Indonesian Local Learning Ecosystem in Energy Transition Era Ensure Wealth Stay in Local Economies

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***Abstract*— The aim of this study is to elaborate the impact of collaborative work among stakeholders in Indonesia upstream oil & gas industry for create value through supply chain management by prioritizing local products. Challenges of local products are not only from qualities and quantities as per industrial demands, but also from sustainable principles that start applying by Upstream Oil & Gas Industry. The implementation of sustainable principles is very important to ensure that Indonesia can fulfil the target of energy transition as mentioned on the Paris Agreement in 2015. In this moment, Indonesia oil and gas industry and supported by the Government of Indonesia already prepared the roadmap to support the energy transition by reducing emissions, applying new technology for CCU/CCUS, and emphasizing the crucial role of the supply chain sustainability. As part of supply chain management (SCM) sustainability principles, the government and industry need to prepare the local companies to support the energy transition target. The landscape of the Indonesian petroleum industry, focusing on specific regulations for local content improvement and their alignment with supply chain sustainability in the energy transition era. Indonesian oil and gas companies operate under Production Sharing Contracts (PSC) with the government. The PSC has agreed to target local content with the government during exploration and operation. To achieve this, local companies must enhance their capabilities through research and development (R&D) to remain competitive and support decarbonization strategies without compromising local content and emissions reduction initiatives. This paper discusses, according to the research, local companies have limitations to get access of new technologies that will be implemented during energy transition era. Therefore, collaborative work among Government and Industries is required to ensure local companies can be ready by the time the energy transition begins. Overcoming the challenge and limitation, this paper belief that collaboration among Government, Oil & Gas Company, Supporting Industries (Vendor), Financial and Education Institution in Indonesia during the energy transition has pivotal role. By fostering collaboration, embracing sustainability principles, and investing in research and development, stakeholders can create a thriving ecosystem that supports local economic growth and environmental stewardship. Successful development programs through collaboration are ultimately expected to enhance job creation for Indonesian citizens, addressing the needs of the country with large population like Indonesia.**

***Keywords*—** *Local content, Local Learning, Ecosystem, Collaboration, Supply Chain Sustainability, Upstream Oil & Gas, Energy Transition.*

1. Introduction

In energy transition era, it is required to adapt to new approach for better climate. Based on Paris Agreement in 2015, 196 parties are committed to limit global warming. Since 2020, countries have been submitting their national climate action plans, know as Nationally Determined Contributions (NDCs). In their NDCs, countries communicate actions they will take to reduce their greenhouse gas emissions in order to reach the goals of the Paris Agreement [1].

Align with the NDCs, Oil & Gas industries are also demanded to reduce its emission, one of crucial role to support emissions reduction is supply chain sustainability. The objective of supply chain sustainability is to create, protect and grow long-term environmental, social and economic value for all stakeholders involved in bringing products and services to market [2]. Supply Chain Management (SCM) is the gate of better material selection in supporting emission reduction, need to be more agile and acquire sustainability principle.

Align with the sustainability concept of the SCM, most of Oil & Gas Company also consider embracing their contractors to ensure the alignment with emission reduction roadmap and sustainability principle. This paper will discuss more on Indonesian Petroleum Industries landscape that has specific regulation on local content improvement and how this regulation could be aligned with supply chain sustainability principle in energy transition era.

In Indonesia, Oil & Gas Company operate under

Production Sharing Contracts (PSC) with the government, utilizing two scheme agreements: Cost Recovery (CR) or Gross Split (GS). Both CR and GS need to achieve targeted local content as agreed with the government, therefore, local capabilities need also to keep up with decarbonization strategy, ensuring no trade off between local content and emissions reduction initiaves in the future. One of the critical points of local content aligment is related to Local Companies adaptability. Local companies need to improve their capabilities through Research & Development (R&D) to maintain their competitiveness in energy transition era.

Following are figures that explain the difference between CR and GS scheme:

