Enclosure 1

Notification of the Allocation of Newly Issued Ordinary Shares in Combination with Warrants Representing the Right to Purchase Ordinary Shares of Banpu Public Company Limited No.4 (BANPU-W4) and Warrants Representing the Right to Purchase Ordinary Shares of Banpu Public Company Limited No.5 (BANPU-W5)

of

Banpu Public Company Limited

Important Disclaimers

*By accepting delivery of this notification of the rights to subscribe (the "**Notice of Subscription Rights**") for newly issued ordinary shares offered to the existing shareholders of Banpu Public Company Limited (the "**Company**") in proportion to their respective shareholdings (the "**New Shares**") together with warrants representing the right to purchase ordinary shares of Banpu Public Company Limited No. 4 ("**Warrants BANPU-W4**") and warrants representing the right to purchase ordinary shares of the Company No. 5 ("**Warrants BANPU-W5**") which shall be issued and allocated to the existing shareholders of the Company who subscribe for and are allocated with newly issued ordinary shares offered to such existing shareholders in proportion to their respective shareholdings, the shareholders acknowledge and agree to the disclaimers and conditions set forth below.*

*This offering of the New Shares together with Warrants BANPU-W4 and Warrants BANPU-W5 to the existing shareholders of the Company in proportion to their respective shareholdings is an offering of securities in Thailand pursuant to Section 33 of the Securities and Exchange Act B.E. 2535 (as amended) and will only take place in Thailand. These New Shares, Warrants BANPU-W4 and Warrants BANPU-W5 (i) have not been and will not be registered with the U.S. Securities and Exchange Commission or any other securities regulatory authority in any country other than Thailand, or under the U.S. Securities Act of 1933 (the "**U.S. Securities Act**") or the laws of any jurisdiction other than Thailand, and (ii) unless registered under the U.S. Securities Act or pursuant to an exemption from such registration, may not be offered or sold in the United States of America (the "**U.S.**"). The Company does not intend to register these New Shares, Warrants BANPU-W4 and Warrants BANPU-W5 under the U.S. Securities Act or conduct any offering of securities in the U.S.*

The shareholders are prohibited to disclose, publish or distribute the Notice of Subscription Rights, whether in whole or in part. This Notice of Subscription Rights does not constitute an offering to sell or a solicitation of an offering to subscribe for or to buy any securities of the Company in the U.S. or any other country. No money, securities or other consideration is being solicited by this Notice of Subscription Rights. Any delivery of money, securities or other consideration in response to this Notice of Subscription Rights or the information contained herein will not be accepted. The Company urges that the shareholders who accept the delivery of this Notice of Subscriptions Rights must rely upon their own examination of the restrictions regarding investment in the securities and offering to sell the securities in the countries of their domicile or nationality. The Company will not be responsible for any violation of any of these restrictions by any person. The shareholders warrant that they are not restricted under any law of any jurisdiction to subscribe for the New Shares, Warrants BANPU-W4 and Warrants BANPU-W5, and the subscription by the shareholders of the New Shares, Warrants BANPU-W4 and Warrants BANPU-W5 will not be a violation of any applicable law of the relevant jurisdiction.

Part 1

Information on the Allocation of Newly Issued Ordinary Shares in Combination with Warrants

Part 1 Information on the Allocation of Newly Issued Ordinary Shares in Combination with Warrants Representing the Right to Purchase Ordinary Shares of Banpu Public Company Limited No.4 (BANPU-W4) and Warrants Representing the Right to Purchase Ordinary Shares of Banpu Public Company Limited No.5 (BANPU-W5) (the "Newly Issued Ordinary Shares in Combination with Warrants")

1. Date, Month, Year and Number of the Meetings which Approved the Allocation of Newly Issued Ordinary Shares in Combination with Warrants

The Board of Directors' Meeting	: The Board of Directors' Meeting No. 6/2021 on 30 June 2021 approved the capital increase and the allocation of Newly Issued Ordinary Shares in Combination with Warrants, and the Board of Directors' Meeting No. 7/2021 on 20 July 2021 subsequently approved the adjustment of such capital increase plan and the allocation of Newly Issued Ordinary Shares in Combination with Warrants in order to conform with the Notification of the Capital Market Supervisory Board No. TorChor. 34/2551 Re: Application for and Approval of Offering of Newly Issued Warrants and Newly Issued Underlying Shares dated 15 December 2008 (as amended)
The Meeting of the Shareholders	: The Extraordinary General Meeting of the Shareholders No. 1/2021 on 9 August 2021

2. Details of the Allocation of Newly Issued Ordinary Shares in Combination with Warrants

The Extraordinary General Meeting of the Shareholders No. 1/2021 held on 9 August 2021 has resolved to approve the allocation of newly issued ordinary shares in the amount not exceeding 1,691,527,171 shares with Baht 1.00 par value per share to the existing shareholders of the Company in proportion to their respective shareholdings at the ratio of 3 existing ordinary shares to 1 newly issued share at the offering price of Baht 5.00 per share, whereby the existing shareholders shall be entitled to subscribe for the new shares in excess of their entitlements pursuant to the given ratio (oversubscription), provided that the existing shareholders who express their interests to subscribe for the new shares in excess of their entitlements shall be allocated with the over-subscribed new shares only if there remains unsubscribed shares from the allocation, together with the issuance and allocation of the (i) warrants representing the right to purchase ordinary shares of Banpu Public Company Limited No.4 (BANPU-W4) ("**Warrants BANPU-W4**") in the amount not exceeding 1,691,527,171 units to the existing shareholders of the Company who subscribe for and are allocated with newly issued ordinary shares offered to them in proportion to their respective shareholdings at the ratio of 1 new ordinary share to 1 unit of Warrants BANPU-W4 at no cost (i.e. offering price per unit is Baht 0) and its exercise price is Baht 5.00 per share; and (ii) warrants representing the right to purchase ordinary shares of Banpu Public Company Limited No.5 (BANPU-W5) ("**Warrants BANPU-W5**") in the amount not exceeding 1,691,527,171 units to the existing shareholders of the Company who subscribe for and are allocated with newly ordinary shares offered to them in proportion to their respective shareholdings at the ratio of 1 newly issued ordinary share to 1 unit of

Warrants BANPU-W5 at no cost (i.e. offering price per unit is Baht 0) and its exercise price is Baht 7.50 per share. The details are as follows:

2.1 **Newly Issued Ordinary Shares**

Type of Securities	:	Ordinary Shares
Par Value Per Share	:	Baht 1.00
Paid-up Capital prior to the Capital Increase	:	Baht 5,074,581,515
Capital to be Increased and Number of Shares to be Allocated	:	Baht 5,074,581,513 divided into: (1) ordinary shares in the amount not exceeding 1,691,527,171 shares to be offered to the existing shareholders of the Company in proportion to their respective shareholdings (the "**New Shares**"); (2) ordinary shares in the amount not exceeding 1,691,527,171 shares reserved for the exercise of Warrants BANPU-W4; and (3) ordinary shares in the amount not exceeding 1,691,527,171 shares reserved for the exercise of Warrants BANPU-W5;
Offering Price Per New Share	:	Baht 5.00
Subscription Ratio for New Shares	:	3 existing shares to 1 New Share
Allocation Method for New Shares	:	The conditions for allocation of the New Shares to the existing shareholders of the Company in proportion to their respective shareholdings are as follows: (a) offering at the ratio of 3 existing shares to 1 New Share at the offering price of Baht 5.00 per share; (b) any fraction of shares from the allocation shall be rounded down; (c) the existing shareholders shall be entitled to subscribe for the New Shares in excess of their entitlements pursuant to the given ratio (oversubscription). In this regard, the existing shareholders who express their interests to subscribe for the New Shares in excess of their respective shareholding rights shall be allocated with the over-

subscribed New Shares only if there remains unsubscribed shares from the above allocation and such New shares shall be reallocated in their entirety until there are no leftover from the allocation.

If the number of New Shares remaining unsubscribed is less than the number to which the existing shareholders have expressed their interest to subscribe in excess of their respective shareholding rights, then in principle, the Company shall proceed to allocate the remaining unsubscribed shares to those shareholders who have expressed their intention to subscribe for shares in excess of their respective shareholding in accordance with the ratio of the number of over-subscribed shares and the number of New Shares remaining unsubscribed, provided that this remains subject to the discretion of the Company

In the event that the allocation of the oversubscribed New Shares above would result in any oversubscribing shareholders being obliged to make a mandatory tender offer pursuant to the relevant notification of the Capital Market Supervisory Board, such shareholders must comply with the relevant laws and regulations accordingly;

(d) in the case where there are shares remaining unsubscribed after the exercise of subscription rights by the existing shareholders of the Company, the Company shall seek for approval from its next shareholders' meeting to reduce its registered capital accordingly;

(e) the shareholders who are eligible to subscribe for the New Shares shall be those whose names are recorded in the share register on 17 August 2021 (Record Date), and the subscription and payment period for the New Shares allotted and offered to the existing shareholders in proportion to their respective shareholdings shall be 6 to 17 September 2021;

(f) additionally, the Company reserves the right to refuse to offer or allocate newly issued ordinary shares to any shareholder

			if such offering or allocation will or may result in the Company being subject to any obligations under the law of other jurisdictions, such as the existing shareholders in the United States of America and other countries as the Company deems appropriate (which may include no offering or allocation of newly issued ordinary shares to U.S. Persons as defined under Regulation S of the U.S. Securities Act of 1993)

2.2 **Warrants BANPU-W4**

Name of Securities	:	Warrants Representing the Right to Purchase Ordinary Shares of Banpu Public Company Limited No.4 (BANPU-W4)
Number of Allocated Warrants	:	Not exceeding 1,691,527,171 units
Number of Allocated Ordinary Shares to Accommodate the Exercise of Warrants	:	Not exceeding 1,691,527,171 shares with Baht 1.00 par value per share
Type of Securities	:	Named certificate and transferable warrants
Term of Warrants	:	1 year after the issuance date of the Warrants BANPU-W4. The Company will not extend the term of Warrants BANPU-W4.
Offering Method	:	Allocation to the existing shareholders of the Company who subscribe for and are allocated with the New Shares in proportion to their respective shareholdings at the ratio of 1 New Share to 1 unit of Warrants BANPU-W4. In this regard, the shareholders who are eligible to subscribe for the newly issued ordinary shares together with the warrants shall be those whose names are recorded in the share register on 17 August 2021 (Record Date).
Offering Price	:	No cost (i.e. offering price is Baht 0 per unit)
Exercise Price	:	Baht 5.00 per share (unless the exercise price is adjusted under the conditions of the right adjustment). If the exercise price is adjusted, the adjusted exercise price shall not be lower than the par value of the Company's shares at the time of the adjustment.

Exercise Ratio	:	1 unit of Warrants BANPU-W4 for 1 ordinary share (unless the exercise ratio is adjusted under the conditions of the right adjustment)
Exercise Date and Exercise Period	:	On the date of the first anniversary of the issuance date of the warrants
Period for Notification of Intention to Exercise the Warrants	:	The holders of Warrants BANPU-W4 who wish to exercise their rights to purchase the ordinary shares of the Company must notify the intention to purchase ordinary shares of the Company within 15 business days prior to the exercise date. The warrant holders can express their intention to exercise the rights on any working day during the above given period.
Conditions concerning the Right Adjustment	:	The Company shall adjust the exercise price and the exercise ratio upon the occurrence of any of the following events to ensure that the benefits of the warrant holders will not be less favourable: (1) The Company changes the par value of the shares due to a consolidation or split of the shares; (2) The Company offers newly issued shares at a price lower than 90 per cent of the market price of the ordinary shares of the Company; (3) The Company offers newly issued securities in the form of convertible debentures or warrants representing the right to buy any shares with the determined or calculated price of the newly issued shares to accommodate the exercise of rights under such convertible debentures or warrants, at an amount of lower than 90 per cent of the market price of the ordinary shares of the Company; (4) The Company makes all or partial dividend payment by way of issuing newly issued shares to the shareholders; (5) The Company pays cash dividend that exceeds the rate in Terms and Conditions; and (6) There are any other events similar to those mentioned in (1) to (5) above that may impair benefits of holders of the warrants. The Board of Directors or a person delegated by the Board of Directors shall be empowered to determine terms and conditions and other

			particulars pertaining to the adjustment or change of the exercise ratio and the exercise price.
	Secondary Market of Warrants	:	The Company will register the Warrants BANPU-W4 issued as listed securities on the Stock Exchange of Thailand (the "**SET**")
	Secondary Market of Ordinary Shares Reserved for the Exercise of the Warrants	:	The Company will list the ordinary shares issued in accordance with the exercise of warrants on the SET
	Registrar	:	Thailand Securities Depository Company Limited
	Other Conditions	:	The Board of Directors or a person delegated by the Board of Directors shall be empowered to determine terms and conditions and other particulars pertaining to the warrants and to negotiate, finalise and sign relevant documents and agreements which are necessary and appropriate in connection with the issue and allocation of the warrants, as well as filing applications for registrations of the warrants as listed securities on the SET and performing any acts to seek approval from the relevant authorities.
2.3	**Warrants BANPU-W5**		
	Name of Securities	:	Warrants Representing the Right to Purchase Ordinary Shares of Banpu Public Company Limited No.5 (BANPU-W5)
	Number of Allocated Warrants	:	Not exceeding 1,691,527,171 units
	Number of Allocated Ordinary Shares to Accommodate the Exercise of Warrants	:	Not exceeding 1,691,527,171 shares with Baht 1.00 par value per share
	Type of Securities	:	Named certificate and transferable warrants
	Term of Warrants	:	2 years after the issuance date of the Warrants BANPU-W5. The Company will not extend the term of Warrants BANPU-W5.
	Offering Method	:	Allocation to the existing shareholders of the Company who subscribe for and are allocated with the New Shares in proportion to their respective shareholdings at the ratio of 1 New Share to 1 unit of Warrants BANPU-W5. In this regard, the shareholders who are eligible to subscribe for the newly issued ordinary shares together with the warrants shall be those whose names are

		recorded in the share register on 17 August 2021 (Record Date).
Offering Price	:	No cost (i.e. offering price is Baht 0 per unit)
Exercise Price	:	Baht 7.50 per share (unless the exercise price is adjusted under the conditions of the right adjustment). If the exercise price is adjusted, the adjusted exercise price shall not be lower than the par value of the Company's shares at the time of the adjustment.
Exercise Ratio	:	1 unit of Warrants BANPU-W5 for 1 ordinary share (unless the exercise ratio is adjusted under the conditions of the right adjustment)
Exercise Date and Exercise Period	:	On the date of the second anniversary of the issuance date of the warrants
Period for Notification of Intention to Exercise the Warrants	:	The holders of Warrants BANPU-W5 who wish to exercise their rights to purchase the ordinary shares of the Company must notify the intention to purchase ordinary shares of the Company within 15 business days prior to the exercise date. The warrant holders can express their intention to exercise the rights on any working day during the above given period.
Conditions concerning the Right Adjustment	:	The Company shall adjust the exercise price and the exercise ratio upon the occurrence of any of the following events to ensure that the benefits of the warrant holders will not less favourable: (1) The Company changes the par value of the shares due to a consolidation or split of the shares; (2) The Company offers newly issued shares at a price lower than 90 per cent of the market price of the ordinary shares of the Company; (3) The Company offers newly issued securities in the form of convertible debentures or warrants representing the right to buy any shares with the determined or calculated price of the newly issued shares to accommodate the exercise of rights under such convertible debentures or warrants, at an amount of lower than 90 per cent of the market price of the ordinary shares of the Company;

(4) The Company makes all or partial dividend payment by way of issuing newly issued shares to the shareholders;

(5) The Company pays cash dividend that exceeds the rate in Terms and Conditions; and

(6) There are any other events similar to those mentioned in (1) to (5) above that may impair benefits of holders of the warrants.

The Board of Directors or a person delegated by the Board of Directors shall be empowered to determine terms and conditions and other particulars pertaining to the adjustment or change of the exercise ratio and the exercise price.

Secondary Market of Warrants	:	The Company will register the Warrants BANPU-W5 issued as listed securities on the SET
Secondary Market of Ordinary Shares Reserved for the Exercise of the Warrants	:	The Company will list the ordinary shares issued in accordance with the exercise of warrants on the SET
Registrar	:	Thailand Securities Depository Company Limited
Other Conditions	:	The Board of Directors or a person delegated by the Board of Directors shall be empowered to determine terms and conditions and other particulars pertaining to the warrants and to negotiate, finalise and sign relevant documents and agreements which are necessary and appropriate in connection with the issue and allocation of the warrants, as well as filing applications for registrations of the warrants as listed securities on the SET and performing any acts to seek approval from the relevant authorities.

3. Record Date to Determine the Name of the Shareholders who are Eligible to Subscribe for the Newly Issued Ordinary Shares in Combination with Warrants

The shareholders who are eligible to subscribe for the Newly Issued Ordinary Shares in combination with Warrants shall be those whose names are recorded in the share register on 17 August 2021 (Record Date).

4. Date of Subscription and Payment for the New Shares

4.1 **Period of Subscription and Payment of Newly Issued Shares in Combination with Warrants**

From 8.30 to 16.00 hours of 6 to 17 September 2021 (totaling 10 business days).

