Appendixes

Appendix 1: The First Working Group (WG) Meeting

Attendance List

Country	Institution	Member(s)
Cambodia	Ministry of Mines and Energy (MME)	Mr. PHAN Bunthoeun, Deputy Director, Department of Thermal and Combustion Energy
	Electricity Authority of Cambodia (EAC)	Mr. CHHUN Ratana, Chief, Regulation and Licensees Section
	Electricite Du Cambodge (EDC)	Mr. BOU Dolla, Deputy Chief, Thermal and Solar Division
Indonesia	Ministry of Energy and Mineral Resources (MEMR)	Ms. Elis Heviati, Deputy Director for Investment and Cooperation of Bioenergy Directorate of Bio Energy Director General for New Energy, Renewable Energy and Energy Conservation
	PT. PLN (Persero)	Mr. Agung Wibowo Engineer, System Planning Division, PT. PLN (Persero)
Philippines	Department of Energy (DOE)	Ms. Ruby B. De Guzman, Chief Science Research Specialist, Biomass Energy Management Division, Renewable Energy Management Bureau (REMB)
		Mr. Jensen M. Alvarez Senior Science Research Specialist, Biomass Energy Management Division Renewable Energy Management Bureau Department of Energy
	Meralco Powergen Corporation	Litz M. Manuel-Santana, Vice President for External Affairs
Thailand	Ministry of Energy	Dr. Yaowateera Achawangkul, Mechanical Engineer, Senior Professional Level, Department of Alternative Energy Development and Efficiency (DEDE)
		Dr. Weerawat Chantanakome, Special Counselor on International Affairs (as an advisor)
	Electricity Generating Authority of Thailand (EGAT)	Mr. Chawit Chongwilaiwan, Head, Renewable Energy and Power Plant Survey and Potential Appraisal Section, Renewable Energy Planning and Feasibility Study Department Power Plant Development Planning Division
		Mr. Prasit Chantong, Engineer, Renewable Energy Project Cost and Project Appraisal Section, Power Plant Development Planning Division
Organization		**Participants**
Economic Research Institute for ASEAN and East Asia (ERIA)		Dr. Han Phoumin, Senior Energy Economist
Japan Coal Energy Center (JCOAL)		Mr. Osamu Tsukamoto, President (as an observer)
		Mr. Masamichi Hashiguchi, Senior Executive Director/Secretary General
		Mr. Toshiyuki Oda, Director, International Collaboration Department
		Dr. Kazuyuki Murakami, Principal Deputy Director, International Collaboration Department
		Ms. Toshiko Fujita, Principal Deputy Director, International Collaboration Department
		Mr. Yasuo Otaka, Deputy Director, Resources Development
		Mr. Masahiro Ozawa, Chief Engineer, International Collaboration Department
		Ms. Yamada, Fumiko, Assistant Director, International Collaboration Department
IHI Corporation		Dr. Toshiro Fujimori, Technology & Intelligence Integration and Industrial Systems & General-Purpose Machine Business Area Technical Supervisor
KINSEI SANGYO Co.,Ltd.		Dr. Keiichi Kaneko, Managing Director /General Manager of Development & Overseas Department
		Mr. Taotiang Phatthakon, Engineer, R&D Department
Tromso Co., Ltd.		Mr. Yuichi Yanaka, Staff, Sales / Technical

Minutes of the First WG Meeting

The master of ceremonies (MC) announced the start of the meeting and called on Dr Han Phoumin, Energy Economist, ERIA; Dr Weerawat Chantanakome, Special Advisor, Ministry of Energy, Thailand; and Mr Osamu Tsukamoto, President of JCOAL.

- Address by Dr Han Phoumin, Senior Energy Economist, ERIA

First of all, I would like to greet a very good afternoon the two other speakers of the opening session and all the distinguished WG members; those who have been continuously contributing from the phase 1 study to this phase 2 study; and those who have joined us for the phase 2 study.

This is the first meeting of phase 2 of the ERIA study, which is about a very important theme; that is, biomass–coal cofiring. JCOAL has been commissioned to conduct this important research project which, I think, will benefit ASEAN and the entire region of East Asia. We are aware that cofiring, particularly of coal and biomass, will be extremely important in the future of ASEAN. The actual cofiring practices hopefully will be successfully implemented and will bring about a significant reduction of greenhouse gas (GHG) emissions.

