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SUMMARY REPORT
THE FIRST POLICY DIALOGUE

DECARBONISATION STRATEGIES AND POLICIES IN INDONESIA

OCTOBER

2022

Policy Dialogue on Decarbonisation Strategies and Policies in Indonesia (Summary Report)

October 13th, 2022

I. Welcoming Remarks

By: Dr Ir. Rachmat Mardiana, MA – Director of Electricity, Telecommunications and Informatics, the Ministry of National Development Planning (BAPPENAS)

This policy dialogue is inseparable from the efforts of BAPPENAS to compile documents that will be submitted this year and next year for the preparation of the RPJMN 2025-2029 (the National Mid-term Development Plan). Also, this activity is part of preparing planning documents to make Indonesia one of the developed countries before 2045. Noteworthy, the challenges will also become even more severe, like the covid pandemic in 2020, and to realise a developed country or get out of the middle-income country device (5% GDP growth). Currently, BAPPENAS is preparing six strategies that can support these efforts to support the progression of becoming a developed country. One of them is a strategy for a low-carbon economy, then a green economy, energy transition, and digital transformation are no less important. From these strategies, BAPPENAS perceives that the importance of data collection with big data will also require additional capacity, especially for the energy transition.

The energy sector faces some challenges. In terms of domestic energy consumption, like Liquefied petroleum gas (LPG), it still relies on fossil energy sources from other countries. Then the second challenge is that energy resources for renewable availability are still intermittent due to the tropical climate. There is also a problem due to the geographical location of Indonesia being in the form of small islands. In terms of financing ability, it is also a problem.

Furthermore, the Government of Indonesia has been attempting to replace fossil power plants that are more than 35 years old in 2025 (there are around 3000 MW) to be replaced with renewable energy. Then there are also coal-fired power plants that can be co-fired from biomass to increase the opportunity to multiply biomass. However, the issue of how the supply of biomass is very important to be addressed so that this approach can be sustainable.

For the development of renewable energy, there are several efforts to mainstream renewable utilisation. For example, from the policy side, some subsidies provide opportunities or attract investors. From the financial side, the government needs to identify funding sources so that the risk is low and financing is affordable. In the form of performance-based, currently, some initiatives like green bonds or later, there will also be other instruments for smart grids and batteries. Given that some renewable energy sources are intermittent, supporting infrastructure is needed, like batteries or charging stations.

II. Bioenergy Development in Indonesia

By: Iryan Permana – Directorate of Bioenergy, Directorate General of New Renewable Energy and Energy Conservation (EBTKE), the Ministry of Energy and Mineral Resources (KESDM)

Energy transition has become something that most Indonesian societies are aware of, and all nations are committed to it, including Indonesia, especially within the G20. One of the issues raised is energy transition. From the Indonesia side, KESDM has also recently completed the last series of G20 presidential working groups in Bali with a plan for a greener energy transition based on

renewable energy, one of which is biogas and biomass energy. Still, on the other hand, there are three aspects of energy provision to be considered, namely, affordability, availability and finally, the environmental elements.

For Indonesia itself, it is known that the energy transition plan has been mandated in the state, in the form of RUEN, to achieve 23% clean energy in the energy mix by 2025. It is reported that the achievement reached 12.2% in 2021. To get 23%, biogas technology has a portion of around 489 million m^3. At the same time, there is a massive development from the current data, especially in small-scale such as biogas for home, communal, and industrial scale for power generation. Meanwhile, direct utilisation has only reached the range of 32 million kiloliters. Indeed, the difference is still very large compared to the RUEN projection figures. However, it should be noted that there is a possibility that the assumptions used at the RUEN planning have a disparity with reality.

KESDM attempted to mainstream clean energy utilisation, especially bioenergy, by EBTKE. The first example is the substitution of fossil fuels in the transportation sector with biofuel. This program is already running, namely the B30 program (30% bio-fuel). Meanwhile, the ratio will be increased through a program, namely the B40 plan. PLN (A state-owned Electricity Company) has made several attempts in the electricity sector, including co-firing with biomass at coal power plants, although the percentage is small. The second activity is the replacement of fossil technology with renewable energy. However, this comes with challenges, such as oversupply in Java in the electricity sector; thus, it becomes more challenging to increase capacity with renewables.

Nevertheless, there are several programs to achieve the renewable target mix in 2025. For instance, the replacement of diesel-based power plants to clean energy, smart grid developments and plans to reduce coal power plants. Also, regarding non-electricity use, biogas is from the small-scale household to industrial scale. These are in line with Indonesia's aims in Net Zero Emission 2060 (NZE 2060). Although some plans under NZE 2060 are still a draft from the KESDM and need to be synchronised with other stakeholders, such as the Ministry of Environment and Forestry (KLHK), those plans are still relevant.