4.2 **Method and Location for the Subscription of Newly Issued Shares in Combination with Warrants**

The existing shareholders who wish to subscribe for the Newly Issued Shares in Combination with Warrants or their attorneys may submit documents required for the subscription and payment for the Newly Issued Ordinary Shares in Combination with Warrants at [name of the Subscription Agent] which is the Company's Subscription Agent of the Newly Issued Ordinary Shares in Combination with Warrants (the "**Subscription Agent**" or "[●]"). The Company or the Subscription Agent reserve the right to allow the subscription by other methods as may be deemed appropriate during 6 to 17 September 2021 (totaling 10 business days) from 8.30 hours – 16.00 hours at the following address:

Name: Bualuang Securities Public Company Limited

Location: 29th Floor, Silom Complex Office Building, 191 Silom Road, Silom, Bangrak, Bangkok 10500

Contact : Ms.Jarupa / Ms.Suwalee / Mrs.Thanamas / Ms.Malee / Ms.Benjawan / Ms.Manisa / Ms.Piyaporn

Tel. : 0-2231-3777 or 0-2618-1000 ext:1122,1133, 1141, 1142, 1143, 1146, 1147

Fax: : 0-2618-1120

Subscription of newly issued ordinary shares of the Company through potal mail or at any branch of commercial banks is strictly refrained.

4.3 **Procedures for Payment of the Newly Issued Ordinary Shares in Combination with Warrants**

[The subscriber must make payment of the subscription price in full via:

4.3.1 cheque, draft or cashier cheque dated no later than 14 September 2021 and must be able to be collected by the Clearing House located in Bangkok within the next business day, or via bill payment system of Bangkok Bank Public Company Limited by using the enclosed Bill Payment Slip (Enclosure No. 5), or via counter payment at any branches of Bangkok Bank Public Company Limited. *In case the payment is made via cheque, draft or cashier cheque, the date must be no later than 14 September 2021 and must be able to be collected by the Clearing House located in Bangkok within the next business day, and the subscriber who wish to make the subscription payment by cheque, draft or cashier cheque shall cross the cheque, draft or cashier cheque as payable only to "Bualuang Securities Public Company Limited for Share Subscription" account, as well as specifying name, last name, address and contact number at the back of such cheque, draft or cashier cheque. ***The subscriber must not make a payment or date a cheque before the subscription date*;

4.3.2 Transfer of money via Automatic Transfer System (ATS) to the bank account. The transfer of money via ATS can be completed only if the subscriber has opened a trading account with the Subscription Agent and has sent a request to transfer via ATS, and such ATS is effective on the subscription date;

4.3.3 Make a payment by deduction of cash from a trading account opened with the Subscription Agent; or

4.3.4 Transfer of money via Electronic Bill Payment system of Bangkok Bank through Internet Banking channel. This channel is for the subscriber who has a bank account with Bangkok Bank and already registered with Bualuang Internet Banking ("Bualuang iBanking") with Bangkok Bank. The Subscriber can scan QR code shown on subscription process screen via

www.bualung.co.th for the subscription payment (BLS's subscriber information of 10-digit Registration No. (Ref.1) and 13-digit ID Number or passport number (Ref.2) will automatically show on the screen) or the subscriber can log-on Bualuang iBanking via https://ibanking.bangkokbank.com and make a payment by filling in service code "ROBLS01", then filling in required information by stating the 10-digit Registration No. in Ref.1 (Registration No. as stated in the Certificate for the subscription rights of the newly issued ordinary shares issued by TSD) and stating 13-digit ID Number or passport number in Ref.2, and filling in desire payment. Check information of payment transaction then save and/or print payment evidence for further subscription process (The subscriber information will base on information of Ref.1 and Ref.2 in subscription detail only)

4.3.5 Mobile Banking system of [Bangkok Bank's Bualuang Moblile Banking Application ("Bualuang mBanking") / other banks' Mobile Banking channel.] through the two following methods:

(1) By scanning the QR Code shown on subscription process screen via www.bualuang.co.th (BLS's subscriber information of 10-digit Registration No.(Ref.1) and 13-digit ID number or passport number (Ref.2) will automatically show on the screen) and filling in desire payment. Check information of payment transaction then save and/or print payment evidence for further subscription process (The subscriber information will base on information of Ref.1 and Ref.2 in the subscription detail only).

(2) The subscriber can log-on to the application and make a payment by filling in service code "ROBLS01", then filing in required information by stating the 10-digit Registration No. in Ref.1 (Registration No. as stated in the Certificate for the subscription rights of the newly issued ordinary shares issued by TSD) and stating 13-digit ID number or passport number in Ref.2 and filling in desire payment. Check information of payment transaction then save and/or print payment evidence for further subscription process (The subscriber information will base on information of Ref.1 and Ref.2 in the subscription detail only)

4.4 Required Documents for the Subscription

4.4.1 Completed and duly signed Subscription Form for the Newly Issued Ordinary Shares in Combination with Warrants.

The Company has delivered the Subscription Form for the Newly Issued Ordinary Shares In Combination with Warrants to all the shareholders whose names are recorded in the share register on 17 August 2021 (Record Date) who are eligible to subscribe for the Newly Issued Ordinary Shares In Combination with Warrants. In addition, the shareholders may also obtain the Subscription Form for the Newly Issued Ordinary Shares In Combination with Warrants from the Subscription Agent or download such form from the Company's website (www.banpu.com).

4.4.2 Certificate for Subscription Entitlement of the Newly Issued Ordinary Shares in Combination with Warrants issued by Thailand Securities Depository Company Limited.

4.4.3 Evidence of subscription payment for the Newly Issued Ordinary Shares in Combination with Warrants via Bill Payment to the bank account, or in case of payment made by cheque, draft or cashier cheque (so-called "**Bank Cheque**") which name, last name and contact number are specified at the back of the cheque, draft or cashier cheque, must be enclosed together with the Subscription Form and fully completed Bill Payment form.

4.4.4 In case the payment was made via Internet Banking of Bangkok Bank or Mobile Banking channel, a copy of evidence of the payment for the Newly Issued Ordinary Shares in Combination with Warrants via Internet Banking or Mobile Banking channel of [Bangkok Bank Public Company Limited/ the relevant bank].

4.4.5 In case of the absence of Certificate for Subscription Entitlement of the Newly Issued Ordinary Shares in Combination with Warrants as per item .44.2, and/or in the case there was a change to the shareholder's name/last name which causes the shareholder's name/last name to differ from those recorded in the share register on 17 August 2021 (which is the Record Date to determine the shareholders who are eligible to subscribe for the Newly Issued Ordinary Shares in Combination with Warrants) or differ from the Certificate for Subscription Entitlement of the Newly Issued Ordinary Shares in Combination with Warrants, then documents issued by the government authority e.g. affidavit, marriage certificate, divorce certificate, notification of name/last name change etc., are also required.

4.4.6 The following identification documents:

(1) <u>In the case of Thai individual</u>

A certified true copy of a valid national identification card or a government official identification card, or a certified true copy of the first page of a house registration certificate and the page that contains national identification number. [The signature must match the signature in all subscription documents.]

(2) <u>In the case of foreign individual</u>

A certified true copy of a valid alien identification card or a passport. [The signature must match the signature in all subscription documents.]

(3) <u>In the case of Thai juristic person</u>

(a) A copy of an affidavit issued by the Ministry of Commerce no longer than 1 year prior to the submission date of the Subscription Form, certified true copy by authorized person and affixed with the company's seal (if any); and

(b) A certified true copy of document in item (1) or (2) (as the case may be) of the authorized person who certified true copy on the document pursuant in item (3) (a). [The signature must match the signature in all subscription documents.]

(4) <u>In the case of foreign juristic person</u>

(a) A copy of Certificate of Incorporation, Memorandum of Association and/or Affidavit of the juristic person issued no longer than 1 year prior to the submission date of the Subscription Form, certified true copy by the authorized person of the juristic person and affixed with the company's seal (if any); and

(b) A certified true copy of document in item (1) or (2) (as the case may be) of the authorized person who certified true copy on the document pursuant in item (4) (a). [The signature must match the signature in all subscription documents.]

A copy of all documents above must be certified by the Notary Public and affixed with the seal of the Notary Public, or by any other authorized organization of the country in which the documents are issued or certified, and certified by an official of the Thai Embassy or Consulate in the country in which the documents are prepared or certified. All of which must be dated no longer than 1 year prior to the submission date of the Subscription Form for the Newly Issued Ordinary Shares in Combination with Warrants.

4.4.7 In case there was an appointment of a custodian as an authorized person(s), there must be a power of attorney for the custodian. The Subscription Form for the Newly Issued Ordinary Shares in Combination with Warrants and all supporting documents will be signed by the custodian and must be attached with the custodian's document specifying the authorized person and a copy of a valid national identification card or other identification documents of such authorized person.

4.4.8 Power of attorney [(Enclosure No. 7)] affixed with Baht 30 stamp duty (in case of authorizing an attorney to act on the subscriber's behalf) together with a certified true copy of a national identification card of the subscriber and the attorney.

4.4.9 For the subscriber who wishes to deposit the Newly Issued Ordinary Shares in Combination with Warrants in the issuer account No. 600 under the name of the subscriber, please complete all details in "Additional Documents for Securities Subscription Specifically for Those Who Intend to Deposit Securities into the Issuer Account Only" (Enclosure No. 8) for submission to Thailand Securities Depository Company Limited. If the subscriber did not enclose the additional supporting document, the Company hereby reserves the right to issue a share certificates in the name of the subscriber.

If the subscriber fails to submit the required subscription documents above or the documents are incomplete, the Company or the Subscription Agent reserve the rights to deem that such subscriber did not intend to exercise the right to subscribe for the Newly Issued Ordinary Shares in Combination with Warrants. However, the Company or the Subscription Agent may exercise its discretion in exempting certain subscription documents for any subscribers, or requesting for any other substitute documents or additional documents as it deems appropriate.

In addition, the Company or the Subscription Agent reserve the rights not to deliver documents on the offering of the Newly Issued Ordinary Shares in Combination with Warrants, and the right not to allocate the newly issued shares to any subscriber if such offering or allocation will or may cause the Company to violate any laws, rules or regulations of other jurisdictions, or will cause the Company to have additional

obligations other than those required under the relevant laws or regulations of Thailand on securities offering such as the existing shareholders in the United States of America and other countries, or as the Company deem appropriate (which may include no offering or allocation of newly issued ordinary shares to U.S. Persons as defined under Regulation S of the U.S. Securities Act of 1993).

4.5 **Conditions of Subscription**

4.5.1 The shareholders who subscribe for the Newly Issued Ordinary Shares in Combination with Warrants shall be entitled to subscribe in accordance with, in excess of, or less than their entitlements pursuant to the given ratio. In this regard, the shareholders who express their interests to subscribe for the Newly Issued Ordinary Shares in Combination with Warrants in accordance with their entitlements (any fraction shall be rounded down), or less than their entitlements shall be allocated with the full amount they so subscribed.

4.5.2 The shareholders who have subscribed and paid for the subscription price is not permitted to cancel their subscription.

4.5.3 In the case that the subscription payment is made by Bank Cheque, the subscription payment will be completed once the paying bank cashes out the amount specified in the Bank Cheque, and the subscription for the Newly Issued Ordinary Shares in Combination with Warrants will be deemed complete once the Company or the Subscription Agent can collect the subscription payment only.

If (1) the shareholder who subscribes for the shares is unable to pay for the subscription price, or the Subscription Agent is unable to collect the payment in any case (either in whole or in part) within the specified subscription and payment period, whereby the Company or the Subscription Agent is not at fault; or if (2) the shareholder who subscribes the shares has incompletely or unclearly filled in the details in the Subscription Form for the Newly Issued Ordinary Shares in Combination with Warrants, the Company or the Subscription Agent is entitled to deem that such subscriber has waive the right to subscribe for the Newly Issued Ordinary Shares in Combination with Warrants. In this regard, the Company or the Subscription Agent hereby reserves the right to further allocate such Newly Issued Ordinary Shares in Combination with Warrants.

In making the subscription payment for the Newly Issued Ordinary Shares in Combination with Warrants, the shareholders should closely examine the subscription payment method and proceed in accordance with the conditions and method specified. If the shareholder fails to comply with the method for the subscription payment and fails to proceed in accordance with conditions and method specified in order for the subscription payment to be collected within the subscription period, the Company or the Subscription Agent is entitled to deem that such shareholder has waive the right to subscribe for the Newly Issued Ordinary Shares in Combination with Warrants. In this regard, the Company or the Subscription Agent hereby reserves the right to further allocate such Newly Issued Ordinary Shares in Combination with Warrants.

4.5.4 The Company and the Subscription Agent reserve the rights not to allocate the newly issued shares to any subscriber if such offering or allocation will or may cause the Company to violate any laws, rules or regulations of other jurisdictions, or will cause the Company to have additional obligations other

than those required under the relevant laws or regulations of Thailand on securities offering such as the existing shareholders in the United States of America and other countries, or as the Company deem appropriate (which may include no offering or allocation of newly issued ordinary shares to U.S. Persons as defined under Regulation S of the U.S. Securities Act of 1993).

4.5.5 Return of Subscription Payment of the Newly Issued Ordinary Shares in Combination with Warrants

In the case that the shareholders have expressed their intention to subscribe for the Newly Issued Ordinary Shares in Combination with Warrants in excess of their entitlements (oversubscription) but were not allocated with all or some of the oversubscribed portion, the Company or the Subscription Agent will proceed to return the subscription payment for the portion of shares that has not been allocated or has not been fully allocated (without interest and/or any damages) within 10 business days from the end of the subscription and payment period, via one of the methods specified by the shareholder in the Subscription Form for the Newly Issued Ordinary Shares in Combination with Warrants as follows:

(1) In the case that the shareholder has a trading account with Bualuang, the return of the subscription payment shall be made by transferring via Automatic Transfer System (ATS) to the bank account of the subscriber according to the information provided to Bualuang as specified in the subscription form for the newly issued ordinary shares within 5 business days from the end of the subscription period

(2) In the case that subscriber subscribes via E-RO, the cash will be transferred to the subscriber's bank account of only 8 specified banks, which are: Bangkok Bank Public Company Limited ("BBL"), Krung Thai Bank Public Company Limited ("KTB"), Bank of Ayudhya Public Company Limited ("BAY"), Kasikornbank Public Company Limited ("KBANK"), CIMB Thai Bank Public Company Limited ("CIMBT"), TMBTHANACHART Bank Public Company Limited ("TTB"), The Siam Commercial Bank Public Company Limited ("SCB"), and United Overseas Bank (Thai) Public Company Limited ("UOBT"). The cash will be transferred to the bank account specified via E-RO system within 7 business days from the end of the subscription period;or

(3) In the case that subscriber submits subscription documents at Bualuang, the return of the subscription payment (1) by transferring to the subscriber's bank account of only 8 specified banks which are BBL, KTB, BAY, KBANK, CIMBT, TTB, SCB, UOBT appearing in the shareholders register book of the Company on August 17, 2021(record date) in case that it is unable to refund with this method, the Company or Bualuang shall refund to subscriber by issuing a crossed cheque method. Or (2) Issuing a crossed cheque made payable to the subscriber and such cheque will be delivered by registered postal mail to the address shown in the shareholders register book on the record date which is August 17, 2021, within 10 business days from the end of the subscription period.

Nevertheless, in the case that it is unable to return the subscription payment for the portion of shares that was not allocated or was not fully allocated via Automatic Transfer System (ATS) to the bank account of the subscriber as

specified in the Subscription Form in any case which is outside of the control of the Company or the Subscription Agent, the Company or the Subscription Agent shall return the subscription payment for the portion of shares that has not been allocated or has not been fully allocated by issuing cheque of Bangkok Bank Public Company crossed as payable only to the subscriber and deliver such cheque by registered postal mail to the address appears in the shareholders' database of the Company.

In case of the return of the subscription payment by a cheque, the subscriber will be responsible for fee charged by the different Clearing House or Bank Cheque (if any).

In case the Company or the Subscription Agent cannot return the subscription payment to the subscriber within 10 business days from the end of the subscription period, the subscriber shall receive interest at the rate of 7.5% per annum on the subscription payment which has not been returned, calculated from the date following the last day of the 10 business days subscription period to the date of which the subscription payment has been returned. Nevertheless, in any case, if there was a transfer of the subscription payment for the portion of shares that has not been allocated or has not been fully allocated via Automatic Transfer System (ATS) to the bank account of the subscriber as specified in the Subscription Form for the Newly Issued Ordinary Shares in Combination with Warrants, or via delivery of cheque to the address appears in the shareholders' database of the Company by registered postal mail, it shall be deem that the subscriber has duly received the subscription payment for the portion of shares that has not been allocated or has not been fully allocated, and the subscriber shall no longer have the right to claim any interest and/or damages from the Company or the Subscription Agent.]

4.5.6 The Company or the Subscription Agent hereby reserves the right to change the details of method of the subscription payment, terms and conditions of subscription or any information relating to the subscription method of the Newly Issued Ordinary Shares in Combination with Warrants as it deems appropriate in the case that there are any problems, obstacles or limitations in its operation, by taking into account the utmost benefit of the subscription of the Newly Issued Ordinary Shares in Combination with Warrants.

