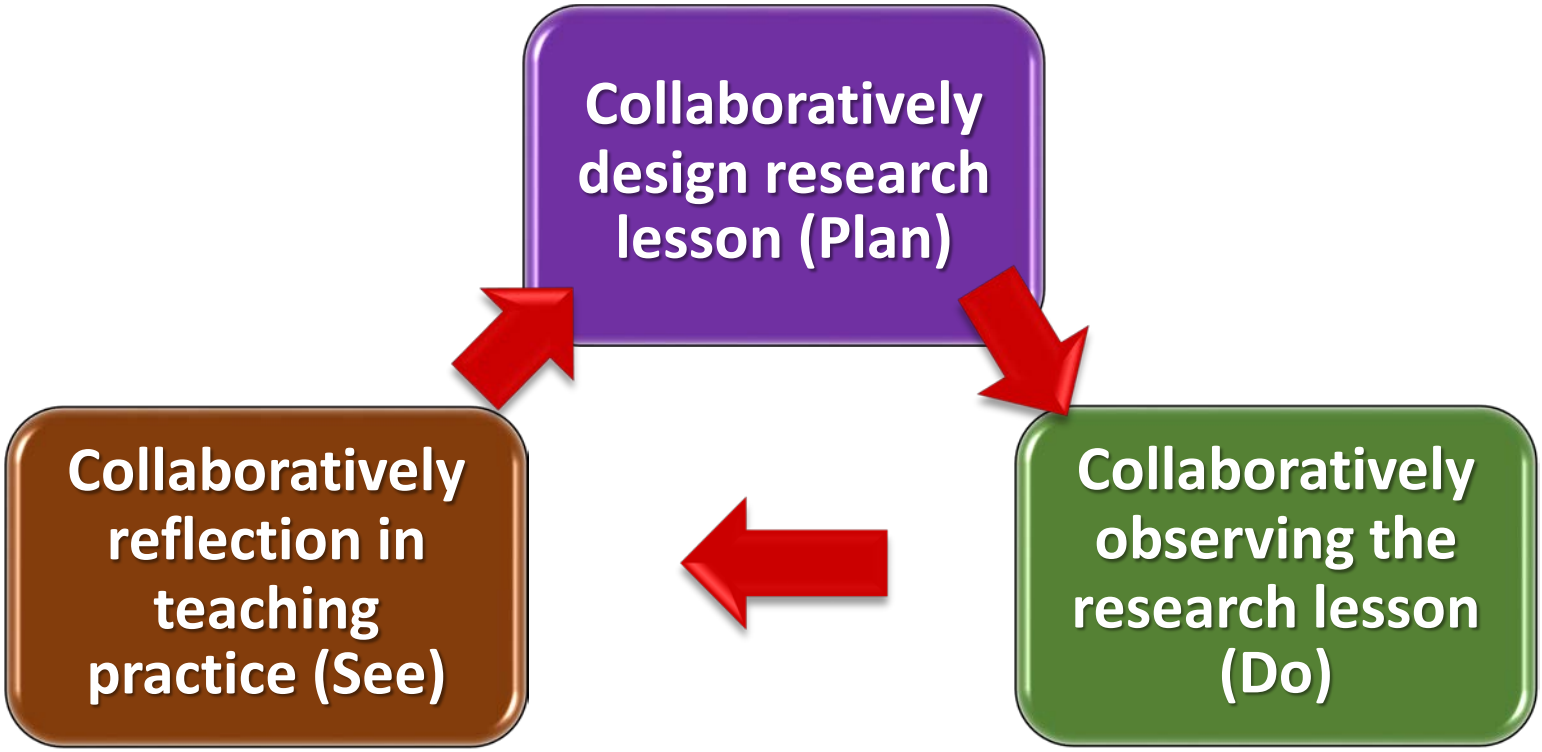
Three steps of Lesson Study in Thailand



(Inprasitha, 2010 & 2011)

Effective Plan for Bringing Energy into Secondary Mathematics Classroom in School Using Lesson Study in Thai Context

Energy Effective Plan for Teaching

Meeting for planning among networking universities in Thailand for selecting sites of data collection

12-15 February 2016

Studying science for Energy Efficiency and planning the teaching content at the secondary school levels.

