

# ASEAN ENERGY MARKET INTEGRATION (AEMI) FORUM:

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## ENERGY PRICING AND SUBSIDIES

### AGENDA

**PROJECT OVERVIEW**

**DISCUSSION PAPER**

**PARTICIPANTS LIST**

**BIOGRAPHICAL NOTES**

**BANGKOK, 27-28 FEBRUARY 2015**





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## **AGENDA**

**AEMI FORUM: ENERGY PRICING AND SUBSIDIES  
BANGKOK, 27-28 FEBRUARY 2015**





ศูนย์อาเซียนศึกษา  
จุฬาลงกรณ์มหาวิทยาลัย  
ASEAN STUDIES CENTER  
CHULALONGKORN UNIVERSITY



NUI  
Norwegian Institute  
of International  
Affairs

***ASEAN ENERGY MARKET INTEGRATION (AEMI) FORUM***  
***ENERGY PRICING AND SUBSIDIES***  
***27-28 February 2015, Pathumwan Princess Hotel, Bangkok***  
***Forum held under Chatham House Rule***

**AGENDA**

**Friday, 27 February 2015**

- 17:30-18:00 Registration
- 18:00-18:30 Drinks and appetizers
- 18:30-21:00 Dinner at the Pathumwan Princess Hotel

**Saturday, 28 February 2015**

- 8:15-8:30 **Registration**
- 8:30-8:45 **Opening Remarks: AEMI Vision Moving Forward**  
Dr. M. R. Kalaya Tingsabadh, Vice-President, Chulalongkorn University
- 8:45-9:00 Group Photo
- 9:00-9:30 **Introductions**  
All Participants
- 9:30-10:00 **AEMI Project: Ambitions and Challenges**  
Dr. Nawal Kamel, Chulalongkorn University  
Dr. Indra Øverland, Norwegian Institute of International Affairs
- 10:00-11:00 **Fossil Fuel Subsidy Reform in ASEAN: What do we know?**  
Roundtable Discussion: All Participants
- 11:00-11:15 Coffee Break

- 11:15-12:30 **Towards a Consistent Methodology for National Analyses**  
Roundtable Discussion: All Participants
- 12:30-14:00 Lunch
- 14:00-15:15 **National Scenarios: Mitigation Measures and Impacts Analyses**  
Roundtable Discussion: All Participants
- 15:15-15:30 Coffee Break
- 15:30-16:15 **Consistent National and ASEAN Analyses: Towards an ASEAN model?**  
Roundtable Discussion: All Participants
- 16:15-17:00 **Research Outline: National and ASEAN Analyses**  
Roundtable Discussion: All Participants
- 17:00-17:30 **Division of Labour, Timeline and Next Steps**  
Dr. Nawal Kamel, Chulalongkorn University  
Dr. Indra Øverland, Norwegian Institute of International Affairs  
Roundtable Discussion: All Participants
- 17:30-17:45 **Conclusions and Forum Closing Statement**  
Dr. Suthipand Chirathivat, ASEAN Studies Center, Chulalongkorn University
- 17:45-18:30 Drinks and appetizers
- 18:30-21:00 Dinner at the Pathumwan Princess Hotel

## **PROJECT OVERVIEW**

**AEMI FORUM: ENERGY PRICING AND SUBSIDIES**

**BANGKOK, 27-28 FEBRUARY 2015**



**ASEAN ENERGY MARKET INTEGRATION (AEMI) FORUM**

**ENERGY PRICING AND SUBSIDIES**

**27-28 February 2015, Pathumwan Princess Hotel, Bangkok**

**AEMI PROJECT OVERVIEW**

**A. MOTIVATION**

**Context<sup>1</sup>**

1. ASEAN is facing an energy challenge. Primary demand for energy is set to grow steadily at 4.4% per year up to 2030, in the face of increased economic activity, population growth, rising electrification rates, and expansion of the transport sector. The implication is that energy demand will double by 2030, after having already expanded 2.5 times since 1990. Demand for all hydrocarbons is set to expand: oil by 50%; natural gas by 80%; and coal by 300%, as it replaces gas and oil, notably for electricity generation. According to the Asian Development Bank, even with the best scenarios for energy efficiency and renewable energy, ASEAN energy production cannot meet such rapidly increasing demand.
2. This soaring energy demand is combined with a declining energy production within ASEAN. ASEAN oil production is expected to fall by almost one third by 2030, after having declined by 10% per year in the last decade. Also ASEAN's surplus of natural gas and coal available for export will continue to decline, as ASEAN production is outpaced by its domestic demand. Currently, renewables represent only 3% of primary energy mix in ASEAN-5 (Indonesia, Malaysia, the Philippines, Singapore and Thailand) and this ratio is set to fall, as gains from the use of alternative energy will only displace current use of biomass.
3. Moreover, ASEAN's environmental sustainability is set to decline. ASEAN energy-related greenhouse gas emissions are expected to double by 2030, after having increased by 57% during the last decade. This is due in part to the expected 8% annual increase in coal consumption for electricity generation. Moreover, ASEAN energy intensity is lagging world averages. It improved only by 12%, compared to 26% worldwide. Moreover, ASEAN industrial energy intensity has been worsening steadily in the last three decades (decreasing on average by 0.2% per year in 1980-2011). As a result, ASEAN currently consumes more than twice the amount of energy per unit of GDP than the average industrial countries (OECD). End-users appliances (e.g., incandescent light, bulbs, air conditioners; industrial motors) are highly inefficient compared to best available technologies.

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<sup>1</sup>Sources: AEMI Group (2013), *ASEAN Energy Market Integration (AEMI): From Coordination to Integration*; Asia Development Bank (ADB) (2013), *Asian Development Outlook 2013: ASEAN's Energy Challenge*; International Energy Agency (IEA) (2012), *World Energy Outlook*; International Monetary Fund (IMF) (2013), *Energy Subsidy Reform: Lessons and Implications*; International Institute for Sustainable Development (IISD) (2013), *A Guidebook to Fossil-Fuel Subsidy Reform for Policy-Makers in Southeast Asia*; The World Bank (2010), *Subsidies in the Energy Sector: An Overview*.



4. Finally, ASEAN energy poverty is higher than the world average. More than one fifth of ASEAN population (some 130 million people) still lack access to electricity, and nearly half (45%) relies on traditional use of biomass for cooking (about 230 million people). Lack of access to modern energy services is a serious hindrance to economic and social development, and must be overcome if sustainable and equitable growth is to prevail within the ASEAN Economic Community.

## **Challenges**

5. International organizations (ADB, IEA) propose ASEAN energy market integration as the most efficient way for ASEAN to address its energy challenges. They also recognize that the creation of an efficient ASEAN-level regional energy market is a major challenge, as it requires harmonization of energy pricing and subsidies for energy product and services; rationalization of tariffs and non-tariff barriers; expansion of market connectivity through gas pipelines and power grid; and formulation of a common strategy for energy security. Moreover, for the integrated ASEAN energy market to be socially equitable and environmentally sustainable, member states need to agree common policies to deploy renewable energy; enhance energy efficiency; and secure access to clean energy sources. ASEAN energy market integration therefore involves all of these elements.
6. A group of concerned ASEAN academics held a session at Chulalongkorn University (May 2013, Bangkok) and constituted themselves into the AEMI Group, agreeing to work together to make the case for ASEAN Energy Market Integration (AEMI) within the forthcoming ASEAN Economic Community (AEC). The vision is to allow for the free flow of energy products, services, investment and skilled labor in the framework of the AEC. The approach is consistent with the purpose of the AEC, to transform ASEAN into a single production market with a free flow of goods, services, investment and skilled labor. AEMI is a logical extension of such provisions to the energy sector.
7. The AEMI Group committed to working together to develop the AEMI concept, analyze its rationale, assess its potential benefits, and propose an approach for its deployment within the AEC through 2030. Through their studies, the AEMI Group demonstrated that the development of AEMI is an imperative requirement for the success of the AEC, given the vital role that energy plays in sustaining economic growth and in securing the wellbeing of people. Moreover, if designed properly and implemented efficiently, AEMI has the potential to deliver economic, social and environmental benefits to all ASEAN member states. It could improve energy efficiency, help creation and deployment of renewable energy and address energy poverty across ASEAN.
8. The AEMI Group published a Book: “*AEMI: From Cooperation to Integration*” (2013) distributed to ASEAN Senior Officials, policymakers and academics (in Bangkok, Jakarta, Manila, Kuala Lumpur, Singapore, and Tokyo). The work of the AEMI Group was supported since its inception by Chulalongkorn University (Bangkok, Thailand).

## **Policy making**

9. The AEMI Group was successful in opening a dialogue with ASEAN policymakers on energy market integration. It made the case for the successor of the current ASEAN Plan of Action for Energy Cooperation (APAEC, 2010-2015), to move from regional energy “cooperation” into energy “integration”, to take the energy dialogue beyond the current piecemeal bilateral trading arrangements, into fully integrated energy policies within the framework of the AEC.

10. The AEMI Group worked closely with the ASEAN Secretariat and relied on the data and publications from the ASEAN Center for Energy (ACE). It was invited to address the 31st Senior Officials Meeting on Energy (SOME) in Bali (June 2013). The SOME endorsed the AEMI initiative and encouraged the AEMI Group to report back their results on the subsequent SOME.
11. More recently, the SOME adopted “ASEAN connectivity and energy market integration” as the main theme for the upcoming APAEC 2016-2020 and instructed the drafting committee to prepare the document accordingly. This agreement is to be concluded by the ASEAN Energy Ministers by December 2015. As a result of this development, the AEMI Group currently focuses its analytical work on defining an AEMI Blue Print. It has already identified the set of issues that needs to be addressed in the design of the next APAEC, with a view to formulating policy recommendations directly relevant to its drafting in 2015 and to its deployment through to 2020.

