



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

27-28 February 2015, Pathumwan Princess Hotel, Bangkok

.FORUM CONCLUSIONS AND STATEMENT

1. The core objective of the Forum was 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).

2. At its conclusion, Forum participants agreed a common analytical approach and a clear division of labor, as well as a defined timeframe. Moreover, participants also agreed to adopt a coherent approach, so as to allow comparison of their analytical analyses across the ten ASEAN member states. For this purpose, they agreed to use consistent definitions, data bases, modeling tools, and to run equivalent scenarios for each analysis at the national level.

A. CONSISTENCY ACROSS NATIONAL ANALYSES

DEFINITIONS

3. **Energy** – covers primary hydro-carbons energy sources (oil, natural gas, and coal), as well electricity and energy from renewable sources.

4. **Energy subsidies** - are measured as the difference between a "benchmark border" price and the price in the domestic market (Price-gap approach). In the case of electricity, it is the difference between the price charged to national 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.

5. **Consumer/consumption subsidies** —arise when the prices paid by consumers (firms and household) are below the benchmark price. For electricity, this includes subsidy for electricity generation, and any direct subsidy on the electricity price for consumers (household and firms). The reference benchmark price will be calculated for the latest available year. The benchmark year (the base year for analysis) should be 2012.

6. **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 rebates, accelerated depreciation, as well as research and development grants. It would also include subsidies for renewable energy. The Forum resolved not to cover producer/production subsidies in the analytical work to be undertaken.



MODELING TOOLS

7. Participants agreed that the family of Computable General Equilibrium models (CGE) is the most appropriate to conduct the quantitative impact analysis. The CGE model is to include supply and demand behaviors across all markets in the economy.
8. At the same time and on a parallel track, participants also agreed to join efforts to build an ASEAN CGE model, consistent with national ones. Further investigations are needed to find out whether such a model would be built from scratch, or on the basis of current initial available ASEAN CGE models.
9. To supplement the national analyses, an econometric analysis will also be conducted at the ASEAN level, to shed light on the relationship between different indicators impacted by Energy Subsidy Removal (ESR).
10. Overall, for modeling the impacts ESR at the national and ASEAN levels, forum participants agreed to use the CGE-family models on a coherent and comparable basis:
- (a) Consistent ASEAN data sets at national level (and same base year)
 - (b) Consistent CGE family of models (with supply and demand behaviors)
 - (c) Equivalent scenarios for subsidy removal at national levels.

DATA

11. Forum participants agreed on using a consistent database for the ten ASEAN member states, building on the information in GTAP data basis and SAM, and using GAMS and GEMPACK as needed to input appropriate additional data (notably on subsidies).
12. Forum participants agreed on sufficiently disaggregated energy data by fuel type and by household income level. There would be four levels used for energy data:
- (a) Primary energy
 - (b) Final energy consumption
 - (c) Renewable energy
 - (d) Electricity
13. Models need to be adequately disaggregated to project fuel consumption after subsidy removal including fuel-switching behavior. Participants agreed that GHG emissions savings from fuel subsidy removal can be estimated by multiplying the new projected level of energy consumption by carbon-emission factors for each fuel.
14. Furthermore, Forum participants agreed to compile an inventory of national subsidy policies across ASEAN member states and their implementation, particularly regarding energy consumption subsidies.



EXPECTED ESR IMPACTS

15. Forum participants agreed to analyse the impacts of ESR on macroeconomic, fiscal, welfare and environmental indicators. The anticipated directions of change and outcome from ESR scenarios are normally as follows:

- (a) Macroeconomic impact: negative on gross domestic product growth in the short run, positive in the middle and long run.
- (b) Fiscal impact: normally produces net savings in government budgets.
- (c) Social welfare impacts: regressive on households. 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).
- (d) Greenhouse gas emissions: Environmental impact is generally positive. According to the IMF, subsidies removal will lead to a reduction of carbon dioxide. However, IISD points that the net impact depends on fuel substitution. GHG emissions savings from fuel subsidy removal could be large, and this could help raising financial and technical support.
- (e) Impact on RE and EE at the national levels.

SCENARIOS

16. Forum participants agreed to run the following four ESR scenarios for each of the ten national analyses of ESR impacts (under consistent assumptions for a variety of oil prices). These scenarios are to be consistent across national-level analyses, and yet provide some flexibility to take into account national circumstances. The agreed ESR scenarios are:

- (a) Business as usual (no change to current policies)
- (b) ESR without any mitigation measures for the poor
- (c) ESR reallocating government net savings towards targeted direct income transfer for the poor at the national level. The exact measures would depend on national circumstances (could include targeted cash or near-cash transfers (vouchers); or increased expenditures on assistance to the poor for health and education).
- (d) ESR reallocating government net savings towards indirect transfers through investments in infrastructure and technology most relevant to the poor. The exact measures would depend on national circumstances (could include measures such as targeted investments for clean technology in rural areas; infrastructure investment for electrification; investment in public transport networks; or increased investment in health and education).



