

INDONESIAN COAL ROAD TO THE FUTURE

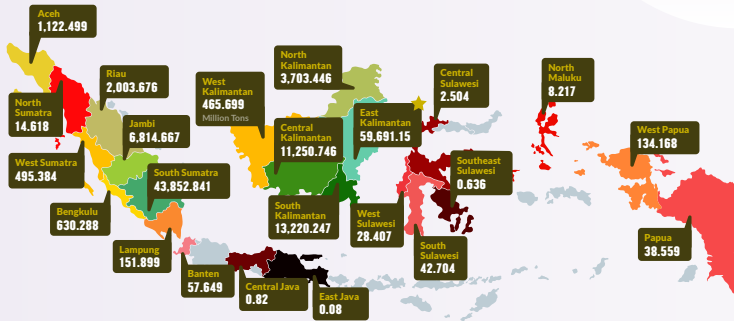
INTRODUCTION

Indonesia is the largest coal producer in the world. In 2020, Indonesia's coal Production reached 562.5 (7.27%) million tons and ranked 3rd in coal production in the world (PYC Data Center, 2021). A transformation in coal utilization is needed to optimize Indonesia's coal reserve while still in line with national net-zero targets. This infographic highlights the coal transformation program and its valorization potential. Domestic coal is focused not only on fuel but also as raw material to make derivative product with added value, such as chemicals. The methanol from coal can be converted into Dimethyl Ether (DME) that in the end can substitute LPG.



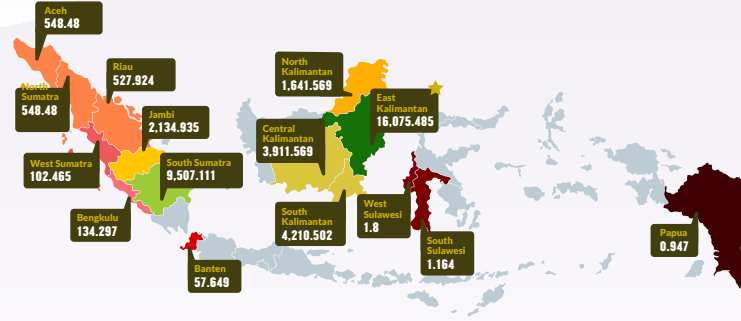
TOTAL COAL RESOURCES

Million Tons (2020)



TOTAL COAL RESERVES

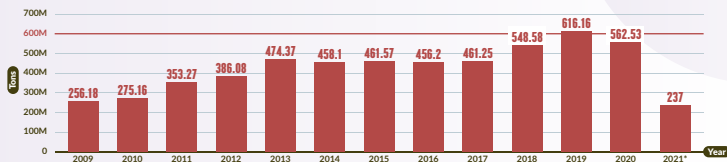
Million Tons (2020)



(PYC Data Center, 2020)

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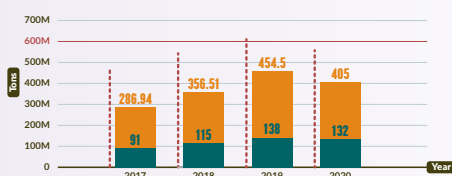
COAL PRODUCTION



The Ministry of Energy and Mineral Resources (MEMR) has raised the coal production target in 2021 by 75 million tons to 625 million tons from the initial target of 550 million tons. The consideration for this decision was the impact of Covid-19 pandemic on the mining sector in 2020, resulting in a decline in economic mining activities globally. Government support is needed through the addition of 2021 coal production for export.



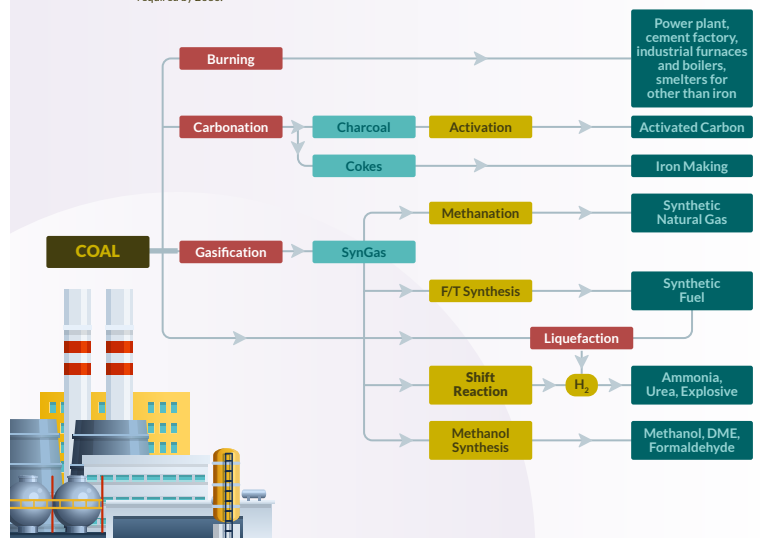
DOMESTIC USE AND EXPORT OF COAL



Indonesia's Domestic use of Coal
Indonesia's Coal Export

INDONESIA'S COAL TRANSFORMATION PROGRAMS

Following Indonesia's Paris Agreement ratification with Law 16/2016, in the context of optimizing NRE without neglecting Indonesia's abundant coal resources, Indonesia applies co-firing technology. Coal Gasification and Liquefaction as a bridging fuel and chemicals. As much as 76% of the current national LPG needs are met through imports. In 2020, the value of LPG imports reached USD 2.8 billion. Thus, it becomes part of the current account deficit and becoming a concern for the government. In the National Energy Plan (RUEN) compiled by the Ministry of Energy and Mineral Resources, Dimethyl Ether (DME) is an alternative energy to substitute LPG in order to reduce LPG imports. In the beginning of 2021, MEMR has projected DME equivalent to 3.5 million tons of LPG is required by 2030.