## **B. STRUCTURE**

### **Focus**

12. The adoption of “connectivity and energy market integration” as the main theme of the new APAEC represents a major shift in ASEAN perspective, and a challenge to its policymakers. The proper formulation of AEMI Blue Print would provide ASEAN greater energy security, enhanced economic efficiency, and improved opportunities to fight energy poverty and to address environmental problems.
13. The purpose of the AEMI Project is to bring together energy experts from ASEAN member states and beyond, to further develop the concept of AEMI and design its Blue Print components. Building on the work accomplished by the AEMI Group, it would undertake policy analysis and formulate recommendations for the next APAEC (2016-2020) from the drafting stage in 2015 through the period of implementation to 2020.
14. The AEMI Project is geared towards enhancing ASEAN energy policy dialogue, and engaging policymakers (including the ASEAN Center for Energy, the ASEAN Secretariat and all ASEAN energy bodies), non-government organizations, as well as energy and environment experts from the region and beyond.

### **Approach**

15. The AEMI project will convene a series of thematic Forums to assess ASEAN energy challenges, identify opportunities and challenges in implementing AEMI, and formulate policy recommendations for the new APAEC. These Forums will be designed to engage an interaction policy dialogue between academics, energy practitioners, civil society organizations, ASEAN policymakers as well as international organizations.
16. Each thematic Forum corresponds to one of the components identified for the AEMI Blueprint. These themes include: expanding renewable energy; improving energy efficiency; securing clean energy access to isolated remote areas; tackling energy subsidies while enhancing affordability of energy to the poor; improving market connectivity; fostering clean energy technology; and advancing energy security. Table 1 provides a preliminary list of such thematic Forums.

17. Special attention will be given to convening a Forum to assess the impact of small-and-medium-scale renewable energy projects in remote and isolated areas across ASEAN, and to investigate ways to help forge a role for ASEAN in global renewable energy development. In particular, the Forum would assist in developing a survey to be conducted in at least 20 local communities that have recently installed renewable energy sources across a minimum of four ASEAN member states.

### **Outputs**

18. A *Forum Report* will summarize the conclusions from each Forum, highlight the emerging policy recommendations, and outline next steps to further develop them (including surveys at the national levels, interactions with ASEAN policy makers, and investigations with national energy entities). Moreover, a survey of renewable energy will be produced.
19. An *AEMI Policy Paper* will be drafted on each of the Forum themes, focused on analyzing policy options and making policy recommendations for the APAEC (2016-2020).
20. The *AEMI Website* will be created to e-Publish *AEMI Policy Papers*, post information related to the ASEAN energy, distribute Forum outputs, and receive comments and suggestions.

### **Support**

21. The project is funded by the Norwegian Ministry of Foreign Affairs, building on the AEMI work initiated and supported by Chulalongkorn University, Thailand. It is housed at the ASEAN Studies Center (ASC), Chulalongkorn University, where the AEMI Secretariat will also be located. The project is funded by the Norwegian Ministry of Foreign Affairs.
22. The project is jointly coordinated by Dr. Nawal Kamel (ASC) and Dr. Indra Øverland, the Norwegian Institute of International Affairs. An AEMI Advisory Committee will review progress, provide advice and supervise the budget. Furthermore, an AEMI Review Committee will provide guidance on the technical aspects of the AEMI project, and include prominent energy experts and practitioners from ASEAN and beyond.

### **Partnerships**

23. The AEMI project will seek to expand the current AEMI Group, which currently includes academics from most ASEAN countries. The project will seek to include active participation of ASEAN academic institutions and research institutes currently present within the AEMI Group, and to expand this network further. [Table 2](#) provides the list of AEMI Group members as of January 2015.
24. The AEMI project will also strive to broaden the AEMI network to gradually include relevant civil society organizations, multilateral organizations, foundations, as well as (neutral) bilateral and multilateral donors. It will also build linkages with ongoing related international initiatives on green energy and technology, and on access to renewable energy.

**Table 1: POTENTIAL FORUM TOPICS**

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>(1) ADDRESSING ENERGY POVERTY</b></p> <p>(a) How would AEMI help access to energy and eradicate energy poverty across ASEAN?</p> <p>(b) What is the investment need to improve access to electricity and clean energy fuel across ASEAN?</p> <p>(c) Which policy incentives would encourage private sector investments in energy infrastructure projects?</p> <p>(d) How to quantify the implications of eradicating energy poverty on narrowing the development gap across ASEAN (an objective of the AEC), and on improving GDP prospects across ASEAN?</p> <p>(e) What policy recommendations for APAEC (2016-2020)?</p>                                                                                                                                                                                                                                                                       |
| <p><b>(2) TACKLING ENERGY PRICING AND SUBSIDIES</b></p> <p>(a) What are the options to “decouple” energy pricing from welfare objectives to assist the poor in most vulnerable ASEAN communities (e.g., tax breaks, social security mechanisms, and rebates on energy bills).</p> <p>(b) Can AEMI help implement ASEAN-wide subsidy instruments to protect the poor while allowing the energy market function efficiently?</p> <p>(c) What are the policy recommendations for the APAEC (2016-2020)?</p>                                                                                                                                                                                                                                                                                                                                                                                                |
| <p><b>(3) EXPANDING RENEWABLE ENERGY</b></p> <p>(a) What are the options for establishing ASEAN-level targets?</p> <p>(b) How to quantify the impact of such targets on key environmental and economic indicators?</p> <p>(c) What are the policy incentives to encourage the use of Renewable Energy in the context of AEMI?</p> <p>(d) What are the policy recommendations for the APAEC (2016-2020)?</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <p><b>(4) SMALL-SCALE RENEWABLE ENERGY AND ENERGY POVERTY</b></p> <p>(a) The Forum will discuss a project implemented by surveying at least 20 local communities in at least four ASEAN countries that have recently installed renewable energy sources. The design of this survey will be presented for review and input at a workshop before the survey is carried out.</p> <p>(b) The survey would address the following questions:</p> <p>(i) Are previously energy-poor communities within ASEAN in fact “leapfrogging” directly from biomass energy to clean energy?</p> <p>(ii) What developmental benefits has the deployment of renewable energy actually delivered in these local communities?</p> <p>(iii) How could ASEAN use its remote, energy-poor communities to play a constructive and proactive role in global climate policy by creating a market niche and setting precedents?</p> |

**(5) IMPROVING ENERGY EFFICIENCY**

- (a) What are the options for establishing ASEAN-level targets?
- (b) How to quantify the impact of such targets on key environmental and economic indicators?
- (c) What are the policy incentives to encourage Energy Efficiency in the context of AEMI?
- (d) What are the policy recommendations for the APAEC (2016-2020)?

**(6) ENERGY TARIFFS AND NON-TARIFFS BARRIERS**

- (a) What are the tariffs and non-tariffs barriers to the free flow of energy goods, services and investments across national borders in the framework of AEMI?
- (b) What are the policy recommendations for the APAEC (2016-2020)?

**(7) INFRASTRUCTURE NEEDS FOR CONNECTIVITY**

- (a) What are the investments needed to build the physical, financial and legal/regulatory connectivity through the ASEAN Power Grid and the Trans-ASEAN Gas Pipeline?
- (b) What are the investments needed for the ASEAN Power Grid to be able to absorb the full potential from Renewable Energy sources, so that renewables can compete on an equal footing with traditional sources?
- (c) What are the policy recommendations for APAEC (2016-2020) for investments in energy infrastructure and smart grids?

**(8) FORMULATING ENERGY TECHNOLOGY STRATEGY**

- (a) What are the ASEAN-level policy incentives to develop and deploy clean energy technology?
- (b) What incentives for the private sector in creation and deployment of clean energy technology in ASEAN?
- (c) Could AEMI facilitate the creation of an *ASEAN Clean Energy Technology Fund*?
- (d) What policy recommendations for the APAEC (2016-2020)?

**(9) ADVANCING ASEAN ENERGY SECURITY**

- (a) What are the core components of an ASEAN energy security strategy?
- (b) Would the ASEAN energy strategy address oil and gas physical reserves and deployment conditions?
- (c) Would the ASEAN energy strategy include reserve margins for power generation, to maintain electricity provision through national and local grids?
- (d) What are the strategic policy recommendations for the APAEC (2016-2020)?

**(10) DEVELOPING ANALYTICAL TOOLS FOR ASEAN ENERGY POLICY**

- (a) Which econometric tools and methodologies could best quantify AEMI economic, welfare and environmental benefits across ASEAN (e.g., impact on energy prices, economic growth, energy savings, reduction in greenhouse gas emissions and energy security)?
- (b) Which tools could best assess the impact of adopting ASEAN targets on Renewable Energy and Energy Efficiency? What are the policy recommendations for the APAEC (2016-2020)?