4.6 **Other Important Information**

4.6.1 The name of the subscriber and the name of the holder of the securities trading account shall be the same. If the account number of the securities trading account belongs to other person, the share(s) will not be able to be deposited into such account and the subscriber will not be able to trade the shares on the first trading date of the Company's ordinary shares on the SET. In this regard, the Company reserves the right to issue a share certificate to such subscriber.

4.6.2 Please specify the correct Thailand Securities Depository Company Limited membership number (Broker Code) to which the share(s) will be delivered. If the Thailand Securities Depository Company Limited membership number is incorrect, the share(s) will be delivered to other recipient, in which case the Company or the Subscription Agent will not be responsible for the lost or delay in claiming back the share(s).

4.6.3 If the Company is unable to return the subscription payment to the subscriber within the specified period due to circumstances which are beyond reasonable

control of the Company or the Subscription Agent, the Company and the Subscription Agents will not be responsible for any interest and/or damages and will return only the subscription payment payable to the subscriber who has not been allocated or has not been fully allocated with the shares from the Company, as described in Clause 4.5 "**Conditions of Subscription**".

4.6.4 If the number of shares that the shareholder specified in the Subscription Form for the Newly Issued Ordinary Shares in Combination with Warrants does not match with the subscription payment received by the Company, the Company hereby reserves the right to adhere to the number of shares based on the subscription payment.

4.6.5 If you have any questions, please contact

Bualuang Securities Public Company Limited

Location: 29th Floor, Silom Complex Office Building, 191 Silom Road, Silom, Bangrak,Bangkok 10500

Contact : Ms.Jarupa / Ms.Suwalee / Mrs.Thanamas / Ms.Malee / Ms.Benjawan /Ms.Manisa / Ms.Piyaporn

Tel. : 0-2231-3777 or 0-2618-1000 ext:1122,1133, 1141, 1142, 1143, 1146, 1147

Fax: : 0-2618-1120

5. Objectives for the Capital Increase

5.1 The Company plans to increase its capital of (a) approximately Baht 8,458 million from an offering the newly issued ordinary shares to the existing shareholders in proportion to their respective shareholdings (b) approximately Baht 8,458 million from an issuance of Warrants BANPU-W4 and (c) approximately Baht 12,686 million from an issuance of Warrants BANPU-W5. If the new ordinary shares were fully subscribed and the Warrants BANPU-W4 and Warrants BANPU-W5 were fully exercised, the Company will be able to raise additional funds of approximately Baht 29,602 million in total from this capital increase.

5.2 The proceeds from this capital increase will be utilised in 3 areas.

- To increase financial liquidity and flexibility to ensure the company secure sufficient funds for future investment and facilitates the company in accomplishing its sustainable growth objectives.
- To improve the Company's financial strength, prepare for appropriate financial structure with healthy financial ratio to support its business expansion plan while maintain its ability to meet its financial obligations.
- To be used as working capital for the new projects and/or existing projects and/or for repayment of debts.

The company is determined to accelerate its sustainable growth strategy to ultimately maximizing value to the investment as well as return to shareholders and will consider to the appropriate allocation and utilization of proceeds by focus in accommodating its investment for growth and then to remain as working capital to ensure company's financial flexibility.

5.3 However, if the proceeds from this capital increase is lower than as expected, the proceeds utilization plan may differs from the plan set out above.

6. Benefits which the Company will receive from the Capital Increase/ the Allotment of the Newly Issued Ordinary Shares

This capital increase will enhance the Company's financial strengths and increase its financial liquidity to ensure that the Company secures sufficient funds for existing and future operations, and will facilitate the Company in accomplishing its growth objectives according to the strategy plan smoothly. It will also reduce interest payment burden of the Company, as well as increase working capital for business operation and help enhance the capability for investment expansion which will contribute to the Company's future growth.

7. Benefits which the Shareholders shall receive from the Capital Increase/ the Allotment of the Newly Issued Ordinary Shares

7.1 **The Dividend Policy and Right to Receive Dividend**

The Company will pay dividends at the rate of approximately 50% of its consolidated net profits after deducting any reserve funds as required by law or as established by the Company. However, such dividend payment rate depends on the cash flows and investment obligations of the Company and its group companies, including any legal limitations and other necessity.

7.2 **The eligibility to receive dividends from the Company's business operation**

Persons who are allocated with the Newly Issued Ordinary Shares in Combination with Warrants will be entitled to receive dividends from the Company's business operation after they have exercised their rights to subscribe for the newly issue ordinary shares and have been registered as the shareholders of the Company, and the Company has declared dividend payment in accordance with the relevant laws and regulations.

7.3 **Others**

This capital increase will help strengthen the Company's financial status, increase working capital to be used for business operation, and will enhance the Company's ability to generate more income and profits. The shareholders of the Company will receive benefits as the Company will be able to utilise the fund raised from this capital increase for its future projects as appropriate, which allows the shareholders to become part of the driving force of the Company's growth and it is an opportunity to create good return on investment in the long run. In addition, the shareholders who exercised their rights to purchase ordinary shares under Warrants BANPU-W4 and Warrants BANPU-W5 will have the same rights as the shareholders of the Company, such as the right to receive dividends and the right to attend and to vote in the shareholders meeting.

8. Other Details Necessary for Shareholders in Making Decision to Purchase Newly Issued Ordinary Shares in Combination with Warrants

8.1 **Impact of the Issuance and Offering of the Newly Issued Ordinary Shares in Combination with Warrants to the Shareholders**

The shareholders of the Company may be impacted by the issuance and allocation of the New Shares as follows:

8.1.1 Price Dilution of 31 per cent with the calculation details as follows:

= (Weighted average price 15 business days before the offering is made - market price after the offering is made) / Weighted average price 15 business days before the offering is made

= (15.50-10.67)/15.50

= 31 per cent

By market price after the offering is made is calculated as follow

$$= \frac{(5,074,581,515 \times 15.50) + (1,691,527,171 \times 5) + (1,691,527,171 \times 5) + (1,691,527,171 \times 7.5)}{(5,074,581,515 + 1,691,527,171 + 1,691,527,171 + 1,691,527,171)}$$

$$= \frac{108,257,738,975}{10,149,163,028}$$

= 10.67

8.1.2 Control Dilution of 50 per cent with the calculation details as follows:

= Number of newly issued shares offered / Total number of shares after the offering is made

$$= \frac{5,074,581,513}{(5,074,581,515+1,691,527,171 +1,691,527,171 +1,691,527,171)}$$

= 50 per cent

8.1.3 Earnings per share dilution of 50 per cent by using profit of first quarter 2021 as a base for calculation and the calculation details as follows:

= (Earning per share before the offering is made – Earning per share after the offering is made) / Earning per share before the offering is made

= (0.30 – 0.15) / 0.30

= 50 per cent

Notwithstanding the above dilutions, this offering will strengthen the Company's financial position as the Company will have sufficient capital to support present and future business operation, and will have less interest payment burden attributing to repayment of debts. It will also increase working capital for business operation and help enhance the capability for investment expansion which will contribute to the Company's future growth as a whole. Therefore, the Board of Directors of the Company is of the opinion that despite the impact from the above dilutions, the offering of the New Shares will be beneficial to the shareholders, will allow the shareholders to become part of the driving force of the Company's growth and will be an opportunity to create good return on investment in the long run.

8.2 **Actions Following the Issuance and Offering of the Newly Issued Ordinary Shares in Combination with Warrants**

The Company shall proceed to register the paid-up capital with the Ministry of Commerce within 14 days after the end of subscription period, and shall submit an application for registrations of all newly issued ordinary shares which have been allocated to the shareholders who subscribed for such new shares as listed securities on the SET thereafter.

Part 2

Business Information

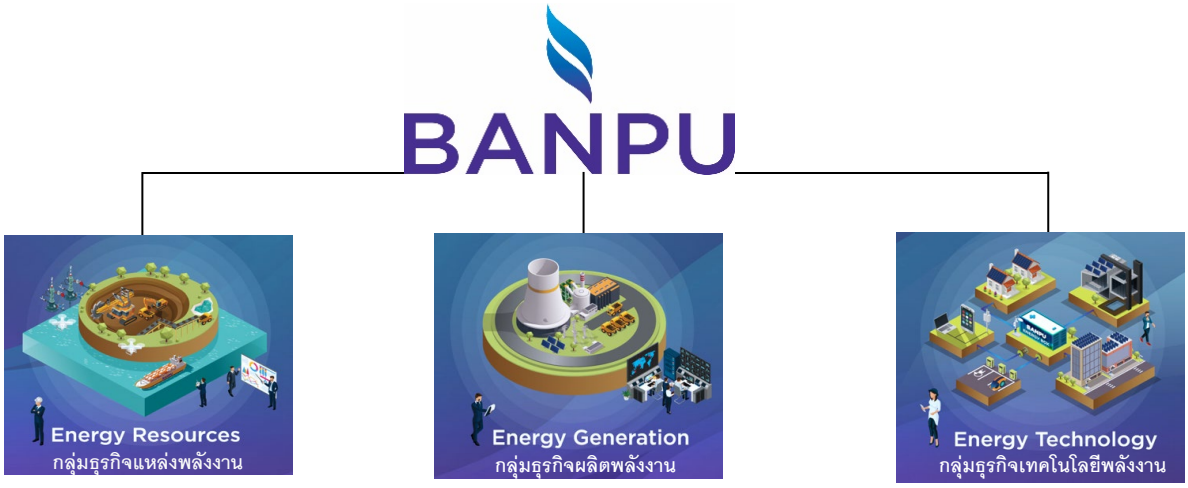
1. General Information

Name of Company	:	Banpu Public Company Limited
Address	:	26th - 28th Floor, Thanapoom Tower, 1550 New Petchburi Road, Makkasan, Ratchathewi, Bangkok 10400
Telephone	:	0-2694-6600
Fax	:	0-2207-0696-8
Web Site	:	www.banpu.com

2. Type of Business and Core business of company

2.1 Overall image in conducting business of the Company

Nowadays, Banpu Public Company Limited, subsidiary and associate company, conducts major important business, which are energy resources consisting of coal and gas and energy generation business consisting of conventional power plant and renewable based power plant and energy technology as follows:



Energy Resources Business consists of Subsidiaries and associates below

Company		Type of Business	Shareholding Percentage
1) Banpu Public Company Limited	BANPU	Energy	-
2) Banpu Minerals Company Limited.	BMC	Coal mining and trading	100.00% (held by Banpu Public Company Limited)
3) Banpu International Limited	BPI	Investment in coal mining	100.00% (held by Banpu Minerals Company Limited)
4) Chiang Muan Mining Company Limited	CMMC	Coal mining and trading	100.00% (held by Banpu Minerals Company Limited)
5) Banpu Coal Sales Company Limited	BCS	Coal trading	100.00% (held by Banpu Minerals Company Limited)
6) Banpu Coal Investment Company Limited	BPCP	Investment in coal mining	100.00% (held by Banpu Minerals Company Limited)
7) Banpu Singapore Pte. Ltd.	BPS	Coal trading	100.00% (held by Asian American Coal, Inc.)

Company		Type of Business	Shareholding Percentage
8) Banpu Minerals (Singapore) Pte. Ltd.	BMS	Investment in coal mining	50.00% (held by Banpu Minerals Company Limited) 50.00% (held by Banpu Coal Investment Co.,Ltd.)
9) Hebi Zhong Tai Mining Co., Ltd.	HEBI	Investment in coal mining	40.00% (held by Banpu Minerals Company Limited)
10) PT.Indo Tambangraya Megah Tbk	ITM	Construction, trading, transportation, industry, repair and services related to coal mining and electricity business	67.13% (held by Banpu Minerals (Singapore) Pte. Ltd.)
11) PT.Kitadin	KTD	Mining, contractor & trading in Indonesia	100% (held byPT. Indo Tambangraya Megah Tbk)
12) PT.Indominco Mandiri	IMM	Coal mining in Indonesia	100% (held by PT. Indo Tambangraya Megah Tbk)
13) PT.Jorong Barutama Greston	JBG	Coal mining in Indonesia	100% (held by PT. Indo Tambangraya Megah Tbk)
14) PT.Trubaindo Coal Mining	TCM	Coal mining in Indonesia	100% (held by PT. Indo Tambangraya Megah Tbk)
15) PT.Bharinto Ekatama	BEK	Coal mining in Indonesia	100% (held by PT. Indo Tambangraya Megah Tbk)
16) PT. ITM Indonesia	ITMI	Trading, land transportation, industry, agriculture, construction, repair and services	100% (held by PT. Indo Tambangraya Megah Tbk)
17) PT Tambang Raya Usaha Tama	TRUST	Mining Support services	100% (held by PT. Indo Tambangraya Megah Tbk)
18) PT. ITM Batubara Utama	IBU	Coal mining business	100% (held by Indo Tambangraya Megah Tbk)

Company		Type of Business	Shareholding Percentage
19) PT. ITM Energi Utma	IEU	Energy business	99.99% (held by PT. Indo Tambangraya Megah Tbk)
20) PT. Tepian Indah Sukses	TIS	Coal mining in Indonesia	100% (held by PT. Indo Tambangraya Megah Tbk)
21) PT. Gas Emas	GEM	Major trading of solid, liquid and gas fuel and other related products	91.99% (held by PT Indo Tambangraya Megah Tbk) 6.01% (held by PT ITM Indonesia)
22) PT. Nusa Persada Resources	NPR	Coal Mining in Indonesia	100% (held by PT. Indo Tambangraya Megah Tbk)
23) PT. Energi Batubara Perkasa	EBP	Coal Trading	100% (held by PT. Indo Tambangraya Megah Tbk)
24) PT. Nusantara Timur Unggul	NTU	Fuel Distributor	33.34% (held by PT. ITM Indonesia)
25) PT. Sentral Mutiara Energy	SME	Major trading of solid, liquid and gas fuel and other related products	100% (held by PT. Indo Tambangraya Megah Tbk)
26) PT. Graha Panca karsa	GPK	Coal mining and major trading of metal goods for construction material	75.19% (held by PT Sentral Mutiara Energy)
27) Banpu (Beijing) Energy Trading Ltd.	BBET	Coal trading	100.00% (held by Banpu Minerals (Singapore) Pte. Ltd.)
28) BMS Coal Sales Pte. Ltd.	BMSCS	Coal trading including coal agent and coal blending	100.00% (held by Banpu Minerals (Singapore) Pte. Ltd.)
29) Hunnu Coal Pty Limited	HUNNU	Coal mining and trading	100.00% (held by Banpu Minerals (Singapore) Pte. Ltd.)
30) Banpu (Shanghai) Trading Co., Ltd.	BST	Coal trading	100.00% (held by Banpu Minerals (Singapore) Pte. Ltd.)

Company		Type of Business	Shareholding Percentage
31) BP Overseas Development Company Limited	BPOD	Investment in coal mining	100.00% (held by Banpu Public Company Limited
32) Asian American Coal, Inc.	AACI	Investment in coal mining	100.00% (held by BP Overseas Development Company Limited)
33) Shanxi Gaohe Energy Co., Ltd.	GAOHE	Investment in coal mining	45.00% (held by Asian American Coal Inc.)
34) Banpu Australia Co. Pty. Ltd.	BPA	Investment in coal mining in Australia	100.00% (held by Banpu Singapore Pte. Ltd.)
35) Banpu Australia Resources Pty. Ltd.	BPR	Investment in coal mining	100.00% (held by Banpu Australia Pty. Ltd.)
36) Centennial Coal Company Limited	CEY	Coal Mining and Marketing	100.00% (held by Banpu Australia Pty. Ltd.)
37) Centennial Inglenook Pty Limited	-	Coal Mining	100.00% (held by Centennial Coal Co., Ltd.)
38) Centennial Coal Sales & Marketing Pty Limited	-	Coal Mining	100.00% (held by Centennial Coal Co., Ltd.)
39) Centennial Northern Coal Services Pty Limited	-	Employer Company for Newstan Washery	100.00% (held by Centennial Coal Co., Ltd.)
40) Centennial Airly Pty Limited	Airly	Coal Mining	100.00% (held by Centennial Coal Co., Ltd.)
41) Berrima Coal Pty Limited	-	Dormant	100.00% (held by Centennial Coal Co., Ltd.)
42) Centennial Angus Place Pty Limited	Angus place	Coal Mining	100.00% (held by Centennial Coal Co., Ltd.)