Source : PYC Data Center, 2021 and MEMR, 2021

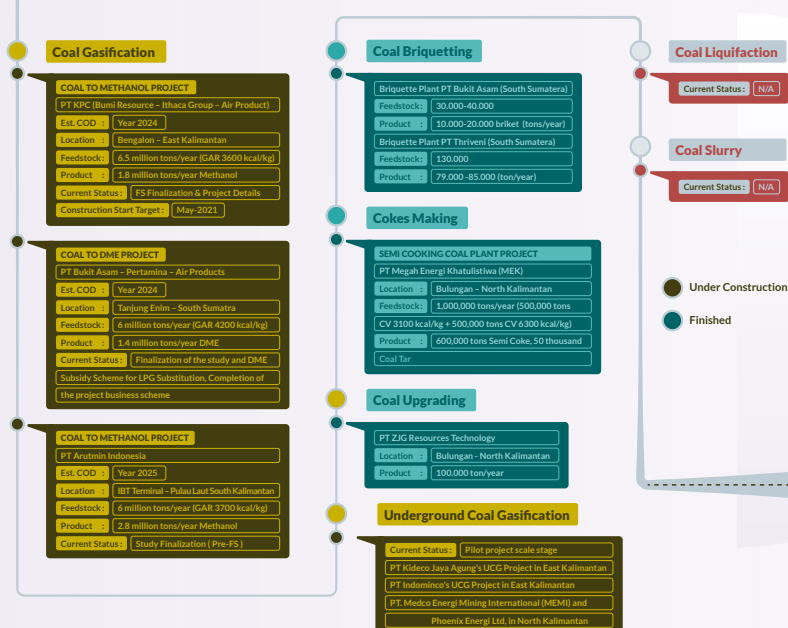
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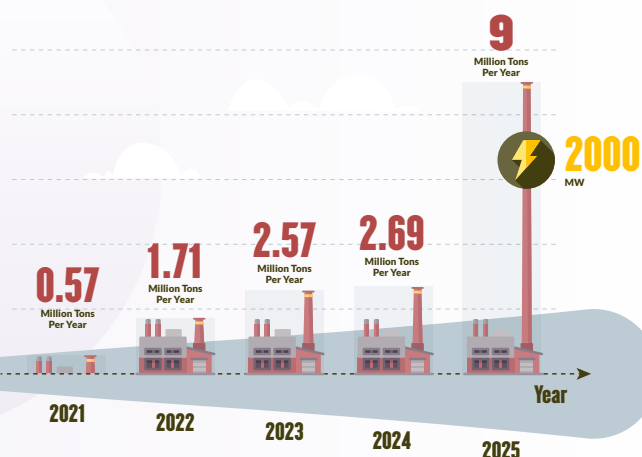
INDONESIA COAL DOWNSTREAM DEVELOPMENT PROGRESS



Source : MEMR, 2021

INDONESIA POWER PLANT CO-FIRING ROADMAP

Co-firing is a co-combustion technology of partial substitution of coal with biomass while still paying attention to the quality of the fuel as needed. In 2025, Indonesia has targeted to employ 52 co-firing power plants. Additionally, MEMR will soon retire 1 GW of capacity coal-fired steam power plant by 2025 to accommodate net-zero emission by 2060.



Source : Bisnis Indonesia, 2021 and MEMR, 2021

CHALLENGES AND RECOMMENDATIONS



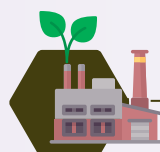
Commercial viability

The economic viability of coal utilization requires a high investment. The coal to chemicals project investment can reach a value of more than 2 Billion USD.



Readiness of the market

The strategy on how the market can absorb products at competitive prices is needed.



Risk mitigation

As a coal company that penetrates the chemicals industry through gasification, it takes a lot of learning, preparation of resources and collaboration with various parties to understand and manage the business, technological and commercial risks of a gasification project.

Incentive and policy

Coal to chemicals projects require support from the government in the form of regulations and incentives to accomplish project feasibility (such as tax holidays and coal price formulas).

Sustainability

All the process in the downstream life cycle analysis needs to be conducted to know the greener chemical process in the industry. Because the longer the process it requires, potentially more waste and emission will be produced. Additionally, the extension of the mining contract will likely hinder the energy transition.



ABBREVIATIONS:

COD : Commercial Operation Date
LPG : Liquefied Petroleum Gas
DME : Dimethyl Ether

GAR : Gross as Received
GW : Gigawatt
MEMR : Ministry of Energy and Mineral Resources

NRE : New and Renewable Energy
RUEN : National Energy Plan (Rencana Umum Energi Nasional)
MW : Megawatt

Pre-FS : Pre-Feasibility Study
N/A : Not Available