Figure 1. Biogas Development Plan and Implementation in Indonesia

Given the renewable potential in Indonesia, the government expects to achieve net zero emissions, with the main basis being the utilisation of renewable energy. Looking at the GigaWatt (GW) potential, particularly at the potential renewable total of 3600 GW, it seems huge likely even though the potential is at theoretical calculation. When later, the utilisation must move from technical to economic potential, ready to be delivered. For bioenergy, the theoretical possibility of 53 GW is based on agricultural, forestry, livestock, industrial and waste wastes. Then, from the main product of vegetable oil, Indonesia still has very large palm oil and forestry plants. This has the potential to be developed into one of the supports to fulfil domestic energy needs.

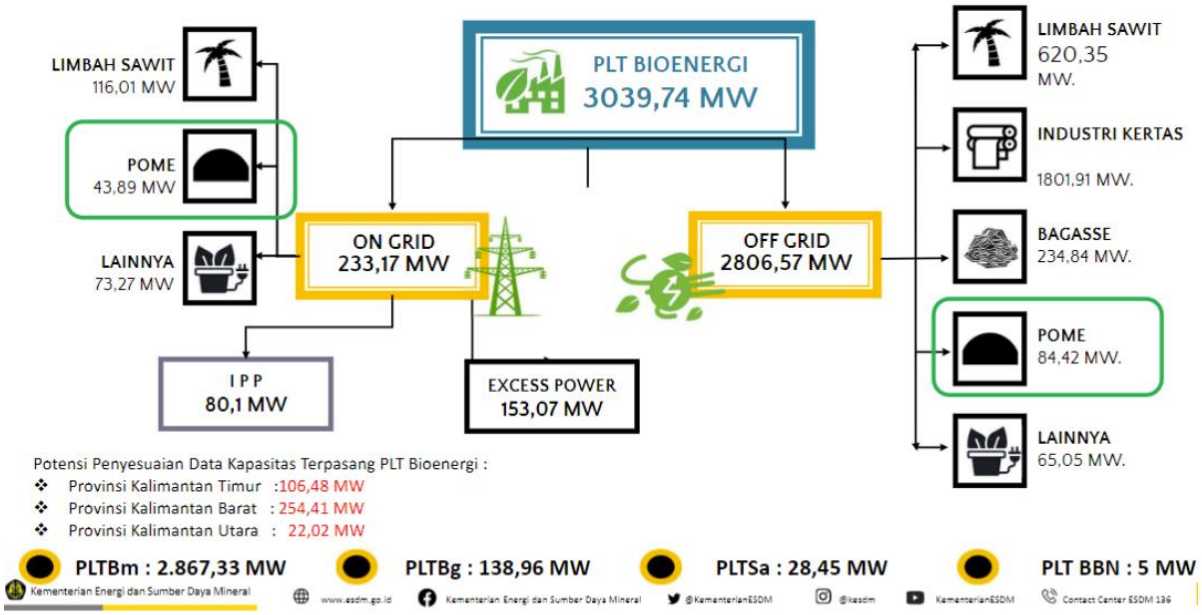

Figure 2. Installed capacity of bioenergy power plants until 2022

Regarding upgrading biogas to biomethane or Bio-CNG (Bio-Compressed Natural Gas), many parties have started to discuss opportunities for this technology development and conducted technical assessments. KESDM has been striving in this topic with the expectation that this purified biogas is one of the opportunities to replace gas supplies. KESDM have been actively starting the discussions with the pertinent stakeholders, followed by market assessment, pre-feasibility studies, and a defined regulatory framework. Regarding the regulatory framework, KESDM assisted this sector to enter commercial and licensing because this biogas contains, and the commercial license has been introduced recently with KBLI[1] 35203. Some investors want to join this development by registering with BKPM (Ministry of Investment / Investment Coordinating Board). With this progress, investors are expected to start contributing to bio-methane development. Currently, there is an example of one bio-methane developer carried in East Kutai, East Kalimantan, which uses the produced bio-methane for its consumption (both factory and transportation).

Another prospect of Bio-CNG is evidence of a ground-breaking at one of the projects owned by PT KIS (Kingdom Indonesia Plantations) in Langkat, North Sumatra, which is planned to be commissioned from April 2023 to November 2023 for three projects. This project produces a volume of bio-CNG reaching 1230 mmBTU / day with an investment of 15 million US dollars. At that time, the Director of Bioenergy attended the ground-breaking. This is a starting point for the future, and innovations on the research side are still necessary.