Company		Type of Business	Shareholding Percentage
43) Centennial Coal Infrastructure Pty Limited	-	Coal exporting logistics and infrastructure	100.00% (held by Centennial Coal Co., Ltd.)
44) Centennial Fassifern Pty Limited	-	Coal Mining	100.00% (held by Centennial Coal Co., Ltd.)
45) Centennial Northern Mining Services Pty Limited	-	Employer Company for Newstan	100.00% (held by Centennial Coal Co., Ltd.)
46) Centennial Mandalong Pty Limited	Mandalong	Coal Mining	100.00% (held by Centennial Coal Co., Ltd.)
47) Centennial Mannering Pty Limited	Mannering	Coal Mining	100.00% (held by Centennial Coal Co., Ltd.)
48) Centennial Munmorah Pty Limited	-	Coal Mining	100.00% (held by Centennial Coal Co., Ltd.)
49) Centennial Myuna Pty Limited	Myuna	Coal Mining	100.00% (held by Centennial Coal Co., Ltd.)
50) Centennial Newstan Pty Limited	Newstan	Coal Mining	100.00% (held by Centennial Coal Co.,Ltd.)
51) Centennial Springvale Pty Ltd.	Springvale	Coal Mining	100.00% (held by Centennial Coal Co., Ltd.)
52) Charbon Coal Pty Limited	Charbon	Coal Mining	100.00% (held by Centennial Coal Co., Ltd.)
53) Ivanhoe Coal Pty Limited	-	Coal Mining	100.00% (held by Centennial Coal Co., Ltd.)
54) Coalex Pty Limited	-	Coal Mining - Clarence JV	100.00% (held by Centennial Coal Co., Ltd.)
55) Centennial Clarence Pty Limited	Clarence	Coal Mining - Clarence JV	100.00% (held by Centennial Coal Co., Ltd.)

Company		Type of Business	Shareholding Percentage
56) Hartley Valley Coal Company Pty Limited	-	Dormant	100.00% (held by Centennial Coal Co., Ltd.)
57) Powercoal Employee Entitlements Company Pty Limited	-	Employee Trust Company Ex Powercoal	100.00% (held by Centennial Coal Co., Ltd.)
58) Centennial Drilling Services Pty Limited	-	Drilling Services	100.00% (held by Centennial Coal Co., Ltd.)
59) Powercoal Pty Limited	-	Dormant Holding company	100.00% (held by Centennial Fassifern Pty Limited)
60) Elcom Collieries Pty Limited	-	Dormant	100.00% (held by Powercoal Pty Limited)
61) Huntley Colliery Pty Limited	-	Dormant	100.00% (held by Powercoal Pty Limited)
62) Mandalong Pastoral Management Pty Limited	-	Dormant	100.00% (held by Powercoal Pty Limited)
63) Collieries Superannuation Pty Limited	-	Superannuation Company (Dormant)	100.00% (held by Powercoal Pty Limited)
64) Powercoal Superannuation Pty Limited	-	Superannuation Company (Dormant)	100.00% (held by Powercoal Pty Limited)
65) Centennial Springvale Pty Limited	-	Coal Mining	100.00% (held by Centennial Springvale Holding Pty Limited)
66) Springvale Coal Pty Limited	-	Coal Mining	100.00% (held by Centennial Springvale Holding Pty Limited)
67) Boulder Mining Pty Limited	-	Coal Mining	100.00% (held by Centennial Springvale Holdings Pty Limited)

Company		Type of Business	Shareholding Percentage
68) Springvale Coal Sales Pty Limited	-	Coal Marketing	100.00% (held by Centennial Springvale Holdings Pty Limited)
69) Clarence Coal Investments Pty Limited	-	Coal Mining - Clarence JV	100.00% (held by Coalex Pty Limited)
70) Clarence Colliery Pty Limited	-	Coal Mining - Clarence JV	100.00% (held by Coalex Pty Limited)
71) Clarence Coal Pty Limited	-	Coal Mining - Clarence JV	100.00% (held by Coalex Pty Limited)
72) AFE Investments Pty Limited	AFE	Mining Investment	100.00% (held by Banpu Australia Co. Pty Limited)
73) Centennial Wallarah Pty Limited	-	Coal Mining	100.00% (held by Centennial Coal Co., Ltd.)
74) Port Kembla Coal Terminal Limited	PKCT	Ship loading Coal Port	16.66% (held by Centennial Coal Co., Ltd.)
75) Hunnu Investment Pte. Ltd.	HUNI	Foreign Trade	100.00% (held by Hunnu Coal Pty. Ltd.)
76) Hunnu Resources LLC	HUNR	Foreign Trade	100.00% (held by Hunnu Coal Pty. Ltd.)
77) Munkh Sumber Uul LLC	-	Foreign Trade	100.00% (held by Hunnu Resources LLC)
78) Golden Gobi Mining LLC	GGM	Foreign Trade, Minerals exploration	100.00% (held by Hunnu Resources LLC)
79) Bilegt Khairkhan Uul LLC	-	Foreign Trade, Minerals exploration, Minerals mining	100.00% (held by Hunnu Resources LLC)
80) Hunnu Power LLC	-	Foreign Trade	100.00% (held by Hunnu Resources LLC)

Company		Type of Business	Shareholding Percentage
81) Munkhnoyon Suvraga LLC	-	Foreign Trade, Minerals mining, Tourism and Construction	100.00% (held by Hunnu Resources LLC)
82) Hunnu Altai LLC	-	Foreign Trade, Minerals exploration, Minerals mining	100.00% (held by Hunnu Investment Pte. Ltd.)
83) Hunnu Altai Minerals LLC	-	Foreign Trade, Minerals exploration	100.00% (held by Hunnu Altai LLC)
84) Hunnu Gobi Altai LLC	-	Foreign Trade, Minerals exploration, Minerals mining	80.00% (held by Hunnu Altai LLC)
85) BOG Co., Ltd.	BOG	Investment in energy business	100.00% (held by Banpu Public Company Limited)
86) Banpu North America Corporation	BNAC	Investment in oil and gas business	100.00% (held by BOG Co., Ltd.)
87) BKV Corporation	BKV	Investment in oil and gas business	96.30% (held by Banpu North America Corporation)
88) Kalnin Venture LLP	-	Investment in oil and gas business	100.00% (held by BKV Corporation)
89) BKV LLP	-	Investment in oil and gas business	100.00% (held by BKV Corporation)
90) BKV Chaffee Corners, LLC	-	Investment in oil and gas business	100.00% (held by BKV LLP)
91) BKV Chelsea, LLC	-	Investment in oil and gas business	100.00% (held by BKV LLP)
92) BKV Operating, LLC	-	Investment in oil and gas business	100.00% (held by BKV LLP)
93) BKV Barnett, LLC	-	Investment in oil and gas business	100.00% (held by BKV LLP)
94) Banpu Vietnam LLC	BPVT	Investment in power business	100.00% (held by Banpu Public Company Limited)

Energy Generation Business consists of Subsidiaries and associates below

Company		Type of Business	Shareholding percentage
95) Banpu Power Public Company Limited	BPP	Investment in power business	78.66% (held by Banpu Public Company Limited
96) Banpu Coal Power Limited	BPCP	Investment in power business	100.00% (held by Banpu Power Public Company Limited
97) Banpu Power (Japan) Co., Ltd	BPPJP	Investment in alternative energy	100.00% (held by Banpu Power Public Company Limited)
98) Banpu Power International Limited	BPPI	Investment in power business	100.00% (held by Banpu Power Public Company Limited)
99) Banpu Power Investment Co., Ltd.	BPIC	Investment in power business	100.00% (held by Banpu Power International Limited)
100) Shijiazhuang Chengfeng Cogen Co., Ltd	ZD	Power and heat production and sales	100.00% (held by Banpu Power Investment Co., Ltd.)
101) Banpu Investment (China) Ltd.	BIC	Investment in power business	100.00% (held by Banpu Power Investment Co., Ltd.)
102) Pan-Western Energy corporation LLC	PWE	Investment in power business	100.00% (held by Banpu Power Investment Co., Ltd.)
103) Shanxi Lu Guang Power Co., Ltd.	SLG	Power and heat production and Sales	30.00% (held by Banpu Power Investment Co., Ltd.)
104) Zouping Peak Pte. Ltd.	ZP	Power and heat production and Sales	100.00% (held by Banpu Power Investment Co., Ltd.)
105) Zouping Peak CHP Co., Ltd.	ZPP	Power and heat production and Sales	70.00% (held by Zouping Peak Pte. Ltd.)
106) Banpu Power Trading (Shandong) Co., Ltd.	-	Power trading	100.00% (held by Banpu Investment

Company		Type of Business	Shareholding percentage
			(China) Co., Ltd.)
107) Banpu Power Trading (Hebie) Co., Ltd.	-	Power trading	100.00% (held by Banpu Investment (China) Co., Ltd.)
108) Tangshan Banpu Heat and Power Co., Ltd.	LN	Power and heat production and Sales	87.92% (held by Pan-Western Energy corporation LLC) 12.08% (held by Banpu Investment (China) Co., Ltd.)
109) PT. ITM Banpu Power	ITMBPP	Investment in power business	70.00% (held by PT.Indo Tambangraya Megah Tbk) 30.00% (held by Banpu Power Public Company Limited)
110) BLCP Power Ltd. (BLCP)	BLCP	Investment in consultancy services to the operator of power generation	50.00% (held by Banpu Coal Power Limited)
111) Hongsa Power Company Limited	HPC	Power generation and Sales	40.00% (held by Banpu Power Public Company Limited)
112) Phu Fai Mining Company Limited	PFMC	Investment in coal mining	37.50% (held by Banpu Power Public Company Limited)
113) BPP Renewable Investment (China) Co., Ltd.	BPPRIC	Investment in alternative energy	100.00% held by Banpu NEXT Company Limited)
114) Anqiu Huineng Renewable Energy Co., Ltd.	Huineng	Solar power	100.00% (held by BPP Renewable Investment (China) Co., Ltd.)
115) Weifang Tian'en Jinshan Comprehensive Energy Co., Ltd.	Jinshan	Solar power	100.00% (held by BPP Renewable Investment (China) Co., Ltd.)

Company		Type of Business	Shareholding percentage
116) Dongping County Haoyuan Solar Power Generation Co., Ltd	Haoyuan	Solar power	100.00% (held by BPP Renewable Investment (China) Co., Ltd.)
117) Anqiu County Hui'en PV Technology Co., Ltd.	Hui'en	Solar power	100.00% (held by BPP Renewable Investment (China) Co., Ltd.)
118) Jiaxing Deyuan Energy-Saving Technology Co., Ltd.	Jiaxing	Solar power	100.00% (held by BPP Renewable Investment (China) Co., Ltd.)
119) Feicheng Xingyu Solar Power PV Technology Co., Ltd.	Xingyu	Solar power	100.00% (held by BPP Renewable Investment (China) Co., Ltd.)
120) Jiangsu jixin Electric Power Co., Ltd.	Jixin	Solar power	100.00% (held by BPP Renewable Investment (China) Co., Ltd.)
121) Banpu Power Trading G.K.	BPPTGK	Energy trading	100.00% (held by Banpu Renewable Singapore Pte. Ltd.)
122) BRE Singapore Pte. Ltd.	BRES	Investment in renewable energy business	100.00% held by Banpu NEXT Company Limited)
123) BPP Vinh Chau Wind Power Limited Liability Company	BPPVC	Wind power production, power transmission and distribution	100.00% (held by BRE Singapore Pte. Ltd.)
124) Banpu Japan K.K.	BPJP	Investment in and support for energy businesses including renewable energy	100.00% (held by Banpu NEXT Company Limited)
125) Power Vietnam Company Limited	PV	Investment in power business	100.00% (held by Banpu Coal Power Limited)
126) Banpu Energy Australia Pty. Ltd.	BEN	Renewable energy	100.00% (held by Banpu Australia Pty. Ltd.)

Company		Type of Business	Shareholding percentage
127) Airly Solar Pty Limited	-	Renewable energy	100.00% (held by Centennial Energy Australia Pty Limited.)
128) Banpu Renewable Australia Pty. Limited	BREN	Renewable energy	100.00% (held by Banpu NEXT Company Limited)

Energy Technology Business consists of Subsidiaries and associates below

Company		Type of Business	Shareholding percentage
129) Banpu NEXT Company Limited	BNEXT	Investment in alternative energy	50.00% (held by Banpu Public Company Limited) 50.00% (held by Banpu Power Public Company Limited)
130) Banpu NEXT Green Leasing Company Limited	BNGL	Investment in clean energy and alternative energy	100.00% (held by Banpu NEXT Company Limited)
131) Banpu Energy Services (Thailand) Company Limited	BEST	Investment in alternative energy	100.00% (held by Banpu Engineering Services Company Limited)
132) Aura Land Development Pte. Ltd.	ALD	Investment in property for solar energy business	75.00% (held by Banpu Energy Services (Thailand) Company Limited)
133) Aizu Land Solar G.K.	ALSGK	Land owner of Solar project	100.00% (held by Aura Land Development Pte. Ltd.)
134) Hokkaido Solar Estate	HSEGK	Land owner of Solar project	60.00% (held by Banpu Energy Services (Thailand) Company Limited)
135) Aizu Energy Pte. Ltd.	AZE	Investment in alternative energy	75.00% (held by Banpu NEXT Company Limited)

Company		Type of Business	Shareholding percentage
136) Banpu Renewable Singapore Pte. Ltd.	BRS	Investment in alternative energy	100.00% (held by Banpu NEXT Company Limited)
137) Banpu Power Trading G.K.	BPPTGK	Energy Trading	100.00% (held by Banpu Renewable Singapore Pte. Ltd.)
138) Digital Energy Solutions Corporation	DESC	Electricity sales and management	49.00% (held by Banpu Renewable Singapore Pte. Ltd.)
139) Global Engineering Co., Ltd.	GE	Electricity sales and resource aggregator of virtual power plant	19.90% (held by Banpu Renewable Singapore Pte. Ltd.)
140) BPIN Investment Company Limited	BPINI	Investment in alternative energy	100.00% (held by Banpu NEXT Company Limited)
141) Urban Mobility Tech Company Limited	UMT	Electric Vehicle business	30.66% (held by Banpu NEXT Company Limited)
142) Sunseap Group Pte. Ltd.	SSG	Investment in renewable energy business	38.46% (held by BPIN Investment Co., Ltd.)
143) Durapower Holdings Pte. Ltd.	DPH	Manufacturing of Lithium-Ion Battery (LiB) for EV and Energy Storage System (ESS)	47.68% (held by BPIN Investment Co., Ltd.)
144) FOMM Corporation	FOMM	Electric Vehicle business	21.45% (held by Banpu NEXT Company Limited)
145) Banpu Innovation & Ventures Company Limited	BIVTH	Research and development in disruptive technology	100.00% (held by Banpu Public Company Limited)
146) Banpu Innovation & Ventures (Singapore) Pte. Ltd.	BIVSG	Investment in research and	100.00%

Company		Type of Business	Shareholding percentage
		development business	(held by Banpu Innovation & Ventures Company Limited)
147) Banpu Innovation & Ventures LLC	BIVUS	Research and development in disruptive technology	100.00% (held by Banpu Innovation & Ventures (Singapore) Pte. Ltd.)
148) G.E.P.P. SA-ARD Co., Ltd.	GEPP	Investment in clean energy	25.00% (held by Banpu NEXT Company Limited)

- The policy in dividing business operation of affiliated company

  We engage in energy businesses throughout the supply chain, from energy source, delivery, generator and services with an aim to be leading energy business operator in Asia focusing in innovation, technology, sustainability which is our corporate's vision to deliver green and sustainable energy to everyone in the region.

Energy Resources	• **Mining Business** Mining Business is our main business which have been in operation for almost four decades, locating in Indonesia, Australia and China. Our energy sources are from Mongolia where coal produced will be sold to industrial customers and plant in Asia and Europe
	• **Gas Business** Exploration and production of natural gas from shale. The production site is located in Marcellus, the United States of America whereas natural gas produced will be transported via the national gas pipeline to be sold to customers.
	• **Related business** To increase stability of the supply chain and to increase variety of products according to customers' demand, in addition to coal and gas businesses, the Company operate in energy sourcing business such as market and sales, logistics, sourcing and transmission.
Energy Generation	• **Conventional Power Plant** We focus on incorporating technologies to increase the efficiency of energy generation such as Clean Coal Technology) and High Efficiency Low Emission: HELE. the Company currently investing in coal-fired power plant In Thailand Laos and China. Combined head and power plant in China increases variety of products by selling Steam and chilled water to customers around the power plant.
	• **Renewable Based Power Plant**. Energy business which is environmental friendly and corresponds to the low carbon society. the Company invest in solar power plant in China, Japan and Vietnam, part of which is under construction.
Energy Technology	• **Rooftop and Floating Solar Power Solutions Service** One-stop service for solar power system. Currently providing services in Thailand and Singapore to satisfy demand for clean energy and smart technology for retail customers in the south east Asia.
	• **Energy Storage** Energy storage system business to satisfy demand for sufficient industrial energy usage including battery for the electric market, production facility of which is located in China
	• **Smart Community** Smart city and smart infrastructure business for sufficient energy usage of private and urban use.

	• **Electric Vehicle Business** Design and manufacturing of electric vehicle, an extension of the investment in battery business to support future usage of clean energy.
	• **Power Business** Digitalised power business to facilitate efficient usage of power in the future, currently investing in Japan.

2.2 Nature of the products or services

ENERGY RESOURCES BUSINESS

1. Coal Business

Coal is a solid fuel; the color is normally ranged from dark brown to black. The production process of coal starts from exploring coal sources that has commercial potential, producing (excavating and transporting), selecting coals, pulverizing coals to get the size and quality that meet customers' required and put them in the mine to deliver to the customers.

A. Coalmines in Republic of Indonesia the overall amount of production in 2020 is 18.4 million tonnes, consist of:

1) **Indomico mine** processed by PT. Indominco Mandiri, which ITM holds 100 percent shares. It is located in Bontang, East Kalimantan province. There are 37.8 million tonnes of coal reserves, and the production is around 13.3 million tonnes per year. They use an open-pit mining method and the production in 2020 is around 9 million tonnes. Indomico mine has the Bontang port that can support the coal's uploading from Indonesia.

