Momentum for Improving Coal Transportation Infrastructure

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Kalimantan is Indonesia's coal production centre, producing more than 90 percent of the country's coal production. Kalimantan's coal resources are in fact only 51 percent of the country's coal resources, while other areas, such as Sumatra has big coal reserves, especially proven reserves. The quality of Kalimantan's coal is prima with its high calorific value, and has low ash and sulphur contents, making it quite saleable, either on the export or domestic markets.

Compared to Sumatra, which has big coal reserves and coal mines, the coal industry in Kalimantan has more advantages due to their proximity to coasts and big rivers (such as Barito and Mahakam) which enable coal to be transported without having to build expensive transportation infrastructures.

Nevertheless, the capacities of the currently existing coal transportation infrastructures in Kalimantan—especially provided by nature—are quite limited and should not be forced to serve the increasing number of coal traffics, moreover when coal production is augmented in large scales. Investments to increase coal transportation capacities are needed to meet the coming rising demands for coal.

Coal Mining in Kalimantan

In 2005 Indonesia's coal resources were estimated to total 57.8 billion tons and 51 percent of these resources (29.7 billion tons) were in Kalimantan. Out of these 29.7 billion tons 9.7 billion tons were classified as indicated reserves, while 4.2 billion tons were classified as proven reserves. The spread of the reserves were mainly in East and South Kalimantan and almost none in West Kalimantan.

The eastern and southern parts of Kalimantan have high quality coal deposits with high calorific value, low sulphur and ash contents. About one third of Kalimantan's coal have high calorific value of more than 6100 kcal/kg while about 45 percent have medium calorific value of 5100 to 6100 kcal/kg.

In 2005 Kalimantan had 70 coal mines at the production, construction, feasibility study, exploration and general survey stages. Of these 70 mines, 69 are located in East, South and Central Kalimantan, and only one operates in West Kalimantan. The mining is done by 'world class' mining companies, (such as Adaro, Kaltim Prima Coal, Arutmin, and others) based on Coal Contracts of Work, as well as by cooperative units which undertake small scale coal mining.

More than 90 percent of Kalimantan's coal production from principal companies, are exported. Four principal companies (Adaro, Kaltim Prima Coal, Arutmin, Kideco_Jaya Agung) producing about 70 percent of Kalimantan's coal production, with each company producing more than 10 million tons per annum, or bigger than the production from the main coal producer in Sumatra (PT Batubara Bukit Asam) which produces less than 10 million tons per annum.

So far the constructions of coal infrastructures in Kalimantan have been focused on the ports of export, which have been done by the private sector. Kalimantan has 13 coal terminals, some of which have big handling capacities (such as the Tanjung Bara, North and South Pulau Laut, Balikpapan) and others are river terminals. The present handling capacities of the coal terminals in Kalimantan are about 100 million tons per annum.

Most of these coal terminals are dedicated and only the Batikpapan Coal Terminal and the Indonesian Bulk Terminal are available for common use.

Mahakam and Barito are the main rivers in Kalimantan, the traffic lane of coal barges. The size of these barges are 3000 to 10 000 DWT. The coal carrying vessels for export purposes have the capacities of up to 180 000 DWT. This coal transportation fleet is dominated by foreign companies.

Not a single railway network has been constructed in Kalimantan which is the most efficient transportation mode having the small environmental impact on coal bulk transportation (as proved in the USA, Australia and other countries). Feasibility studies have been conducted on the coal railway routes in Kalimantan, for example by Japan Institute of Energy Economics, Japan's METI and RI's BAPPENAS (RI's National Development Planning Agency). But so far there is no realization of the said railway network, it is hampered by the expensive construction cost, the weak institutional capacity to construct new railway lines, including the present Railway Law which only permits PJKA/PTKA state railway company to construct railways.