[1] KBLI or Klasifikasi Baku Lapangan Usaha Indonesia is Indonesian Standard Industrial Classification

Overall, there are technical aspects to be considered in biogas development. Firstly, biogas processing increases biogas production with co-digestion and maintains production stability with pre-treatment. Then the second is to continue the quality improvement of biogas. To do so, KESDM plans to integrate biogas as fuel to reduce LPG dependency. Also, this biogas fuel will be injected into Jargas (gas city network), then enter the final consumer or be included in the retailers or distributors who distribute this fuel in the future. In the future, it is expected not only to see biogas at the household scale but also, it is expected that biomethane can later be transported, injected into the gas network or mixed or transported and packaged for the consumption of the end-users. This plan is still being discussed with the Directorate General of Oil and Gas - KESDM. Perhaps, this will be a good achievement to be able to replace gas and later be more beneficial to the community with this bio-methane.

Lastly, KESDM cannot do it alone for biogas development because it is not only within the KESDM scope in terms of feedstock and stakeholders. Other stakeholders need to be involved. For example, the Ministry of Agriculture, the Ministry of Environment and Forestry (KLHK), the local government, and the community must be involved. Academics are also needed to contribute to the application of better technology. NGOs are also involved in assisting in discussions so that, in the future, this sector can move towards greater commercialisation.

III. Introduction of Decarbonisation Projects

By: Sustainability & Resilience (Su-re.co) and Stockholm Environment Institute (SEI)

3.1. The current and ongoing activities

By: Dr Takeshi Takama (CEO of Su-re.co)

Su-re.co is currently involved in research and implementation projects in Indonesia since 2020 that can contribute to the policy-making process related to low-carbon development in 2030 or 2060. For example, there is TIPPING+ related to the energy transition from coal to renewable energy. The LANDMARC project on climate change mitigation in the land sector also exists. Under LANDMARC, Su-re.co is working on various land-use mitigation strategies, including biogas and compost. Su-re.co is also working on biogas deployment, a grant from the German government, and IKI Small Grants. In this implementation project from the German Government, Su-re.co has installed about 40 biogas units. Maybe in 3 months, there will be another 30 biogas units. This project is currently helping coffee and cocoa farmers in Bali and NTT (East Nusa Tenggara) in this implementation project. Hopefully, all these initiatives can help the government's low-carbon development programme.

3.1.1. TIPPING+ (2020 – 2023): Enabling positive tipping points towards clean energy in Indonesia

By: Cynthia Ismail (Su-re.co Researcher)

This project explores how electricity and cooking fuel sectors could be transformed towards a more low-carbon orientation. Su-re.co has conducted many discussions with stakeholders, including central and local governments, NGOs and communities. Su-re.co explored the desired energy transition scenario futures in these engagements. The interactions and discussions revealed that most of these stakeholders stated that electricity would indeed be one of the main energy sources in the future, with more renewable deployment in the system. Currently, su-re.co works with the University of Graz, Austria, to assess the socio-economic impacts of the policy interventions planned by the policymakers, including BAPPENAS, KESDM and PLN, in defining Net Zero Emission by 2060. With this policy dialogue,

Su-re.co team can contribute to the making of the RPJMN (2025 – 2029) and the RPJPN (2025 – 2045).

3.1.2. ADB Study on Indonesia's Just-Energy Transition with Gender Lens (2022)

By: Sarah Wibisono (Su-re.co Green Business Developer)

Regarding energy transition, Su-re.co also continues the latest research with TUDelft - The Netherlands and the University of Sussex – The United Kingdom, led by the Asian Development Bank. This research is entitled towards Indonesia's Just Energy Transition, which is to provide more understanding of the status of gender equality and gender equity in the energy transition in Indonesia, given that the country is beginning to move from fossil to cleaner energy sources. For women and girls to fully participate, a concerted effort is needed to address their exclusion from the energy transition. Here, there are three main findings related to gender issues in the supply side and demand side of the energy sector. This study also identified narratives related to gender issues in the energy sector from the pertinent stakeholders. The study indicates that policies and institutions across the Indonesian energy supply and demand side exhibit gender-blind policies and practices.

Moreover, this research also conducted a competition involving several female artists participants to design this research report. This activity is expected to showcase women's participation in the energy transition in Indonesia. To identify the narratives, a participatory approach was conducted with semi-structured interviews with several stakeholders in the field of energy transition ranging from the government, private companies in the energy, farmers and homemakers. In the end, this study suggests several policy recommendations related to capacity building, gender-responsive policies, education related to gender-just energy transitions, and capacity-building to increase awareness of gender issues in the energy sector.