In this meeting, we will make efforts to highlight how the region will continue to work together to mitigate GHG emissions.

The phase I study was already conducted and the outcome was reported, which was well accepted. Now we are to find out the modality of technologies and policy support. The target is cofiring biomass and coal, whether with existing coal power plants or with incoming power plants. So, I hope that this study, from every point of view, will be successful in addressing, through policy recommendations, the issue of CO_2 emissions in the future. It is also anticipated to identify and accelerate the potential of biomass utilisation in the region. With this, I also welcome and thank all of you in the region, whose names are to be tied to this study. I believe that the study will be very successful. With that, I conclude my welcome remarks.

Since Dr Weerawat was not yet in the meeting, the MC suggested that Mr Tsukamoto, President of JCOAL, deliver his remarks first, to which Dr Phoumin agreed.

- Address by Mr Osamu Tsukamoto, President of JCOAL

Good afternoon. I would like to express my sincere gratitude to all of you participating in today's meeting. JCOAL has been commissioned to undertake the second phase of ERIA's research on the cofiring of biomass and coal. The results of the findings of the first study in 2019 indicated that the energy situation, the biomass resource, and the introduction of renewable energy are different from one country to the other. Today we will share useful information and exchange opinions to identify the recommendations for the by-country

optimal models of cofiring of biomass and coal. Such cofiring is expected to contribute to reducing CO_2 emissions, improve energy security in each country, and provide local people with job and business opportunities. Lastly, I would like to again express my sincere respect and gratitude to the ERIA Secretariat for their decision to continuously engage in such important topics. My appreciation is also for the representatives from the four relevant ASEAN Member States (AMS) that have been cooperating with us and for the specialists from Japanese companies who will later share with us excellent technology information that would enable implementation of projects. Thank you.

The MC explained the agenda, to which another session on biomass cofiring–related technologies was added for three brief presentations by representatives of Japanese companies that are active in ASEAN region.

This was followed by the self-introduction of the WG members and representatives of Japanese companies.

The MC introduced Dr Weerawat Chantanakome, Counselor and Senior Policy Advisor to the Ministry of Energy, Thailand.

- Address by Dr Weerawat Chantanakome, Special Counselor on International Affairs, Ministry of Energy, Thailand

Good afternoon, everyone. On behalf of Thailand, I am pleased to welcome all of you and all of my old friends to this very important meeting on biomass and coal cofiring in ASEAN that has come at the right time. Especially during the post-COVID time, we need something like a new normal. I hope everyone always stays safe and healthy. With that, just to remind you, at the last ASEAN Ministers on Energy Meeting (AMEM), the issue of the rising demand for coal towards 2040 was discussed, amongst others. At the same time, the current amount of unused biomass is so huge. So, the combination of coal and biomass is an issue that perhaps can be addressed at the same time. Also, during such activities, you can also address climate change and the reduction of emissions. With that, I think phase 1 had a very successful outcome, right? From that successful outcome, we go further in phase 2 by pursuing the way forward and actions to be taken since it is time to act and facilitate cofiring with the model that you propose. Thus, I think the combination of coal and biomass depends not only on the type and volume of biomass but also on suitable technology.

I would also like to remind you that the last AMEM meeting in September 2019 confirmed that, in ASEAN, electricity demand will go up, possibly triple, towards 2040. The share of coal in power generation may also rise to 50%. Just one thing to mention, even if nothing happens. And then, renewable energy and electricity generation will increase threefold at the same time towards 2040. With that, the action that you may like to do today is to show the region, through the phase 2 study, how you will go for the guidelines on the optimal policy framework for ASEAN on the utilisation of cofiring. Also, we would like to gear up ASEAN, including Thailand, to go for the strategy on how proceed with implementation. Not only that. I think that at the end of the day, we need the recommendation and policy

interpretation of the role of cofiring to address the situation where a huge amount of regional biomass is produced and unused. We would like to know how these two energy fields can go together for us to move forward to address energy security and reduce CO_2 emissions at the same time. With that, I appreciate the opportunity that ERIA and JCOAL provided. I hope the meeting will be very successful today. Thank you.

The MC requested the three parties and company representatives to introduce themselves.

Finally, the MC introduced the JCOAL representatives: Mr Osamu Tsukamoto, President; Mr Masamichi Hashiguchi, Senior Executive Director/Secretary General; Mr. Toshiyuki Oda, Director of International Collaboration; Ms. Toshiko Fujita, Principal Deputy Director, International Collaboration; and the members of the Study Team – Dr. Murakami, Mr. Ozawa, and Ms. Yamada.