**Table 2: AEMI Group Members**  
(As of January 2015)

|             |                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                            |
|-------------|------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| BRUNEI      | Dr. Lim Chee Ming                                                                                                      | Associate Professor, Institution of Engineering and Technology, Universiti Brunei Darussalam (UBD), Bandar Seri Begawan.                                                                                                                                                                                                                                                                   |
| CAMBODIA    | Dr. Srinivasa Madhur                                                                                                   | Director of Research, Cambodia Development Resource Institute (CDRI), Phnom Penh.                                                                                                                                                                                                                                                                                                          |
| INDONESIA   | Dr. Maxensius Tri Sambodo<br><br>Dr. Tri Widodo                                                                        | Researcher, Indonesian Institute of Sciences (LIPI)-Economic Research Center, Jakarta.<br><br>Fellow, Institute of Southeast Asian Studies (ISEAS), National University of Singapore (NUS), Singapore.<br><br>Professor and Head of Economics Department, Faculty of Economics and Business, Universitas Gadjah Mada (UGM), Yogyakarta.                                                    |
| LAO PDR     | Dr. Phouphet Kyophilavon                                                                                               | Associate Professor and Vice Dean, Faculty of Economics and Business Management, National University of Laos (NUOL), Vientiane.                                                                                                                                                                                                                                                            |
| MALAYSIA    | Dr. Aishah Bte. Mohd Isa<br><br>Ir. G. Lalchand<br><br>Dr. Leong Yow Peng<br><br>Ir. Tuan Ab. Rashid Bin Tuan Abdullah | Research Fellow, Energy Policy and Research (IEPre), Universiti Tenaga Nasional (UNITEN), Kuala Lumpur.<br><br>Associate, Akademi Sains Malaysia (ASM), Kuala Lumpur.<br><br>General Manager (Corporate Planning & Innovation), National Power Utility, Kuala Lumpur.<br><br>Director, Institute of Energy Policy and Research (IEPre), Universiti Tenaga Nasional (UNITEN), Kuala Lumpur. |
| MYANMAR     | To be determined                                                                                                       | To be determined                                                                                                                                                                                                                                                                                                                                                                           |
| PHILIPPINES | Dr. Adoracion M. Navarro<br><br>Dr. Ma. Joy V. Abrenica<br><br>Mr. Jessie L. Todoc                                     | Senior Research Fellow, The Philippine Institute for Development Studies (PIDS), Manila.<br><br>Associate Professor, School of Economics, University of the Philippines (UP)-Diliman, Manila.<br><br>Consultant, Sustainable Energy, Manila.                                                                                                                                               |

|           |                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SINGAPORE | <p>Dr. Philip Andrews-Speed</p> <p>Dr. Xunpeng Shi</p> <p>Dr. Youngho Chang</p>                                                                          | <p>Principal Fellow, Energy Studies Institute (ESI), National University of Singapore (NUS), Singapore.</p> <p>Senior Research Fellow, Energy Studies Institute (ESI), National University of Singapore (NUS), Singapore.</p> <p>Assistant Professor, Division of Economics, Nanyang Technological University (NTU), Singapore.</p>                                                                                                                                                                                                                           |
| THAILAND  | <p>Dr. Bundit Fungtammasan</p> <p>Dr. Chaiwat Muncharoen</p> <p>Dr. Kitti Limskul</p> <p>Dr. San Sampattavanija</p> <p>Dr. Watcharapong Ratisukpimol</p> | <p>Associate Professor and Vice President for Research, Joint Graduate School of Energy and Environment (JGSEE), King Mongkut's University of Technology Thonburi (KMUTT), Bangkok.</p> <p>Director, Asian Greenhouse Gas Management Center (AGMC), Asian Institute of Technology (AIT), Bangkok.</p> <p>Associate Professor, Faculty of Economics, Chulalongkorn University (CU), Bangkok.</p> <p>Lecturer, Faculty of Economics, Chulalongkorn University (CU), Bangkok.</p> <p>Lecturer, Faculty of Economics, Chulalongkorn University (CU), Bangkok.</p> |
| VIETNAM   | <p>Mr. Nguyen Duc Song</p> <p>Dr. Nguyen Thi Mai Anh</p> <p>Dr. Tran Van Binh</p>                                                                        | <p>Researcher, Demand Forecast and DSM Department, Institute of Energy, Hanoi.</p> <p>Lecturer, Department of Industrial Economics, School of Economics and Management, Hanoi University of Science and Technology (HUST), Hanoi.</p> <p>Lecturer, Department of Industrial Economics, School of Economics and Management, Hanoi University of Science and Technology (HUST), Hanoi.</p>                                                                                                                                                                      |

**DISCUSSION PAPER**

**AEMI FORUM: ENERGY PRICING AND SUBSIDIES**

**BANGKOK, 27-28 FEBRUARY 2015**





***ASEAN ENERGY MARKET INTEGRATION (AEMI) FORUM***  
***ENERGY PRICING AND SUBSIDIES***  
***27-28 February 2015, Pathumwan Princess Hotel, Bangkok***  
***Forum held under Chatham House Rule***

***DISCUSSION PAPER***

**A. FORUM OBJECTIVE**

1. The core objective of the Forum is to analyze the impacts of energy subsidy removal at the ASEAN-level in the framework of ASEAN Energy Market Integration (AEMI), with a view to developing relevant policy recommendations for the new ASEAN Plan of Action for Energy Cooperation (APAEC) (2016-2020). It is convened to agree an analytical approach and division of labor among its participants from ASEAN academic and research institutions.
2. More specifically, the research to be undertaken would be designed to address three interrelated questions:
  - (a) What are the options to “decouple” energy pricing from welfare objectives to assist the poor in most vulnerable ASEAN communities?
  - (b) Can AEMI help develop ASEAN-wide subsidies instruments to protect the poor while allowing the energy market to function efficiently?
  - (c) What are policy recommendations for the new APAEC (2016-2020)?

**B. RATIONALE FOR ENERGY SUBSIDY REMOVAL<sup>2</sup>**

3. Energy subsidies are a major impediment to AEMI within the ASEAN Economic Community (AEC). Moreover, based on numerous studies, the emerging consensus is that energy subsidies have several negative impacts at the macroeconomic, fiscal, welfare, and environmental levels.
4. At the macroeconomic level, energy subsidies depress gross domestic product growth through a number of channels: they can discourage investment in the energy sector; diminish private sector competitiveness; and create incentives for smuggling.

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<sup>2</sup> Sources: AEMI Group (2013), *ASEAN Energy Market Integration (AEMI): From Coordination to Integration*; Asia Development Bank (ADB) (2013), *Asian Development Outlook 2013: ASEAN's Energy Challenge*; International Energy Agency (IEA) (2012), *World Energy Outlook*; International Monetary Fund (IMF) (2013), *Energy Subsidy Reform: Lessons and Implications*; International Institute for Sustainable Development (IISD) (2013), *A Guidebook to Fossil-Fuel Subsidy Reform for Policy-Makers in Southeast Asia*; The World Bank (2010), *Subsidies in the Energy Sector: An Overview*.

5. At the fiscal level, energy subsidies exacerbate budget deficits; crowd out growth-enhancing public spending; and are inefficient tools to reach the poor. Subsidies have put governments under financial stress, often crowding out investments in health care, sanitation, education, and other public spending. It has also limited the ability of state owned utilities to build sufficient capacity, with negative implications on electricity supply (shortages) and on the 134 million people in ASEAN without access to electricity.
6. At the social and welfare levels, energy subsidies are highly inequitable because they mostly benefit upper-income groups; and they divert public resources away from pro-poor spending. IEA finds that there is a substantial leakage of subsidy benefits to top income groups. Its analysis indicates that only 8% of the subsidy granted typically reaches the poorest income group. IMF study of 20 countries examined the direct impacts of increasing energy prices, and found that increasing prices for gasoline and electricity have a strong progressive impact, but the same is not true for kerosene which is strongly regressive.
7. At the environmental level, energy subsidies stall growth of cleaner fuels and technologies and as a result increase carbon dioxide and other greenhouse gas (GHG) emissions. It also delay development of renewable technologies and discourage adoption of energy efficient measures. According to the IMF, the effect of subsidy removal is a reduction in GHG emissions (through a reduction in usage of fossil fuel, and increase in cleaner forms of renewables). However, IISD argues that this net effect depends on the nature of the fuel and the technology substitution (increase in the use of coal).

### **C. TOWARDS A CONSISTENT METHODOLOGY**

#### **DEFINITIONS**

8. Energy – covers primary hydro-carbons energy sources (oil, natural gas, coal) as well as electricity.
9. Price-gap approach – where energy subsidies are measured as the difference between a benchmark border price and price in the domestic market. In the case of electricity, it is the difference between the price charged to consumers and the appropriate benchmark price, which is the cost-recovery price for the domestic producer, including a normal return to capital and distribution costs.
10. Consumer/consumption subsidies—arise when the prices paid by consumers (firms and households) are below a benchmark price (international price). For electricity, this includes subsidy for electricity generation, and any direct subsidy on the electricity price for consumers (household and firms).
11. Producer/production subsidies—arise when prices received by suppliers are above the benchmark price. These are mainly subsidies to major oil companies in the form of tax reimbursements, accelerated depreciation, and research and development grants.
12. Subsidies to account for pre-tax subsidy—price paid below supply and distribution costs; or tax subsidy—taxes below their efficient level. Note that IEA has published an on-line database to increase the availability and transparency of energy subsidy data.

## **MODELING TOOLS**

13. The objective is to use consistent modeling tools and data, for coherent comparison across countries.
14. The price-gap approach is the most useful and widely used and recommended (IEA, IMF, IISD).
15. The choice of appropriate models to conduct the quantitative impact analysis includes: Computable General Equilibrium (CGE) (with supply and demand behaviors across all markets in an economy); linear programming; and econometric models.

## **DATA**

16. Agree on identifying or building a consistent ASEAN economic database, from those typically used (e.g., household income expenditure surveys, I-O tables, Social Accounting Matrices (SAMs)).
17. Agree on sufficiently disaggregated data -- by fuel type and by household income level.
18. For modeling the impacts of energy subsidy removal (ESR), agree that it will be sufficient to capture the top “largest” subsidies accounting for, say, more than 80% of total energy subsidies.

