Just energy transitions and coal bed methane: the case of Indonesia.

SUMARNO, T.B.

2021

Chapter 1
Introduction

1.1 Introduction

This chapter provides an overview and the background context of the book. The focus is on the energy transition in Indonesia from an energy justice perspective and exploring the contribution of Coal Bed Methane (CBM) to Indonesia's National Energy Policy (NEP) and the Indonesian energy mix. Also explored is the incentivisation schemes through taxation policy that are applied to develop energy technology (in terms of CBM) in Indonesia, the U.S. and Australia. A recurrent theme throughout the book is that within the transition process to a low-carbon economy, it is important to consider that justice is present and where the benefit and impacts of the energy sector are distributed equally to society.

As one of the most populated countries in South East Asia (SEA), Indonesia accounts for around 40% of the total population in SEA, and hence the development of a cleaner energy movement in Indonesia becomes really significant. Indonesia is the world's fourth most populous country with a current population of 274 million people in 2020 (United Nations, 2020) and is forecasted to increase to 331 million people in 2050 (Indonesia Population, Worldometer, 2020). This increase in population and growth in the economy will increase energy demand in Indonesia. Indonesia is now classified as an upper middle income country (World Bank, 2020a) and has the biggest economy in SEA (World Bank, 2020b). Indonesia is also the world's biggest island country consisting of 17,508 islands, around 6,000 of which are inhabited. Any success in the country's energy development plan will contribute to the rest of the region and also could act as a guide for neighbouring countries and other countries with similar contexts and challenges.

This book gives a new perspective on the energy sector, especially on CBM and its role in the energy transition in Indonesia. Further, this book will also add to the literature on the energy transition as seen from the role of the fossil fuel perspective, which in this case is CBM. By bringing new perspectives to advance the energy transition in Indonesia and that together with other energy sources, it is hoped that this book will lead to energy sustainability, providing readers with an understanding of the key issues around CBM project development in general and its role in a just transition to the low-carbon economy in Indonesia and beyond. For resource-rich (in particular for CBM) developing and emerging countries that are moving towards the low-carbon economy, this book also seeks to provide readers with food for thought for their transition strategy.

1.2 Overview on Indonesia's Energy Sector

According to the National Energy Council of the Republic of Indonesia (2020), Indonesian's energy demand is going to be dominated by three different sectors until 2050: industry; transportation; and households. Industry and households mainly use coal and gas as their energy sources, while transportation uses fossil fuel. According to Indonesian President

Regulation No.22/2017 (General Plan of National Energy), industry is estimated to use 48% of total final energy while transportation and household are estimated to use 30% and 15%, respectively, of total final energy by 2025. Assuming economic growth is 7.3% in 2050, these three sectors will still be the main users of the total energy being produced with lower percentages compared to the 2025 energy demand mix, which are 46%, 26%, and 14% for industry, transportation and household, respectively.

That being said, fossil fuels remain the main energy sources in 2025: oil (25%), gas (22%) and coal (30%). However, Indonesia has a general plan for Renewable Energy (RE) development, with a target of a 23% share of RE in the energy mix by 2025. This energy mix will evolve and is estimated to change by increasing the usage of RE to 31% in 2050, and reducing the usage of fossil fuels, especially coal to 25% in 2050 and oil to 20%, while gas usage is estimated to increase to 24%. Increasing RE and decreasing fossil fuel usage is expected to increase Greenhouse Gas (GHG) emission reduction from 34.8% in 2025 to 58.3% in 2050. A review of the NEP achievement, published during the 4th quarter of 2020 and the NRE 23% in 2025 is far from the current achievement. Indonesia has only achieved 9.5% NRE since 2015, meaning that in 5 years' time, Indonesia must add more to the equation, i.e. 13.5% RE to its energy mix (National Energy Council, 2020). CBM is known as a new energy technology in Indonesia, therefore it can contribute to reducing carbon dioxide emissions through reducing a reliance on coal in Indonesia.

According to the NEP (Government Regulation No. 79/2014), CBM was envisaged to play a very minor role in the national energy mix by 2025. Bachtiar (2018) has noted that the Government of Indonesia (GoI) does not seem to be intentionally developing the CBM industry regardless of their effort all the way back in 2010 when they first tried attracting investors to develop CBM in the country.