B. ASEAN LEVEL ANALYSES

17. Parallel to the national-level analysis, participants also agreed to 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.

18. Two methodologies would be developed in parallel for the ASEAN-level analysis:

- (a) Econometric analysis at the ASEAN-level
- (b) ASEAN-level CGE model, to be constructed simultaneously with the national-level CGEs.

C. DIVISION OF LABOUR AND TIMELINE

19. Participants agreed a division of labor, identifying the team leader for the ten national-level analyses, as well as for the ASEAN-level analysis. Several participants however indicated that they would need to get approval from their direct authority, or clearance from relevant institutions. Moreover, team leaders also need to investigate availability of colleagues to participate in the work, and assess the requirement for its feasibility.

20. **Table 1** provides an overview of the provisional division of labor.

21. Participants also agreed a process and timeline for this work as follows:

- (a) deliver the paper outline by the end of March 2015, along with a specification of team members and a detailed assessment of the financial requirements needed to deliver it;
- (b) the first draft paper to be submitted after six months, at the end of September 2015;
- (c) an AEMI Forum would be held in early November 2015 to analyze CGE results at the national and ASEAN levels, and consider policy options;
- (d) final papers to be submitted by mid-December 2015, for e-publication on the AEMI Website as working papers, with intellectual property (IP) rights remaining with authors;
- (e) authors to consider publishing the collection of papers as an academic Book, or as a special edition of a reputable academic journal.

22. **Table 2** provides a more detailed overview of the agreed process and timeline. When submitting the paper outline in mid-March, participants agreed that team leaders would identify their team members, and provide a detailed assessment of the requirements (human and financial resources) to deliver a quality output within the agreed timeframe (including costs for acquiring data, CGE models, as well as travel and communication costs).

23. Forum participants also agreed the following broad research outlines to serve as a common basis for their papers at the national-level as well as the ASEAN-level.



D. RESEARCH OUTLINE NATIONAL-LEVEL CGEs ANALYSIS

- I. Overview of national energy subsidies and their implementation
- II. Methodological approach, which should be cohesive across the analyses of all ASEAN member states (definition, data sources, CGE model).
- III. Compilation of a harmonized panel database at the national level on:
 - (a) Disaggregated energy supply and demand, energy types
 - (b) Disaggregated energy consumption by sector and income levels
 - (c) Energy subsidies
 - (d) All related energy, economic and trade data required for scenarios
- IV. Use of the national-level CGE model (consistent with CGE models used at national-levels) to analyze the impacts of ESR at the national-level under four scenarios:
 - (a) Business as usual
 - (b) ESR without mitigation measures
 - (c) ESR reallocating government net savings towards direct income transfers targeted to the poor (specify mitigation measures)
 - (a) ESR reallocating government net savings into indirect transfers targeted to infrastructure and technology most relevant to the poor (specify mitigation measures).



E. RESEARCH OUTLINE ASEAN-LEVEL CGE ANALYSIS

- I. Compilation of a panel matrix of energy demand and supply (by sector) at the ASEAN-level. Compilation of a harmonized panel database for the ASEAN on:
 - (a) Disaggregated energy supply and demand, energy types
 - (b) Disaggregated energy consumption by sector and income levels
 - (c) Energy subsidies
 - (d) All related energy, economic and trade data required for scenarios

- II. Construction of an ASEAN-level CGE energy model in the framework of AEMI. This model should be disaggregated enough to 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

- III. Using the ASEAN CGE model, analyze the impacts of ESR at the ASEAN-level in the framework of AEMI, under five scenarios:
 - (a) Business as usual
 - (b) ESR without mitigation measures
 - (c) ESR reallocating governments net savings towards direct income transfers targeted to the poor (specify mitigation measures)
 - (d) ESR reallocating governments net savings into indirect transfers targeted to infrastructure and technology most relevant to the poor (specify mitigation measures)
 - (e) Reallocate governments net savings towards investments in building a more equitable and cohesive ASEAN (e.g., measures aimed at closing the development gap across ASEAN member states; investment in greater connectivity through the ASEAN Power Grid and Gas Pipeline; building mechanisms to shelter the AEC from fluctuations in oil prices).