## **D. NATIONAL SCENARIOS**

### **IMPACTS OF ESR**

19. Macroeconomic impact: negative on gross domestic product growth in the short run, positive in the middle and long run.
20. Fiscal impact: net savings in government budgets.
21. Household and social welfare impacts: regressive. Overall, an increase in prices of energy has a negative impact on welfare. However, welfare distributions for increasing prices differ by type of fuel (LPG, kerosene).
22. Environmental impact, through greenhouse gas emissions: generally positive. Subsidies removal will lead to a reduction of carbon dioxide (IMF). However, the net impact depends on fuel substitution (IISD). Models need to be adequately disaggregated to project fuel consumption after subsidy removal, including fuel-switching behavior, and can then multiply the new projected level of consumption by carbon-emission factors for each fuel. If addressed properly, GHG emissions savings from fuel subsidy removal could be large, and this may be helpful in raising financial and technical support from international agencies and donors.

### **MITIGATION MEASURES**

23. Safety nets are necessary to reduce the impact of subsidy removal on the poor. Analysis of such measures and their effectiveness needs to be country specific.
24. In the short term: support is needed to shield the poor from price rises. In the long term, there could be a need for more permanent social assistance, or measures to help the poor cope with energy price volatility.

25. Targeted transfers or near-cash transfers (vouchers) are the preferred approach to compensation (IISD). However, other options include reallocating government net savings into social investments, and productive infrastructure expansion geared towards the poor (public transport, access to clean energy and electricity).
26. Phasing-in subsidies removal over time (gradual removal say, over five years) is recommended over one step implementation (big bang). Also, sequencing sectors could be factored in, rather than removing subsidies in all sectors at the same time.

## **SCENARIOS**

27. Scenarios would be agreed on for the implementation across all national analyses. There would essentially be three types of phased subsidy removal: without any mitigation measures; reallocating government net savings towards the poor at the national level; reallocating them towards greater ASEAN energy connectivity.
28. Reallocating government net savings from ESR towards the poor could include:
  - (a) Reallocating towards social safety nets: increased expenditures on assistance of poor for health and education, or targeted poverty reduction programs (e.g., environmental protection and disaster management; extending social welfare schemes);
  - (b) Reallocating towards social reinvestments: increased investment in health and education, infrastructure and agriculture, in public sector transport networks, in access to electricity and clean energy sources).
29. Five scenarios would project the ESR impacts and government use of net savings:
  - (a) No mitigation measures
  - (b) Paying out cash (or near cash) compensation to the poor(say the 20% bottom income)
  - (c) Reallocate net savings into social safety nets
  - (d) Reallocate net savings towards social reinvestments
  - (e) Reallocate net savings in greater ASEAN Connectivity (ASEAN Grid and Gas Pipeline).

## **E. CONSISTENT NATIONAL AND ASEAN ANALYSES**

### **NATIONAL-LEVEL ANALYSIS**

30. Conduct national analysis of ESR impacts, on coherent and comparable:
  - (a) Consistent ASEAN data sets at national level
  - (b) Consistent CGE family of models
  - (c) Equivalent scenarios for subsidy removal at national level

## ASEAN-LEVEL MODELING TOOLS

31. Based on national analyses, how can we draw conclusions at the ASEAN level? As a first step, can we integrate and “aggregate” the tools we already have available at the national-levels into an ASEAN-level analysis?
32. How do we proceed to build ASEAN-level CGE? Or econometric models? Tables 1-4 describe some of the CGE models most relevant to a multi-country ASEAN-level analysis (these are existing multi-country models used by the IEA, EU, and UNFCCC as well as one ASEAN model built by researchers).

## ASEAN-LEVEL ANALYSIS

33. Parallel to the national-level analysis, conduct ASEAN-level analysis based on:
  - (a) ASEAN data set, consistent with data used for the national-level analyses
  - (b) Agreed assumptions for AEMI within the AEC
  - (c) Agreed scenarios consistent with those in national-level analyses.
33. Two methodologies would be developed in parallel:
  - (a) Econometric analysis at the ASEAN-level
  - (b) ASEAN-level CGE Model, to be constructed simultaneously

## F. RESEARCH OUTLINE

- 1 Overview of energy subsidies within ASEAN
- 2 Review of the literature on ESR: concepts, theory, experience
  - (a) Globally
  - (b) Within ASEAN
- 3 Review of the literature on ESR impacts on the following indicators:
  - (a) Macroeconomic indicators
  - (b) Fiscal indicators
  - (c) Net Energy consumption: sectors, household, firms
  - (d) Social welfare indicators
  - (e) Energy efficiency
  - (f) Renewable energy
  - (g) GHG emissions
- 4 Defining a cohesive methodological approach across ASEAN member states (data sources, CGE models, and econometric approach).
- 5 Compilation of a panel matrix of sectoral energy demand and supply for the ASEAN
- 6 Compilation of a harmonised panel database for the ASEAN on:
  - (a) Energy subsidies and
  - (b) Related energy, economic and trade data required for scenarios

- 7 Using a coherent family of CGE models, analyse the impacts of ESR in each ASEAN member states under five scenarios:
  - (a) No mitigation measures
  - (b) Paying out cash (or near cash) compensation to the poor (20% lowest income)
  - (c) Reallocate net savings into social safety nets
  - (d) Reallocate net savings towards social reinvestments
  - (e) Reallocate net savings in greater ASEAN Connectivity (ASEAN Grid and Gas Pipeline).
  
- 8 Construction, estimation and validation tests of an econometric model of ESR at the ASEAN level in the framework of AEMI. This model should allow an analysis of ESR impacts on:
  - (a) Economic growth
  - (b) Fiscal balances
  - (c) Net Energy demand / compensation
  - (d) Social welfare
  - (e) Energy efficiency
  - (f) Renewable energy
  - (g) GHG emissions
  
- 9 Construction of an ASEAN level CGE energy model in the framework of AEMI. This model should allow an analysis of ESR impacts on:
  - (a) Economic growth
  - (b) Fiscal balances
  - (c) Net Energy demand / compensation
  - (d) Social welfare
  - (e) Energy efficiency
  - (f) Renewable energy
  - (g) GHG emissions
  
- 10 Policy Implications and Recommendations for the ASEAN, addressing key issues, including:
  - (a) ESR and the poor energy consumers: welfare issues
  - (b) ESR and the energy producers: efficiency issues
  - (c) ESR and environmental issues: GHG emissions and renewables
  - (d) AEMI and ESR: would ESR mitigation be more efficient? Are mitigation impacts within ASEAN bigger than the sum of national impacts?
  - (e) AEMI and ESR: does AEMI provide ASEAN with new tools to mitigate ESR impacts?
  - (f) What are ASEAN policy recommendations to build AEMI in a way that enhances ability for each member state to protect the poor?

**Table 1: Some Response Measures Models**  
(used by the UNFCCC)

| <b>E3ME</b>                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|-----------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Name and contact of organization</b> | <b>Cambridge Econometrics</b><br>Covent Garden, Cambridge, CB1 2HS, UK<br>Tel: +44 (0)1223 460760                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Description of model</b>             | <p>The econometric E3ME model has been built as a framework for assessing energy-environment-economy issues and policies. Its close links between energy demand and economic indicators make it well-suited to assessing the social and economic impacts of response measures. In particular, additional taxes or the removal of subsidies can be assessed with the model. E3ME can also be used to examine the impacts of efficiency measures, including rebound effects.</p> <p>In the past the model has mainly been used for:</p> <ol style="list-style-type: none"> <li>1. general macro and sectoral economic analysis;</li> <li>2. more focused analysis of policies relating to greenhouse gas mitigation;</li> <li>3. assessing incentives for industrial energy efficiency;</li> <li>4. analysing sustainable household consumption – for example to assess impacts of raw material taxation on household consumption patterns and other economic variables.</li> </ol> <p>Recently the model has been used to contribute to several official policy assessments in Europe, including the Energy Taxation Directive, the Energy Efficiency Directive and the 2030 environmental targets. It is also frequently being applied at national level, both within and outside Europe.</p> |
| <b>Particular relevance</b>             | E3ME is relevant in assessing the socio-economic impacts of the climate change mitigation policies, for example the effect these policies have on specific industries or on income distribution. E3ME can be particularly useful in analysing changes to policies regarding taxation, subsidies and efficiency improvements of activities relating to fossil fuels.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Coverage</b>                         | Global coverage. 53 regions.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Model applications</b>               | <p>COMETR assessed the economic and environmental impacts of European environmental tax reforms carried out in the 1990s. E3ME was used to examine both the short and long-term effects of these reforms, with particular emphasis on competitiveness. (<a href="http://www2.dmu.dk/cometr/">http://www2.dmu.dk/cometr/</a>).</p> <p>The CLIMACAP project provided improved modelling capacity and policy formulation to support the development and implementation of low carbon development strategies in Latin America. The project integrated model improvement, capacity building and policy strategy support into a single coherent process.</p> <p>E3ME publications<br/>(<a href="http://www.camecon.com/EnergyEnvironment/EnergyEnvironmentEurope/ModellingCapability/E3ME/publications.aspx">http://www.camecon.com/EnergyEnvironment/EnergyEnvironmentEurope/ModellingCapability/E3ME/publications.aspx</a>).</p>                                                                                                                                                                                                                                                                                                                                                                  |