Indonesia's CBM resources are located in the archipelago basins with total potential CBM resources of 453 Tcf (Wood Mackenzie, 2015; CBM Asia, 2016; Stevens et al., 2001; Stevens and Hadiyanto, 2004). 85% of these basins contain lignite to sub-bituminous (low-rank coal), and 15% is bituminous to anthracite (low-rank coal) (Flores, 2014: 568). CBM operators initially believed that Indonesian CBM was not a prospective resource due to its rank & low quality until the success of the Powder River Basin (PRB), the largest coal bed basin in the US (Stevens and Hadiyanto, 2004). The sub-bituminous coal has similarities with the PRB in terms of coal thickness, coal rank, areal extent and gas adsorption capacity (Flores, 2014). Moreover, the Miocene coal deposits in Indonesia have a thicker, deeper, and higher rank of coal than the PRB does (Stevens and Hadiyanto, 2004), and therefore Indonesia is expected to have far better resources.

The first seven CBM projects were awarded in 2008 under Production Sharing Contract (PSC) arrangements. This CBM PSC applies the same terms and regulation with PSC for natural gas, the only difference being the split of its CBM, which is 55:45, whereas for natural gas the split is 70:30, for government and investor, respectively. The number of CBM projects increased to 54 contracts in 2012, but these numbers decreased by 2018 to just 30 contracts (SKKMigas, 2018) with no CBM production. This highlighted the point that there is more to a

successful energy sector than just geological conditions. What also matters is the taxation system which plays a significant role in any energy resource development (Collier, 2010).

1.3 The Non-OECD vs OECD Countries' Fiscal Regimes and The Importance of Fiscal Incentives

According to Collier (2010), for low-income resource-rich countries (such as Indonesia), resources discovery is likely to be far more critical than in high-income resource-rich countries. In some low-income resource-rich countries, there are bountiful resources that have not been discovered. The reason is in part due to country-specific fiscal regime arrangements that do not provide sufficiently attractive incentives to discover the resources in the first place (Collier, 2010). Vivoda (2017) has argued that resource-rich countries with high grade deposits attract investment more easily. From the investors' perspective, those who are risk-taking juniors, will aim to invest in areas that have good prospects regardless of risks. However, when it comes to investment decision making, they will balance the prospects against risk criteria (Vivoda, 2017). According to some, geology is the most influential factor that determines countries' investment attractiveness, while regulatory and fiscal are the fourth and fifth most influential factors (Johnson, 1990; Otto, 1992; O'Neill, 1993; Morisset, 1999; Morgan, 2002; Kasatuka and Minnitt, 2006; Tienhaara, 2006; Penney et al., 2007; Tole and Koop, 2010). However, Collier (2010) mentioned that in order to manage the resources successfully, there is a second aspect considered equally as important as the discovery of the resources, which is the design of appropriate fiscal regimes. The quality of the hydrocarbons, the amount discovered, the location of the reservoir and its proximity to consumer markets are known as the main factors that determine a commercial discovery (Sigam and Garcia, 2012).

Many developing economies use tax incentives to attract both domestic and foreign investment, as for them, the revenue generated from natural resources are often their primary source of revenue (Redhead, 2018; IMF, 2015). The extractive industries are significant for many developing countries to grow their economy (United Nations, 2017; Sigam and Garcia, 2012). For many resource-rich developing countries, revenues generated from extractive industries are often the major sources of revenue (Redhead, 2018). The government should create a balance or sustain a supportive environment for substantial investment with the country's needs, such as revenue that can be used to support their development (United Nations, 2017). Some developing economies may be more concerned to show that the one who exploits resources should be the nation rather than foreign companies (Calder, 2014). Meanwhile, in the OECD countries, it is common to have privately-owned companies carry out natural resource operations (Calder, 2014). However, Kasatuka and Minnit (2006) found that there were some non-commercial risks that deterred foreign investment in resource-rich countries, including government instability, poor socio-economic conditions, corruption.