Presentation by Cambodia: Slide 010

<Q&A >

Ms Yamada, JCOAL Study Team: I am undertaking the part in the JCOAL Study Team to identify the optimal technology and policy measures for Cambodia.

I know that the imported coal you refer to is of a very high rank, that is, bituminous. I wonder why bituminous coal is imported from Indonesia while it is of high quality but is not economically supported. Other countries import even cheaper and lower-ranked coals from Indonesia.

Mr Bou Dolla: The quality of domestic coal is not satisfactory in terms of gross calorific value (GCV). It can be as low as 1,000 kCal/kg, which may not satisfy the standards of the Ministry of the Environment and Ministry of Mines and Energy. We use imported coal from Indonesia that is even more than 6,000 kCal/kg, compared to domestic coal quality, which is very low.

Ms Yamada: I have another question about the list of biomass power plants in your presentation. It is a bit different from the one provided by the WG under phase 1. Many of them are no longer in operation anymore. Why are these biomass power plants not in operation anymore? Is it only because of economic reasons, or are there no incentives? Please give us information on why that is happening.

Mr Phan Bunthoeun: For biomass power generation, we used firewood to cook and produce electricity; that is over. Now, we have biomass power plants. However, biomass, as we see in the case of bagasse, has seasonality, so there are some difficulties in that context.

The MC asked Dr Phoumin to comment.

Dr. Phoumin: Thank you for the presentation of Cambodia members represented by Mr Phan Bunthoeun. I would like to know if the operating factor, the load factors from the biomass power plant, operate only during the dry season. At least biomass power plants must start

the feedstock's supply chain to increase their operation rate so that the capital can be returned. In that case, I am not sure why because Yamada-san is asking whether the biomass plants stopped operations because of seasonal fluctuation of the feedstock supply or other reasons. If it is feedstock, I think it will be very important to understand the supply chain of biomass – whether not only bagasse can be used because biomass is hugely available from other sources. In that case, I think Cambodia may need to study the supply chain more. I am not sure if that is correct or not. However, from an economic point of view, I think we need to understand well how to ensure that the power plant is operating at the optimum level to ensure that returns can be expected. Just my comment, by the way. Thank you.

Mr Phan Bunthoeun: The biomass power plants in Cambodia produce electricity primarily for their use, and the remaining power is sold to the Electricité du Cambodge (EdC). It is not for the EdC only. So, they produce power during the dry season, and they use it for their use and sell the remaining to the EdC.

Mr Bou Dolla: Let me clarify a little. As I said, we are not very sure about the power plant in Kratie (no. 5 in the list) – whether it can produce more. But power plant no. 1 produces power even during the rainy season though production is unlike the coal power plant. Thank you.

Presentation by Indonesia: Slide 020

<Q&A >

Dr Murakami: I understand you have already conducted tests on cofiring in existing power plants. Just one point: I would like to know the current situation of the development of biomass pelletisation: what pelletisation technology is available in Indonesia? I refer to the list of power plants that includes those with biomass or waste pellets. Who handles the pelletisation?

Dr Murakami: Kaliandra. Who is doing this pelletisation?

Ms. Elis Heviati: PT PLN and its subsidiary have conducted seven successful trials of biomass cofiring at existing coal-fired power plants (CFPPs). One of the trials, which used waste-based pellets, is located in Jeranjang CFPP, Lombok, West Nusa Tenggara. In this trial, PT Indonesia Power – a subsidiary of PT PLN – collaborates with the local government. For the trial, the waste-based pellets were taken from Klungkung Bali, where a community-based pellet facility was developed. However, in the future, an Refuse Derived Fuel (RDF) facility will be built in Kebon Kongok Landfill to supply the waste-based pellets for cofiring needs at the Jeranjang Power Plan. The plan is currently under discussion between related parties with support funding from the Ministry of Public Works and Housing.

Ms Yamada: When we did the phase 1 study, I heard from you that there were no clear incentives about biomass cofiring in the existing power plants. My impression is, in a relatively short period since then, Indonesia has undergone so much development about it. I wonder how IP (Indonesia Power) and other stakeholders came in to be engaged in the

projects: whether incentives were already in place or they were ordered by the government.