|                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|-----------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Other projects / research</b>        | E3ME Asia - The main outcome of this project is the book <i>E3 Modelling for a Sustainable Low Carbon Economy in East Asia</i> , which will be published in 2015. For this purpose, a previous version of the E3ME model is expanded to provide detailed coverage of China, Japan, Korea and Taiwan.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>E3MG</b>                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Name and contact of organization</b> | <b>Cambridge Econometrics</b><br>Covent Garden, Cambridge, CB1 2HS, UK<br>Tel: ++44 (0)1223 460760                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Description of model</b>             | <p>The econometric E3ME model has been built as a framework for assessing energy-environment-economy issues and policies. Its close links between energy demand and economic indicators make it well-suited to assessing the social and economic impacts of response measures. In particular, additional taxes or the removal of subsidies can be assessed with the model. E3ME can also be used to examine the impacts of efficiency measures, including rebound effects.</p> <p>In the past the model has mainly been used for:</p> <ol style="list-style-type: none"> <li>1. general macro and sectoral economic analysis;</li> <li>2. more focused analysis of policies relating to greenhouse gas mitigation;</li> <li>3. assessing incentives for industrial energy efficiency;</li> <li>4. analysing sustainable household consumption – for example to assess impacts of raw material taxation on household consumption patterns and other economic variables.</li> </ol> <p>Recently the model has been used to contribute to several official policy assessments in Europe, including the Energy Taxation Directive, the Energy Efficiency Directive and the 2030 environmental targets. It is also frequently being applied at national level, both within and outside Europe.</p> |
| <b>Particular relevance</b>             | E3ME is relevant in assessing the socio-economic impacts of the climate change mitigation policies, for example the effect these policies have on specific industries or on income distribution. E3ME can be particularly useful in analysing changes to policies regarding taxation, subsidies and efficiency improvements of activities relating to fossil fuels.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Coverage</b>                         | Global coverage. 53 regions.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |



|                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|----------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Model applications</b>        | <p>COMETR assessed the economic and environmental impacts of European environmental tax reforms carried out in the 1990s. E3ME was used to examine both the short and long-term effects of these reforms, with particular emphasis on competitiveness. (<a href="http://www2.dmu.dk/cometr/">http://www2.dmu.dk/cometr/</a>).</p> <p>The CLIMACAP project provided improved modelling capacity and policy formulation to support the development and implementation of low carbon development strategies in Latin America. The project integrated model improvement, capacity building and policy strategy support into a single coherent process.</p> <p>E3ME publications<br/>(<a href="http://www.camecon.com/EnergyEnvironment/EnergyEnvironmentEurope/ModellingCapability/E3ME/publications.aspx">http://www.camecon.com/EnergyEnvironment/EnergyEnvironmentEurope/ModellingCapability/E3ME/publications.aspx</a>).</p> |
| <b>Other projects / research</b> | <p>E3ME Asia - The main outcome of this project is the book <i>E3 Modelling for a Sustainable Low Carbon Economy in East Asia</i>, which will be published in 2015. For this purpose, a previous version of the E3ME model is expanded to provide detailed coverage of China, Japan, Korea and Taiwan.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

Source:[http://unfccc.int/adaptation/adverse\\_effects\\_and\\_response\\_measures\\_art\\_48/items/5158.php](http://unfccc.int/adaptation/adverse_effects_and_response_measures_art_48/items/5158.php)

**Table 2: EU multi-country modeling system**

QUEST is the global macroeconomic model DG ECFIN (European Commission) uses for macroeconomic policy analysis and research. It is a structural macromodel in the New-Keynesian tradition with rigorous microeconomic foundations derived from utility and profit optimisation and including frictions in goods, labour and financial markets.

There are different versions of the QUEST model, estimated and calibrated, each used for specific purposes. Model variants have been estimated using Bayesian methods, jointly with colleagues at the Joint Research Centre of the European Commission. These dynamic stochastic general equilibrium (DSGE) models are used for shock analyses and shock decompositions, e.g. to assess the main drivers of growth and imbalances (Euro area, Germany, Spain, the US).

Larger multi-country calibrated model versions are used to address issues for which a deeper level of disaggregation is required, both at the regional and sector level. Many of the main applications deal with fiscal and monetary policy interactions and either use a one-sector model or models that explicitly distinguish tradables and non-tradables sectors. Other model variants also include housing and collateral constraints, and a banking sector. All calibrated model versions are employed using different country disaggregation, focusing on the euro area or EU as a whole, and other global regions, or on individual member states.

For the analysis of structural reforms, we use an extended version of the QUEST model that captures both investment in tangibles and intangibles (R&D), and disaggregates employment into three skill categories. In this model, variant technological change is semi-endogenous, adopting the Jones (1995) knowledge production function, and this model is used to analyse the impact of structural reforms in the EU.

Source: [http://ec.europa.eu/economy\\_finance/research/macroeconomic\\_models\\_en.htm](http://ec.europa.eu/economy_finance/research/macroeconomic_models_en.htm)

**Table 3: Energy Technology Systems Analysis Program (ETSAP)**

ETSAP is an Implementing Agreement of the International Energy Agency (IEA), first established in 1976. It functions as a consortium of teams and invited teams that actively cooperate to establish, maintain, and expand a consistent multi-country energy/economy/environment/engineering (4E) analytical capability.

Its backbone consists of individual national teams in nearly 70 countries, and a common, comparable and combinable methodology, mainly based on the MARKAL / TIMES family of models, permitting the compilation of long term energy scenarios and in-depth national, multi-country, and global energy and environmental analyses.

ETSAP promotes and supports the application of technical economic tools at the global, regional, national and local levels. It aims at preparing sustainable strategies for economic development, energy security, climate change mitigation and environment.

As part of its outreach activities, ETSAP collaborates with many other research teams throughout the World, participates in various global forums (EMF 22, for example), and makes its Newsletter and its Proceedings available online to the public at large.

By statute, ETSAP meets twice a year to exchange experiences, discuss ways to improve the tools and manage the common activities. Local experts are invited to these meetings so that they are exposed to the paradigm and can interact with the ETSAP participants from their country. These meetings are also held in non-Annex I countries and they often lead to collaborative model building projects with local and third party funds.

Members in ASEAN:

Malaysia  
Philippines  
Singapore  
Thailand  
Vietnam

Other Members include:

Norway  
Australia

Source: <http://www.iea-etsap.org/web/index.asp>

**Table 4: Inter-Regional System of Analysis for ASEAN (IRSA-ASEAN) Model**

The IRSA-ASEAN model is a multi-country CGE model that stem from other developments in CGE modeling over the last 20 years; some of these sources of inspiration are direct and easily identified, including one of the first CGE models for Indonesia by Lewis (1991) and Resosudarmo (2002), the GTAP model (Hertel, 1997), and the Globe model (McDonald et al., 2007), meaning that the IRSA-ASEAN model is a unique model in its own right, both structure-wise and purpose-wise. The IRSA-ASEAN model itself is a multi-country model that solves at the country level, meaning that optimizations are performed at this level. This approach allows for variation in price as well as in quantity for each country to be observed using this model. This approach enables observation of the impact of a shock specific to one country compared with other countries, the whole ASEAN economy, and within the country itself.

The IRSA-ASEAN model includes six ASEAN member countries, namely Indonesia, Malaysia, The Philippines, Singapore, Thailand, and Vietnam. As optimization is performed at the country level, and taking into account the “sovereignty” element of each country, the model uses neither a bottom-up nor a top-down approach<sup>3</sup>. Each country is instead connected through commodity flows (i.e. trade of goods and services), as well as transfer flows (i.e. remittances and savings-investments). The model also allows direct transfer of primary factors of production, e.g. fragmentation. As a consequence of the sovereignty element in the IRSA-ASEAN model, each country has its own balance of payments as well as savings and investment accounts. Each country deals directly with other countries in terms of trading and is allowed its own set of tariff barriers. For example, in the IRSA-ASEAN model, each country can export/import goods and services directly to/from the rest of the world (ROW).

Another important highlight of the IRSA-ASEAN model deals with the issue of double-dividends. The model internalizes the double-dividend hypothesis by explicitly incorporating various recycling mechanisms. In this regard, aside from the government increasing its expenditure, the carbon tax revenue can either be recycled directly to households (e.g. by a direct one-time lump-sum cash transfer to low-income households), or recycled back to industry (e.g. by indirect tax reduction, so that it creates a less distortionary tax system, or supposedly so).

Another distinctive feature of the IRSA-ASEAN model is that it is connected to a micro simulation model to disaggregate the four household groups, namely Rural-Low, Urban-Low, Rural-High, and Urban-High. Once a solution has been found for a particular simulation, through the micro simulation model, household groups are disaggregated further into one hundred groups based on population percentile groups in both rural and urban areas. The micro simulation basically disaggregates household expenditure for each commodity using an expenditure share coefficient for each percentile household group.

Source: Ditya A. Nurdianto and Budy P. Resosudarmo, *ASEAN Economic Community and Climate Change* (2014).

<sup>3</sup> This is in line with real world evidence in which unlike the EU, ASEAN is not a supranational organization.

## **PARTICIPANTS LIST**

**AEMI FORUM: ENERGY PRICING AND SUBSIDIES**

**BANGKOK, 27-28 FEBRUARY 2015**



**ASEAN ENERGY MARKET INTEGRATION (AEMI) FORUM**  
**ENERGY PRICING AND SUBSIDIES**  
**27-28 February 2015, Pathumwan Princess Hotel, Bangkok**  
*(as of 23 February 2015)*

**LIST OF PARTICIPANTS: ACADEMICS**

| Country     | Name                                      | Title                                                                                                                                                         |
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| Brunei      | Dr. Hetti Arachchige<br>Gamini Premaratne | Senior Lecturer, Deputy Dean of Graduate Studies and Research, UBD School of Business and Economics, Universiti Brunei Darussalam (UBD), Bandar Seri Begawan. |
| Cambodia    | Dr. Srinivasa Madhur                      | Director of Research, Cambodia Development Resource Institute (CDRI), Phnom Penh.                                                                             |
| Indonesia   | Dr. Tri Widodo                            | Professor and Head of Economics Department, Faculty of Economics and Business, Universitas Gadjah Mada (UGM), Yogyakarta.                                     |
| Laos PDR    | Dr. Phouphet<br>Kyophilavong              | Associate Professor and Director, Research Division of Economics and Business Management, National University of Laos (NUOL), Vientiane.                      |
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|             | Dr. Youngho Chang                         | Assistant Professor, Division of Economics, Nanyang Technological University (NTU), Singapore.                                                                |

|          |                           |                                                                                                                                                                           |
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| Taiwan   | Dr. Shih-Mo Lin           | Professor, Department of International Trade and Director of Applied Economic Modeling, Chung Yuan Christian University (CYCU), Taoyuan City.                             |
| Thailand | Dr. Kitti Limskul         | Associate Professor, Faculty of Economics, Chulalongkorn University (CU), Bangkok.                                                                                        |
|          | Dr. Nattapong Puttanapong | Lecturer, Faculty of Economics, Thammasat University (TU), Bangkok.                                                                                                       |
|          | Mr. Sittisak Sugsaisakon  | Program Manager, Asian Greenhouse Gas Management Center, Asian Institute of Technology (AIT), Bangkok.                                                                    |
| Vietnam  | Dr. Tran Van Hoa          | Adjunct Professor, Centre for Strategic Economic Studies, Victoria University and Director, Vietnam and ASEAN Plus (East Asia Summit) Research Program (CSES), Melbourne. |