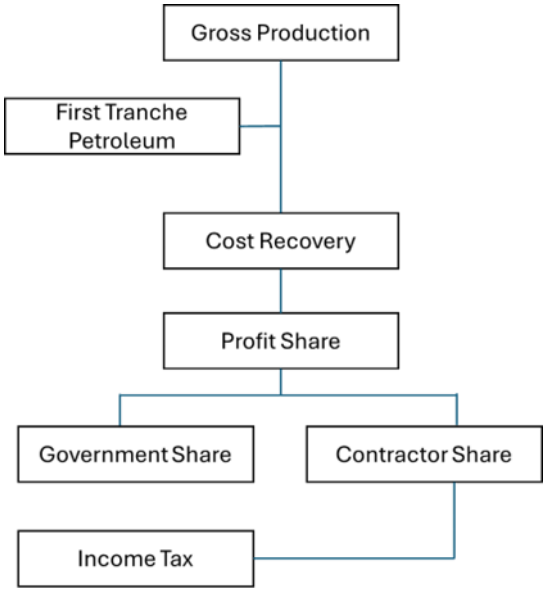

Figure 1. PSC Agreement Scheme – Cost Recovery

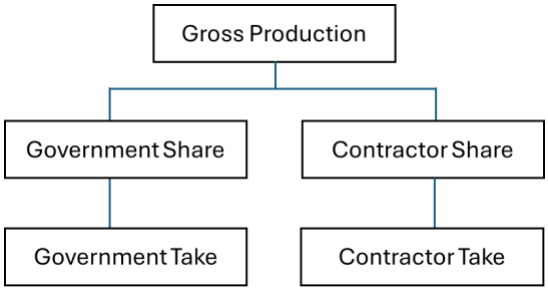

Figure 2. PSC Agreement Scheme – Gross Split

As a Company, PSC has responsibilities with local communities and development. Helping communities realize the benefits of oil and natural gas production requires effective community engagement and direct communication with local residents and their leadership about environmentally responsible development [3]. This paper will further discuss on collaboration between Government, Oil & Gas Company, Supporting Industries (Vendor), Financial and Education Institution to achive decarbonization target during energy transition and ensure wealth is stayed in local economies.

2. Energy Transition as Change's Force

In the energy transition era, organizational needs to adapt with changes. One of the external forces that mostly drive organizational's sustainability policy are political and legal changes [4]. Based on Intergovernmental Panel on Climate Change (IPCC) sixth assessment report, The issue of climate finance is closely related to the conversation on international cooperation and the question of how cross-border investments can support climate mitigation and adaptation in developing countries. However, the issue is also related to more general questions of how financial institutions, both public and private, can assess climate risks and opportunities from all investments, and what roles states, government and markets can play in making them more sustainable.
The report also mentioned there are three level at which policy attention on climate now may need to be focused (global, national and local). This paper will focus on local level due to Global low-carbon transition also dealing with job losses (Carley and Konisky 2020; Crowe and Li 2020; Pai et al. 2020; Cunningham and Schmillen 2021; Hanto et al. 2021). Therefore, each country needs to empower local learning on adapting energy transition. Government plays important roles on local learning develop that align with Oil & Gas industry decarbonizing roadmap.

On PSC level, as reponse of external forces on political and social factor related to Sustainability, roadmap for Just Transition is developed. Each PSC has its own perspective and goals, most of it make the triple bottom line busines [5] as basis in developing sustainability goals & roadmap. One of PSC in Indonesia use the models is MedcoEnergi, MedcoEnergi has 3 Pillars of Sustainability Leadership of and by our Employee (People), Environmental and Social Development (Environmental), Local Community Empowerment (Social). Guided by these pillars, MedcoEnergi operates our business with integrity and transparency to safeguard our social license to operate [6].

Considering challenges during low-carbon transition, Masterman-Smith (2013) cautions against a lack of understanding of the dynamics of job creation [7], it could be knowledge and skill gaps during the transition. How low-carbon transition might impact inter-regional relationships is also a discussion that should be highlighted in future research. First, this paper will focus on how Government and PSC could work together in creating awareness on Energy Transition for local communities to ensure local learning is aligned with energy transition roadmap.

3. Local Learning Aligment

Oil & Gas industry has many positive impacts in local development. There are supporting industries for oil & gas industries that absorbing local manpower. PSC also develops local communities by creating small-scale industries based on local potential such as agricultural and marine. One of the examples is MedcoEnergi develop cassava-based product from one of operational area. The local community is now able to explore new markets after being introduced by MedcoEnergi on online marketplaces

and platforms. This local learning is expected to survive and grow even when the PSC has changed its form following a new energy transition strategy.

Oil & Gas industries also have impact to supporting industries such as OCTG, Linepipe, Valves, etc. These industries evolve with Oil & Gas industries development. In Indonesia, these industries absorb knowledge transfer from foreign company to local manpower. Government also made several local content regulations that support Local Company in these industries to get the same opportunities to compete in supporting Oil & Gas Industries.

