List of Project Members

- **Shigeru Kimura (Organiser):** Special Advisor to the President for Energy Affairs, Energy Unit,

 Research Department, Economic Research Institute for ASEAN and East Asia (ERIA)
- Ichiro Kutani (Leader): Senior Research Fellow, Manager of Global Energy Group 1, Assistant

 Director of the Strategy Research Unit, Institute of Energy Economics, Japan (IEEJ), Japan
- **Abdul Muizz Faiz Hazwan Haji Mat Yassin:** Project Coordinator; Energy Efficiency and Conservation Unit; Ministry of Energy, Manpower and Industry; Brunei Darussalam
- **Heang Bora:** Deputy Director, New and Renewable Energy, General Department of Energy, Ministry of Mines and Energy, Cambodia
- Sari Murdiyati: Section Head, Analysis and Evaluation of Energy Conservation Program Section,

 Directorate General of New and Renewable Energy and Energy Conservation, Ministry of

 Energy and Mineral Resources, Indonesia
- Mitsuru Motokura: Senior Coordinator, Global Energy Group 1, Strategy Research Unit, IEEJ,

 Japan
- Yohei Kato: Senior Researcher, Global Energy Group 1, Strategy Research Unit, IEEJ, Japan
- **Davanhny Xaneth:** Acting Director, Energy Policy and Planning, Ministry of Energy and Mines,

 Lao People's Democratic Republic
- Zamzurina Zulkifli: Assistant Secretary; Energy Sector; Minister of Energy, Science, Technology,
 Environment and Climate Change; Malaysia
- Nay Lin Tun: Deputy Director, Energy Efficiency and Conservation Department, Ministry of Industry, Myanmar
- Artemio P. Habitan: Division Chief, Energy Efficiency and Conservation Division, Energy
 Utilization Management Bureau, Department of Energy, Philippines

Viritphal Vacharapanich: Professional Engineer, Bureau of Energy Efficiency Promotion,
 Department of Alternative Energy Development and Efficiency, Ministry of Energy, Thailand
 Le Ba Viet Bach: Government Officer, Energy Efficiency and Sustainable Development, Ministry of Industry and Trade, Viet Nam

List of Figures

Figure 1.1	Energy Efficiency Target During 2010–2036 in Thailand	41
Figure 2.1	Comparison of Electricity Demand Outlook by Scenario	57
Figure 2.2	Electricity Saving Potential	57
Figure 2.3	Electricity Saving Potential by Periods	59
Figure 2.4	Image of Gross Benefits	60
Figure 2.5	Cumulative Gross Benefit by Periods	64
Figure 2.6	Investment and Benefit	65
Figure 2.7	Required Investment	67
Figure 2.8	Image of Avoided Power Generation	69
Figure 2.9	Avoided Electricity by Fuel, Association of Southeast Asian Nations	71
Figure 2.10	Net Generation Capacity Construction Cost	76
Figure 2.11	Avoided Carbon Dioxide Emissions	78

List of Tables

Table 1.1	Typical Financing Mechanism	2
Table 1.2	Types of Energy Efficiency and Conservation Financing	6
Table 1.3	Evaluation of Energy Conservation Policy Infrastructure in the	7
	Association of Southeast Asian Nations and Japan	
Table 1.4	Evaluation of Energy Efficiency and Conservation Regulations by Sector	11
	in Brunei Darussalam	
Table 1.5	Energy Efficiency and Conservation Regulations by Sector in Cambodia	15
Table 1.6	Energy Efficiency and Conservation Regulations by Sector in Indonesia	17
Table 1.7	Energy Efficiency and Conservation Regulations by Sector in the Lao's	20
	People Democratic Republic	
Table 1.8	Energy Efficiency and Conservation Regulations by Sector in Malaysia	23
Table 1.9	Energy Efficiency Policy Targets in Myanmar	25
Table 1.10	Energy Efficiency and Conservation Regulations by Sector in Myanmar	27
Table 1.11	Energy Efficiency Targets in the Philippines	29
Table 1.12	Energy Efficiency and Conservation Regulations by Sector in the	31
	Philippines	
Table 1.13	Energy Efficiency and Conservation Regulations by Sector in Singapore	36
Table 1.14	Energy Efficiency and Conservation Regulations by Sector in Thailand	42
Table 1.15	Energy Efficiency and Conservation Regulations by Sector in Viet Nam	47
Table 1.16	Energy Efficiency and Conservation Regulations by Sector in Japan	52
Table 2.1	Electricity Saving Potential (Alternative Policy Scenario-Business as	58
	Usual)	
Table 2.2	Electricity Price by Country	61
Table 2.3	Effects of Initial Investment (Gross Benefit-1)	61
Table 2.4	Effects of Additional Investment-1 (Gross Benefit-2)	62
Table 2.5	Effects of Additional Investment-2 (Gross Benefit-3)	62
Table 2.6	Effects of Additional Investment-2 (Gross Benefit-4)	63
Table 2.7	Effects of Additional Investment-2 (Gross Benefit-5)	63
Table 2.8	Cumulative Gross Benefit by Country	64

Table 2.9	Lost Benefits by Investment Start Year (Association of Southeast Asian	65
	Nations)	
Table 2.10	Required Amount of Energy Efficiency and Conservation Investment by	67
	Country	
Table 2.11	Net Benefit by Country	68
Table 2.12	Unit Construction Cost and Capacity Factor (Coal and Natural Gas)	69
Table 2.13	Avoided Electricity Generation (2040)	70
Table 2.14	Avoided Coal and Natural Gas Electricity Generation and Capacity	71
Table 2.15	Avoided Coal and Natural Gas Generation Capacity Construction Cost	72
Table 2.16	Increase of Nuclear and Renewable Electricity Generation (Alternative	73
	Policy Scenario-Business as Usual	
Table 2.17	Unit Construction Cost and Capacity Factor (Nuclear and Renewable)	74
Table 2.18	Plant Construction Cost Increase of Nuclear Power Plant and	74
	Renewable Energies	
Table 2.19	Net Electricity Generation Capacity Construction Cost, 2040	75
Table 2.20	Avoided Carbon Dioxide Emissions by Electricity Demand Decrease	77
Table 2.21	Annual Net Benefit and Internal Rate of Return of Energy Efficiency and	7 9
	Conservation Investment	
Table 2.22	Energy Subsidies in Selected Association of Southeast Asian Nations	80
	Countries	
Table 2.23	Tentative Calculation of Gasoline and Diesel Price Reductions	81
Table 2.24	Net Generation Capacity Construction Cost and Gross Domestic	82
	Product	
Table 2.25	Avoided Carbon Dioxide Emissions and Total Carbon Dioxide Emissions	83
Table 2.26	Estimated Value of Avoided Carbon Dioxide Emissions	84