**LIST OF PARTICIPANTS: ASEAN OFFICIALS**

|           |                            |                                                                                                            |
|-----------|----------------------------|------------------------------------------------------------------------------------------------------------|
| Indonesia | Mr. Beni Suryadi           | Programme Officer, Regional Energy Policy and Planning Department, ASEAN Centre for Energy (ACE), Jakarta. |
|           | Ir. Dr. Sanjayan Velautham | Executive Director, ASEAN Centre for Energy (ACE), Jakarta.                                                |

**LIST OF PARTICIPANTS: EXTERNAL EXPERTS**

|               |                                            |                                                                                                                                                        |
|---------------|--------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|
| Australia     | Dr. Budy Resosudarmo<br><i>(via Skype)</i> | Associate Professor, The Arndt-Corden Department of Economics, The Australian National University (ANU), Canberra.                                     |
| Norway        | Dr. Indra Overland                         | Senior Researcher, Head of Energy Program, Norwegian Institute of International Affairs (NUPI), Oslo and Professor, University of Nordland, Bodø.      |
| USA           | Mr. Keith Rabin                            | President, Singapore-based KWR International (Asia) Pte. Ltd. and New York-based KWR International, Inc. KWR International (Asia) Pte. Ltd. Singapore. |
| Thailand      | Dr. Shobhakar Dhakal                       | Associate Professor, School of Environment, Resources and Development, Asian Institute of Technology (AIT), Bangkok.                                   |
|               | Dr. Ni Lar                                 | Lecturer, School of Economics, Chiang Mai University, Thailand.                                                                                        |
| International | Dr. Christopher Beaton                     | Research and Communications Officer, International Institute for Sustainable Development (IISD)                                                        |

## **BIOGRAPHICAL NOTES**

**AEMI FORUM: ENERGY PRICING AND SUBSIDIES**

**BANGKOK, 27-28 FEBRUARY 2015**



***ASEAN ENERGY MARKET INTEGRATION (AEMI) FORUM***  
***ENERGY PRICING AND SUBSIDIES***

*27-28 February 2015, Pathumwan Princess Hotel, Bangkok*

**AEMI ADVISORY COMMITTEE ATTENDING MEMBERS**



**Dr. Charit Tingsabadh**

*Assistant Professor and Director, Centre for European Studies (CES), Executive Committee Member, Chula Global Network (CGN), Chulalongkorn University (CU), Thailand*

B.A. Economics Cambridge University, M. Social Sciences in Birmingham University-UK and PhD Development Planning, UCL London University-UK. Former Director of the Centre for Ecological Economics, he is interested in economics of the environment and in Social and Environmental Research including climate change, forestry development, and urban environmental management. As Director of CES, besides European studies and theoretical aspects of regional integration and how they may apply in other contexts e.g. the ASEAN region, he is now developing co-operations with Centres for EU Studies in Thailand and abroad through joint activities such as exchanges of information, research and scholarly exchanges.



**Dr. Chayodom Sabhasri**

*Associate Professor and Dean, Faculty of Economics, Chulalongkorn University (CU), Bangkok, Thailand*

Chayodom Sabhasri has been the Dean of the Faculty of Economics, Chulalongkorn University, since April 2012. He earned his Ph.D. in Economics from University of Wisconsin-Madison, MSc, in Economics from the LSE, and B. Econ from Chulalongkorn University. He has over 70 publications in books and academic papers. In the beginning of his career, his academic works concentrated on international finance. Recently, most of his projects have been on the economic integration especially the issues free trade areas. He is an advisor to the General Director of the Department of International Trade Promotion, Ministry of Commerce. Lately, he has been appointed to be a member of Performance Appraisal Committee for State Own Enterprises, Ministry of Finance.





**Dr. Indra Øverland**

*Senior Researcher, Head Energy Program, Norwegian Institute of International Affairs (NUPI) and Professor, University of Nordland, Bodø, Norway*

Indra Overland is head of the Energy Program at the Norwegian Institute of International Affairs and Professor II at the University of Nordland. He did his PhD at the University of Cambridge and has since published extensively on energy issues. He was awarded the Toby Jackman Prize for best PhD dissertation, the Marcel Cadieux Prize for an article on Russia's Arctic energy policy in *The International Journal*, the Stuland Prize and co-authored the most cited article published by the Journal of Eurasian Studies. During his studies he specialized on South-East Asia, and he later worked as a long-term political observer in Cambodia and did research in Myanmar.



**Dr. Nawal Kamel**

*Visiting Professor, Faculty of Economics, Chulalongkorn University (CU), Bangkok, Thailand*

Nawal is a Visiting Professor at the Faculty of Economics, Chulalongkorn University, Bangkok. Until 2012, she was a Director at the World Bank, in Washington, D.C., a position she had held since 1994. During her career, Nawal has also served at the Deputy Ministerial level in the Department of Natural Resources, Canada, working closely with the Minister to advise on decisions regarding his portfolio of energy, mining, and forestry. She was the Canadian lead for a joint Canada-US Task Force on electricity distribution in North America, co-chaired by the Ministers of Energy from both the US and Canada. The success of this Task Force earned her the 2005 Key Women in Energy-Global award from the Energy Marketers Association in the US. Nawal has also spent two years at the Oxford Institute for Energy Studies (UK), an academic organization dedicated to research in energy and to fostering a dialogue between energy producing and consuming countries, and private sector entities. Finally, as part of her contribution to her country of origin, Nawal was also the founding Executive Director of the Sawiris Foundation for Social Development, the first family Foundation dedicated to social development in Egypt. Nawal holds a Doctorate in Mathematics from the Sorbonne (Paris) and a Doctorate in Economics from Oxford (UK).



**Dr. Suthiphand Chirathivat**

*Executive Director, ASEAN Studies Center, Chulalongkorn University (CU),  
Bangkok, Thailand*

Dr. Suthiphand chairs Chula Global Network and ASEAN Studies Center. He teaches economics at Chulalongkorn University. Until recently, he was Dean, Faculty of Economics, Chairman of the Ph.D. Program in Economics, Chairman of Economics Research Center and Center for International Economics. He has previously served as Director of the Centre for European Studies and Center for International Economics at Chulalongkorn University. Concurrently, Dr. Suthiphand holds professional positions including Vice Chairman of Economics Discipline Committee, National Research Council, Honorary President of the Former Students in France, member of the International Advisory Board, ASEAN Economic Bulletin, editorial member of Asian Business and Management, Vice President of the Alliance Francaise of Bangkok. Dr. Suthiphand previously held a position as Advisor to the Ministers of Foreign Affairs, Minister of Commerce, Minister of Agriculture, Minister of Finance, Deputy Minister of Transport and Communications and Economic Affairs Committee and also Foreign Affairs Committee of the Thai Parliament. He was also Member of the APEC Panel of Independent Experts, Founding Member of the EU-LDC networks of the Netherlands Economic Institute, Member of the Triple-T Task Forces of the Pacific Economic Cooperation Council (PECC). He represented Thailand, East Asia Expert Study Group (ASEAN+3 until 2009) and Comprehensive Economic Partnership in East Asia (CEPEA). He also served as President of the Association of Former Students in France, Thailand and Executive Member of the Economic Society in Thailand.

## **ASEAN OFFICIALS ATTENDING**



**Mr. Beni Suryadi**

*Programme Officer, Regional Energy Policy and  
Planning Department, ASEAN Centre for Energy (ACE),  
Jakarta, Indonesia*

Beni Suryadi is an energy professional with solid experience in managing researches and programmes in ASEAN. As Programme Officer, he manages the coordination with ASEAN Specialized Energy Bodies and Sub-Sector Networks for the implementation of ASEAN Plan of Action for Energy Cooperation (APAEC) 2010-2015, and the cooperation with Dialogue Partners (China, Japan, Korea and U.S) and International Organizations.

He also leads the research team to provide policy recommendation for the region in achieving its target on low emission strategies (reducing energy intensity and increase the role of renewable energy), energy access, climate change and energy market integration.



**Dr. Sanjayan Velautham**

*Executive Director, ASEAN Center for Energy (ACE),  
Jakarta, Indonesia*

Sanjayan Velautham was appointed as the Executive Director of the ASEAN Centre for Energy (ACE) in January 2015 reporting directly to the Governing Council consisting of Leaders of the Senior Offices on Energy from the ASEAN member states.

Sanjayan Velautham has more than 25 years of experience in the industry, academia and research institutes. A registered professional engineer (P.Eng.), with a doctoral degree in Engineering and involved in the energy industry for about 15 years and 10 years of research/teaching experience at Kyushu University, Japan and University Technology Malaysia.

Before taking the assignment as Executive Director, he had worked in Singapore initially with Agency of Science, Technology and Research (A\*STAR) as a Deputy Director and then with General Electric as Country Manager for the Power Generation Services business. He had started his career with Tenaga Nasional Bhd. in Malaysia within the Power Generations Division. He had also served as the National Project Manager for the BioGen Project for United Nation Development Programme (UNDP – Malaysia).