2) **Trubaindo mine** processed by PT.Trubaindo Coal Mining, a subsidiary which ITM holds 100 percent shares. It is located in West Kuti, East Kamlimantan province. There are 39.2 million tonnes of coal reserves. They use an open-pit mining method, and the production in 2020 is around 4.2 million tonnes.

3) **Bharinto mine** processed by PT. Bharinto Ekatama, a subsidiary which ITM holds 100 percent shares. It is located in North Barito, Central Kalimantan province and West Kutai, East Kalimantan province that close to Tubaindo mine. There are 146.0 million tonnes of coal reserves. They use an open-pit mining method, and the production in 2020 is around 2.7 million tonnes.

4) **Jorong mine** processed by PT. Jorong Barutama Greston (Jorong), a subsidiary which ITM holds 100 percent shares. It is located in Tanah, South Kalimantan province. There are 9.0 million tonnes of coal reserves. They use an open-pit mining method, and the production in 2020 is around 1.2 million tonnes.

5) **Kitadin mine** processed by PT. Kitadin, a subsidiary which ITM holds 100 percent shares. It is located in Bontang and Kutailartanegara, East Kalimantan province. There are 1.8 million tonnes of coal reserves. They use an open-pit mining method, and the production in 2020 is around 1.2 million tonnes.

6) **TIS mine** processed by PT. Tepian Indah Sukses, a subsidiary which ITM holds 100 percent shares. It is located in East Kalimantan province. There are 5 million tonnes of coal reserves. They use an open-pit mining method

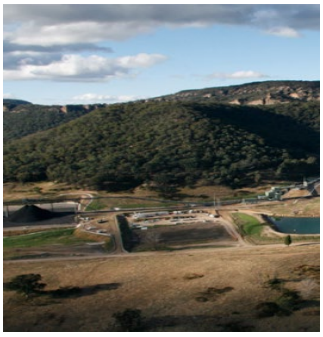
7) **NPR mine** processed byPT. Nusa Persada Resources a subsidiary which ITM holds 100 percent shares. It is located in Central Kalimantan province. There are 77.4 million tonnes of coal reserves. They use an open-pit mining method and is expected to operate in 2022

Australian's coal market

Centennial is one of the underground coal mine processor in New South Wales State. Electricity generation from coal in New South Wales State uses the coals that produced and distributed by Centennial. The main assets used in Centennial business consist of the patent in conducting coal mining business in Northern part and Western part of New South Wales State. The overall amount of production in 2020 is 12.4 million tonnes compound of the following mines:

1) Airly mine

Airly mine which the Company hold 100 percent shares is located near Lithgow in the collier county of Western side, New South Wales State. There are 25.06 million tonnes of coal reserves, and the production in 2020 is around 1.5 million tonnes. The Airly mine uses the technology of continuous miner in mining



2) Angus Place mine

Angus Place mine which the Company hold 100 percent shares is located in collier county in Western of New South Wales state. There are 53.00 million tonnes of coal reserves. Starting from the end of February 2015, production is suspended (Care & Maintenance) for moving machines and staffs to expand the production at Springvale mine and will be back for the production at the Angus Place mine later.

3) Springvale mine

Springvale mine which the Company hold 100 percent shares, is located in collier country in Western of New South Wales state. There are 18.89 million tonnes of coal reserves and the production of in 2020, is around 2.9 million tonnes of coals. The Springvale mine uses the Longwall Mining technology. The Angus Place mine and Springvale mine produce coals that used as thermal for domestic and international markets. They also have coal belt to transport coals to customers (power plants) especially in domestic country by having Lidsdale Sliding that transportation has been expanded to support an increasing amount of coal exported further.

4) Charbon mine

Charbon mine is the joint venture between Centennial (95 percent) and SK Energy Australia Pty Ltd. (5 percent). It is located in Kandos, in the collier country, the Western of New South Wales state. 2015 is the last year of production and Charbon mine went into the ground rehabilitation process.

5) Clarence mine

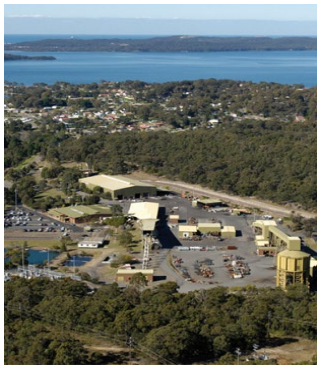
Clarence mine is the joint venture between Centennial (85 percent) and SK Energy Australia Pty Ltd. (15 percent), which operated by Centennial mine. Clarence mine is located near Lithgow, in the collier county of Western of New South Wales State. There are 31.76 million tonnes of coals reserves. The production in the beginning of 2020 is around 2.1 million tonnes of coals. The Clarence mine is a high-efficient underground Continuous Mining. Moreover, the Clarence mine focuses on exporting coals outside the country especially through Kembla port

6) Mandalong mine

Mandalong mine which the Company hold 100 percent shares, is located near Morisset, New South Wales State. There are 56.63 million tonnes of coal reserves. In 2020, they could produce 5.2 million tonnes of coals. The Mandalong is an underground Longwall Mining with high production capacity and the coal seam can be excavated with the thickness more than 5 meters. The coals produced will be used in domestic markets and for exporting at Newcastle port.

7) Myuna mine

Myuna mine in which the Company hold 100 percent shares, is located near Lake Macquarie in collier county of Newcastle, New South Wales State. There are 34.42 million tonnes of coal reserves. In 2020, they could produce 1.0 million tonnes of coals. They use underground continuous mining method with coals belt to transport coals directly to the neighborhood customers.



8) Northern Coal Services (NCS)

Northern Coal Services is a coal washing plant that located in collier county of Newcastle, New South Wales State. Since it is located near Newcastle port, NCS washes the coals that used as heating fuel and semi-soft type of coal coke that excavated from mines, preparing for delivery to domestic and international markets. The connection with double-track railways makes an effective and fast uploading to Newcastle port. The production capacity of Northern Coal Services is 4 million tonnes per year and there are specific distribution routes for exporting and transporting to domestic customers.

Future Project

1. Newstan Extension

The Newstan Extension plan is the project that explores and studies possibility of utilization of existing mining infrastructure in order to expand the coals reserves and production capability. At present, it is during Feasibility study of coal reserves that have semi-soft type of coal coke properties.

2. Mandalong Southern Extension

The Mandalong South plan is an extension from Mandalong mine. At present, it is in the process of excavation to study the possibility of the project in 2 years period. The mine plan is designed to have more efficiency by connecting it with Mandalong mine.

3. Neubeck

The Neubeck mine plan is in the western part of New South Wales State. It is located near domestic customer's power plant. The quality of coals can be used in domestic markets as well as export to international market. The coals exported will be transported to Kembla port. At the moment, it is during the development into Open-cut mining.

- **Coal mine in People's Republic of China**

1. Gaohe Mine by BP Overseas Development Co., Ltd. (the Company's subsidiary) hold 100 percent shares in Asia American Coal Inc. (AACI). AAIC was established to develop and co-invest in coal business in People's Republic of China in a joint venture with Shanxi Lu'an Mining Industry (Group) Co. Ltd., which is the major coal producer in People's Republic of China. They established Shanxi Gaohe Energy Co., Ltd and each hold 45 and 55 percent shares respectively. Gaohe mine is an underground Longwall mining that located in Shaxi province. There are 117.4 million tonnes of coal reserves. In 2015, they produced 8.1 million tonnes of coals.

2. Hebi Mine by Banpu Mineral Company Limited (the Company's subsidiary) entered into a joint venture with Hebi Coal and Electricity Co., Ltd. in which each holding 40 and 60 percent shares in Hebi Zhong Tai Mining Co., Ltd. (HZTM) respectively. HZTM was established to process on the production and distribution of coals from Hebi that located in Henan province. It is an underground Longwall Mining that has 14.5 million tonnes of coal reserves and the production in 2020 is around 1.2 million tonnes of coals.

- **Coal mines in Mongolia**

Mongolia has the big source of coal reserves with an opportunity to develop as a major coal exporter in the future. Their border adjacent to Russia and China, which are countries with heavy coals consumption industries in top rank of the world. The Company have coals sources that cover the area of South Gobi, Middle Gobi, and in the Western part of the country which consists of three major projects that are in the process of development as follows:

1. Tsant Uul

The Tsant Uul plan is located in South Gobi in the south of Mongolia near the border of China (an autonomous region, Inner Mongolia province). They received the patent permits in 2011, with 30 years concession. At present, it is a developing plan and they are studying on possibility in increase the value of existing coals to response to the needs of Chinese market. They already have an experimental on installing the Pilot Plant in pilot project. In production process, it is the extracting tars from coals (coal to coal tar), which this preliminary experiment can produce tars with the total amount of 5,000 liters. This can be assured that the Tsant Uul coals source can extracting tars. They currently study the possibility to increase value of tars, charcoal, and gas received from production process then preparing for commercial production in the next step. In 2562, study for feasibility of appropriate engineering and technology to change tars to chemical product and study for the demand of such chemical products in Mongolia and People's Republic of China.

The studies in respect of engineering and technology in 2020 includes the study on the optimum chemical and physical properties of tars and charcoal which can be developed into a valuable chemical product in which the market demands.

2. Altai Nuurs

Altai Nuurs is located in Gobi Altai in the west of Mongolia. They have both coking coal and thermal coal. the Company received approval to change mineral exploration to patent permit status and in 2017 the Company has explored and apply for approval of the study of the feasibility of mining and received approval from relevant officials. the Company has yet to explore opportunity of other mineral in the patent permit area in 2019. In 2020, the Company has reviewed its available patent and permit under the laws of Mongolia.

3. Unst Khudag

Unst Khudag is located in Central Bobi in the middle of Mongolia by having Thermal coal type. They were approved to change the status of mineral exploration patent permit with 30 years concession and can renew the patent permit when expired. In 2017, they received approval for the study of feasibility of mining project from relevant official including the study the amount of reserves water that will use in the project. Moreover, in 2019 they also study the feasibility of preliminary engineer, investment, and cost of production in transforming coals to chemical products and electric power as well as study the chemical products market in Mongolia and People's Republic of China. In 2020, a study is conducted with regards to engineering and technology and initiate a preliminary study on technology to increase value of products, particularly using coal as fuel in production line and focusing on export to People's Republic of China

2. Gas Business

Natural gas is an important source of energy in the production of heat and electricity. The natural gas in stored underground in the shale. Sourcing of natural gas includes excavation and production which requires expertise and advance technology to obtain natural gas to be passed on the industrial and household section through pipeline

1. Investment in natural gas in Marcellus in the U.S.

In 2016, the Company invested in the U.S. natural gas via a fund with a vision for low-risk and high-return investment. The investment is in shale gas production site located in northeast Pennsylvania Marcellus with low production cost which has the most natural gas reserves in the U.S with the following source;

Natural gas source: Chaffee Corners

the Company invest in Chaffee Corners in March of 2016 by purchasing 29.4 percent of right In exploration contract via a fund alongside two other investors, one of which is Repsol, holding 65.4 percent of such right and acting as natural gas producers under the exploration contract and seller to buyer in the country of use in power production, pro-rata of the ratio of the fund established by the Company.

Natural Gas Source: NEPA Corners-1 and NEPA Corners-2

the Company invest approximately 63 million USD in NEPA Corners 1 in January 2017 as an investment in 10.24% interest in joint operation agreement via a fund. An asset of which is an operating asset and the Company later acquired additional interest in March 2017, in NEPA Corners 2 in an amount of 15.75 million USD, resulting in 12.8 interest in the joint operation agreement

NEPA Corners-3

the Company invest approximately 16.25 million USD in NEPA Corner 3 in May 2017 by investing in joint operation agreement via a fund, asset of which is operating asset with Warren Resources as operator of the natural gas production in NEPA Corners 3

NEPA Corners-4

the Company invest approximately 210 million USA in NEPA Corners-4 in October 2017 by investing in 80% interest in joint operation agreement to take first operator position via an established fund, similar to all previous investments. Subsidiary is established by the fund to support natural gas production and business expansion in the future.

NEPA Corners-5

the Company invest approximately 105 million USA in NEPA Corners-5 in December 2017 by investing in 88% interest in joint operation agreement to take operator position similar to those of NEPA Corner 4

2. Investment in natural gas in Barnett in the U.S.

On 17 December 2019, the Company entered into a purchase and sales agreement to acquire a gas operation in the Barnett gas field in Texas, the U.S. with an investment value of USD 770 million, and is the operator of the production

In addition, on 15 April 2020, the Company has adjusted the details in the purchase and sales agreement to acquire a gas operation in the Barnett gas field. The value of investment capital was changed in the amount of USD 570 million or equivalent to approximately 18,650 million baht and the total value of benefits to the seller in the future is not more than USD 260 million within a period of 4 years from 1 January 2021 to 31 December 2024. The value of added benefits depends on the annual averaged Henry Hub price starting from USD 2.75 per mmBtu, or the average yearly, West Texas Intermediate price starting from USD 50 per barrel. The acquisition of a gas operation in the Barnett gas field was completed on 1 October 2020.

Barnett's gas field in the Fort Worth Basin is the area of both infrastructure and transportation, and is the main production source that qualifies the needs of significant natural gases in the Gulf of Mexico coastal states of the U.S. for more than 20 years. It covers the area approximately 320,000 acres of the area of producing natural gases in the Barnett gas field. The benefits in production wells are 89 percent of the total wells which are more than 4,000 wells, with critical infrastructure already supported**.**

From investing in the Barnett gas field, the total capacity of Banpu's natural gas business in the U.S. has increased from approximately 200 million cubic feet per day to nearly 700 million cubic feet per day and has 1P natural gas reserved increasing to approximately 4.0 trillion cubic feet. Thus, BNAC has become the largest natural gas producer in the Barnett gas field.

On 1 May 2020, the Company restructured Banpu holding shares in BKV by Banpu North America Corporation (BNAC), a subsidiary of Banpu in which BNAC has changed its ownership stake as a limited liability partner in BKV Oil & Gas Capital Partners, L.P. to a common shareholder in BKV Corporation (BKV). BKV is registered in the U.S. and has a registered capital of USD 1.5 billion.

After the restructuring, Banpu holds 96.30 percent of BKV's shares in BKV through its subsidiary BNAC and has control over indirect subsidiaries, namely BKV Chaffee Corners, LLC., BKV Chelsea, LLC., BKV Operating, LLC. and BKV Barnett, LLC. in the same proportion. This restructuring also makes Banpu indirectly acquire Kalnin Ventures, LLC which is a company established to support investment management through BKV in the same proportion so that it becomes a part of the business group as well.

On 16 December 2020, Oaktree Capital Management L.P. ("Oaktree" or "Oak Tree"), a global investment management firm showed its confidence in BKV by investing USD 100 million in preferred stock in order to strengthen Banpu's ability to expand its natural gas business in the U.S. so as to enable the Company to achieve its goal of becoming a leader in the use of technology for natural gas business development that covers both Exploration and Production (E&P) to be in line with Banpu's goals to expand the natural gas business in the U.S. continuously and sustainably.

In 2020, the Company's average production capacity is approximately 700 million cubic feet per day. As of December 31, 2020, the Company's reserves of natural gas (P1) are 3,556,566 million cubic feet.

ENERGY GENERATION BUSINESS

1. Conventional Power Plant Business

1.) Combined Heat and Power, CHP

Banpu Power Public Company Limited (BPP) (which is a subsidiary of the Company holding 78.66% shares). BPP holds 100% of the paid-up capital in Banpu Power Investment Co., Ltd (BPIC), which is registered in Singapore through Banpu Power International Co., Ltd. (BPPI). There are 3 investment in Combined Heat and Power plant in northern region of People's Republic of China with the installed electricity capacity with total of 323 MW and 1,318 tonnes per hour of production capacity of installed steam hour in which the total equity capacity is 613 MW,. The details are as follows:

1. Luannan CHP plant

It is located in Luannan District, Tangshan City, Hebei Province. It is a power plant that generates electricity and steam using coal as fuel. It has 125 MW of electricity generation and 278 tonnes per hour of steam production capacity. Total equity capacity is 227 MW.

2. Zhengding CHP Plant

It is located in Zhengding District Shijiazhuang City, Hebei Province. It is a power plant that produces electricity, steam, hot water and cold water using coal as fuel. It has 73 MW of electricity generation capacity and 370 tonnes per hour of steam production capacity. Total equity capacity is 139 MW.

3. Zouping CHP Plant

It is located in Zouping District, Binzhou City, Shandong Province. It is a power plant that produces both electricity and steam. It uses coal as fuel with 125 MW of electricity generation capacity and 670 tonnes per hour of steam capacity. The total electricity generation capacity is 247 MW equivalent in which BPIC holding 70%, thus, it has an equity capacity of 173 MW in proportion to the investment.

