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Asia-Pacific Economic Cooperation

筑波大学 University of Tsukuba

Promises and Challenges to Energy Efficiency on STEM and Cross-border Education: Indonesia Perspective

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Presented at The 10th APEC-Tsukuba Conference
Innovation of Mathematics Education through Lesson Study
Challenges to Energy Efficiency on STEM and Cross-border Education
February 11-15, 2016, University of Tsukuba, Tokyo, Japan

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Overview

- Brief Information on Education in Indonesia
- Major issue on Energy in Indonesia
- In relation to STEM, what reform is going on in Indonesia?
- In relation to lesson study for Cross Border, what is possible for Indonesia?

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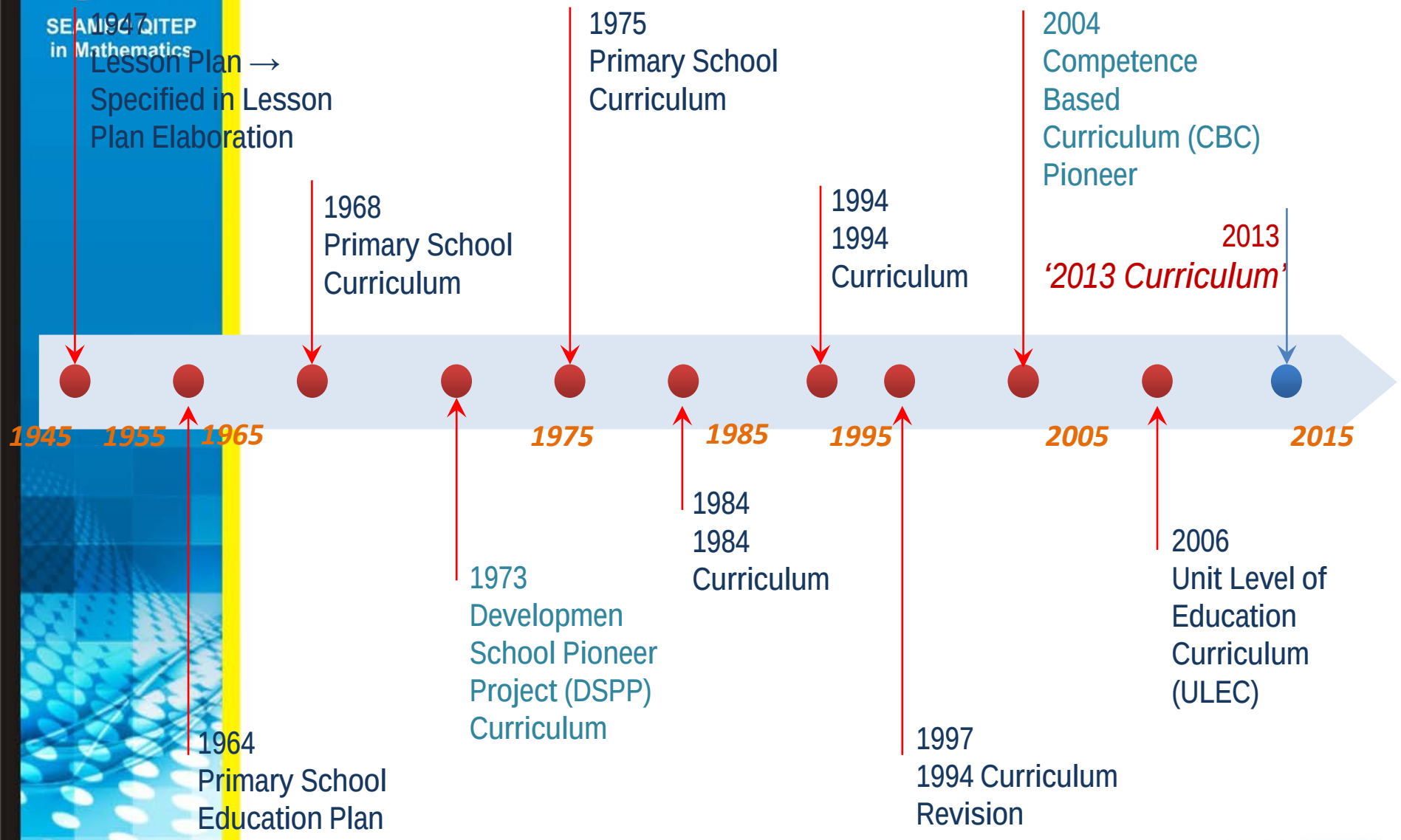
Curriculum Development in Indonesia



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Major issue on Energy in Indonesia

- Inequality of access to energy such as electricity
- Traffic jam in capital cities – waste of time and fuel consumed
- Energy used at home and office