Sanjayan has authored several publications, in international conferences, journals and subject modules particularly in the field of energy. He was also a panel member in preparing the Thermal Energy Efficiency Guideline for Malaysia. His interest among others is to continue to engage in the strategy and policy research related to Sustainable Energy Development within the ASEAN region.

## **ACADEMICS ATTENDING**



**Dr. Adoracion M. Navarro**

*Senior Research Fellow, Philippine Institute for Development Studies (PIDS), Manila, Philippines*

Dr. Navarro's policy research interests revolve around energy and other infrastructure sectors. She gained practical knowledge on economic policy analysis by conducting studies as a Senior Research Fellow at the Philippine Institute for Development Studies, as well as through her past experience working at the Philippine National Economic and Development Authority-Infrastructure Staff, Philippine Build-Operate-Transfer Center (now Public-Private Partnerships Center), International Monetary Fund-Government Finance Division, private consultancy firms, and Philippine-based multilateral and bilateral aid agencies. She finished her Ph.D. (Economics) from the University of the Philippines-Diliman. She also obtained an MPA (Economic Policy Management) from Columbia University-New York.



**Dr. Hetti Arachchige Gamini Premaratne**

*Senior Lecturer and Deputy Dean, UBD School of Business and Economics (UBDSBE) at University of Brunei (UBD), Bandar Seri Begawan, Brunei Darussalam*

Dr. Gamini joined the UBD School of Business and Economics (UBDSBE) at University of Brunei in July 2009, where he enjoys teaching and researching in the areas of Economics, Econometrics and Finance. He is currently serving as the Deputy Dean of Graduate Studies and Research of UBDSBE. Prior to moving to Brunei, he was holding an Assistant Professor position (2001-2009) at Department of Economics in the Faculty of Arts and Social Sciences, National University of Singapore. He has also served as a teaching and Research assistant at the University of Illinois (1994-2001) and Statistician at the Sample Survey Division of the Department of Census and Statistics (1986-1993), Sri Lanka and an Assistant Lecturer in mathematics at University of Ruhuna (1985), Sri Lanka.

He is a well-experienced researcher and his research interests include volatility models, hypothesis testing, behavioral finance, financial crisis and risk management. He has published in internationally refereed journals and book chapters including Journal of Financial Econometrics and Journal of statistical planning and inference. He has supervised, co-supervised, and served on the advisory and examination committees of a number of M.Sc. and Ph.D. students. His students have taken faculty positions at academic institutions and high-rank jobs at government and private sector. He is also an expert trainer on econometrics software such as Eviews, Gauss, RATS, and Splus.



**Dr. Kitt Limskul**

*Associate Professor, Faculty of Economics Chulalongkorn University (CU), Bangkok, Thailand*

He is Associate Professor of the Faculty of Economics, Chulalongkorn University. He is currently also the Director of Economics Modeling and Forecasting Program, Chulalongkorn University (EMF). He received his PhD in economics from Nagoya University, Japan.

His main research interests are Human Resource Economics: Education, Labor Supply, Macro Economics: Open economy Macroeconomics, Financial Crisis and Currency Crisis, Currency Attack Economic Forecasting, Economic Modelling, Econometrics Leading Economic Indicator Economic Accounting: National Accounts, Input-Output Account, Flow of Fund Account, Current Account, Balance of Payment Account.

**Dr. Maria Nimfa Mendoza**

*Assistant Professor, School of Economics, University of the Philippines (UP), Manila, Philippines*

Maria Nimfa F. Mendoza is Associate Professor, School of Economics, University of the Philippines (Diliman). She is also a research fellow of the Manila-based Center for the Advancement of Trade Integration and Facilitation (CATIF). She obtained her B.S. Applied Mathematics and M.S. Statistics degrees from the University of the Philippines at Los Baños, and her Ph.D. Economics degree from the University of British Columbia (Canada). Her current research interests include energy pricing and policies, sustainable development, and income inequality.



**Dr. Nattapong Puttanapong**

*Lecturer, Faculty of Economics, Thammasat University  
(TU), Bangkok, Thailand*

Dr. Nattapong Puttanapong is a lecturer in Faculty of Economics, Thammasat University. He was also the Deputy Director of Bachelor of Economics, International Program and the Director of Research Committee until recently.

He received Master and PhD degree in Regional Science/Regional Economics from Cornell University, USA, under Royal Thai Government Scholarship.

Dr. Nattapong is an Executive Board member of The Economic Society of Thailand, and also hold the position of Economist at Fiscal Policy Research Institute, Ministry of Finance, Bangkok, Thailand.



**Dr. Phouphet Kyophilavong**

*Associate Professor and Vice-Dean, Faculty of Economics  
and Business Management, National University of Laos (NUOL),  
Vientiane, Lao PDR*

He is Associate Professor, and Vice-Dean of the Faculty of Economics and Business Management, National University of Laos. He received his PhD in economics from Kobe University in 2003. He has been carrying out research on macroeconomic management issues, Small and Medium Enterprises (SMEs) development, economic integration, energy, natural resources and environmental issues, and poverty in Laos and published several journals, and book chapters such as Economic Modelling, Global Business Review and others. He has directed numerous projects in his areas of expertise and has worked closely with national organizations, universities and government agencies in Laos, and with international organizations such as Economic Research Institute for ASEAN and East Asia (ERIA), the Asian Development Bank (ADB), ADB Institute, Japan International Cooperation Agency (JICA), UNDP, Mekong River Commission (MRC), IUCN, World Trade Organization (WTO) and World Bank. He was also visiting scholar at Pukyong National University, Nagoya University, University of Laval, Nanyang Technological University, and Harvard University. He is also editor in chief of the journals “Lao Journal of Economics and Management” and “Lao Trade Research Digest”.



**Dr. Saeed Solayman**

*Centre for Poverty and Development Studies (CPDS), Faculty of Economics and Administration, University of Malaya (UM), Kuala Lumpur, Malaysia.*

Saeed Solaymani has completed his PhD at the age of 35 years from University of Malaya, Malaysia. He was a researcher at the center for poverty and development studies at the University of Malaya. He is an assistant professor in the department of economics at the Razi University. He has published more than 10 papers related to energy and environmental Economics in scientific journals and has been serving as an editorial board member of the journal of Asia-Pacific studies.



**Dr. Shih-Mo Lin**

*Professor, Department of International Trade and Director of Applied Economic Modeling at Chung Yuan Christian University (CYCU), Taoyuan City, Taiwan*

Shih-Mo Lin is currently a Professor in the Department of International Trade at Chung Yuan Christian University, Taiwan. He is also the Director of the Centre for Applied Economic Modeling at CYCU. He received his PhD in Energy Economics from West Virginia University in 1991, and spent one and a half years at Penn State University pursuing post-doctoral research. His research interest includes energy modeling, computable general equilibrium modeling, input-output analysis, integrated modeling for bottom-up and top-down models, renewable energy development, etc.



**Mr. Sittisak Sugsaisakon**

*Program Manager, Asian Greenhouse Gas Management  
Center, Asian Institute of Technology (AIT), Bangkok,  
Thailand*

Mr. Sittisak Sugsaisakon is currently the Program Manager at Asian Greenhouse Gas Management Center. He received his Bachelor degree from Chulalongkorn University in Chemical Engineering (Fuel and Combustion Technology), and later received his Master degree in Mechanical Engineering specialized in Sustainable Energy Engineering from Royal Institute of Technology (KTH), Sweden.

He is certified by ASEAN Energy Management Scheme (AEMAS) as Certified Energy Manager: Ref no. CEM-TH-009-0811

He is also a Certified Technical Expert by Germanischer Lloyd Certification GmbH to validate and verify CDM projects within sectoral scope 1 (Energy Industries (renewable/non-renewable sources) and technical area TA1.1: Thermal energy generation from fossil fuels and biomass including thermal electricity from solar and TA1.2: Energy generation from renewable energy sources. Ref no. 080.

**Dr. Srinivasa Madhur**

*Director of Research, Cambodia Development Resource  
Institute (CDRI), Phnom Penh, Cambodia*

He held various positions at the Asian Development Bank (ADB) in Manila, the Philippines (1994–2010) with last position held as Senior Director heading the Office of Regional Economic integration. Before joining ADB in 1994, he worked as Economic Adviser to the Indian Government (1987–1994) and as a research economist at the National Institute of Public Finance and Policy, New Delhi, India (1978–1987). He was the Member of the Economic Advisory Council to the Indian Prime Minister (1991–93). He was also the Visiting Professor at the Graduate School of International Studies, Seoul National University, Seoul, Korea (March – August 2011), and the Visiting Fellow at the Korea Institute for International Economic Policy, Seoul, Korea (July, 2011).

He is an economist by training with specialization and research work in international macroeconomics, econometric modeling, global governance, Asian economic development and policy, regional economic integration. He has a PhD degree in economics from Delhi School of Economics, University of Delhi, New Delhi, India (1985) and was a Fulbright Post-doctoral Fellow at the Department of Economics, Yale University, New Haven, U.S.A. (1988).





**Dr. Tran Van Hoa**

*Professor, Centre for Strategic Economic Studies (CSES),  
Victoria University  
Director, Vietnam and ASEAN Plus (East Asia Summit)  
Research Program Melbourne, Australia*

Professor Tran Van Hoa holds higher degrees from the University of Western Australia and Monash University in Australia. He has taught at universities in Australia, India, Korea, Thailand, Vietnam and the US, and extensively researched, published and provided training for government officials on major areas of economic development in Asia, regional economic integration, trade and investment, international business, Asian crises and management, competition law, anti-corruption policies, climate studies, and energy and trade policy modelling. He is the author of 26 books and over 200 refereed articles and commissioned reports. Prof Tran Van Hoa also was consultant to ministries of trade and commerce in Thailand and Vietnam, the UNESCAP, and various consulting firms in Australia.