3.1.3. IKI Small Grants (2021-2022): Biogas Initiatives with Carbon Offset

By: Fabian Wiropranoto (Su-re.co Researcher)

Su-re.co is also currently initiating the application of biogas in the agricultural sector and identifying potential carbon markets link for this technology in Indonesia. GGIZ funds it under IKI Small Grants with three main outputs and will be finalised by October 2022. The objective of this project is to reduce emissions, and has the first output of installing 40 biogas plants in Bali, Flores, and Java. Currently, Su-re.co has installed over80 household-scale biogas units. The second output, Su-re.co conducted climate field schools in collaboration with BMKG (Indonesia Meteorology, Climatology, and Geophysics Office), particularly BMKG Bali and BMKG NTT, as a capacity-building programme to teach farmers about climate change adaptation, including how to use biogas. Lastly, conducting a feasibility study to identify how to market the frugal biogas design, especially looking at funding mechanisms through the carbon market or other alternatives. With the market approach, it is expected that this frugal design of biogas can be scaled up to achieve the target of installing household-scale biogas of up to 20,000 units. Theoretically, 20,000 units are enough to help farmers and the state reduce subsidies for chemical fertilisers and LPG.

3.1.4. LANDMARC (2020 – 2024): Land-Use Based Mitigation for Resilient Climate Pathways

By: Francis X. Johnson (SEI Senior Research Fellow)

Currently, Su-re.co and SEI (Stockholm Environment Institute) are working on the LANDMARC project funded by the European Commission research program from 2020 - 2024. This project looks at this land-climate-development nexus from the technical side in terms of earth observations and modelling but also from the stakeholder side on how to get carbon out of the atmosphere and into the land where it will reduce the effects of greenhouse gases. The project includes 16 case studies and five regional platforms in which SEI take the lead on regional platforms. For example, Southeast Asia is gathering stakeholders from throughout the region, and the LANDMARC project is doing this the next year. All policymakers are most welcome as participants in this dialogue.

To emphasise the significant difference between land use and the other sectors, because land use affects the climate and vice versa, it is more complex than the energy and industry sectors. There is a diverse range of land-use sectors, including forestry, agriculture, livestock, and natural land, as well as multifunctional land uses. Although everyone talks about the 1.5-degree target, this target has already been surpassed. This implies very significant problems because people live on land. Currently, the 1.5 degrees target under the Paris Agreement refers to ocean and land together, but the impacts on land can already be very serious. Figure 3 depicts historical emissions, with the orange lines representing the net CO2 emissions from the land sectors. When looking at Southeast Asia and the Pacific region, the land sectors have historically accounted for the vast majority of emissions. Regarding emissions per capita, you can see that a very significant share of emissions for Southeast Asian Pacific is coming from land sectors, so the challenge is that land is now perceived as a problem because of emissions. Still, through land mitigation, there are possibilities to turn the land sector from problems to solutions.

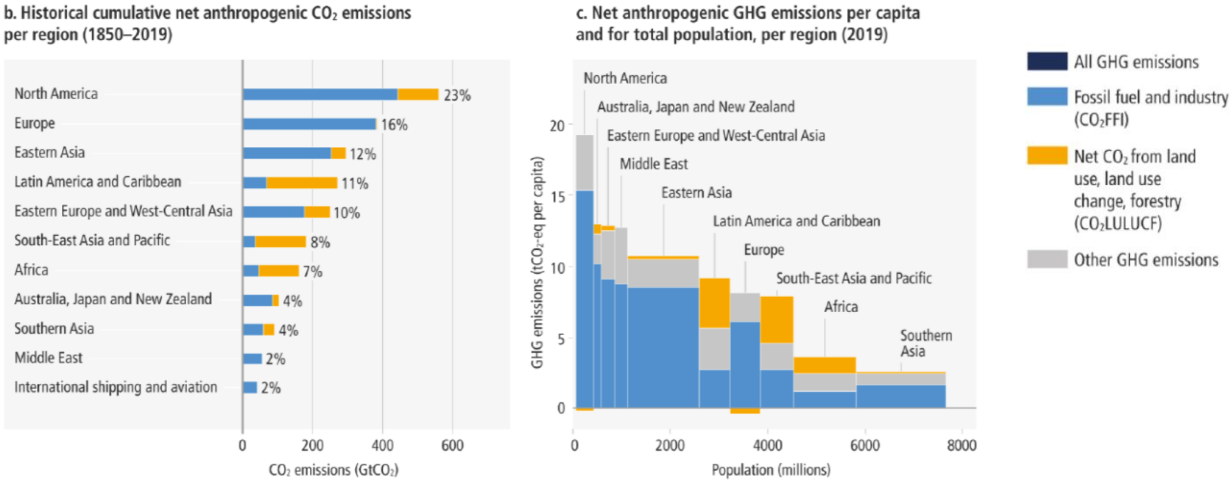

Figure 3. Historical cumulative CO2 emissions per region (1850 - 2019)

The story about the investment in Southeast Asia is similar to the GHG emissions. In Figure 4, the needed investments are 6-12 times as much, which is needed across all sectors and segments; however, an important share of those investments is in Southeast Asia's land

sector. Other regions in this category are also important, which is quite significant for Southeast Asia.