Ms. Elis Heviati: There have been many discussions about incentives. Those are still under discussion, so we started the pilot programme with the PT PLN first. I hope incentives are coming, which depends on how well the pilot project with the PLN goes.

The MC thanked the members of Indonesia and requested the Philippine representatives to present.

Presentation by the Philippines: Slide 030

<Q&A >

The MC thanked the two representatives from the Department of Energy (DOE) and asked the other Philippine representative, Ms Litz M. Manuel-Santana of MERALCO PowerGen, to speak for comments or supplementary explanation from the viewpoint of one of the major companies in the private sector.

Ms Litz M. Manuel-Santana: I would like to inform the team members that MERALCO PowerGen is currently doing projects mostly on renewables, solar, and wind projects. We have not gone into biomass yet, and our bigger projects are on coal. We have started operations of Ventura Power Unlimited, which is a super-critical cofired power plant in Quezon Province of the Philippines. In September 2019, we started another cofired power plant along the east coast of Quezon. This is a 1,200-MW power plant also using super-critical technology.

Ms Yamada: Now I would like to open the floor for questions about the DOE presentation and company or business activities of MERALCO PowerGen.

Mr Masahiro Ozawa: Thank you. My name is Ozawa, engaging in the research work for the Philippines under this study. I have one question. I learned recently from the Philippine media ecobusiness.com that 'The Philippines considers the power sector future without new coal'. It was in ecobusiness.com and the Philippine news. They reported that the country's Congressional Committee on Climate Change approved House Resolution 761, calling for a climate energy response, which includes not permitting any new coal plants. This is very big news, I think. Does it mean a policy change?

Ms Ruby B. De Guzman: The news article emanated from the Philippine Congressional Committee on Climate Change, which approved this resolution. They are yet to invite us to comment on this proposed House resolution.

So, we have not yet been invited by the Philippine Congress because it just adjourned its regular session and will resume in July. So, there have been calls that no permits will be issued to incoming or new coal plants that will be proposed or will apply.

But as I mentioned earlier, the DOE stands with its position that it is technology neutral. That all types of technologies – be they coal, natural gas, renewables – are all welcome, provided they would provide efficient, reliable, and the least-cost options and flexibility in our power system.

So, basically, in the Philippines, coal is the fuel for all our baseload plants. Our coal-fired plants are baseload and provide the basic generation for the country's energy demand. But we are still waiting to be called or invited to this hearing. When the Philippine Congress or any committee of the Philippine Congress approves a House resolution, all concerned government agencies are invited to provide comments before this resolution is passed into law.

Ms Yamada: Cofiring. Is that categorised under this? Is that also eligible for these fiscal and non-fiscal incentives? Or some of them are not applicable? Or none of them are applicable?

Ms Ruby B. De Guzman: The Renewable Energy (RE) Law encourages hybrid systems. It is a combination of conventional and renewable energy systems. But cofiring is different from hybrid systems. If this cofiring of coal with biomass will be allowed, it may not qualify for incentives under the RE law. It may be treated as a conventional power facility.

The MC thanked the Philippine members and asked the Thai members to proceed with their presentation.

Presentation by Ministry of Energy, Thailand: Slides 040 and 041

<Q&A >

The MC thanked the presenters from the Department of Alternative Energy Development and Efficiency, Ministry of Energy (DEDE) and the Electricity Generating Authority of Thailand (EGAT) and announced that the floor is open for questions and comments.

Dr Weerawat Chantanakome: Thank you very much. You know, I think the process went very smoothly. I hope we can get the solution today. Anyway, ladies and gentlemen, I think we will have to put this on the table until the very end, but let me give some comments about the 'hybrid' that one of the members referred to.

So, what we are doing right now is on hybrid. What kind of hybrid is not an issue. As you know, all kinds of biomass and all other fossil fuels and renewables apply. I think that before we act, we must identify the advantages and disadvantages, including the environmental benefits and impacts.

On the environmental benefits, for example, CO_2 emissions come from coal which, at the same time, provides the benefit of low cost. People do not talk about it officially anymore; however, they still use coal in their backyard. In Germany, people still use coal. Even though they advocate for renewable energy, they still use coal for security and affordability.

Before we move on, I will look into the differences at this moment. For example, when you combine biomass with coal in an existing CFPP, I think you can save on your budget, such as grid connection fees, which, in the case of starting afresh a biomass power plant are required.