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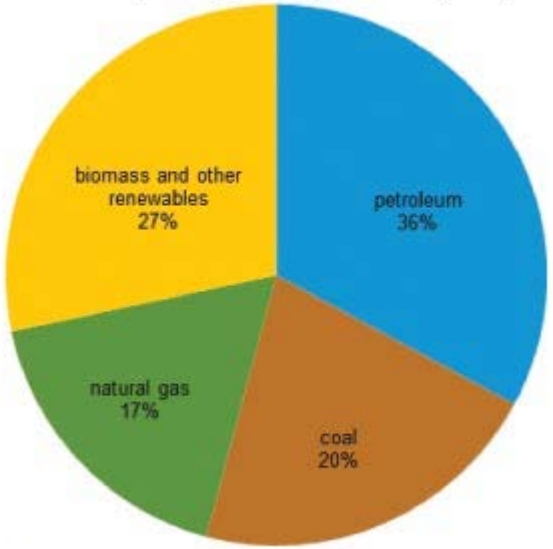
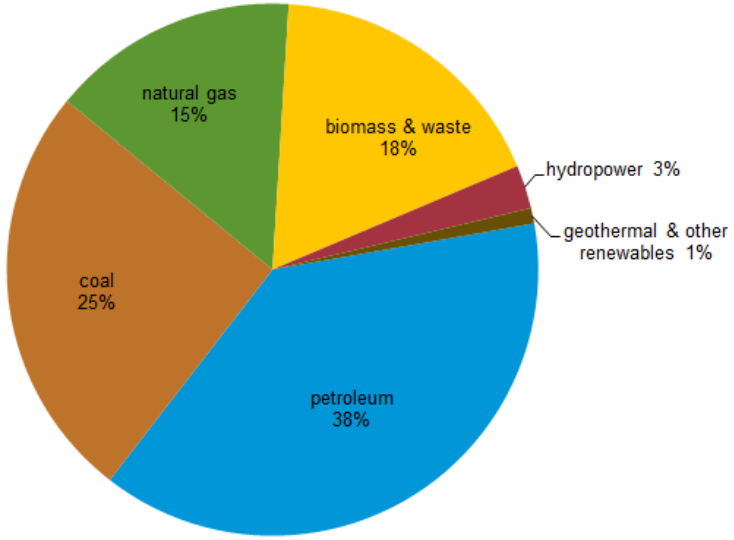
Primary Energy Consumption in Indonesia in 2012 and 2013

Indonesia total primary energy consumption, 2012



eia **Source**: U.S. Energy Information Administration, International Energy Statistics and BP Statistical Review

Figure 1. Indonesia total primary energy consumption, 2013



eia Source: Indonesia's Ministry of Energy and Mineral Resources

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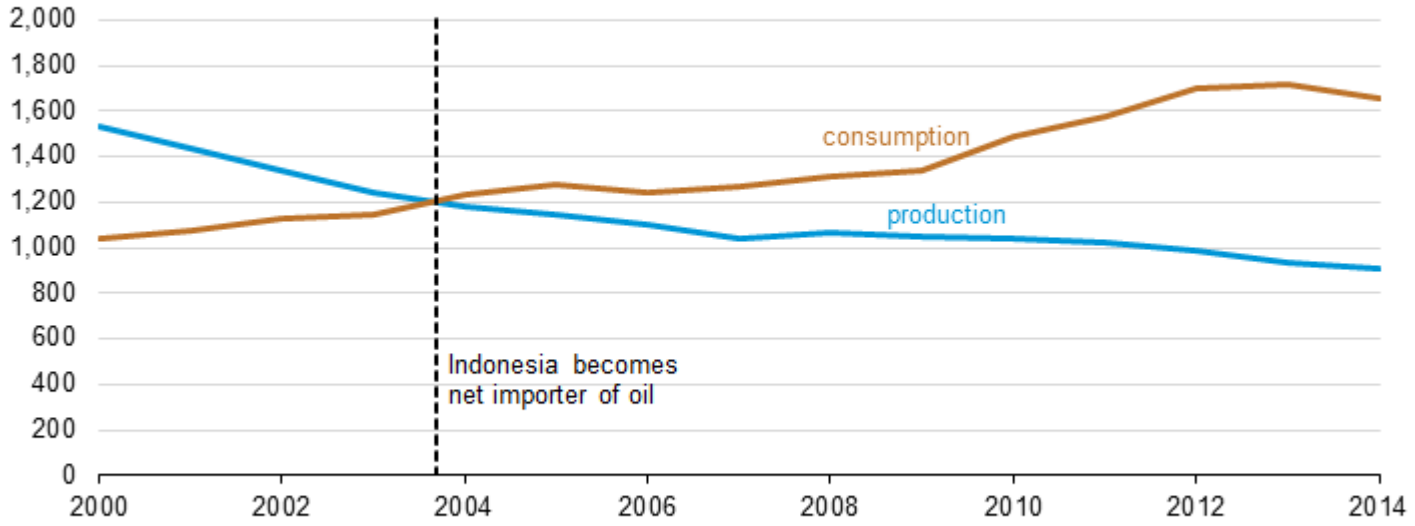
Oil Supply and Demand