In contrast to developed economies, significant revenues generated from extractive industries in developing economies can often lead to poor governance. Therefore, the implementation of a contractual agreement and state participation is significant (Calder, 2014). Calder (2014) also wrote that many developing economies imposed corporate income tax as

well as output-based royalties, and countries may also impose additional taxes to obtain a higher share of the revenue. In consequence, countries end up creating a fiscal regime that is not easy to administer as they imposed graduated royalties to obtain higher shares yet still imposed an income tax. It has become a challenge to administer fiscal regimes applied to many different varieties of resources. Therefore, it is known that many developing economies have no one size fits all fiscal regime (Calder, 2014; United Nations, 2017). Designing appropriate fiscal regimes which provides sufficient revenue for the country while also providing enough encouragement to invest is vital, as well as the necessary supportive legal and policy framework (Redhead, 2018; Calder, 2014; IMF, 2012; Sigam and Garcia, 2012). This becomes the main task for policymakers (Redhead, 2018; Calder, 2014; IMF, 2012). Meanwhile, fiscal decentralisation is more common in developed economies, such as in the U.S. and Australia with federal government structures (Calder, 2014).

1.4 Discussions on CBM PSC in Indonesia, The U.S. Royalty/Tax System, and the Australian Petroleum Resource Rent Tax

1.4.1 CBM PSC in Indonesia

There have been three generations of CBM fiscal regime since the first CBM block was awarded in 2008. The oldest generation of CBM PSC was implemented only from 2008 – 2009. The second generation was net PSC with different terms on production split before POD, and the last generation is the Gross Split PSC implemented since January 2017.

Indonesia has been exploring for unconventional hydrocarbon since 2008. Sukhyar and Fakhruddin (2013) stated that Indonesia has identified 128 sedimentary basins, and that most of the basins are indicated to contain unconventional hydrocarbons (shale oil and gas and CBM). Indonesia has one of the world's largest CBM resources (Len, 2014). The first CBM PSC contract was signed in 2008, and up to 2016 there were 54 CBM PSCs which had been signed (PriceWaterhouseCoopers, 2014; National Exploration Committee, 2015; Bowe and Moore, 2015). Indonesia set a regulation to improve CBM development activities, namely MoEMR Regulation No. 36/2008. This regulation was expected to attract new investors on CBM (PriceWaterhouseCoopers, 2016). There are two PSC generations on CBM; the first generation was those signed in between 2008 and May 2009. The difference between the first generation and the second generation was the treatment for production before POD and the cost recovery. The first CBM PSC had 90% cost recovery, and the GoI owned the production before the POD. In the second CBM PSC, the cost recovery was 100%, and the contractor could sell the production before POD and share it based on the split in the contract. During this period, the cost was not yet recovered (PriceWaterhouseCoopers, 2016)

The MoEMR established a regulation for CBM, Ministry Regulation No. 36/ 2008. This regulated CBM activities, covering the licensing process and sharing facilities in the activities. Chapter 8 article 31 of the regulation stipulated that CBM was one of Indonesia's potential strategic resources to fulfil domestic needs. An optimised development would, therefore, be required for CBM. The CBM contract could be publicly tendered or a direct offer by the joint study or joint evaluation.

In late 2015, the MoEMR published a new regulation for CBM acceleration, Ministry Regulation No. 38/2015, regulating the options of the fiscal system for CBM as a result of discussions between the GoI and the CBM contractors. The first option was the Net PSC. Similar to the PSC, this applied to conventional hydrocarbons with modified shares of 55:45 (GoI: CBM contractors) to attract prospective CBM investors. Adding favourable long term CBM prospects to Indonesian (Len, 2014), these modified shares attracted many CBM investors.

The current CBM contractors have faced many challenges very much related to PSC implementation. Therefore, the two other options were designed as a response to the problems and challenges faced by the contractors. The second option was the Net PSC Sliding Scale proposed by SKKMigas. The difference here was in the implementation of the Sliding Scale system on First Tranche Petroleum (FTP) and the production split after cost recovery. The third option was a non-cost recovery Gross PSC sliding scale proposed by the CBM investors.

Based on research on fiscal regimes in some CBM countries around the world, Chakhmakhchev and Fryklund (2008) found that Indonesia was predicted to meet difficulties in developing the CBM industry with its current fiscal regime. The fiscal system currently applied to CBM in Indonesia does not support the development of the industry. Favourable geological conditions are insufficient to develop the industry. Other things have to be appropriately set up to support the development of the industry, such as the fiscal system, regulation, as well as infrastructure (Sigam and Garcia, 2012; IMF, 2012; Redhead, 2018).