That said, the existing system is originally for 100% coal. So, for cofiring with biomass, a technology that allows smooth cofiring of the two will be required. While biomass cofiring conducted in an existing CFPP and reduced CO_2 emissions look good in the eyes of anti-pollution people, what we should pay attention to is, the more you like to increase the portion of biomass, the more technical deliberation will be required. There will be another future option that the biomass portion becomes larger than that of coal. We cannot phase out coal, but we can reduce the amount we use.

My last point is that because we are concerned with policy, we believe we need to talk at the municipal level, so we will convince them to step forward for action. This is because people at the municipal level are always talking, but they take no action. The economic, operational, and environmental factors, apart from cost, need to be considered. But have them on a test-by-test basis. This is my view on your next step in terms of policy to promote this kind of hybrid into a reality. Thank you so much.

Ms Yamada: Thank you very much, Dr Weerawat. What Dr Weerawat has told us – the economic, operational, and environmental aspects of these forthcoming plans – is very important.

Thank you again, Dr. Weerawat, for providing important insights for us to incorporate in our report.

(Dr Weerawat Chantanakome left for another meeting.)

Dr Murakami: I have one question about the community power plant. What kind of technologies are adopted in the plant? I understand such power plants are smaller in scale.

Dr Yaowateera Achawangkul: Dr Murakami, the technology is for a community-based plant. Actually, the concept of the community power plant is not new; it has been there for more than 10 years before, but at the beginning we tried to do this more to skill up the capacity of people there. We tried to educate them that a power plant does not necessarily have to be on a large scale. Therefore, I think if we try to implement biomass power generation in the community, it is good for sustainability. If the people think that is complicated to operate at their end, they will give up the power plant operation. But we put out the maximum capacity of the community power plant at 10 MW. In Thailand, a lot of such power plants are using the system. The operation is going well. This is my comment.

Mr Chawit Chongwilaiwan: May I add my comments? May I share more? Biomass utilisation does not require too specific technical knowledge. And by using biomass power, Thailand's ecological condition is unspoiled. What the community has to do is to mix the fuel. The quality is maintained.

Presentation by the Team: Slide 050

The MC announced that questions on the team's presentation will be accepted after the presentations of the three technology companies: IHI Corporation, Kinsei Sangyo, and Tromso.

Presentation by private companies (files are not available in this transcription):

Dr Yaowateera Achawangkul: I have some comments on the Tromso presentation, about rice husk transformation. In Thailand, rice husk is used for other purposes; and obtaining a sufficient volume of rice husk may not be easy. Is it ok with your technology that we use other biomass forms that have the same properties as rice husk. something quite simple like sawdust?

Mr Yanaka, Tromso: Thank you for your questions. Well, we may mix it with other materials, like you said, sawdust and others (peanut shells, banana peels). Every organic material is available to be mixed with our machinery. However, the very important thing is moisture. It is important to be very dry. We have already implemented the solidification tests of sawdust. Then, we could succeed in solidifying 50% of sawdust and 50% of rice husk. It is possible to solidify and put on fire so you can use the fuel as usual.

Dr Yaowateera Achawangkul: Yes, thank you. I have another question about your system. Is there already an actual power plant where your technology has been applied?

Mr Yanaka, Tromso: We have a project in Viet Nam and have done a feasibility study on gasification generation plants. Now we are planning to conduct some projects, a city-to-city collaborative programme that focuses on the feasibility of the cofiring process. We are yet to have a generation plant in actual operation.

Ms Yamada: We already learned from the Cambodian delegates that some of the biomass power plants are not in operation. Some of them are just seasonally being operated. However, the Philippines uses bagasse and generates power throughout the year. I am wondering why bagasse is seasonal in Cambodia but is not seasonal in the Philippines? You do not have a similar climate, right? How about in Thailand? They don't have bagasse.

Dr Yaowateera Achawangkul: Yes, currently we have a total capacity of 2,000 MW for the bagasse-fired power plant in Thailand. We use it not only for power generation but also for co-generation. They have their own plant; they can supply the steam to the factory.

The MC thanked Dr Yao for the comments and asked Dr Murakami for some words before closing the meeting.