Across many industries, traditional SCM is getting more and more complex. However, this increased sophistication is not directed towards increasing shared value for all stakeholders, particularly, the local communities [8] also local company. Align with oil & gas industries to reach target net zero emission, the supporting industries also need to adapt with PSC regulations related to scope 2 of net zero emission. To align with the PSC strategy, Local Company need awareness that as supporting industries they need to adapt with changes in main industries. Local Industries need to understand how the net zero emissions target will be applied to oil & gas industries and how this impact local industries, especially on their competitive advantage in the market.

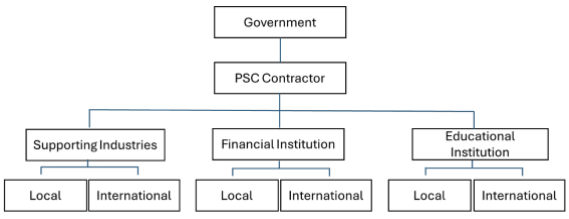

Figure 3. Collaboration among stakeholders

Government and PSCs could collaborate in creating awareness of energy transition for local industries. Develop sense urgency on changes & improvement that align with decarbonization policy. This is to ensure that exisiting investment, facilites of supporting industries could adapt during energy transition so long-term sustainability of supporting industries could be maintained.

The government plays an important role in ensuring whether wealth generation will stay in local economies or flow outwards during energy transition. There is also a trade-off if we want to optimize supporting industries and Oil & Gas production today, are we confident enough that renewable energy in the future will suffice the energies demand. Government needs to ensure energy access, security and environtment is balanced in the future (balancing energy trilema). A fair distribution of decision making, representation, the costs, and benefits of energy services across time and space is basic framework for Policymaker in develop comprehensive program for Local Learning in facing energy transition.

Based on the above discussion, it is important that all the stakeholders in Oil & Gas industries ensure that local industries can compete in future energy transition. Create awarenes as the first step that adaptability to Just Transition is required as part of local learning. After that comprehensive program from Government with collaboration with PSC could ensure that local learning is aligned with energy transition. Each stage of learning needs to be evaluated to ensure the learning path meets with a decabonization roadmap.

One of the crucial stages is how to ensure the existing investment and facilites could adapt with future demand. This way, if investment shifts occur, the profits and spending remain local and can offset the costs of transitioning to new energy sources. Local industries can collaborate with oil and gas companies, as their main customers, to align their technologies with decarbonization strategies. This collaboration will maximize benefits for locals through synergy between Government, PSC, Supporting Industries (Vendors), Financial and Education Insitution.
This synergy will strengthen local capabilities, maintaining competitiveness during the energy transition by fostering research and development (R&D) supported by government regulations, corporate demand, financial backing, and manpower alignment through educational support. By the time energy transition is implemented, it is expected that R&D strategy of local companies is ready to take off.

The financial sector has an important role to ensure the R&D can be implemented locally and align with decarbonization target. Globally, investors are increasingly prioritizing net-zero emissions for oil and gas companies. As part of the awareness campaign, the financial sector could apply the same principles, but less stringent, to the local company. When local companies demonstrate R&D results that align with greenhouse gas (GHG) standards, financial institutions may offer incentives such as favorable loan terms or reduced interest rates to support their efforts.

Educational institutions support the R&D by supplying manpower that aligned with industrial demand to adapt during energy transition. The competencies demanded by industries should be integrated into educational programs to foster continuous improvement and ensure alignment with the R&D requirements of decarbonization strategy. Educational institutions could also develop tailor made programs to produce graduates who are readily equipped to meet the demands of industries in energy transition era.

Related to manpower readines in energy transition era, Medco Energi in 2021 Annual Report [9] mentioned therea are trained staff in carbon capture, utilization and storage (CCUS), and enrollment of Senior leaders in LEAD program, which covers a wide variety of goals and challenges as outlined in the Sustainable Development Goals of the United Nations. Those tailor-made development programs are designed to capture commercial opportunities on CCUS and organizational alignment with Medco Energi Three Pillars of Sustainability (figure 4). This program also aligns with the Medco Energi 2021 theme “Building Our Future Sustainable Energy and Natural Resources” as part of Company commitment to reduce emissions.