Having oil and gas businesses with PSC as a system requires the players to comply with regulations attached to the PSC to allow them to recover their costs, and any unexpected costs that are not eligible for cost recovery (e.g. any costs that are not approved by the GoI as part of their activities budget) may distort the project value (Metters, 2014). In the PSC implementation, investors operate the business activities at their own sole risks, and only when they start producing the hydrocarbons do they start to share their risks with the government via the cost recovery mechanism (Metters, 2014). In the third generation PSC (after 2010), investors were no longer able to transfer any cost in a dry hole field to the production field due to the ring-fence policy (Metters, 2014). According to Metters (2014), cost recovery is a control mechanism by the GoI on the development of their resources which were carried by investors. Hence, cost recovery is not a right for investors, rather a result of investors complying with the regulations in conducting their business in Indonesia.

Indonesia started its first CBM project in 2008 and applied the conventional PSC to CBM. CBM development in Indonesia was expected to increase both gas reserves and increase the use of environmentally friendly sources of energy and employment (Makmun & Sitepu, 2012). One of the most important aspects in developing CBM projects in Indonesia is designing an economic scheme to govern the shares between the GoI and investors (Lalean, 2008). Four years later, CBM players had become fully aware that the business models applied to CBM were completely different from the business models of conventional oil and gas (Lalean, 2012). CBM required more flexibility to accommodate the dynamics of the CBM operations, and the initial CBM PSC applied in Indonesia was considered unattractive (Lalean, 2012; Makmun & Sitepu, 2012). A CBM project in Indonesia is classified as a marginal project. Hence a

supportive regulation and fiscal system has become significant for CBM development (Makmun & Sitepu, 2012).

Furthermore, the CBM business model cannot simply be adopted from conventional oil and gas models. CBM capital expenditures and operating expenditures in each CBM field can be different from one to the other (Lalean, 2008). According to Lalean (2010), the government should develop a supportive policy to improve CBM investment. Kusumah and Munawar (2015) noticed that CBM development in Indonesia has been slowing down since 2015, highlighting that it would be hard to develop a greenfield project[1] even with huge resources (in the case of a CBM project) with the initial CBM PSC since a CBM project is capital intensive, especially at the initial stage (Kusumah & Munawar, 2015). Not only is a huge investment fundamental for CBM to kick off, it also requires land access which is one of the challenges facing CBM development in Indonesia (Kusumah & Munawar, 2015). However, if the CBM project is a brownfield project,[2] it still can be economically viable using the initial CBM PSC with conditions where there is full integration with a conventional project, and there is flexibility on its regulation that allow this to happen (Kusumah & Munawar, 2015). Incentives on tax to the CBM industry in the U.S. is one of the key factors of CBM development success there (Chakhmachev and Fryklund, 2008). CBM projects in Indonesia require high gas prices as well as supportive fiscal mechanisms (Makmun & Sitepu, 2012). Lalean (2012) stated that Indonesia must re-engineer the operating principles and procedures for the CBM industry, and the GoI must recreate a new fiscal system applied to CBM (Lalean, 2012). According to Len (2014), the GoI should consider a new administration system that enables greater cost-effectiveness and project flexibility. These can be done by addressing the licensing and fiscal regimes, as well as the regulatory and bureaucratic constraints, and procurement restriction (PTK 007) in CBM activities (Len, 2014). Makmun & Sitepu (2012) stated that the next step after improving the regulation would be to develop an effective fiscal system for the industry.

This book later will discuss comprehensively in the Chapter 6 the implementation of CBM PSC in Indonesia and provide more evidence of the importance of the efficient and effective fiscal system to support the CBM industry in Indonesia by looking at the U.S. Royalty Tax System and the Australian Petroleum Resource Rent Tax System. Therefore, discussion on how the U.S. and Australia implemented their fiscal policy, including incentives for CBM, are discussed in the following subsections.

1.4.2 The U.S. Royalty/Tax System applied to the CBM industry

The implementation of the royalty/tax system in the U.S. is somewhat different depending on whether implemented at the State or Federal jurisdiction. For example, in terms of tax parameters, among major oil-producing states, tax structures vary considerably, and tax bases interact differently between the State and Federal level (Kunce et al., 2003). These differences can be found in the treatment of royalty payments, incentives on exemptions and credits against tax liabilities in a specific condition (Kunce et al., 2003).

[1] Greenfield project means the project does not follow any previous project, in other word, the project requires new facilities to kick-off (Bayar, 2017)

[2] Brownfield project means the project utilises existing facilities, or sharing facilities with other project. (Bayar, 2017)

Royalty paid to the Federal Government as a result of oil and gas production on Federal land contributes significantly to Federal Government revenues. However, 20% of this revenue is usually transferred to the State Governments for funding their public services (Bank & Kuuskraa, 2006). In the State of Wyoming, for example, state royalties and production tax income have become important sources of State revenue and public service development (Bank & Kuuskara, 2006).