Dr Murakami: I would like to say a few words to close this First WG Meeting. First of all, I would like to thank all of you for joining this WG. Initially, we planned to have this WG meeting at the end of April in Bangkok. However, due to the COVID-19 pandemic, we were

not able to make it and instead arranged this online meeting. As this is the first experience for JCOAL, tests arranged in connection with this WG meeting would not have been satisfactory. However, we are grateful that this WG meeting was very successfully conducted, thanks to the contributions of each WG member. We will continue further study with close communication with working members. We will work hard to make the technical proposal and policy recommendations for each country. We look forward to meeting with you again in late September 2020.

Appendix 2: The Second Working Group (WG) Meeting

Attendance List

Country	Institution	Member(s)
Indonesia	Ministry of Energy and Mineral Resources (MEMR)	Ms. Elis Heviati, Deputy Director for Investment and Cooperation of Bioenergy Directorate of Bio Energy Director General for New Energy, Renewable Energy and Energy Conservation
	PT. PLN (Persero)	Mr. Agung Wibowo System Planning Division, PT. PLN (Persero)
Philippines	Department of Energy (DOE)	Ms. Ruby B. De Guzman, Chief Science Research Specialist, Biomass Energy Management Division, Renewable Energy Management Bureau (REMB)
		Mr. Jensen M. Alvarez Senior Science Research Specialist, Biomass Energy Management Division Renewable Energy Management Bureau Department of Energy
	Meralco Powergen Corporation	Litz M. Manuel-Santana, Vice President for External Affairs
Thailand	Ministry of Energy	Dr. Yaowateera Achawangkul, Mechanical Engineer, Senior Professional Level, Department of Alternative Energy Development and Efficiency (DEDE)
		Dr. Weerawat Chantanakome, Special Counselor on International Affairs (as an advisor)
		Mr. Tananchai Mahattanchai, Senior Professional Geologist, Department of Mineral Fuels
	Electricity Generating Authority of Thailand (EGAT)	Mr. Chawit Chongwilaiwan, Head, Renewable Energy and Power Plant Survey and Potential Appraisal Section, Renewable Energy Planning and Feasibility Study Department Power Plant Development Planning Division
		Mr. Prasit Chantong, Engineer, Renewable Energy Project Cost and Project Appraisal Section, Power Plant Development Planning Division
Organization		**Participants**
Economic Research Institute for ASEAN and East Asia (ERIA)		Dr. Han Phoumin, Senior Energy Economist
Japan Coal Energy Center (JCOAL)		Mr. Osamu Tsukamoto, President (as an observer)
		Mr. Masamichi Hashiguchi, Senior Executive Director/Secretary General
		Mr. Toshiyuki Oda, Director, International Collaboration Department
		Dr. Kazuyuki Murakami, Principal Deputy Director, International Collaboration Department
		Mr. Yasuo Otaka, Deputy Director, Resources Development
		Mr. Masahiro Ozawa, Chief Engineer, International Collaboration Department
		Ms. Yamada, Fumiko, Assistant Director, International Collaboration Department

Minutes of the Second Working Group (WG) Meeting

Opening Session

- Address by Dr Han Phoumin, Senior Energy Economist, ERIA

  It is good that the study is in its final stage to provide suggestions for the policy direction on biomass cofiring in ASEAN, thanks to the cooperation of all WG members. The AMS will benefit from the proposals to obtain ideas on how to apply technology, what policy instruments would be desirable to facilitate biomass utilisation in the power sector, by which ASEAN will further progress in CO_2 emissions mitigation. I would say this study is, to some extent, the first to discuss and deliberate on biomass cofiring in ASEAN.

- Address by Dr Weerawat Chantanakome, Special Counselor on International Affairs, Ministry of Energy, Thailand

  I am happy to see the progress of the study, which will facilitate biomass utilisation in ASEAN's power sector. ASEAN will continuously utilise coal towards 2040 as it provides affordability and energy security. So, adding biomass utilisation through cofiring would be good in terms of having an option to reduce emissions to address climate change issues. I expect maximised benefits will be obtained through the study, which I believe would provide a platform and a springboard for the next step for the realisation of projects.

- Address by Mr Osamu Tsukamoto, President of JCOAL

  This study was conducted coincidentally during the COVID-19 pandemic. I suppose every single WG member, being in the position to formulate policy and policy instruments, must have been extra busy to address the social and economic change in the energy sector that the pandemic has caused. I would like to offer my utmost gratitude to all of you for the generous and dedicated contributions to this study under such severe circumstances.