The present problem is that the coal transportation capacity through the rivers can no longer be tolerated due to the dense traffic and less traffic days caused by the changing seasons and silting. The increase in transportation capacities in the main rivers do not only need dredging and widening, but also rebuild the bridges. The Mahakam, for example, has a long bridge but not high enough for coal barges.
to pass through. This is worsened by the busy water traffic carrying various commodities in the Mahakam estuary. The Barito has a high sedimentation rate coming from the estuary, especially when the river floods. Barges of up to 10,000 DWT may be used in the upstream of the Barito river, but smaller barges of 3000 DWT should be used in the downstream due to the shallow waters.

The chaotic, disorganized coal traffic which pollutes and disturbs the traffic of other commodities, next to the often belated dredging has recently caused the regional government to threaten to close the coal transportation. (See Kompas article on 3 May, 2006). The Barito lane increasingly shallow. If the dredging fund does not come down, coal transport will be stopped. This clearly makes the situation increasingly complicated.

Not only the river transportation, but also coal trucks, which polluted and some of them damaged public roads, are parts of the daily complaints of the public in Kalimantan. Most of the roads traversed by coal trucks are dirt roads which will be muddy on rainy days, hampered the transportation of coal. In addition, trucks with heavy loads of coal quickly damage the roads and repair would need a very high cost. The burden of constructing and maintaining roads (which could reach tens or even hundreds of kilometres) to be borne by each company is heavy enough.

Recently the central and the regional governments are constrained in providing development funds, which is clearly reflected by the disintegrating transportation infrastructures and in the generally declining transportation services in this country. The construction of steam power plants and the preparation of mines are the responsibility of the Energy and Mineral Resources Department but it is not clear where the Transportation of coal is concerned. Are coal transportation (through rivers, by train, by land and sea) becomes a high priority compared to the various problems in this sector?

**Accelerates Steam PP Construction**

The accelerated construction of 17 000 Mw coal fuelled power plants (8700 Mw by PLN and 8300 Mw by the private sector), recently planned by the government, is a strategic effort to increase the electrification ratio and to reduce the dependency of the national energy mix upon oil fuel.

The program which endeavours to construct 70 percent of the national capacity of power plants or more than twice the present capacity of coal fuelled steam power plants (7550 Mw) and is targeted to be completed by 2010—which has been adopted in the General Plan of Electricity Supply—certainly contains complex and simultaneously challenging works. As is known, the constructions of power plants to reach the present capacity are gradually and intensively done have started since the first Five Year Development Plan in the 1970s.

It is clear that the construction of a coal-fuelled power plant is not just a matter of installing electricity generators in some places, but also a matter of preparing various infrastructures, both in the upstream and downstream, by increasing the installation's capacity or by building new ones.

The carelessness in preparing the said processing chain may have the consequences that the planned projects worth tens of trillions of rupiah may not be efficient or useless. The government has such an experience, for example in the construction of a combined-cycle power plant—which did not get a gas supply—or which experienced a long lag between the installed power plant and the available transmission/distribution facilities.

Basic questions related to the plan of the accelerated constructions of the 17 000 Mw coal-fuelled power plants are: 1) where will the power plant units be constructed and 2) where will the coal supplies come from. The answers to both questions will determine the pattern of the coal transportation infrastructures to be established. It can be estimated that the coal traffic in the framework of the accelerated construction of the power plants will be used to supply coal to Java from the coal mines in Kalimantan.

To guarantee the safe electricity supply from the planned power plants—most of them will belong to the Java-Madura-Bali system—the signing of the supply agreements should be expedited to ascertain the prices and to make sure that the works in the upstream end
mines) can be prepared. Later it will be impossible to suddenly change the mining companies' sales contracts or to get cheap coal in large scales continuously in the free markets.

**Several Proposals**

Indonesia's coal proven reserves are seven billion tons in total, sufficient to meet the demand for 75 million tons per annum needed by the planned expanded construction of steam power plants. So far Kalimantan is the main coal supplier and will still be reliable in the future. Nevertheless, Sumatra—in view of its quite big coal proven reserves—can also be made an alternative source to supply coal demanded by the steam power plants later on. Both ways can be applied, provided that coal transportation infrastructures are built and developed for the purpose.