One of the taxes in Wyoming State's fiscal regime for CBM is severance tax. According to the model by Kunce et al. (2003), increasing severance tax can decrease production in two ways. First, increasing severance tax will reduce the future net-of-tax profits, which in turn limits the exploration incentives and eventually reduces exploration activities. Fewer exploration activities leads to less additional reserves being discovered, which then increases exploration costs, and finally decreases the production costs. Second, if the exploration effort is constant, increasing severance tax will reduce the net profit, and at some point, it will reach marginal production, and eventually will cease the production. They also stated that in the case of increasing the severance tax in Wyoming, this only reduced production by less than 6% over a forty-year period; hence, overall the State will increase their revenue from severance tax (Kunce et al., 2003).

CBM development (PRB) in Wyoming has grown dramatically since the late 1990s, which contributed significantly to the State government and its counties' income from taxes and royalties (Mackinnon and Fox, 2006). The CBM industry has brought impacts to the economy of Wyoming. Not only has it contributed to State revenues (i.e. severance tax), it also increased the employment rate in Wyoming (Waeckerlin, 2005). It was expected to create approximately 7,000 new jobs in 2006. In that time, the CBM development brought improvements to their public programs, such as education and health care (Waeckerlin, 2005). A report by Anderson ZurMuechlen and Co. (2001) revealed that there has been multiplier effects on CBM development in the PRB. CBM development also increased the revenue of the government from the perspective of employee's wages and benefits. Thus, it can be stated that new jobs, new income sources and new revenue for the government are the results of CBM development in the PRB (Bryner, 2002; Hulme, 2002; Mudd, 2012). These do however have multiplier impacts on society, such as the increase in demand on public services and increasing environmental impacts including traffic, air pollution, and noise (Byrner, 2002; Hulme, 2002).

Having such a huge contribution to both Federal and State Governments, the U.S. Federal Government has supported and offered incentives for CBM development activities. One of the incentives given at the national level is tax credits for unconventional technologies used for extracting oil and gas. In addition, the Federal Government provided research support for CBM development through the Department of Energy and land access to Federal land for CBM development (Skov & Myers, 2004). The Wyoming legislature urged the state agencies to speed up the permit issuance process for CBM production (Skov & Myers, 2004).

As mentioned above, as a multiplier effect of CBM development, it also results in environmental impacts to the State. There is a significant body of literature that has raised concerns about the resultant impacts on water quality and quantity. Fracking and dewatering are the two main activities that are most likely to impact water (Bryner, 2002; Waeckerlin,

2005; Hulme, 2002; Skov & Myers, 2004; Mackinnon & Fox, 2006; Mudd, 2012). This literature states that the dewatering process could lead to diminished underground water supplies, and there is a risk of groundwater being polluted when discharging the water. There may be circumstances where the environment is unable to handle a large amount of water being disposed of as a result of the dewatering process in CBM development. Bryner (2002) and Hulme (2002) added that more environmental disturbances such as noise, air pollution, increasing traffic, congestion and issues with other land uses can also happen as a result of CBM development.

Hulme (2002) also mentioned that air pollution was one of the impacts of CBM activities directly related to health conditions experienced in CBM areas. In addition, there is also a concern for wildlife habitat as there is an increase in human contact in the occupied areas. These impacts have been mitigated by some governments (such as The State of Wyoming) since CBM has significantly contributed to economic growth and its national energy production (Mudd, 2012). Likewise, the Government State of Colorado has established mitigation rules and the requirement, for example, for surface mitigation, is also required for CBM players to install electric motors to reduce noise levels (Bryner, 2002).

Therefore, while there are many positive contributions to the States, CBM development also has created additional challenges to the government. There has been significant population growth in the areas where CBM developments are located (Hulme, 2002; Bryner, 2002). This then becomes a challenge for the government since they have to further develop public facilities including growing demand for housing, water, sewer, education, health care services and refuse disposal. More funds are required to be allocated to face these challenges. As a result, CBM development in these states has allowed the government to spend more fund for education (i.e. school facility improvement) (Hulme, 2002).