2.) BLCP Power Company Limited (BLCP)

Banpu Power Public Company Limited (BPP) (which is a subsidiary of the Company Holding 78.66 percent shares) BPP holds 50 percent of BLCP Power Company Limited, an independent power producer (IPP), a 1,434 MW thermal power plant. It has two power plants with an equity capacity of 717 MW, using good quality coal named bituminous as fuel which is mainly imported from Australia. It is located at Map Ta Phut Industrial Estate, Rayong Province. There is a Power Purchase Agreement (PPA) with the Electricity Generating Authority of Thailand for a 25-year concession starting from the opening day of sector two commercial operation, start the power plant construction in August 2003 and open the commercial operation for sector one in October 2006. The second production sector is opening the commercial operation in February 2007. At present, BLCP already operates for 14 years.

3.) Hongsa Power Company Limited (HPC)

Banpu Power Public Company Limited (BPP) (which is company subsidiary that hold 78.66 percent shares) do the joint venture with Ratchburi Holding Company Limited (RATCH) and Lao Holding State Enterprise (LHSE) which is the government enterprise of Lao People's Democratic Republic to join establish Hongsa Power Company Limited (HPC) and Phu Fai Mining Company Limited (PFMC). Both companies have the headquarters in Vientiane, Lao PDR. The objective of HPC and PFCM is to conduct the power plant project in Hongsa, Lao People's Democratic Republic, the essence of joint venture are as follows:

- HPC received the concession from the Lao government to be a person who has the right to develop, construct and operate the Hongsa Power Plant. The concession rights commenced from November 2009 until the expiration date of 25 years from the date of the third unit commercial operation of Hongsa in March 2016.The proportion of shareholding is that BBP hold 40 percent shares, RATCH hold 40 percent shares, and LHSE hold 20 percent shares.

- PFMC received the concession in conducting lignite mine. The proportion of shareholding is that BBP hold 37.5 percent shares, RATCH hold 37.5 percent shares, and LHSE hold 25 percent shares.

Hongsa power plant is mine mouth power plant that use lignite energy. There is 1,878 MW of installed production capacity, which consists of three unit of electricity generation, each unit has 626 MW. The first manufacturing unit operated commercially on 2 June 2015. The second manufacturing unit operated commercially on 2 November 2015 and the third manufacturing unit operated commercially on March 2016.

4.) Shanxi Lu Guang Power Plant Project

Banpu Power Public Company Limited (BPP) (which is subsidiary of the Company Holding 78.66 percent shares). BPP holds 100% of the paid-up capital in BPIC to do joint venture and to develop the Shanxi Lu Guang Power plant project. This project is a new coal thermal power plant with 1,320 MW size that located in Changzhi city, Shanxi province, People's Republic of China (3 kilometers away from Gaohe mine). The shareholder and shareholding proportion are Banpu Power Investment Ltd. hold 30 percent shares, Gemeng International Energy Co., Ltd. "Gemeng" hold 35 percent shares, and Shanxi Lu'an Mining Group "Lu'an" hold 35 percent shares.

Lu'an is one of the shareholders of Shanxi Gaohe Energy Co., Ltd., which hold and operate Gaohe mine in Shanxi province (the shares proportion are Lu'an hold 55 percent shares, and the Company indirectly hold 45 percent shares). This power plant project receives the last approval from Shanxi Provincial Development and Reform Commission on November 2015. As of 31 December 2020, the project has made 100% construction progress and can begin commercial operations within 2021.

General information of Shanxi Lu Guang Power Plant:

Power generation capacity	:	1,320 MW (2 x 660 MW)
Technology	:	Ultra-super critical
Coal usage	:	approximately 3.2 to 3.5 million tonnes per year
Coal source	:	Gaohe mine (using coals belt to transport coals), Lu'an mine and other mine
Shareholding Percentage	:	Gemeng (35 percent), Lu'an (35 percent) and Banpu Power Investment Company Limited(30 percent)
Value	:	Approximately 5,200 million Yuan (equivalent to approximately 755 USD)
COD	:	within 2021

2. Renewable Based Power Plant

1.) Solar power plant in People's Republic of China

Banpu NEXT Company Limited, a subsidiary of Banpu, holds 100 percent shares in BPP Renewable Investment (China) Co., Ltd. investing in 7 solar power plant in People's Republic of China with a total production capacity of 177.32 MW with pricing scheme of 20 years Feed-in Tariff (FIT) as follows;

1. **Jinshan solar power plant** located in Weifang city, Shandong province, with power capacity of 28.95 MW and achieved commercial operation date in September 2016
2. **Huineng solar power plant 1 and 2** located in, Weifang city, Shandong province, with aggregate power capacity of 21.50 MW, Huineng Solar power plant 1 have power capacity of 10.43 MW and Huineng solar power plant have power capacity of 11.08 MW and achieved commercial operation date in July 2016.

3. **Haoyuan solar power plant** located in Tai'an city, Shandong province, with power capacity of 20.00 MW, and achieved commercial operation date in October 2016
4. **Hui'en solar power plant** located in Weifang city, Shandong province, with power capacity of 19.70 MW, and achieved commercial operation date in January 2017
5. **Deyuan solar power plant** located in Jiaxing, Zhejiang province, with a capacity of 51.64 MW and achieved commercial operation date in February 2017,

6. **Xingyu solar power plant** located in Tai'an city, Shandong province, with capacity of 10.30 MW, COD in July 2017
7. **Jixin solar power plant** located in Jinhu, Jiangsu province, with capacity of 25.22 MW and achieved commercial operation date in July 2019

2.) Power plant and Solar power project in Japan

Banpu NEXT Company Limited, subsidiary of Banpu, invest in power plant and solar power projects in Japan via subsidiaries as follows;

1. **Olympia solar power plant,** is a solar power project with a total generation capacity of 10 MW in which Banpu NEXT holds a 40% interest. Comprises the following 5 projects;
   - 1.1 Hitachi Omiya, located in Ibaraki, with capacity of 2 MW and achieved commercial operation date in July 2013
   - 1.2 Hitachi Omiya 2, located in Ibaraki, with capacity of 2 MW and achieved commercial operation date in January 2015
   - 1.3 Osenosato Katachina, located in Gunma with capacity of 2 MW and achieved commercial operation date in January 2015.
   - 1.4 Sakura 1, located in Tochigi, with capacity of 2 MW and achieved commercial operation date in December 2015.
   - 1.5 Sakura 2. Located in Tochigi, with capacity of 2 MW and achieved commercial operation date in October 2015.
2. **Hino Project:** located in Shiga, with capacity of 3.50 MW. Banpu NEXT holds 75% interest and achieved commercial operation date in May 2016.
3. **Awaji Project,** located in Hyogo, with capacity of 8 MW. Banpu NEXT holds 75% interes and achieved commercial operation date in May 2016.

4. **Mukawa Project** located in Hokkaido, with capacity of 17.00 MW. Banpu NEXT holds 56% interest and achieved commercial operation date in August 2018.
5. **Nari Aizu Project** located in Fukushima, with capacity of 20.46 MW. Banpu NEXT holds 75% interest and achieved commercial operation date in December 2018.
6. **Kurokawa Project** located in Miyagi, with capacity of 18.90 MW. Banpu NEXT holds 100% interest and achieved commercial operation date in December 2019.
7. **Tenzan Project** located in Saka, with capacity of 1.96 MW. Banpu NEXT holds 100% interest and achieved commercial operation date in December 2019.
8. **Muroran I Project,** located in Hokkaido, with capacity of 1.73 MW, Banpu NEXT holds 100% interest and achieved commercial operation date in August 2018.
9. **Muroran II Project,** located in Hokkaido, with capacity of 1.63 MW. Banpu NEXT holds 100% interest and achieved commercial operation date in January 2018.
10. **Takeo II Project,** located in Saka, with capacity of 1.00 MW. Banpu NEXT holds 100% interest and achieved commercial operation date in October 2018.

11. **Kawanishi Dahilia Project (formerly Yamagata Project)** located in Yamagata with capacity of 20.00 MW. Banpu NEXT holds 100% interest and achieved commercial operation date on 16 November 2020.

12. **Sawadee Yabuki Hatsudensho Project (formerly Yabuki Project),** located in Fukushima, with capacity of 7.0 MW. Banpu NEXT holds 75 % interest and achieved commercial operation date on 16 December 2020
13. **Shirakawa Project,** located in Fukushima, with capacity of 10.00MW. Banpu NEXT holds 100% interest. It is currently under construction and is expected to achieved commercial operation date in 2021.

14. **Kessenuma Project**, located in Miyagi, with capacity of 20.00 MW. Banpu NEXT holds 100% interest. It is currently under construction and is expected to achieved commercial operation date in 2021.

15. **Yamagata Iide project,** located in Yamagata, with capacity of 200.00 MW. Banpu NEXT holds 51 % interest and is entitled to invest an additional 34% interest once the project is under construction and an additional 15% after COD. It is currently under development is expected to achieved commercial operation date in 2023.

3.) Wind power project in Vietnam

Banpu NEXT Company Limited, a subsidiary pf Banpu, expanded its energy business to Vietnam via BRE Singapore Pte. Ltd, investing in two wind power production project as follows;

1. **EI Wind Mui Dinh Project** located in Ninh Thuan province, with capacity of 37.6 MW, achieved commercial operation date from 23 April 2019 having FIT pricing at 8.5 US cent per kWh, transmitted to EVN under Power Purchase Agreement for a period of 20 years.

2. **Vinh Chau Project** located in Soc Trang City, with total capacity of 80 MW. Comprising of 3 phases. **The** three phases have a capacity of 30 MW, 30 MW and 20 MW respectively. The first phase is expected to achieved commercial operation date within 2021 and phase 2 and 3 in 2022.

ENERGY TECHNOLOGY

Under the vision of a leader in power business providing full service and combining different technologies and thrive to produce sustainable and clean energy. Therefore, it is a starting point of utilising the 30 year experience in energy business in Thailand and abroad, expertise from business in Solar farm and floating solar in People's Republic of China and Japan, energy trading technology, virtue power plant technology for the benefit of expansion of clean energy in Thailand in the future.

Banpu NEXT Company Limited (Banpu NEXT), a subsidiary of the Company (50 % shares held by Banpu and 50% by BPP). The objective of Banpu NEXT is to study and invest in businesses providing clean energy services, to become leading smart clean energy solution provider in Asia Pacific which respond to customer's demand, specialized in energy technology, with international standards and to fulfil sustainable living.

1. Solar solutions, Solar power, Solar Rooftop and Floating Solar

Banpu NEXT, a professional energy solution provider for solar power on rooftop and floating solar solution, services includes advice, design, installation, analytic and repair for large industries an businesses looking to reduce electricity cost and become more environmentally friendly in a sustainable way by using clean energy.

Banpu NEXT has 249 MW capacity in Solar Power, Solar Rooftop and Floating Solar, both in Thailand and abroad. Installation and after sales services are provided with cutting-edge technologies. Banpu NEXT's team of engineer and customers' relations can perform real-time analysis of the system from its control room. Customers who uses Banpu NEXT's solar system

may check real-time and record of energy generation via tablet or smartphone, along with many other functions/ In addition, Banpu NEXT has strong business partner leading in energy technology and thus allowing the offering of full range of best energy solution, including Energy Storage System, Energy Management System and Electric Vehicle so that everyone can efficiently uses energy with stability, in an appropriate price and environmentally friendly. It has recently designed microgrid system, the first time in Thailand which combines solar system to energy storage system to enable electricity in remote areas without having to be linked to the power grid system.

Investment in Sunseap Group Pte Ltd., a leading service provider in solar system in Singapore

Banpu NEXT, an expert in full –range of installation service for solar solution, combining different and cutting-edge technologies, brings in 30 year experience in Banpu's energy business both in Thailand and abroad and expertise from solar farm management in China and Japan to bring Thailand toward smart-city in the future.

Banpu NEXT holds 48.63 percent shares in Sunseap Group Pte Ltd., a leading solar power solution and energy technology in Singapore.

As of 31 December 2020, Sunseap Group Pte Ltd. has solar power production capacity of 728 MW in Singapore and abroad, whereas Banpu NEXT has a pro-rata capacity of 354 MW based in its investment in Sunseap Group Pte. Ltd.

2. Energy Storage System

2.1 Investment in Durapower Holdings Pte. Ltd., a leader in design, manufacturing and installation of Lithium-ion battery (LiB).

Banpu NEXT invested in energy storage business in Singapore by investing in 47.68 shareholding in Durapower Holdings Pte. Ltd. in March 2018. This investment is the first step of Banpu NEXT towards expansion to energy storage system business in the near future as well as increasing the efficiency of the current business and to continue to add value in the future.

In addition to solar power system, both rooftop and floating solar solution, Banpu NEXT sees necessity of energy storage system in the future as it increases stability of power generation, efficiency of power usage and promote usage of electric vehicle. This is a part of development in energy in Thailand, an objective of this investment in energy storage technology in Singapore.

Durapower Holdings Pte. Ltd. is an expert in designing, manufacturing and installation of storage of lithium-ion battery for vehicle and uninterrupted power supply. Established in Singapore, it has manufacturing site for an international standard LiB at Suzhou city, People's Republic of China, where previously has capacity of 30 MW per hour and in 2019-2020 expanded its capacity to 1 Gwh and is considered a manufacturing site which uses high-technology with 40 guarantee standards to support proactive expansion of customer base in more than 20 countries in Europe, China, Japan,

India, Thailand and ASEAN and corresponds to continuous growth in the lithium-ion battery market, as well as supporting rising demands for electric vehicles, buses, trucks, energy storage systems and large renewable power-generation projects. In this investment, Banpu NEXT and Durapower Holdings Pte. Ltd. will collaborate to improve energy services high-technology and high quality projects for customers.

2.2 e-PromptMove

Banpu NEXT sees problem with unmet electricity needs in time of crisis, and desire to play an important part in providing easy, quick and widespread access to energy. As a subsidiary of Banpu which conducts its business under the vision “Greener & Smarter”, Banpu NEXT uses its knowledge and experience in energy, technology and various energy solution to develop an off-grid solar power generation and storage system called ‘Banpu NEXT e-PromptMove’, introduced with prototype application as a trailer for the first time in Thailand. This concept trailer innovated by a team of researcher, engineer and expert, embodies key features of Banpu NEXT e-PromptMove system, including ability to mobilize even to disaster areas and off-grid regions, providing a safe, speedy, convenient solution to electricity needs as well as having succesfully passed the inspection and tests for efficient use.

Banpu NEXT e-PromptMove embodies hardware and software designed to work together efficiently. Key hardware components are lightweight solar panels, a high-performance lithium ferro phosphate (LFP) battery system, an inverter, and the trailer especially designed to fit the nature of work with rugged and durable construction and an interior display screen for electricity usage monitoring. Software components include energy management system with Internet of Things (IoT) integration to enable efficient control and processing of power generation and storage. This trailer is ideal as a mobile power station for off-grid regions and disaster areas as well as other missions that need of electricity support, such as field operations of mobile healthcare units and maintenance teams.

3. E-Mobility

Banpu NEXT is the first in Thailand to provide integrated electric vehicle and transport. To integrate various traffic and transportation system as well as reduce cost and time incurred for stakeholders, Banpu NEXT works with partners to develop platform with the concept of ‘Mobility as a service’ to provide one-stop service solution, including consultancy, evaluation of mobility needs, provision of the right vehicles to meet specific needs of each company and after-sales support combining advanced hardware and digital technologies for greater efficiency of its after-sales service as well as development of application and integrating fleet management to meet the accurate needs of customers.

3.1 FOMM EV

Banpu NEXT invested in FOMM Corporation (FOMM), a leading compact EV developer in Japan. The investment is worth 20 million USD or approximately 635 million THB for a shareholding of 21.45 percent. The investment aimed to pursuit compact EV for public road usages. FOMM EV also uses Durapower batteries, thus fulfilling Banpu’s clean energy ecosystem.

FOMM established in 2013 which provides services in design, assembly, quality assurance and inspection, sales and delivery to countries in Southeast Asia and Europe. FOMM is a

designer of electric vehicle and focuses in developing compact sized electric vehicle for close-range mobility, hence FOMM stands for 'First One Mile Mobility'. Headquartered in Kawasaki city, FOMM vehicles are designed to float with in-wheel motor for appropriate turns for compact vehicle.

Banpu NEXT is a part of development of 'Smart Mobility', a key to development of 'Smart City', promoting easy transportation through 'Banpu NEXT EV Car Sharing', and FOMM EV renting service via application which corresponds to city people preferring to use clean-energy EV and rents by hour. EV Car Sharing Service is convenient and is linked to public system and is environmentally friendly. The first EV car sharing station has been established at Samyan Mitrtown to enable 24-hour car pick-up/return and charging. There is currently a plan to set up more service stations in more locations across Bangkok metropolitan well as in provincial cities.

3.2 Muvmi

Banpu NEXT sees a problem in pollution and transportation in the daily lives of city people, in 2017, Banpu NEXT invests in 22.50 percent shareholding in Urban Mobility Co., Ltd. (UMT) and in 2019 increasing its shareholding to 30.66. UMT is a company which provides solution for issues of public transportation in the city, focusing on first/ last mile solution. Today, UMT provides Tuk Tuk Hop service to allow tourist to travel through Rattakakosin Island. In addition, UMT designed and manufactured compact EV, starting from electric Tuk Tuk integrated with Internet of Things in fleet management. It developed MuvMi application, an application which allows an On-Demand ride hailing, a system of which allows passengers who travel in the same area to be grouped together. There is more than 100 units of electric Tuk Tuks in Bangkok around Chulalongkorn University, Ari Bts station to Kampaengpetch MRT station, Paholyothin, Ratanakosin Island, Asoke, Nana, Kasetsart University to Senanikom and nearby areas.