The soaring demand for coal by the 17 000 Mw will need increasing capacities of ports, roads, river transportations, transportation fleets on land, river, sea and railway trains, including stockpiles at the the power plants sites.

Our present chaotic coal transportation infrastructures will certainly not be adequate to accommodate the soaring demand for coal needed by the 17 000 Mw power plants. A transportation capacity equal to the present one must be prepared—perhaps with a different mode composition.

The cost for these transportation components may have equal value or higher than the installed machinery of the power plants. Who will be responsible for this giant and complex work? How will this work be organized? How will it be financed?

The following are our proposals: Firstly, the constructions of the coal transportation infrastructures should no longer be the responsibilities of the mining companies as required by the Coal Contracts of Work, but should be led and guided by a master plan for territorial development, which should be formulated by the elements of mining, transportation, finance, central and regional governments. The intersectoral (and the private sectoral) work mechanism in this field should be strengthened or prepared.

Secondly, a good financing scheme should be prepared to reflect the good public private partnership. In each coal transportation infrastructure project to be implemented, whether it will be under a BOT (build, operate, transfer) pattern, the establishment of a consortium or a special purpose vehicle should be accurately studied. The roles of the central and regional governments should be affirmed and strengthened with the spirit to develop the regional capabilities.

Thirdly, the development of alternative transportation modes, especially because the capacities of the rivers in Kalimantan can no longer be increased to accommodate the soaring demands for coal by the powerplants, which mostly will be located in Java. Alternative transportations modes must be realized, in this case various coal transportation studies which had been conducted may be utilized.

Various previous studies have identified that a number of coal railway tracks which should be constructed, namely 1) the Mangkupadi line, 2) the Senggata line, 3) the Mahakam line, 4) the South Balikpapan line, 5) the Selatan (South) line and 6) the Batu line (Picture). The construction of the coal railway lines should be realized, by or by not connecting them with the accelerated construction of the 17 000 Mw coal-fuelled power plants. This construction can start with the line which has the most significant impact on the increased coal production and coal transportation capacity, namely the Mahakam line. The success in materializing one railway line is a very good learning process to realize the other lines which will support the effectivity of coal transportation in this country.

Not only the railway lines, the development of road networks, river transportation modes and especially coal terminals should be reformulated. It is necessary to stress that the construction of transportation infrastructures will not only be useful for the present coal mining activities, but later for other needs of transportation, including for passengers. The construction of these transportation infrastructures can be considered as the form of 'debt repayment' to the land of Kalimantan which has been exploited—including its forest, oil and gas—without leaving adequate infrastructure as heritage.

Fourthly, the government should keep leading the accelerated construction of power plants and the needed transportation infrastructures which should be prepared, at least in its planning and coordination. The construction of transportation infrastructures—including the railway infrastructures, means and modes, as inseparable parts of the construction of the 17 000 Mw coal fuelled power plants. Although the construction of these power plants will rely on PLN and Independent Power Producers, yet the involvement of the government, especially in the construction of the infrastructures, cannot be neglected. The coal supply model of direct appointment or business to business which becomes the present discourse is certainly far from the concept of settling the problem in providing an efficient coal transportation system.

Fifthly, take a lesson from the construction of the first steam power plant in Indonesia, namely the Suralaya, which was successful in the construction of an integrated steam power plant—mine and transportation—in the 1980s as an experience to carry out a comprehensive project almost never to experience again. This model of intersectoral cooperation and project organization in the construction of the Suralaya is worthy for the crash program of the 17 000 Mw power plants to imitate it, although the challenge of the present time will be much more complicated, because multi sources and multi destinations are involved in the coal transportation.

Lastly, hopefully the program to accelerate the construction of the 17 000 Mw coal-fuelled power plants will also be made a momentum to develop the present chaotic coal transportation infrastructures. Not an easy task, but challenging.

(From various sources)
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