1.4.3 Discussion on the Petroleum Resource Rent Tax System

The CBM industry in Australia (CBM is sometimes also called 'coal seam gas') is also known to have contributed to economic and regional development in Australia (i.e. increases household income, GDP, government revenue), and increased numerous employment opportunities for the relevant community (Cully, 2015). As in the PRB, the Australian Government has attempted to achieve a balance between maximising the benefits of the industry and managing the environmental risks (Letts, 2012).

The fiscal arrangements in Australia were considered to be among the most competitive fiscal arrangements worldwide (Australian Government Geoscience Australia, 2015). There had been a long process of development and the Australian Government eventually decided upon the Petroleum Resource Rent Tax (PRRT) for their petroleum industry. Theory on the economic rent of mineral resources had been known since 1914 via Lewi Gray, but the theory on taxing the economic rent was only written in 1948 by E Cary Brown, which then became known as the Brown tax (Mooij and Klemm, 2021). The brown tax approach looked at project cash flow, the cash inflows and cash outflows. In the case of negative cash inflows (including initial capital investment), the government paid at a certain tax rate to the negative cash flows to the investor.

In 1975, Garnaut and Clunies Ross introduced the Resource Rent Tax (RRT), which applied in the variance of the implementation of the Brown Tax. In this variance, the government no longer contributed to the negative cash flow at a certain tax rate. Instead, the investor was allowed to carry forward the loss into the future with interest. The Australian PRRT is based on Garnaut and Clunies Ross's (1975) RRT regardless of the concerns on neutrality and the efficiency test.

The PRRT was initially designed for oil projects, but it has subsequently been applied for LNG projects more recently in Australia, which currently dominates the industry (Callaghan, 2017). PRRT was designed to evade the practical disadvantages of cash flow taxation. Unlike the Brown Tax, the PRRT only taxed positive cash flow and not negative cash flows. It applied to a return after all costs deduction (exploration, development and production costs). It is very much a way of taxing the profitability of a petroleum project, while the tax losses are carried forward to the future and offset against positive cash flow. Therefore in 1988, the Australian Government introduced the PRRT as they also saw that the PRRT was a more efficient and reasonable fiscal regime for the petroleum industry (Australian Government, 2016). However, there was a reduction in PRRT revenue from 2002/03 to 2015/2016 which then led the Australian Government to announce a Federal review of the PRRT and related resource taxes in late 2016 (Kraal, 2017). The review would provide an assessment of PRRT implementation, considering justice and equitable benefits to the Australian community from the industry without discouraging investments (Callaghan, 2017; Kraal, 2017). Callaghan (2017) wrote in the Final Review in 2017 that the decreased revenue on PRRT was due to the decline of the production in mature projects, oil and gas price fluctuations, and increases in the deductible expenditures from new projects' large investment and transferable exploration expenditure between companies under the same group. While the PRRT revenue decreased, the LNG production increased. However, this does not indicate that the Australian community is not receiving equitable benefits from the projects (Callaghan, 2017).

The Australian Government published a report on 'Petroleum Resource Rent Tax Review' in 2017 by Mike Callaghan. A media report released by Frydenberg in late 2018 on the government's responses to the Callaghan PRRT review, stated that the review found that "*changes should be made to PRRT arrangements to make them more compatible with the developments that have taken place in the Australian oil and gas industry*" (Frydenberg, 2018). The PRRT was still the preferred way to provide equitable benefits to the Australian community and still attract the necessary investment. The changes were introduced in July 2019[3] as follows:

- **Lower uplift rates**: The uplift rate on exploration expenditure will be reduced from Long Term Bond Rate (LTBR)+15 percentage points to LTBR+5. All existing investments will be respected.
- **Onshore projects removed from the PRRT regime (include CBM)**: There has been no PRRT revenue generated since it was first implemented, and this is expected to remain unchanged while it has been used to transfer exploration expenditures to

[3] The changes are not being adopted in this discussion.
Treasury Laws Amendment (2019 Petroleum Resource Rent Tax Reforms No. 1) Act 2019.

profitable offshore projects and to reduce the PRRT payable. Therefore, this change is expected to strengthen its integrity while simplifying the system.

- **Review of Gas Transfer Pricing Regulations**:[4] The Treasury commenced a review on this regulation and requested thoughts from industry and communities to contribute to the process of the review.