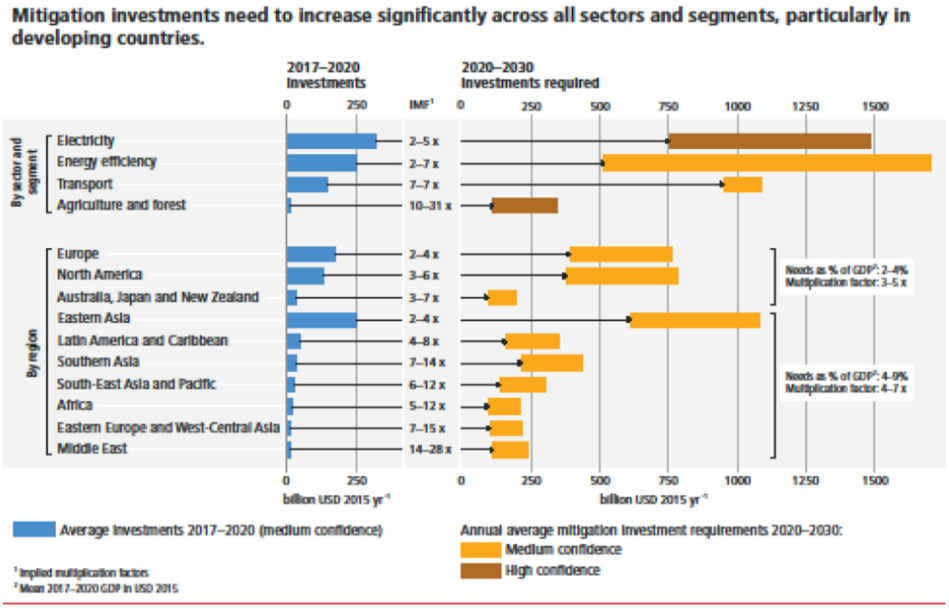

Figure 4. Mitigations need to increase significantly across all sectors and segments, particularly in developing countries

At the same time, Southeast Asia is supposed to be some of the most biodiverse-rich regions in the world with very high conservation importance, and the population density shows this. Concerning the very high number of species found nowhere else, the Southeast Asian region is extremely rich in biodiversity but also more vulnerable because of the high number of people living there. So, learning and investment in these sectors are very important now to come to some quick points about sustainable land use and biomass with climbing SDGs (Sustainable Development Goals). If the emissions are not reduced significantly enough, land remediation becomes even more important because of the long residence of CO2. However, sometimes it is often forgotten that land is where people live, and the temperatures on land are reported to be already so high. There is an opportunity for some benefits by investing in sustainable land use because, unlike the non-land measures, there is an opportunity for very active participation related to the other issues on biogas because here is a chance for very active participation in taking care of land but contributing to climate solutions as well.

Particularly in the Indonesia case study that, Su-re.co leads, the LANDMARC project will focus on agroforestry as one of the critical land mitigation options, given it creates many synergies and contributes significantly to carbon sequestration, as well as biogas and compost. So, the structure of these case studies in the different countries is similar in that there is analysis. Still, this project engages with pertinent stakeholders to understand the feasibility of the land-use mitigation options, not just the technical potential. Furthermore, this project has the opportunity to compare 16 different cases and 16 different countries. So, this project is a good international learning during a four-year project for land-use mitigations within the LANDMARC project.

3.2. Upcoming Projects (Beyond 2022)

By: Dr Takeshi Takama (CEO of Su-re.co)

3.2.1. Waste-to-Energy with Daiki Axis

Su-re.co will collaborate with Daiki Axis, an Indonesian company from Japan, on the waste-to-energy project from wastewater in Bali (Figure 5). In this project, Su-re.co will also collaborate with local universities such as Udayana and UGM (Gadjah Mada University) to utilise this technology for their energy consumption. If this technology can be applied, it can resolve wastewater and energy problems, especially in remote locations in Indonesia.