F. RESEARCH OUTLINE ASEAN-LEVEL ECONOMETRIC ANALYSIS

- I. Compilation of national policy subsidies across ASEAN and their implementation
- II. Review of the literature on ESR: concepts, theory, and experience, both globally and within ASEAN
- III. Review of the literature on ESR expected 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
- IV. 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
- V. Based on the analysis of CGE results at national-levels, ASEAN-level, as well as those from the ASEAN-level econometric analysis, investigate options and formulate ESR recommendations for the ASEAN under AEMI, considering 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 more effectively and efficiently?
 - (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: AEMI FORUM ON PRICING AND SUBSIDIES
27-28 February 2015, Bangkok

NATIONAL-LEVEL CGE ANALYSIS

Country	Team Leader	Title
Brunei	Dr. Hetti Arachchige 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 Kyophilavong	Associate Professor and Director, Research Division of Economics and Business Management, National University of Laos (NUOL), Vientiane.
Malaysia	Dr. Saeed Solaymani	Centre for Poverty and Development Studies (CPDS), Faculty of Economics and Administration, University of Malaya (UM), Kuala Lumpur.
	Ir. Tuan Ab. Rashid Bin Tuan Abdullah (not present at Forum)	Director, Institute of Energy Policy and Research (IEPRE), Universiti Tenaga Nasional (UNITEN), Kuala Lumpur.
	Dr. Fatimah Binti Kari (not present at Forum)	Assoc. Prof. Dr. Hj. Fatimah Kari, Head, Department of Economics, University of Malaya, Kuala Lumpur.
Myanmar	Dr. Ni Lar	Lecturer, School of Economics, Chiang Mai University, Thailand.
Philippines	Dr. Adoracion M. Navarro	OIC Vice President, Senior Research Fellow, The Philippine Institute for Development Studies (PIDS), Manila.
	Dr. Maria Nimfa F. Mendoza	Assistant Professor, School of Economics, University of the Philippines (UP), Manila.

Singapore	Dr. Xunpeng Shi	Senior Research Fellow, Energy Studies Institute (ESI), National University of Singapore (NUS), Singapore.
	Dr. Youngho Chang	Assistant Professor, Division of Economics, Nanyang Technological University (NTU), Singapore.
Thailand	Dr. Kitti Limskul	Associate Professor, Faculty of Economics, Chulalongkorn University (CU), Bangkok.
	Dr. Nattapong Puttanapong	Lecturer, Faculty of Economics, Thammasat University (TU), Bangkok.
	Dr. Shobhakar Dhakal	Associate Professor, School of Environment, Resources and Development, 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.
	Dr. Dang Thi Thu Hoai (not present at Forum)	Deputy Director, Research Department for Public Service Policies, Central Institute for Economic Management (Vietnam).

ASEAN-LEVEL CGE ANALYSIS

ASEAN	Dr. Shih-Mo Lin	Professor, Department of International Trade and Director of Applied Economic Modeling, Chung Yuan Christian University (CYCU), Taoyuan City.
	Dr. Budy Resosudarmo (not present at Forum)	Associate Professor, The Arndt-Corden Department of Economics, The Australian National University (ANU), Canberra.
	Dr. Youngho Chang	Assistant Professor, Division of Economics, Nanyang Technological University (NTU), Singapore.
	Dr. Saeed Solaymani	Centre for Poverty and Development Studies (CPDS), Faculty of Economics and Administration, University of Malaya (UM), Kuala Lumpur.
	Dr. Kitti Limskul	Associate Professor, Faculty of Economics, Chulalongkorn University (CU), Bangkok.

ASEAN-LEVEL ECONOMETRIC ANALYSIS

ASEAN	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.
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EXTERNAL EXPERTS

International	Dr. Christopher Beaton	Research and Communications Officer, International Institute for Sustainable Development (IISD).
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Table 2: TIMELINE

AEMI FORUM ON PRICING AND SUBSIDIES

27-28 February 2015, Bangkok

Outputs	Lead author to Submit Draft Document	Review Committee Comments	Lead author to submit Revised Document
Outline, Team, Requirements	Sunday 15 March 2015	Sunday 22 March 2015	Tuesday 31 March 2015
Draft 1	Sunday 27 September 2015	Sunday 11 September 2015	Tuesday 27 October 2015
AEMI Forum 6-7 November 2015			
Draft 2	Sunday 29 November 2015	Sunday December 6, 2015	Sunday December 13 2015
Editor	Sunday 13 December 2015	Sunday 27 December 2015 Paper Editing Completed	
E-Publication on AEMI Website 27 December 2015 <i>(as Working Papers, IP remaining with authors)</i>			
OPTIONS FOR ACADEMIC PUBLICATIONS <i>(as a Book or a special issue of academic Journal)</i>			

Bangkok, 8 March 2015