The three fiscal regimes in the comparison countries, including the technical aspects of CBM, have been discussed. Understanding the technical point of view will provide background on how technical issues impact the fiscal regime (this will be discussed further in Chapter 4)

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1.5 Energy Transition and Energy Justice

The energy transition is a pathway toward transformation of the global energy sector from fossil-based to zero-carbon (IRENA, 2020). Energy transition refers to the global energy sector's shift from fossil-based systems of energy production and consumption; and this includes oil, natural gas and coal to RE sources such as wind and solar (S&P Global, 2020). The global movement of the energy transition is to support the Paris Agreement that has been signed and ratified by 195 countries. The Paris Agreement is an agreement within the United Nations Framework Convention on Climate Change (UNFCCC) with the main aim as to strengthen the global response to the threat of climate change. The Paris Agreement encourages and drives countries to keep the global temperature rises below 2 degrees Celsius and push further efforts to limit the temperature increase to 1.5 degrees Celsius (United Nations, 2020). This movement has raised concerns of justice scholars, in particular on the justice issues in the process of transitioning.

Energy injustices cause and contribute significantly to global inequality as the sector is prone to corruption, taxation issues, environmental damage, GHG emissions, financial issues, and so on (Jenkins et al., 2016). Jenkins et al. (2016) summarised the global energy challenges as being created by resource scarcity and population growth in an increasingly unpredictable social and environmental climate. They further explored specific energy justice issues and identified them as related to distributional, recognition, and procedural justice. They define distributional justice as the location in which energy injustices happen in the world. For example, the location of coal mining activities where trucks are the means of transport raised justice concerns among nearby communities, for example in Kalimantan, Indonesia (Sumarno, 2020). Recognition-based justice is very much related to sections/groups of society that are ignored/misrepresented in the energy movement (Jenkins et al., 2016). According to Schlosberg (2003), recognition justice aims to fairly represent individuals and free them from any physical threats and offer them complete and equal political rights. Procedural justice is more related to involving communities into the decision-making process, in which policymakers are the main players in the process (Jenkins et al., 2016).

[4] Twenty-one (21) submissions on the review of Gas Transfer Pricing Regulations were received from expected parties, industry and community (2019) : https://treasury.gov.au/consultation/c2019-t364690

A theory on the just energy transition by Heffron and McCauley (2018) sets out that any efforts moving towards a low-carbon economy must be done in a "just" way for environment and society, and this is what this book focuses on. Further, this book reveals issues regarding CBM development in Indonesia which emphasise the concept of energy trilemma (Heffron et. al., 2018). The energy trilemma in Indonesia covers energy and environmental sustainability, energy security, and energy affordability. Heffron and McCauley (2017) discussed further on restorative justice in the energy sector. Restorative justice is primarily used in criminal law. Instead of focusing on punishing the offender, restorative justice aims to repair the harm done to people and/or society/nature. Decision-making would be made taken into consideration the potential harm and the true cost of that decision if restorative justice were applied to the energy sector (Heffron and McCauley, 2017). McCauley et al. (2019) stated that their energy justice framework consisted of four elements added with restorative justice: (1) distributional justice; (2) procedural justice; (3) cosmopolitan justice; and (4) recognition justice.

The energy sector is one of the most significant sectors in the world. The importance of managing supply and demand is clear; not only in terms of economics, this sector has significant impacts on society (welfare), environment, health, infrastructure, policy, and many others. Therefore, energy justice is undoubtedly required in each energy decision and movement, including in the transitioning process from fossil fuels to the full widescale development of a just transition to a low-carbon economy.

1.6 Chapters overview

This book discusses the role of CBM in accelerating the energy transition process in Indonesia. With the aim to look at societal issues, this book also brings an overview on how to re-attract investment to CBM projects. The societal issues can bring significant impact to both the local community as well as the entire nations (Hulme, 2002; Bryner, 2002; Mudd, 2012; Letts, 2012). By bringing new perspectives to advance the energy transition in Indonesia, together with other energy sources, will lead to energy sustainability. Further, this book provides the reader with an understanding of the key issues around CBM project development in general and its role in the just transition to a low-carbon economy in Indonesia and beyond.

This book has seven chapters which provide a comprehensive analysis of the Indonesian energy transition movement highlighting how CBM could contribute to Indonesia's energy transition goals.

Chapter 1: Introduction

This chapter provides an overview and context of the book itself, i.e. an overview of Indonesia, energy transition, energy justice, CBM, and taxation, by discussing the aims of the book in terms of the energy transition movement particularly for developing and emerging economies.