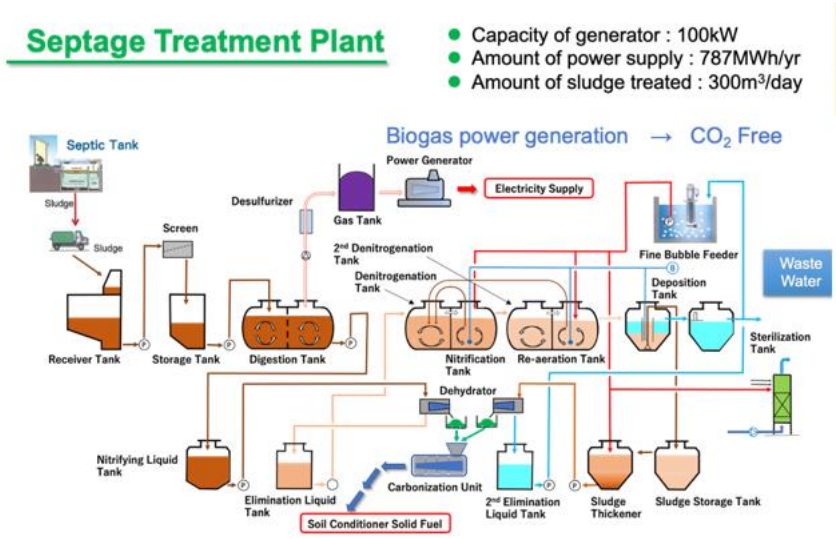

Figure 5. Waste-to-Energy Technology from Daiki Axis

3.2.2. Mount Batur – Bali: Land Reforestation with CIFOR

Furthermore, Su-re.co also has a project in Mount Batur, planned in collaboration with CIFOR (Center for International Forestry Research). This project aims to improve local forestry officials' capacity to adopt a climate-smart agroforestry approach(Figure 6). Many investors are already interested in conducting similar reforestation-related activities in this project. However, at the moment, the pilot project will be located in Bali first.

Figure 6. Reforestation Project between Su-re.co and CIFOR in Bali

IV. The importance of climate data to assess bioenergy potential

By: Jun Ichihara – JICA expert

JICA IS working on the capacity development or implementation of climate change adaptation strategies. This project is still ongoing, and Indonesian ministries or other research institutions may utilise the data on climate change projection data. This project collaborates with the BMKG and Japanese experts, and we can mainly utilise this for adaptation data. Related to the energy transition, agriculture and biomass, these future climate situations like temperature change or precipitation change can be beneficial to maintain and ensuring biomass supply. Last year, the data was obtained using a supercomputer or simulator in Japan. Technically, this data is created with high-resolution climate change data over a five-kilometre mesh. Previously, mainly Indonesia utilised 25-kilometre mesh data. One contribution from this project is better resolution data. Currently, IBM (The International Business Machines Corporation) has started sharing this data, and it can be available if some ministries would like to utilise it. Hence, if any governmental agencies in Indonesia would like to use this data, JICA would like to connect with the right agency and demonstrate.

V. Concluding Remarks

This policy dialogue is inseparable from the efforts of BAPPENAS to compile documents that will be submitted this year and next year for the preparation of the RPJMN 2025-2029 (the National Mid-term Development Plan). Also, this activity is part of preparing planning documents to make Indonesia one of the developed countries before 2045. Noteworthy, the challenges will also become even more severe, like the covid pandemic that all global communities experienced from 2020, and to achieve a developed country status or get out of the middle-income country device (5% GDP growth).

To support the Indonesian Government plans, the ongoing projects that Su-re.co and its partners (e.g., SEI, CIFOR) are working on can mainly support the government's low carbon plan programme in 2030 or 2060. For instance, su-re.co works with modellers under TIPPING+ to assess the socio-economic impacts of the policy interventions planned by the policymakers, including BAPPENAS, KESDM and PLN, in defining Net Zero Emission by 2060. Moreover, not only the energy sector but climate change

mitigations in land sectors also become crucial, given that the land temperature is reported to be above the 1.5 degrees target under the Paris Agreement. This becomes a serious problem since most people live on the land.

In the end, the upcoming policy dialogues between the Indonesian Government and Su-re.co will hopefully generate more concrete actions. With this policy dialogue, Su-re.co and its partners can contribute to providing policy input to prepare the RPJMN (2025 – 2029).

Appendix: Discussion Session

Question 1:

Moderator – Yusuf Suryanto (Directorate of Electricity, Telecommunications and Informatics, BAPPENAS)

As a start, maybe I may ask Mr Iryan, as has been conveyed the potential and maybe what we plan to do related to biogas in terms of if we try to connect with what was mentioned by Mr Takeshi biogas from animal waste, is there any best practices or lessons that the KESDM team may have experienced?