  We believe we can furnish the report that will be conducive to the policy formulation of all four target countries, for which the Study Team and JCOAL are committed to make. In this regard, we very much appreciate your continued cooperation at this meeting and towards the finalisation of the report, without which we may not anticipate the successful completion of the study.

  I am aware that the AMS, like most emerging economies, will make a strong comeback in the power sector in 2021. Then we can ultimately achieve the shared goal of SDG7: 'ensure access to affordable, reliable, sustainable, and modern energy for all by 2030'. I hope the study outcomes will firmly contribute to a clean electricity supply in the AMS that will bolster steady and outstanding growth in the region.

Introduction of participants

The MC announced that the President of JCOAL has left, and the Senior Executive Director/Secretary General is attending on his behalf.

The MC introduced the WG members and announced that three members from Cambodia are not present and that one newly assigned Thai member, Mr Tananchai Mahattanchai, is present.

Mr Tananchai Mahattanchai, Senior Professional Geologist, Department of Mineral Fuels (DMF) of the Ministry of Energy, Thailand, greeted the WG members and expressed his appreciation for joining the WG as a member. He then provided information on the coal situation in Thailand, and introduced the mission and responsibilities of the DMF related to the promotion of coal image and support for the use of CCT for public and local community acceptance. He briefly highlighted some efforts related to coal, including the ASEAN Forum on Coal (AFOC) cooperation, local community engagement, and adoption of the Code of Practice for coal management for which public participation activities are being implemented. (A brief presentation by Mr Tananchai)

Presentation by the Team

The MC announced that the Philippines' subchapter would be discussed first as discussions on Cambodia would be conducted separately, and Indonesia members have not yet arrived.

Presentation by Mr Ozawa: Slides 36-44

- Ms Ruby B. De Guzman, Chief Science Research Specialist, Biomass Energy Management Division, Renewable Energy Management Bureau, DOE, Philippines

  We concur with the biomass sector roadmap, especially on the additional capacity from 2018 to 2040.

  As for 1,550 MW, the data on the installed capacity addition of biomass power in 2018–2040 is based on awarded contracts. It may sound rather small compared to the total power generation capacity of 93,482 MW. Our determination of this capacity is based on our awarded contracts as per the Renewable Energy (RE) Law, where the government, through the DOE, awards or issues operating contracts to biomass RE developers. If I may repeat part of the presentation, a proposed biomass project is evaluated primarily based on feedstock, i.e. feedstock supply, availability, and sustainability. So, the identified capacity of 1,550 MW is based on the projects awarded from 2018, so that is 192 MW. For the medium term of 313 MW, these are ongoing constructions. And for the long term, these are mainly based on the results of the biomass resource assessment conducted. It would mainly be composed of biomass feedstock using municipal solid waste. That is how we identified the total capacity addition of biomass power at 1,550 MW by 2040.

The Philippines has great potential for other biomass resources, but other renewables have yet to be developed only because of the coordinated arrangements required compared to, let say, solar that only requires land.

The energy policy of the Philippines is 'technology neutral'. Whatever energy source that would provide affordability, accessibility, and environmental compliance, etc. would be considered. So, coal use for power generation will continue with the use of CCT; it is expected to remain at 27% by 2040.

- The House of Representatives (Congress) is now considering legislation on biomass energy utilisation through a proposed Biomass Energy Act. We are thinking of using the report, once finalised, as one of the reference documents the DOE would use for briefings of relevant parliamentary members, etc.

- Ms Litz M. Manuel-Santana, Vice President for External Affairs, MERALCO PowerGen Corporation (MGen), Philippines

  MGen through its subsidiary MGreen is planning to build 1,200 MW of renewable energy in the next 5 to 7 years.

Presentation by Mr Otaka: Slides 28–35

- Ms Elis Heviati, Deputy Director for Investment and Cooperation of Bioenergy, Directorate of Bio Energy, Director General for New Energy, Renewables Energy and Energy Conservation, Ministry of Energy and Mineral Resources, Indonesia

  The summary of Indonesia's subchapter well reflected the Indonesian members' presentation at the First WG Meeting. I have no further comments, but the PLN might like to say something as they are engaging in the pilot tests of biomass cofiring.

- Mr Agung Wibowo, Engineer, System Planning Division, PT PLN (Persero), Indonesia

  The tests are still ongoing. We are now working on the RUPTL (National Electricity Business Plan) 2020–2029, the publication of which has been delayed due to the COVID-19 pandemic. We have submitted the first draft recently to the ministry. We are making RUPTL 2020–2030 right now and hope it will be finalised by the end of October 2020 or so. The outcomes of the tests were detailed in the annual report of the PLN and its subsidiaries.