3.3 e-Ferry

Banpu NEXT is committed to sustainable business growth under our 'Greener & Smarter' strategy. Banpu NEXT, a subsidiary of Banpu and a leading smart clean energy solution provider in Asia-Pacific. Banpu NEXT established e-Ferry as Thailand's First Marine Tour e-Ferry, having funded and using energy technology knowledge to manufacture Thailand's First Marine Tour e-Ferry. It also uses lithium-ion battery from Durapower Holdings Pte. Ltd., a partner in which Banpu NEXT invested in, the battery is of high quality with patents and more than 40 guarantee standards. In addition, Banpu NEXT installed an electric charging station in the port of Phuket and adopting energy management system to control energy generation and distribution and ensure energy efficiency and stability throughout each trip as well as collecting data from such system for monitoring and management and repairs and uses data from platform integrated with Internet of Things to develop and design energy consumption suitable for needs and use of each customer. Based on information from Marine Department, there are approximately 3,000 marine tourist boats/ ferries in service, of them, 2,000 are active in four provinces in the Andaman Sea and the Gulf of Thailand, namely Phuket, Phang-nga, Krabi and

Surat Thani. Accordingly, Banpu NEXT plans to manufacture e-ferry for services in the Andaman Sea and the Gulf of Thailand in such four provinces to support growth of e-ferry industries and promote green tourism to tourists and local residents, responding to use of clean energy technology trend and towards Energy 4.0 policy.

4. Smart City

4.1 Khon Kaen Smart City Development Plan

Banpu NEXT sees an importance of moving Thailand towards Energy 4.0 policy and usage of clean energy and therefore join forces with Khon Kaen City Development Network to help advance smart city development in the province in response to Khon Kaen Smart City 2029 master plan.

Banpu NEXT will jointly work with Khon Kaen City Development Network, to conduct a feasibility study on building a well-developed ecosystem of clean energy in the city. The areas of study spans across installation of solar power system and smart electricity transmission, use of energy storage system to increase the capability of power supply, development of smart transportation and alternative mobility systems to support extended development of the light rail system, and introduction of other modern energy technologies to Khon Kaen to support smart environment creation and promote tangible use of clean energy, which will bring a better quality of life to Khon Kaen residents and help drive forward the province's smart city development plan. It focuses on conducting feasibility study on Khon Kaen's adoption of clean energy technology to boost clean energy usage in response to Energy 4.0 policy and Khon Kaen Smart City 2029 master plan. This new move will contribute to better energy efficiency and sustainability, positively create long-term impacts on the environment, and pave way for a better quality of life of Khon Kaen residents.

4.2 Phuket smart city development plan

Phuket is one of the province chosen as pilot smart city development plan in accordance with Phuket City Municipality policy, having 7 purpose namely; Smart Environment, Smart Economy, Smart Mobility, Smart Energy, Smart People, Smart Living and Smart Governance. Banpu NEXT became a part of development towards Smart Mobility, encouraging comfort, environmental-friendly transportation and better quality of life for Phuket residents.

Banpu NEXT will work closely with private and public sector in research and evaluation of solution suitable for needs of Phuket residents, particularly with Banpu NEXT e-ferry, Thailand's first marine e-ferry tour for the tour service in Phuket – Phang-nga route. Along with these, electric vehicle service and platforms and application for car renting, whether car sharing

or car riding, as well as using smart community platform for data collection, analysis and processing using AI technology to help solve Phuket residents' problems such as air and water quality monitoring, smart surveillance stations which have amongst other, COVID-19 screening sensors, people counter and smart parking sensors.

2.3 Market and Competition

1. Market and Competition is Coal Business

1.1 Global Coal Market

Demand

Demand for imported coal in 2020 contracted sharply due to lockdown measures in countries worldwide to control the outbreak of Coronavirus (COVID-19). There have been restrictions on social activities, non-essential travel, and business activities. Most economic activities were disrupted, and electricity demand was declining rapidly, resulting in an 8.1% decline in demand for imported coal from the previous year.

The sharp economic contraction caused prices of oil, natural gas, and coal to fall drastically, enabling gas to compete with coal in Europe and for some periods in Asia. As a result, gas-fired power plants increase their operations while coal-fired power generation was reduced, dragging down coal consumption, especially in Europe.

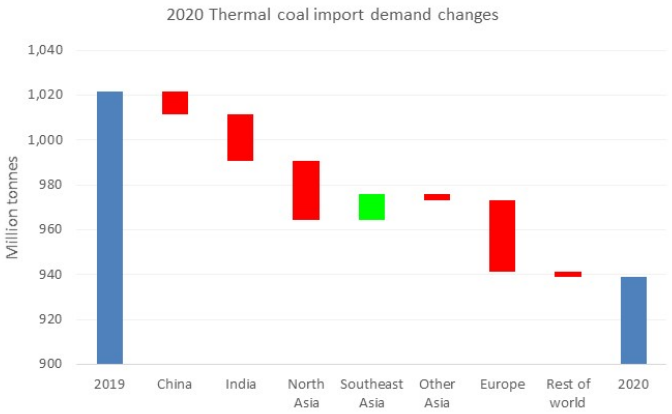
The People's Republic of China remained the world's largest coal importer despite its government's move to limit imports to protect domestic coal business. The impact of the COVID-19 pandemic on China since the beginning of the year had reduced the country's coal demand, while government measures against the outbreak lowered coal production even further. Moreover, imported coal was far cheaper than domestic coal, leading to a huge volume of coal imports in the first half of 2020.

The Chinese government had tried to revive the country's economy since mid-February; however, the public still mostly avoided economic activities, resulting in a slow recovery. Since May 2020, electricity demand had rebounded to its pre-crisis level, driven by hot weather and lower hydropower production capacity. The coal-fired power plants' production was also back at the level prior to the COVID-19 crisis.

Several coal mining accidents in China led the Chinese government to enforce mine safety regulations. Many coal mines had to temporarily suspend or reduce their production capacity, resulting in coal production failing to keep up with demand recovery. Coal prices in China had risen rapidly, especially during the year-end winter months when coal demand increased significantly. In short, domestic production constraints and strict import controls sent China's coal prices up further.

China-Australia trade disputes have been continuing since last year. China has delayed customs clearance of Australian coal imports for a much longer period than any other country, thus, adding costs to Australian coal producers. Nevertheless, coal imports from Australia remained high. Just before the end of 2020, China therefore tightened its restrictions by imposing a ban on coal imports from Australia and asked importers to stop importing Australian coal. Buyers who had purchased Australian coal had to sell off their coal cargoes to other markets, causing Australian coal prices to plunge. After selling off their coal cargoes, Chinese buyers turned to alternative sources for coal, causing coal prices from other countries except Australia to rise rapidly. As a result, more coal buyers from other countries turned to Australian coal, driving up Australian coal prices.

In 2020, Indian coal imports also contracted due to its government's lockdown measures between late March and May to curb the spread of COVID-19. A dramatic drop in electricity demand during the lockdown caused demand for coal to shrink. However, coal production did not suffer much as it was an essential activity exempted from the measures, leading to an oversupply of domestic coal. Yet, there was a demand for imported coal from coal-fired power plants that are distant from coal sources. Likewise, the steel and cement industries preferred imported coal with a high calorific value, especially the cement producers who turned to coal as a replacement for expensive petroleum coke. In India, economy picked up slowly because Covid-19 infection rates remained high, stagnating the demand for imported coal.



Source: Marketing, Sales and Logistics Analyst, Banpu Plc

Japan's demand for imported coal decreased due to lockdown measures following the government's declaration of the state of emergency from April to May to control the spread of COVID-19. Although economic recovery was slow as the number of new cases remained high, coal demand decreased only slightly as most nuclear power plants are during a temporary shutdown.

Coal imports in the Republic of Korea (South Korea) fell in early 2020 as the government restricted coal-fired power generation from December 2019 to March 2020 to reduce air pollution. Besides, there was an increase in nuclear power generation. In May 2020, South Korea announced lockdown measures to stop the COVID-19, dragging down electricity demand to the lowest level in five years. From August to November, prices of liquefied natural gas (LNG) under oil-linked contracts fell sharply after the decrease in oil prices three to six months earlier. Lower LNG prices enabled LNG power plants to compete with coal-fired plants. However, by the end of the year, LNG prices rose thanks to the increased winter demand. Consequently, the cost of electricity from coal-fired plants became lower than that from gas-fired plants. Nevertheless, in December, since the government restricted coal-fired power generation, consumption of imported coal fell sharply in the past year.

Taiwan announced lockdown measures to prevent the spread of COVID-19 fairly early. So, the country was mildly affected by the COVID-19, and its economy rebounded to the pre-crisis level relatively quickly. Therefore, its coal consumption declined only slightly.

Coal demand in Southeast Asian countries was growing, particularly in the Socialist Republic of Vietnam, where coal imports rose significantly over the past year. Vietnam saw commercial commencement of new coal-fired power plants as its electricity demand increased, while domestic coal production slowed down. Vietnam was not much affected by COVID-19 because the government had declared preventive measures fairly early. Most Southeast Asian countries also imported more coal despite economic contraction, except the Philippines, which imported less coal as a result of strict lockdown measures.

The Islamic Republic of Pakistan saw an increase in coal imports despite the enforced lockdown measures as a new coal-fired power plant commenced commercial operations at the end of the year.

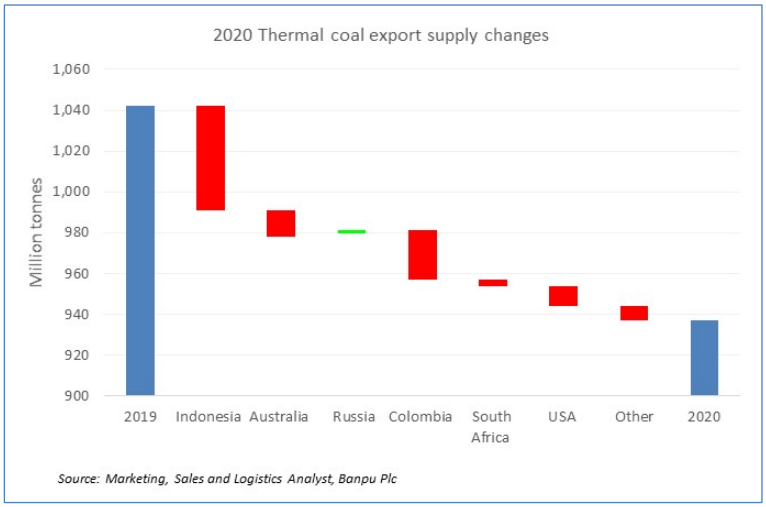
In 2020, coal imports in the European market plummeted due to falling electricity demand caused by lockdown measures to control the spread of COVID-19. Record-low natural gas

prices and a steady increase in power generation from renewable sources lowered the demand for coal. Besides, many European countries have accelerated their plans to phase-out coal use in power plants to meet their greenhouse gas emissions reduction targets. Many countries set a target to end coal use in power generation by 2025, which will result in a significant drop in European coal consumption.

Supply

In 2020, coal exports have declined, mainly driven by the plunge in global coal demand in spite of the fact that coal mines were exempted from Covid-19 lockdown in almost all countries. Indonesian coal exports dropped the most as the demand for imported coal declined in major importing countries such as China and India.

Australia's coal exports also dropped, driven by trade disputes with China, leading to China's ban on imports of Australian coal. Therefore, Australian coal producers were trying to sell coal to other markets to offset the ban, but the effort could only partially fill the gap because China's coal imports were extremely high.



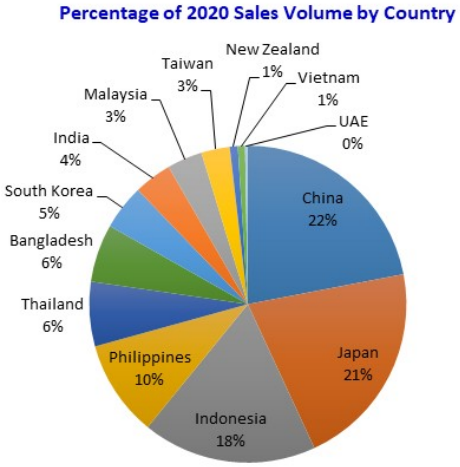
Coal producers in the Republic of Colombia reduced their production capacity. Many coal mines temporarily suspended their production due to lower coal prices in Europe which is a Colombia's primary market. There has been a strike at some coal mines. Apart from that, coal producers had to comply with the government's COVID-19 control measures. These have caused Colombian coal export volume to drop significantly, making it the country that suffered most from the slump in coal exports after Indonesia.

Coal producers in the Russian Federation were trying to increase their exports to Asia as the European market shrank. At the same time, depreciation of Ruble has made Russian coal more competitive in Asian markets. With coal production problems in Colombia, Russia's coal exports to Europe fell only slightly. Russia was the only country enjoying more exports than in the past year despite the sharp demand contraction for imported coal in global market. However, limited rail and terminal capacity has restricted Russian coal exports to the Asian markets. As a result, the growth of Russian coal exports to Asia remained modest.

The Republic of South Africa suffered a mild impact of COVID-19 in the past year as the demand for premium coal from Indian steel and cement industries remained high while the amount of premium coal export was limited. At the end of 2020, South Africa benefited from China's ban on imports of Australian coal as more Chinese buyers turned to South Africa for coal imports.

Last year's U.S. coal exports decreased due to lower demand for coal in Europe as its primary market. Global coal prices which dropped below production cost prompted U.S. coal producers to reduce their exports. In 2020, Banpu's sales from its Indonesian coal mines amounted to 21.2 million tonnes, a decrease of 16.1% from the previous year caused by a sharp contraction of global coal demand and a drastic decline in coal prices. The largest share of 22% went to

China, while the second and third largest shares of 21% and 18%, went to Japan and Indonesia, respectively. The Company increased coal sales to Indonesia by 14% from the previous year because Indonesian buyers were willing to pay higher prices in the situation where global coal prices flopped and coal demand from the steel industry soared. The Company increased coal sales to the Philippines and an emerging market like Bangladesh by 23% and 12%, respectively over the past year as they were high-paying markets



1.2 Coal Market in the Republic of Indonesia

Indonesia's coal production in 2020 was significantly lower than the previous year due to a sharp decline in global coal demand following preventive measures against COVID-19 by international governments. According to its Ministry of Energy and Mineral Resources, Indonesian coal production in 2020 totaled 557 million tonnes, decreasing by 9.5% from the previous year. Nonetheless, coal production was only slightly affected given coal being a primary commodity exempted from the government's COVID-19 control measures.

According to Indonesia's Customs Department, coal exports in the first ten months of 2020 were at 329 million tonnes, falling as much as 14.1% year-on-year. Indonesian exports started to recover around year-end as demand for coal imports from China and India increased. The Company projected Indonesian annual coal exports at approximately 404 million tonnes or 72% of Indonesia's total coal production, a decrease of 12% from the past year,. The country's key export markets were China, India, Japan, South Korea, Taiwan, Southeast Asia, and South Asia.

Coal demand in Indonesia in 2020 was also affected by the COVID-19 pandemic. The Indonesian government enforced nationwide lockdown measures from April to May, restricting social activities and travel. Many industrial plants had been temporarily shut down while electricity demand subsided. However, coal consumption in power plants decreased only slightly as new coal-fired power plants reached their commercial operation date, coupled with coal demand from COD of new steel plants. Banpu estimated that Indonesia's domestic coal demand in 2020 was at approximately 136 million tonnes, decreasing 1.4% from last year. 71% of the demand came from power sector, 10% from cement industry, 9% from iron and steel industry, and the rest from other sectors such as textiles, fertilizers, paper, and petrochemicals.

In 2020, Banpu's coal sales in Indonesia were at 3.8 million tonnes, contributing to 18% of the Company's total sales from its Indonesian coal mines, or a 2.8% market share of Indonesia's coal demand. Major buyers were iron and steel plants, accounting for 55% of the total sales. The rest were coal-fired power plants and cement industry at 39% and 6%, respectively.

Last year, the Indonesian government amended its mining law, allowing companies holding a Coal Contract of Work (CCoW) to convert to Special Business Mining License (IUPK). The license is extendable twice for a period of 10 years each with no tender bidding required. The new law also lifted the previous restriction of coal mining production operation area of 15,000 hectares per license.