**Dr. Tri Widodo**

*Professor and Head of Economics Department, Faculty  
of Economics and Business, Universitas Gadjah Mada,  
Yogyakarta, Indonesia*

Dr. Tri Widodo is a professor and the Head of Economics Department at the Faculty of Economics and Business, Universitas Gadjah Mada (FEB-UGM), Indonesia. He got his Bachelor degree from FEB-GMU (1995), Graduate Diploma of Economics of Development (Grad.Dip.Ec.Dev.) (1999) and Master of Economics of Development (M.Ec.Dev) (2000) from Australian National University, Australia, and Doctor of Philosophy (Ph.D) in Economics from Hiroshima University of Economics, Japan (2009).



**Dr. Xunpeng Shi**

*Senior Research Fellow*

*Energy Studies Institute (ESI), National University of Singapore  
(NUS), Singapore*

Dr. Xunpeng Shi is a Senior Research Fellow at Energy Studies Institute National University of Singapore. Until recently, he was the Chief Researcher for Energy Efficiency and Conservation at the Brunei National Energy Researcher Institute, in which position he has assisted the Brunei government in setting a mandatory energy efficiency standards and labeling programs, including drafting legislation and proposing standards. Previously, he was an energy economist in the Economic Research Institute for ASEAN and East Asia a Jakarta based think-tank to support ASEAN and East Asian Summit (EAS), where he was in charge of a variety of energy research projects. Before he started his PhD, he had various management and research positions in China's leading energy institutes, companies and central government agencies. He has published in leading journals on energy, environmental and development economics and policy with a regional focus of China, ASEAN and East Asia. He obtained his PhD of Economics and Master of Environmental and Resource Economics from the Australian National University, LLM in Mineral Law and Policy from University of Dundee and Bachelor in Marketing from China University of Mining and Technology.



**Dr. Youngho Chang**

*Assistant Professor, Division of Economics, Nanyang  
Technological University (NTU), Singapore*

Dr. Chang is an Assistant Professor of Economics at the Division of Economics and an Adjunct Senior Fellow at the S. Rajaratnam School of International Studies (RSIS), Nanyang Technological University, Singapore. Apart from academic affiliations, he is a member of Technical Committee for Clean Development Mechanism (CDM) Designated National Authority (DNA), National Environment Agency, Singapore.

He published his research papers in internationally refereed academic journals such as *Energy Economics*, *International Economics*, *Econometric Theory*, *Economics Letters*, *Energy Policy* and *Korea and the World Economy* among others. He co-edited books on energy security such as *Energy and Non-Traditional Security (NTS) in Asia*, *Rethinking Energy Security in Asia* (both by Springer), *Energy Security: Asia Pacific Perspectives* (Manas Publications) and *Energy Conservation in East Asia: Towards Greater Energy Security* (World Scientific). Along with academic publications, he carried out consultation projects for the public and private sector. He specializes in the economics of climate change, energy and security, oil and macroeconomy, and the economics of electricity market deregulation. His current research interests are oil price fluctuations and macroeconomic performance, the economics of energy security, energy use and climate change, and sustainability in education.

He has been interviewed and quoted by global and local media such as the *International Herald Tribune*, the *Strait Times*, *BBC*, *Bloomberg*, *Channel News Asia* regarding energy- and climate change-related issues. Before working in the academia, Dr. Chang worked as a landscape architect for two years in Korea and Saudi Arabia, and a financial analyst for four years in Korea. He was a degree fellow at the East-West Center, Hawaii and received his Ph.D. in Economics (Environmental and Resource Economics) from the University of Hawaii at Manoa, U.S.A.

## **EXTERNAL EXPERTS ATTENDING**



**Dr. Budy P. Resosudarmo**

*Associate Professor, The Arndt-Corden Department of Economics, The Australian National University (ANU), Canberra, Australia (via Skype)*

Budy P. Resosudarmo is the head of the ANU Indonesia Project. He is a developmental and environmental economist working on the economy-wide impact of economic and environmental policies on household incomes, analysing the impact of fiscal decentralization policies on local economies, and investigating the political economy of natural resource utilisation. He is also interested in research assessment using spatial and inter-regional modelling techniques. He currently collaborates with several Indonesian research institutes, researching various developmental and environmental issues in Indonesia, particularly in Eastern Indonesia.

Budy is the president of the Pacific Regional Science Conference Organization (PRSCO), the vice-president of the East Asian Association of Environmental and Resource Economics (EAAERE) and the vice president of the Indonesian Regional Science Association. He is also a member of the Advisory Committee of the Economy and Environment Program for Southeast Asia (EEPSEA).



**Dr. Christopher Beaton**

*Research and Communications Officer,  
International Institute for Sustainable Development (IISD)*

Christopher Beaton research role spans various projects within IISD's trade and climate change portfolio. He conducts and manages research for projects in IISD's Global Subsidies Initiative (GSI), including co-authoring, coordinating and editing its 2013 flagship publication *A Guidebook to Fossil-Fuel Subsidy Reform*; managing research to project the impacts of subsidy reform in India, Indonesia and Thailand; and managing the GSI's country work program on fossil-fuel subsidies in Indonesia. Christopher also conducts research for IISD's work streams on global environmental governance and the green economy, contributing recently to the publication *The Future of Sustainable Development: Rethinking sustainable development after Rio+20 and implications for UNEP*, and taking a lead role in researching and drafting the Enabling Conditions chapter of the United Nations Environment Programme's (UNEP) Green Economy Report. He has also prepared research on green taxation in cooperation with the China National Renewable Energy Centre (CNREC), policy briefs on renewable energy for the International Renewable Energy Agency (IRENA) and a state of play of global initiatives to take forward international commitments to Sustainable Consumption and Production (SCP).

Christopher's communications role is focused on supporting the IISD's Global Subsidies Initiative (GSI): managing its website, organising events, facilitating dialogues, representing the GSI and developing strategic thinking and interactive media for communicating the GSI's research and policy recommendations. Recent projects include the development of an educational video with the World Bank Institute's (WBI) Climate Change Unit, co-organising a meeting of the Network for Fuel Price Regulators in cooperation with the German development agency GIZ and developing an interactive timeline for the GSI website to highlight progress that has been made toward G-20 and APEC commitments to reform fossil-fuel subsidies.

Christopher has also combined his interest in policy research and communications through various projects investigating the linkages that exist between the major economic structural change that is needed to achieve sustainable development and the communications challenges that this creates for governments, both in developing transition strategies and implementing policy change.



**Mr. Keith Rabin**

President, Singapore-based KWR International (Asia) Pte Ltd  
and New York-based KWR International, Inc., Singapore

Mr. Keith Rabin serves as President of Singapore-based KWR International (Asia) Pte Ltd and New York-based KWR International, Inc. He possesses over thirty years of public-private sector experience as a manager and consultant with substantial expertise directing energy, renewable energy and rural electrification as well as business, investment, economic, trade and project development, research and public relations/affairs initiatives. Mr. Rabin recently directed a multi-year Myanmar Integrated Energy Development initiative for the University of Tokyo and Economic Research Institute for ASEAN and East Asia (ERIA), emphasizing grid extension, cross-border integration and rural/off-grid development. Mr. Rabin also directed preparation of Energy/Electrification section of Myanmar Comprehensive Development Vision, a multi-sector review for Myanmar's Ministry of National Planning and Economic Planning. Mr. Rabin has also helped to design, implement and support many other energy, infrastructure, economic development, financial transactions, and policy related initiatives for public-private sector clients in Myanmar, Japan, Korea, Indonesia, Thailand, India, Malaysia, Bangladesh, Palau, Singapore, Philippines, China, Hong Kong, Vietnam, Kazakhstan, Turkey, Afghanistan and the United States. Additional experience is in Central and Eastern Europe, Latin America and the Caribbean. Mr. Rabin holds a Master degree from Columbia University School of International Affairs with a focus on International Business and Finance and a Bachelor Degree, Anthropology from the State University of New York/Albany.



**Dr. Shobhakar Dhakal**

*Associate Professor, School of Environment, Resources  
and Development, Asian Institute of Technology (AIT),  
Bangkok, Thailand*

Dr. Shobhakar Dhakal is an Associate Professor at Energy Field of Study of the Asian Institute of Technology in Thailand. His areas of expertise are in urbanization, cities and climate change mitigation; and energy and climate change mitigation policies and modeling. He is also a visiting researcher of the National Institute for Environmental Studies Japan since 2012. Dr. Dhakal is one of the Coordinating Lead Authors for the Fifth Assessment Report of Inter-Governmental Panel on Climate Change (IPCC) for the Working Group on Mitigation (for the Chapter ‘Human Settlements, Infrastructure and Spatial Planning’). He also leads and is a co-editor of ongoing international Assessment Report on Climate Change and Cities. He also serves as a member of the scientific steering committee of the Global Carbon Project, which is premier scientific program under the Future Earth.

Dr. Dhakal was a guest research scholar of International Institute for Applied System Analysis in Austria for 2010-2013. He has served as a lead author for the Global Energy Assessment, principal scientific reviewer for UNEP’s Global Environmental Outlook-5, member of the Consensus Panel on Low Carbon Cities of the Academy of Sciences of South Africa, member of the Cities Energy Modeling Group of the International Energy Agency, an international expert to the Taskforce on Urban Development and Energy Efficiency of the China Council for International Cooperation on Environment and Development, among others. Dr. Dhakal is also one of the editor-in-chiefs of Carbon Management journal published by Taylor and Francis. He has over 50 publications including scientific journals, edited books, journal special issues, and others. He holds Ph.D. from The University of Tokyo.