Figure 4. MedcoEnergi's Three Pillars of Sustainability

To enhance local learning synergy, the government and PSCs need to provide opportunities and develop comprehensive programs for testing the R&D outcomes of local companies. Government policies should encourage both local companies and PSCs to use and improve local products while meeting industrial demands and standards. Given that the upstream oil and gas industry is classified as high-risk, R&D results must meet stringent industrial standards. The quality of materials and services must pass the PSCs' Quality Assessment (QA) and Quality Check (QC). Additonally, the innovative ways from government are required to induce investment that maximize local content and facilitate sustainable industrial development [10]

Providing opportunities for local companies is closely linked to the Supply Chain Management (SCM) function in oil and gas companies. While maintaining material quality, delivery schedules, and production costs, SCM must also create opportunities for new market entrants without disrupting supply for production activities. The domino effect is interesting to be elaborated further since SCM need to meet operational demand, while local vendor need to maintain their competitiveness in market. Failed to meet market trend during energy transition might impact the Competitive Advantage in Local Vendor and even on Company side.

At this stage, SCM should implement sustainability and agility principles to align local development with operational standards and Global Compact Principles. In addition, on this approach, previous study highlights the importance of how CEOs in the Supply Chain should focus on the development of interpersonal relations and maintaining them along with common fate, shared values. Moreover, trustworthy relations must be established between the partners in the Supply Chain for improving Supply Chain Performance and Supply Chain Intergration [11]. Therefore, maintaining supplier relationships is crucial to ensure operational needs and standards are met while providing opportunities for local companies to grow and sustain in future markets competition.

In local company side, it is important to benchmark customer satisfaction, in this context PSC as main customer, to identify areas for improvement, make strategic decisions and set targets to achieve desired satisfaction [12]. "The dance" between PSC and Local Company in supply chain management is expected to drive positive impact for both parties. PSC give opportunity and Local Companies strive to improve the quality to meet industrial standard. At the end of the day, this collaboration can generate spillover effect or even multiplier effect for local and national economy.

To balance "the dance" and ensure PSC do not lose opportunities during the local company development phase, the government plays a vital role in creating a positive climate for local vendor growth, considering operational demands and investment trends during the energy transition era.

4. Discussion

The energy transition era is set to challenge current practices, including supply chain management. Adopting sustainability principles requires every aspect of business to align with cleaner energy for a better climate. As technology in the petroleum industry shifts towards cleaner methods, local companies supporting the upstream oil and gas sector need to be agile and responsive to business demands.

Local companies may struggle to keep pace with rapid business changes without collaborative support from stakeholders. In Indonesia, initiatives for developing local companies need government oversight and opportunities for product trials provided by PSCs. Additionally, financial and educational institutions must support the research and development of new methods for cleaner products, ensuring adequate funding and skilled manpower are available.

This paper still has limitations in highlitghting individual PSCs supplier relationship strategies to address emission reduction challenges and the inclusion of local companies in future supply chain sustainability. This area might further elaborate in future research and discussion. Future studies could explore PSC's strategy aligment with other PSCs, government, supporting industries, and financial and educational institutions to create an ecosystem that

ensures wealth stay in local economy during the energy transition era.

5. Conclusion

In conclusion, the oil and gas industry play a significant role in local development through its positive impacts on supporting industries and communities. Local industries benefit from knowledge transfer and market opportunities provided by oil and gas companies, contributing to economic growth. However, as the industry transitions towards net-zero emissions, supporting industries must adapt to remain competitive. Collaboration among stakeholders, including government, oil and gas companies, financial institutions, universities, and local vendors, is crucial in navigating this transition successfully.

Ensuring the competitiveness of local industries requires a multifaceted approach. This includes integrating sustainability principles into supply chain management, fostering research and development aligned with decarbonization targets, and providing financial incentives for local companies. Educational institutions also play a vital role by supplying a skilled workforce aligned with industry demands and offering tailored programs to meet the needs of the energy transition era.

Government and oil and gas companies must collaborate to create opportunities for local companies and facilitate the testing and implementation of their R&D results. Policies that promote the use of local products and align with industrial standards are essential for supporting local industry development. Additionally, supply chain management practices should adapt to meet operational demands while supporting the competitiveness of local vendors.

Key players in the supply chain and upstream oil and gas industry practitioners can use this study as a foundation for developing learning programs to ensure local companies can support the upstream industry in the long run. Additionally, this study can serve as a basis for fostering collaborative efforts among stakeholders in upstream oil and gas industry to create value through supply chain management by prioritizing local products.

Overall, a coordinated effort among stakeholders that lead by the Government of Indonesia is necessary to ensure the long-term sustainability and competitiveness of local companies during the energy transition era. By fostering collaboration, embracing sustainability principles, and investing in research and development, stakeholders can create a thriving ecosystem that supports local economic growth and environmental stewardship. Successful development programs through collaboration are ultimately expected to enhance job creation for Indonesian citizens, addressing the needs of the country with large population like Indonesia.

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