Figure 2. Petroleum and other liquids supply and consumption, Indonesia 2000-2014

thousand barrels per day



eia Source: U.S. Energy Information Administration, *Short Term Energy Outlook*, September 2015

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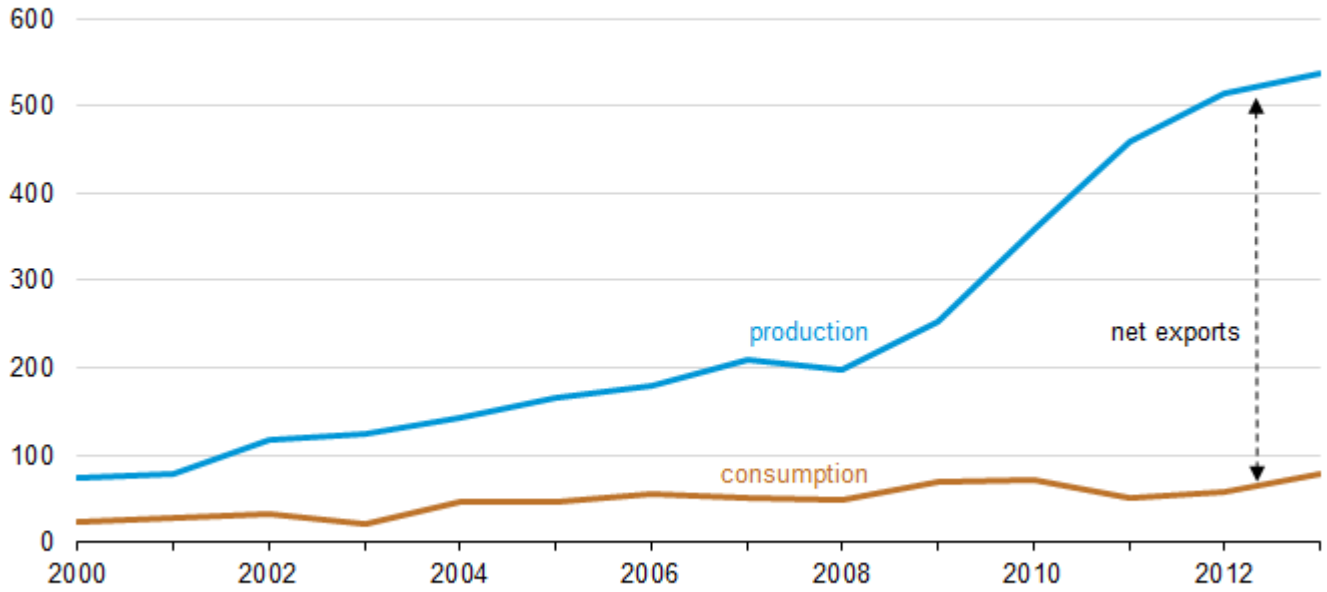
Coal Supply and demand

Figure 8. Coal production and consumption, Indonesia 2000-2013

million short tons



eia Source: U.S. Energy Information Administration

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Energy Awareness

- Campaign on energy saving and conservation through media

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STEM and Education reform in Indonesia

- Emerging and hot issues of STEM in Indonesian education practices
- High Order Thinking is in Curriculum document, yet barely take place in T&L Practice
- STEM is in line and align with new curriculum (K-2013) being implemented
- Possibility to embark the STEM with EE issues

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Proper Possible Topic for STEM - EE

- 'Route mathematics modelling' to solve traffic jam in big city – energy saving and efficiency
- Energy used in household – PS, JSS, SS

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Lesson Study for Cross Border: Possibility for Indonesia

- Cross border within – across provinces
- Cross border with neighboring countries such as Malaysia, Thailand, Brunei, Phillipine
- Lesson Study gains its momentum among teachers and teachers educators

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Goal of EE in Mathematics Classroom

- To promote learning in which while students study such mathematics concepts, they will also learn necessary scientific and practical knowledge about energy efficiency and conservation
- To promote students awareness toward energy used in their daily life
- To promote students positive attitude toward mathematics

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We wish our Students will say….

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Mathematics class is…

- Awesome
- Exciting
- Fun
- Meaningful
- Contextualized
- Eye Opener

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The Way Forward

- People must learn about the role of energy and its availability as well as its impact on their lives.
- For this purpose, the EE research development of SEAMEO QITEP in Mathematics plans to develop E-Textbooks or E-Module on mathematics for energy efficiency through the Lesson Study done by collaboration of the mathematics teachers, educators and experts and through cross border.
- Facilitate teachers to make use of those modules through seminar and in house training

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Acknowledgment

- Special thanks and deep appreciation to:-
  - Prof. Masami Isoda, PhD of CRICED, the University of Tsukuba, Japan
  - APEC Secretariat
  - The Government of the Republic of Indonesia

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Thank You

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