Meeting for planning among networking universities for adjusting plan in according to suggestions

Effective Plan for Bringing Energy into Secondary Mathematics Classroom in School Using Lesson Study in Thai Context

Energy Effective Plan for Teaching

Team of researchers and experts had a meeting to design a lesson plan (2 hours) for 4 purposed schools

Research site in the Northeast of Thailand

use the lesson plan to teach in the 1st school, and the 2nd teachers team, researchers and experts collaboratively observe the classroom

Research site in the South of Thailand

use the lesson plan to teach in the 1st school, and the 2nd teachers team, researchers and experts collaboratively observe the classroom

Effective Plan for Bringing Energy into Secondary Mathematics Classroom in School Using Lesson Study in Thai Context

Energy Effective Plan for Teaching

Research site in the Northeast of Thailand
Collaboratively reflect in the 1st school and then improve the lesson plan

Research site in the Northeast of Thailand
use the lesson plan to teach in the 2nd school, and the 1st teachers team, researchers and experts collaboratively observe the classroom

Research site in the South of Thailand
Collaboratively reflect in the 1st school and then improve the lesson plan

Research site in the South of Thailand
use the lesson plan to teach in the 2nd school, and the 1st teachers team, researchers and experts collaboratively observe the classroom

Effective Plan for Bringing Energy into Secondary Mathematics Classroom in School Using Lesson Study in Thai Context

Energy Effective Plan for Teaching

Research site in the Northeast of Thailand

Collaboratively reflect in the 2nd school and then improve the lesson plan

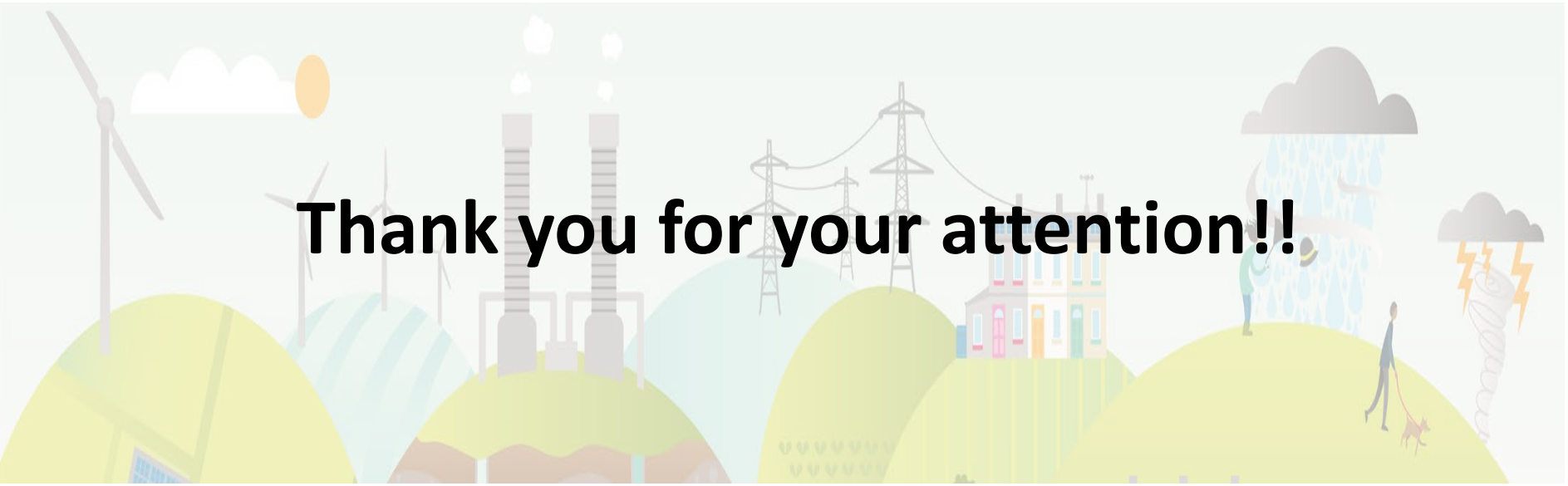
Research site in the South of Thailand

Collaboratively reflect in the 2nd school and then improve the lesson plan

Bring results of teaching from both 2 research sites to discuss and conclude together

References

Department of Alternative Energy Development and Efficiency 2014
http://www.energy.go.th/



Thank you for your attention!!