Answer:

Iryan Permana – KESDM

Regarding best practices, maybe you in KTI BAPPENAS have known for the past five years. The initiation was ten years ago, from KESDM, which has a home biogas programme (BIRU). The BIRU programme is still running, but its growth position is not as massive as it used to be. The implementation is still the same, more or less. If in the past we knew the colleagues from HIVOS who oversaw the implementation of the BIRU programme, now it has been transmitted to the local agency Yayasan Rumah Energi. Where in the past, when it was early, the issue raised was sustainability. So the programme scheme is a partial subsidy where the owner or prospective user can bear the construction costs. However, part of the subsidy is from the programme, not in cash but in kind. The programme will oversee the quality assurance of the construction, and the goods are standardised and certified.

Then the labour costs and other costs are then subsidised into the programme. The implementation side has been quite successful in the past few years. We also actually combine the DAK programme with the BIRU Programme. So when the BIRU program was appointed, when the DAK (Special Allocation Fund) appeared, and then after the DAK was based on the proposal, we collaborated between the Netherlands and the BIRU program. So when implementing the BIRU programme oversees the quality of the goods built, the quality will be controlled after the construction. Of course, this programme will continue to be monitored. Now at some points, the construction is still going well.

If in the past we saw the benefits of biogas in terms of energy, in recent years we have encouraged it in terms of economic productivity; so not only replacing energy in the household but how the products from biogas can be resold and increase the economic productivity of the community because biogas has bio-slurry. This is the reference point of the approach that we are now doing. So it is not just about energy.

We have also published a book on the success of the BIRU programme on how the programme was initiated. So the key is that we want this programme to have long sustainability. In addition, in terms of funding, it was initially from donors, and then banks came in. Lately, we have also started to tap into the CSR side. Indeed, the market is starting to be a little saturated, especially in Java, but it does not rule out the possibility of expanding to other regions. So actually, what is currently an obstacle is the programme part because the funding ability is also increasingly limited, coupled with the pandemic conditions. We are still looking for alternative funding to continue developing biogas. It is especially hoped that the DAK programme can run again. Because when DAK stopped, it also became an obstacle in the BIRU programme. Hopefully, if the DAK is re-enacted, we can synergise it again because when the DAK stopped, it was just when biogas development began to increase to synergise with the BIRU program. Maybe that is all from me regarding best practices.

Question 2:

Moderator – Yusuf Suryanto (Directorate of Electricity, Telecommunications and Informatics, BAPPENAS)

Are there best practices of biogas for power generation for scaling up as well as economic benefits, feedstocks, and benchmarks of supply and demand that can work together?

Answer:

1) **Iryan - KESDM**

Regarding power generation from biogas, as already mentioned, the first one that has done PPA with PLN and as excess power in IPP. Most biogas for electricity is in Sumatra and Kalimantan based on POME (Palm Oil Mill Effluent) waste.

As Mr Rachmat mentioned, there is a unit in Semangke, South Sumatra. We also have the first biogas-to-electricity IPP in Belitung. This unit is also based on palm oil waste. The scale ranges from 5-10 MW, and the average is 5 MW based on the economics of scale for palm oil waste-based.

Indeed, the two sides of the challenge are that now the condition of the electricity supply is still a lot and even oversupply. PLN already has a plan related to biogas to electricity, but it is not as big as the others. Although in terms of prices, everything came out of the new Presidential Decree yesterday, we agree with biogas for power generation. However, the process will be long if done through a business mechanism. As I explained earlier, we also need to look at other options when we can utilise the gas for upgrading.

2) **Takeshi - Su-re.co**

We agree that biogas can become electricity. However, we also need to look at the other side that still around 20-30% of Indonesian people use firewood for cooking. Using biogas for cooking can ease the burden on the country, considering LPG needs to be imported and subsidised with huge funds. Then related to the electricity sector, the electrification ratio has almost reached 100% in Indonesia, but in some locations, there is still no electricity or using diesel. For example, in remote locations. These locations generally do not have waste management facilities as well as in farmer areas. We also think that if wastewater management technology can be utilised to obtain electricity, farmers can obtain a source of clean water. So I think this kind of technology is quite good in providing three solutions to the energy, waste management, and clean water issues.

