Thailand Energy Resources: Today and Tomorrow

Symposium on the Global Energy Future
October 1, 2010
Washington University in St. Louis
Thailand Energy Outlook 2030

- Not as planned
- Current account
- Technology driven
- Policy driven
- Reference
Final Energy Consumption (ref.)
Primary Energy Requirement

![Primary Energy Requirement Chart]

- **Crude Oil**: Red
- **Hydropower**: Light blue
- **Natural Gas**: Orange
- **Nuclear**: Green
- **Renewables**: Yellow
- **Solid Fuels**: Blue

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<th>Year</th>
<th>Crude Oil</th>
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<th>Natural Gas</th>
<th>Nuclear</th>
<th>Renewables</th>
<th>Solid Fuels</th>
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GHG Emission

Energy-related CO2 eq [Million Ton]

-60
-50
-40
-30
-20
-10
0
10
20
30
40
50


N-BI OF  N-HST  N-MRT  N-NGV  N-NUC  P-FES  P-HEV  P-IBAT  P-NUC+  P-PV
Cost and GHG Comparison in 2030 (Ref. case)

Relative cost [Billion THB]

Relative GHG [Million Ton CO2 eq.]
Key Messages

• High increase energy demand foreseen,
• Less attention on energy efficiency than renewable energy,
• Conflict between food and energy crops,
• More energy import expected, especially NG,
Challenges and Needs to Meet Future Energy Demands

Challenges:
- Economical driving policy
- More environmental concerns
- Greed

Needs:
- Efficient consumption & supply
- Renewable energy
- Sufficiency economy
Areas of Research at CU

- Energy
- Climate Change
- Food & Water
- Aging Society
- Emerging Decease
- Human Security
- Advance Material
Energy Cluster

• Covering four key areas:
  - Solar energy
  - Biofuels
  - Fuel cell
  - Energy Resource modeling
Climate Change Cluster

• Changes on land use-urban and rural ecology
• Climate change modeling
• Adaptation and mitigation
• Sustainable Development Study Center in Huay Sai.
Areas of Education at CU

• **Technology based courses:** provided at faculty of science, engineering, architecture, etc.

• **Social and economics based courses:** provided at faculty of economics, ERI, ENVRI

• **Knowledge transfer** to public and nearby communities
Areas of Practice at CU

Energy Efficiency

- each faculty partly responsible for their owned electricity bill,
- conducting energy M&V at university and faculty levels,
- conducting good house keeping, retrofitting in most organizations,
- campaigning energy conservation activities to staff and students.
Areas of Practice at CU

Energy efficiency activities
- Retrofitting lighting system
- Temperature setting for A/C, etc.

Renewable energy
- Food waste conversion to biogas
- Waste recycling management
- Solar PV installation, etc.
CU Strength

• **Energy**
  - *Solar energy*:
  - Biofuel:
  - Energy resources and modeling

• **Environment**
  - Climate change mitigation and adaptation
  - Water management
Areas to be worked on together

• Increase of biomass and biogas potential in tropical countries,
• Development of solar energy for electrical and thermal applications,
• Energy policy and modeling,
• Climate change adaptation and mitigation,
• Water system management
Resources and Funds

Sources of funds:
• Governmental agency
• Research granting agency
• Private sector
• Energy Conservation Fund
Partnerships

- Illinois institute of technology
- University of Tokyo
- Kyoto University
- Nagoya University
- University of Toyama
- University of Kitakyushu,
- Technische Universität Dresden
- University of New South Wales
- University of Waterloo, etc.
Barriers for the proposed partnership

• No legal and political barriers
• Limited grant from government
Change 2x36 W to 1x36 W

Before

After
Food Waste Biogas System
(Semi-dry anaerobic digester)
Solar Air-Conditioning System