  Renewables are aimed to account for 23% for 2025–2029. So, whether biomass cofiring would go well does matter since its successful implementation means the share of renewables would be boosted.

Presentation by Dr Murakami: Slides 45–56

- Dr Yaowateera Achawangkul, Mechanical Engineer, Senior Professional Level, Department of Alternative Energy Development and Efficiency (DEDE)

  Mr Punmeechaow, the new Energy Minister of Thailand, assumed his position in July 2020. Hence, some policies would be amended or changed. The new minister suggests revising the target of the demonstration community power plant installed capacity from the initial 100 MW (quick-win project) to 150 MW. Since EGAT has the discretion about the Power Development Plan, I suggest that the team communicate with EGAT for further confirmation.

- Mr Tananchai Mahattanchai, Senior Professional Geologist, Department of Mineral Fuels, Ministry of Energy, Thailand

  I agree with Dr Yaowateera in the point that before establishing the support policy, we need to correct more data and information to make sure that the policy recommendations to be made are applicable and functional. Also, on behalf of the DMF, I appreciate the work done by the WG and welcome all support from ERIA, JCOAL, and the WG members to help advise on technology and fufil data acquiring. The DMF is exploring an opportunity to implement coal biomass cofiring to drive the achievement of the renewable target. Also, coal and biomass cofiring may result in more public and local community acceptance and help people to realise that coal is an affordable fuel energy with an environment-friendly appearance.

  Thailand is seeking assistance from ERIA and JCOAL to support the project related to the feasibility study of how Thailand will utilise and implement coal biomass cofiring.

- Dr Weerawat Chantanakome, Special Counselor on International Affairs, Ministry of Energy, Thailand

  This direction is really good. Biomass firing under the community power plant programme is one thing; it is good for community development and for ensuring electricity access. On the other hand, biomass cofiring in the CFPPs allows environmentally acceptable and clean coal utilisation and provides opportunities for the reduction of CO_2 emissions while facilitating public acceptance.

- Dr Han Phoumin, Senior Energy Economist, ERIA

  I am pleased to see this development of discussions. The team can further explore this point in the report.

The team clarified that this particular aspect of biomass cofiring is yet to be pursued in the subchapter of Thailand only because the team was aware that biomass firing through the community power plant programme was initiated by the government of Thailand. The team will incorporate the discussions led by the DMF, Ministry of Energy Thailand into the report and add recommendations on the way forward about biomass cofiring in Thailand, the proposal of which was well accepted by Thai members and ERIA.

Closing

Dr Weerawat expressed his appreciation that the study outcomes are concrete. He emphasised that ASEAN would use coal in this period of energy transition; and we have to make it a 'good transition period' by forging synergy of coal and biomass by co-utilising the two fuels.

Dr Phoumin referred to the importance of practical application of the study recommendations to the AMS and asked the WG members for a post-meeting feedback.

Dr Murakami, on behalf of JCOAL and the team, extended a vote of thanks to the dignitaries and experts who have been contributing through discussions at the meeting and providing advice and comments through email.

The MC announced the end of the meeting.

Appendix 3: Breakout session of the Second Working Group Meeting

Attendance List

Country	Institution	Member(s)
Cambodia	Ministry of Mines and Energy (MME)	Mr. Tiv Dara Rith, Vice Chief of Office Department of Cooperation and ASEAN Affairs
		Mr. PHAN Bunthoeun, Deputy Director, Department of Thermal and Combustion Energy
	Electricity Authority of Cambodia (EAC)	Mr. CHHUN Ratana, Chief, Regulation and Licensees Section
	Electricite Du Cambodge (EDC)	Mr. BOU Dolla, Deputy Chief, Thermal and Solar Division
Organization		**Participants**
Economic Research Institute for ASEAN and East Asia (ERIA)		Dr. Han Phoumin, Senior Energy Economist
Japan Coal Energy Center (JCOAL)		Dr. Kazuyuki Murakami, Principal Deputy Director, International Collaboration Department
		Mr. Yasuo Otaka, Deputy Director, Resources Development
		Mr. Masahiro Ozawa, Chief Engineer, International Collaboration Department
		Ms. Yamada, Fumiko, Assistant Director, International Collaboration Department