Chapter 2: Coal Bed Methane & Energy Transition in Indonesia

This chapter covers CBM development in Indonesia a decade on since it started in 2008 and the movement of the country towards a low-carbon economy. This chapter will argue that CBM

is known to be a cleaner energy source compared to other fossil fuel such as coal (Bryner, 2002; Letts, 2012; Flores, 2014), and coal has been the main fuel for power generation in Indonesia. In 2019, coal power plants accounted for 60% of total electricity generated (National Electricity General Plan Republic of Indonesia, 2019). Indonesia has developed its electricity road map towards clean energy and planned to reduce the use of coal by 13% in 2038 (National Electricity General Plan Republic of Indonesia, 2019). Therefore, Indonesia should reconsider developing CBM projects with the focus on economic development and bringing fairness and justice to the transition process, helping Indonesia accelerate towards its energy and climate targets. The issues concerning CBM development in Indonesia shall be addressed alongside identifying how investment in CBM projects can drive the energy transition goal as well as improving societal welfare.

Chapter 3: How CBM Projects align with the Indonesian Energy Transition Goal

This chapter sets out how CBM projects fit into the goal of increasing clean energy supply in Indonesia with regards to the just transition to a low-carbon economy. Having to tackle climate change, Indonesia has started green energy projects through the development of clean energy supplies such as wind power, solar power, bioenergy, geothermal, mini hydro and hydropower. Considering that CBM is a derivative of fossil fuels, Indonesia has developed CBM under the hydrocarbon regimes. It is important to understand that CBM is also known as one of the cleaner fossil fuel sources that can contribute to the additional clean energy supply for the country. The growth of clean energy projects in Indonesia has increased from year to year and CBM can play an instrumental role in contributing to a cleaner society and environment.

Chapter 4: Current Issues on CBM Development in Indonesia – What do they say?

This chapter reveals the real issues regarding the development of CBM projects in Indonesia from different stakeholder perspectives including investors, government, and consultants. Categories and classification of issues are developed and explained in this chapter. It also provides an understanding that there are different ways of seeing a project, yet these issues are interrelated and complex. Furthermore, issues arise due to the impact(s) of other issues, therefore solving issues in isolation will not push CBM development forward. To identify and solve these issues, this chapter will look at two developed countries, the U.S. and Australia, and how they have had successful CBM development and benefited hugely from these projects (Hulme, 2002; Bryner, 2002; Mackinnon and Fox, 2006; Mudd, 2012; Letts, 2012; Cully, 2015).

Chapter 5: Environmental Impacts and Societal Justice Aspect of CBM in Transitioning to Low-Carbon Economy

CBM projects are always located onshore, and this chapter discusses how CBM projects have impacted local communities both economically and environmentally. A survey on the local impacts and local community's expectation was conducted to collect the data for this purpose. This chapter will also elaborate further in terms of energy justice issues which will be explored further in regard to CBM development, e.g. what do they want from the project apart from energy supplies for the community (i.e. distributive, procedural, recognition and restorative justice)? Therefore, this chapter explores in detail the impacts of project development on local

community development and how the impacts and benefits can be distributed fairly to the community.

Chapter 6: Re-attracting CBM Investment in Indonesia

This chapter provides ideas on how countries (with a focus on Indonesia as the case study) can achieve energy transitions goals by re-attracting CBM investment. How would the government be expected to be involved in the success of CBM development and support investors to provide equitable benefits to society? Issues are defined earlier (in previous chapters, see above), and this chapter highlights what can be done to solve the issues concerning society and environmental justice through taxation by utilising examples from the U.S. and Australia. Taxation is one of the key tools in the development of any country and is very much related to welfare distribution, therefore this chapter highlights taxation modifications to improve CBM development and create project attractiveness for governments and investors. Lessons from other countries are drawn from this chapter in the process of suggesting modifications to the taxation system in Indonesia.

Chapter 7: The Future of CBM in Indonesia & International Reflections

This chapter concludes the book, exploring in particular the future outlook of the energy transition in Indonesia and what role CBM can play in energy transition and energy sustainability. As such, it will examine the do's and dont's for the government in developing the clean energy project as a whole and in supporting CBM development in the country. Finally, this chapter provides a number of recommendations to the GoI to achieve future energy transition goals out towards 2050.