Question 3:

Zulfan - Directorate General of New Renewable Energy and Energy Conservation (EBTKE), KESDM

I have a question for Francis. Previously, you mentioned that we had surpassed the 1.5 degrees Celsius temperature in climate change. I wonder how much we surpass the temperature because we have observed the impacts like the drought in Europe and China. The iceberg is melting and, of course, gets worse. However, you are concentrating on 16 countries in your project. Can you elaborate more on how much or how big the increase of 1.5 degrees Celsius is on land?

Answer:

Francis - SEI

The average temperature over land, the figure used for the UNFCCC, is the average temperature over all land and ocean, and land cover 75% of the earth. That is why there is a significant difference between the same average. I think it is more than 1.5, but what is more important than the average is the fact that you know, as I was saying, that people live on the land. We do not live on the oceans, except in some Island states, but 98% of the population lives on the land. The higher temperatures on land mean more severe conditions in many parts of the world and more severe weather events in semi-arid areas regions, more droughts and so forth. So the average is perhaps not that important except that these extreme effects will get worse as the temperature rises, and since we live on the land, we will be feeling them even more.

Question 4

Fabian - Su-re.co

I want to ask a question related to step number 6, mentioned by Mr Iryan, to facilitate investment for biogas development. I have a question. Last week we organised a discussion on this topic. We invited Mr Joko from KLHK, Mr Nur from the Ministry of Finance, Mr Qatro from KESDM and Mr Wayan from BRIN (National Research and Innovation Agency). One of the most important points is the implication of 2021, where Indonesia restricts international carbon market trading to be diverted to domestic trading in the carbon market in Indonesia because it is to claim emission reduction in the country. However, for household-scale biogas, the benefit still has more value, not only in emission reduction. If the price in the domestic market only reflects the emission reduction, it is quite low and may not help increase the number of installations of this biogas. We need to realise that biogas still has many other benefits that might have been explained as well related to reducing or reducing the use of LPG, which may not be reflected in the price. This is my question: can the government plan other investment solutions or mechanisms to encourage the development of this biogas and also for household scale biogas? Thank you.

Answer:

Iryan - KESDM

Regarding biogas to be marketed domestically, the mechanism does not yet exist and even those that have been running usually use international mechanisms, for example, in the BIRU programme itself. They use the Gold Standard, although the emission reduction is not included in the state contribution. Indeed, if we talk about the benefits of biogas, there is quite a lot. Then on the investment side, we hope the government encourages this programme. When talking about small-scale biogas, the benefits in terms of unit costs are also not large enough. However, we hope that the vector is actually in the form of a supply chain not only in terms of the construction of goods but how to empower the community, starting from their ability to build and manage to what I said earlier, how do we increase the selling value or productivity of the biogas by-products, which is the main thing that is interesting so that it not only replaces energy but grows the cement economy. At the same time, because the carbon mechanism for biogas is also not yet nationally, maybe that is a brief answer.

Comment:

Ir. Thomas **Nifinluri, M.Sc - Director of Strategic Policy Centre, KLHK**

Thank you because I think the forestry sector, especially farmers who live and settle in and around forests (agrosilvopasture), is indeed very close to the use of biogas which is related to the task of one

of the innovations in the framework of fostering rather than using firewood. I think this is important because, in practice or best practices for agroforestry, we are familiar with agropasture, where these farmer friends also utilise large and medium livestock to utilise the manure from the livestock as biogas fuel. Incidentally, we also have a cooperation project in West Kalimantan with ITTO (International Tropical Timber Organization). If I am not mistaken, this is also one of the projects where community groups utilise manure from pigs and cattle to be used in areas around the forest. This model needs to be replicated and developed in several other areas to encourage the use of a biogas-based approach.

As mentioned earlier by a colleague from KESDM, there is a need for cross-sectoral cooperation, such as the DEN forum, to discuss accelerating the transition of the renewable energy mix in the ministry's report. So we strongly support this with national energy that can collaborate with other churches to report activities related to accelerating the renewable energy mix in each sector. These activities can also be included as one of the types of new renewable energy that can be encouraged better. The Ministry of Agriculture also we have the 2020-2024 strategic plan (RENSTRA) target by KLHK and in the context of the national general energy plan (RUEN), which is united by matters related to other sectors in developing biogas energy from the production forest that was mentioned earlier.

We also have activities in the forest area of 100,000 hectares to implement biogas in agroforestry areas, but until now, there are only 18 units that only cover 120 ha. Indeed, it has only reached 30 to 40 per cent, but this continues to be encouraged. Then also related to electrical energy and waste utilisation, which is also very relevant to us in KLHK. These activities are expected to accelerate the clean energy mix target according to the RPJMN target in 2024 and later in the RPJMN 2025-2029, which can include clean energy transition, renewable energy, biomass, geothermal, and solar PV.