Besides, the Indonesian government announced a new trade regulation requiring import coal buyers to use only national (Indonesian flagged) carriers for coal transportation. However, just before the regulation came into force on 1 May 2020, the government amended the regulation to only apply to vessels with a capacity of not exceeding 10,000 deadweight tonnage (DWT) as the number of Indonesian barges was not sufficient for transporting all cargoes

1.3 Coal Market in Australia

Most of the coal produced by Centennial Coal Company Limited is used in power plants in New South Wales. Meanwhile, exportations to power plants in Asia continue to increase, Centennial currently accounts for approximately 80 percent of the supply of the amount of fuel required for large coal-fired power plants in the Western Region. The sales of coal to these power plants are made under long-term contracts where coal volumes and futures prices are set. A domestic coal delivery contract with a power plant in New South Wales has the following advantages:

- The location of the Centennial mine is directly connected to the coal transportation system to the power plant. (It looks like a mine-mouth). So, it gives the Centennial a transportation advantage in respect of roads and specific conveyors for transporting coal to power plants. This reduces Centennial's transportation costs as well as its impact on local communities.
- These contracts are under Australian dollars, thereby limiting the risk of foreign exchange fluctuation.
- Domestic coal delivery is an ongoing business. Thus, it can continuously generate cash flow for Centennial from buyers who have good credit ratings in the long run.

Various changes in the coal market, including;

- Coal prices fluctuate due to factors such as cost pressures, scarcity of new supplies, new supplies uncertainty and the cost of producing electricity from coal which is still cheaper compared to using other types of fuel such as natural gas, etc.
- Enforcement of China's coal import quota, especially the coal produced from Australia. However, Centennial has a relatively small amount of coal exported to China, and there are new emerging markets such as Vietnam, the Philippines, and Malaysia having increased demand for coal. Thus, this issue has little impact on Centennials.
- Due to lower coal prices from the global economic slowdown, coal producers are cautious in investing to increase production capacity. Huge consequence which can be seen are coal prices begin to rise towards the end of the year as demand increases during the winter months due to the decline in the supply of coal.
- Overseas power plants consider having stable and essential coal resources in which overseas power plants have invested in coal mining projects in Australia in order to make long-term contracts by purchasing coal at market prices.
- The mining approval process has become difficult in the past 4-5 years, making it more difficult for projects to expand or increase the coal supply. Therefore, domestic power

plants may have to buy coal at higher prices to ensure they have coal for electricity generation, especially buying from current coal sources as much as possible including buying coal from production sites near power plants.

- The Australian Dollar has appreciated in line with other currencies (compared to the US dollar). It requires coal exporters to control production costs. and strict freight to maintain unit profitability
- The flow of carbon dioxide emission reduction causes financial institutions to reduce their lending to the coal mining business and coal power plants. It is difficult to provide funding to develop new projects or increase production capacity in both businesses. The impact on Centennial is small because it operates in accordance with ESG (Environment, Social, and Governance), having coal reserved already and continuously generating cash flow from business operations.

Therefore, higher energy demands coupled with the increasing challenge of procuring new energy sources will make the existing coal resources more valuable. Based on these factors, Centennial considers and plans its coal sales to be consistent with and respond to the growing demand for heating coal. As the contractual obligations in the country begin to expire, Centennial will maintain its priority in supplying coal to domestic power plants as one of the main strategies.

1.4 Coal Market in Thailand

During the first ten months of 2020, private sector's total coal consumption in Thailand was approximately 18.7 million tonnes, falling 0.2 million tonnes or 1% year-on-year due to economic contraction following the government's lockdown measures against the spread of COVID-19. The measures also considerably affected coal demand in industrial sector and caused it to decrease sharply. In the first ten months of 2020, cement industry remained the largest coal consumer in the private sector, with an approximate of 6.4 million tonnes in coal consumption, falling 15.6% year-on-year. Independent power producers (IPP) were the second-largest group of coal consumers with consumption at 5.4 million tonnes, growing 3.8% year-on-year despite the decline in overall electricity demand due to the lockdown measures. As power generation from coal has the lowest costs compared to other commercial fuels, coal-fired power plants could maintain full capacity in the past year.

Small power producers (SPP), mainly industrial producers, have also been affected by the lockdown measures. Coal consumption in the first ten months of 2020 was about 1.5 million tonnes, decreasing 19.2% year-on-year.

On the other hand, other industries such as paper, petrochemicals, textiles, and food, as well as coal traders importing coal for stock and sales, had coal consumption and stockpiling in the first ten months of 2020 at about 5.4 million tonnes or an increase of 28% year-on-year. Coal traders had accelerated coal imports for stock and sales when coal prices were low, leading to a considerable increase in coal imports in this group.

Coal business marketing policy

The Company has a policy for a clear goal of success, with responsibility towards all stakeholders to support the Company's sustainability policy.

1. Focus on pro–active marketing strategy, expand customer base to cover major market in Asia.
2. Increase value of products and services
3. Create market readiness to always be the best choice

4. Compete with honor and ethics and respect customers, business competitors and stakeholders.
5. Develop the Company to be a role model of market leader by adhering to the importance of customers' benefits.

Competitive Strategies in Coal Business

The COVID-19 pandemic has reduced global coal demand while increasing market competition. Customer visits were also restricted. Banpu has thus aligned its strategies with the changing business environment to stay competitive. Major competitive strategies deployed are as follows:

- ***Online Communication***

  The Company has been using voice conference calls and and video conferencing systems to communicate with customers and relevant parties. Chat programs are also used to speed up communication with customers aside from e-mailing. Choice of chat programs varies from country to country to better fit customer's preference. These allow the Company to maintain a close relationship with customers and promptly respond to their needs.

- ***Information Updates***

  Every quarter, the Company sends emails to customers and stakeholders to inform them of the Company's performance to ensure that the Company can deliver coal to customers as committed. The Company also uses emails to inform customers of various updates, such as the Company's COVID-19 measures. So, customers can rest assured that the Company can deliver coal to them even under unusual circumstances.

- ***Product Development***

  The COVID-19 pandemic has reduced global coal demand and caused oversupply in the global market, thus provide customers with more choices. To improve the quality of its coal, the Company uses the optimization model for coal blending to deliver the coal blend that best suits each customer's needs with the least cost. This strategy allows the Company to optimize its coal and coal purchased from external sources to create the highest added value.

- ***Targeting the Right Market***

  Market segmentation and product quality improvement were part of the Company's efforts to sell its coal to high-yield markets. Meanwhile, lower-quality coals were sold to customers who could use low-quality coal. With this strategy, the Company was able to secure its customer base in major markets amid a huge oversupply in the previous year.

- ***Stable Delivery***

  Focusing on reliable and stable delivery of coal to its customers, Banpu owns a large coal terminal with a vast port stockyard, allowing the Company to efficiently prepare for delivery to customers in terms of quality and quantity. Banpu coal is a strong brand that has been trusted by its customers for a long time.

Major Competitors

Banpu's major competitors in the global market remained relatively unchanged as entry to the coal business is difficult for new players. Major competitors were coal producers from Indonesia, Australia, Russia, and South Africa, e.g., Glencore, Yancoal, PT. Bumi Resources Tbk, PT. Bukit Asam Tbk, PT. Adaro Indonesia Tbk, PT. Kideco Jaya Agung, PT. Bayan Resources Tbk, PT. Golden Energy Mines Tbk, SUEK, and Noble Energy, Inc. Meanwhile, it was tougher for coal producers in the U.S. and Colombia to compete in the Asian market since

the coal reserves are too distant from Asian users, causing them to reduce production. Apart from that, there were numerous small coal traders and producers in the market.

The Company's major competitors in Thailand remained the old-time traders, namely SCG Trading Co., Ltd., Lanna Resources Plc., and Asia Green Energy Plc. Since the majority of coal consumed in Thailand is imported coal, there have been many coal traders entering the market. Furthermore, the fact that the market is easily accessible for both small coal traders in Thailand and foreign competitors has made the market highly competitive.

Pricing Policy

The Company's coal prices are determined based on global sales prices at the time of offering and adjusted to the actual quality of coal. The majority of coal is sold based on the index-linked pricing, and derivative instruments are used in managing price volatility. The coal sales price for power plant in Indonesia, however, is set by Indonesian government at a maximum cap of USD 70/tonne for coal with a gross calorific value (GAR) of 6,322 kcal/kg.

Customer Profiles

Banpu's major customers are large-scale coal-fired power plants in many countries such as Japan, South Korea, Taiwan, China, India, the Philippines, Malaysia, and Indonesia. These power plants owned by large and established companies purchase a large volume of coal annually. They have a strict and transparent supplier selection procedure in place, and usually purchase coal through bidding process for both short-term and long-term contracts, with some purchases made in the spot market. The Company also sells coal to other users in cement, pulp and paper, as well as brick industries. As most of these customers need less coal for their operations than large-scale power plants, they usually buy coal through short-term bidding contracts and sometimes from the spot market.

Distribution and Distribution Channel

The Company has delegated BMS Coal Sales Pte. Ltd., its subsidiary in Singapore, to operate coal trading and marketing activities in Indonesia and Australia. BMS is also in charge of sourcing coal from external sources for sale. The majority of sales are direct offers to coal customers. BMS Coal Sales Pte. Ltd. is responsible for identifying market opportunities, making sales offers, bidding and negotiating with customers as well as coordinating with customers about vessels for coal transport and after-sales services. This enables the Company to efficiently focus on customers and expand its markets

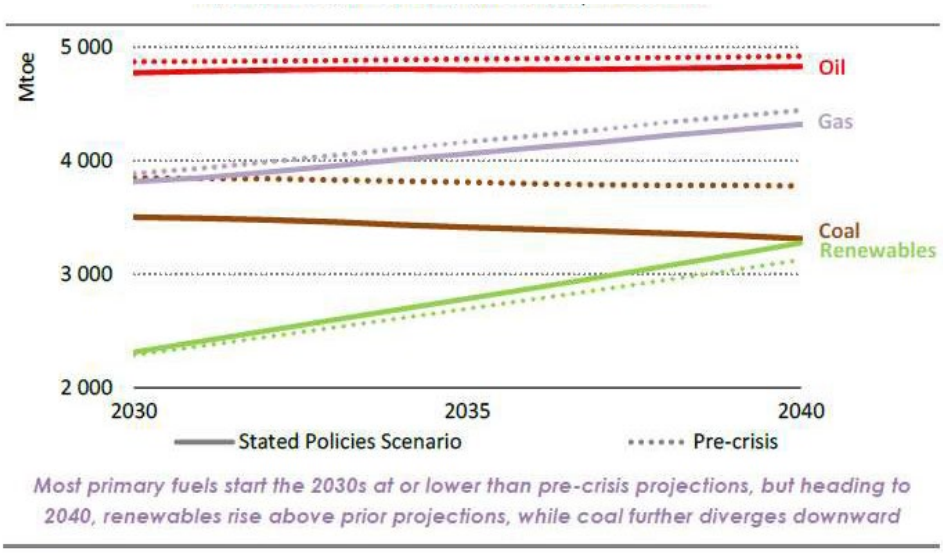
2. Natural Gas Market

1. Global Natural Gas Market

Global energy markets have been roiled through the COVID-19 pandemic. Most of 2020 were characterized by volatility in commodity markets, and natural gas markets were no exception. In particular, the second quarter saw significant reduction in LNG exports of natural gas, while domestic consumption remained resilient. However, as we entered the third and fourth quarters, strong rebounding in LNG and domestic demand have led to a resurgence of natural gas prices. Overall energy projected demand is expected to remain slightly reduced from the pandemic, and full growth recovery in demand is not expected to occur until at least a few years ahead.

However, global natural gas demand growth prospects continue to remain strong. The most recent International Energy Agency (IEA)'s World Energy Outlook (WEO) 2020 from the shows that while global natural gas demand has been reduced from the prior year's estimate (IEA's WEO 2019), the overall trend for natural gas demand remains positively upward in their Stated Policies Scenario. The graph below compares primary energy demand forecasted by the IEA.

Total Primary energy demand by key fuels in the Stated Policies Scenario relative to the WEO-2019, 2030-2040

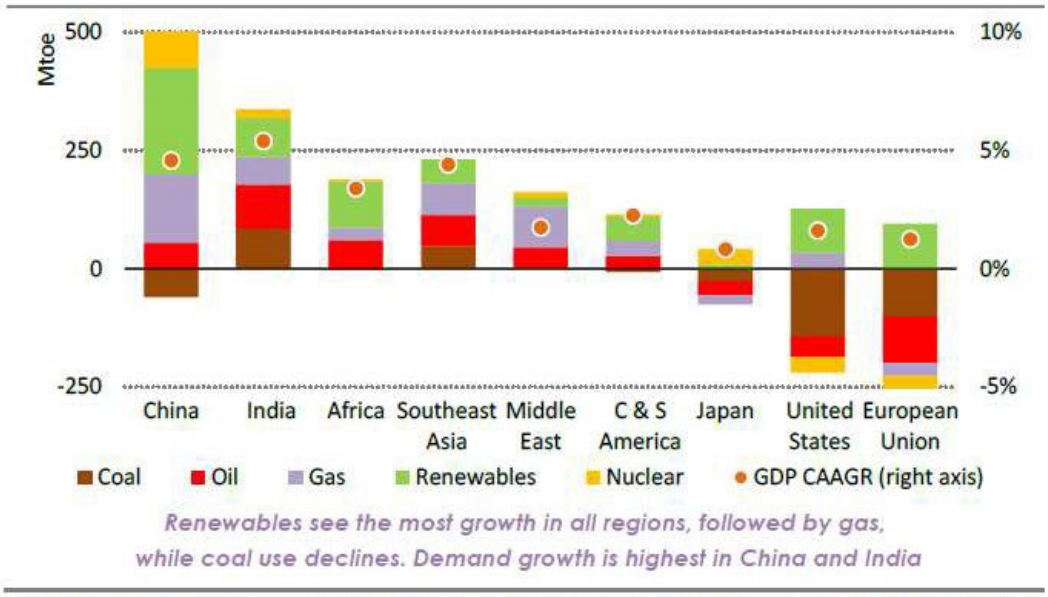


Note: Nuclear (not pictured) does not change substantially from pre-pandemic projections, and starts in 2030 at around 800 Mtoe expanding to around 900 Mtoe in 2040.

The continued growth in demand is due to natural gas being an ideal source of primary energy, which is a bridging fuel between fossil fuels and renewables, as its abundance, relative lower costs, relative lower carbon footprint, and flexibility as a heating or transportation fuel. However, unlike many commodities, natural gas is not easily transported given its standard gaseous state. Therefore, pricing for the commodity is typically much regionalized.

In the wake of the COVID-19 pandemic, Asian economies continued their strong gas demand growth with China, India and Southeast Asia projected to be the largest consumers of natural gas. Additional growth in gas and other sources of primary energy demand also include the Middle East and Central & South America. The graph below from the IEA illustrates the projected demand for gas by region under the Stated Policies Scenario.

Changes in primary energy demand by fuel and region in the Stated Policies Scenario, 2019-2030



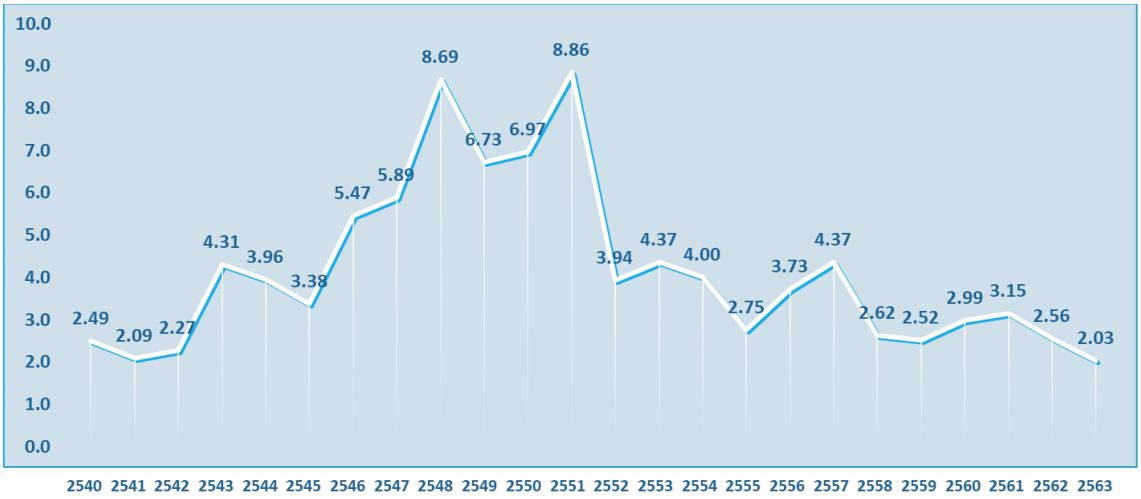
Note: GDP CAAGR = gross domestic product compound average annual growth rate; C & S America = Central and South America.

The U.S., Russia and the Middle East continue to be the largest future producers of natural gas. The supply growth in gas expected to be more moderated than previous projections to keep pace with demand.

2. The U.S. Natural Gas Market

The U.S. natural gas market were extremely depressed in 2020, due to lower overall demand in the first half of the year and persistent oversupply throughout the year (including a mild early start to winter in 2020 and 2021). The key natural gas pricing benchmark, Henry Hub, traded on a USD 2.03 per MMBtu. This price represents the lowest average annual price of the benchmark since 1997. This dramatic reduction in price was the result of significant oversupply from unconventional resource plays in the U.S., coupled pandemic reduced demand (especially for LNG demand in the second and the third quarters of 2020). The chart below shows average annual Henry Hub prices from 1997 – 2020 as reported by the U.S. Energy Information Administration (EIA).

Average of Henry hub Natural Gas Spot Price (Dollars per MMBtu)

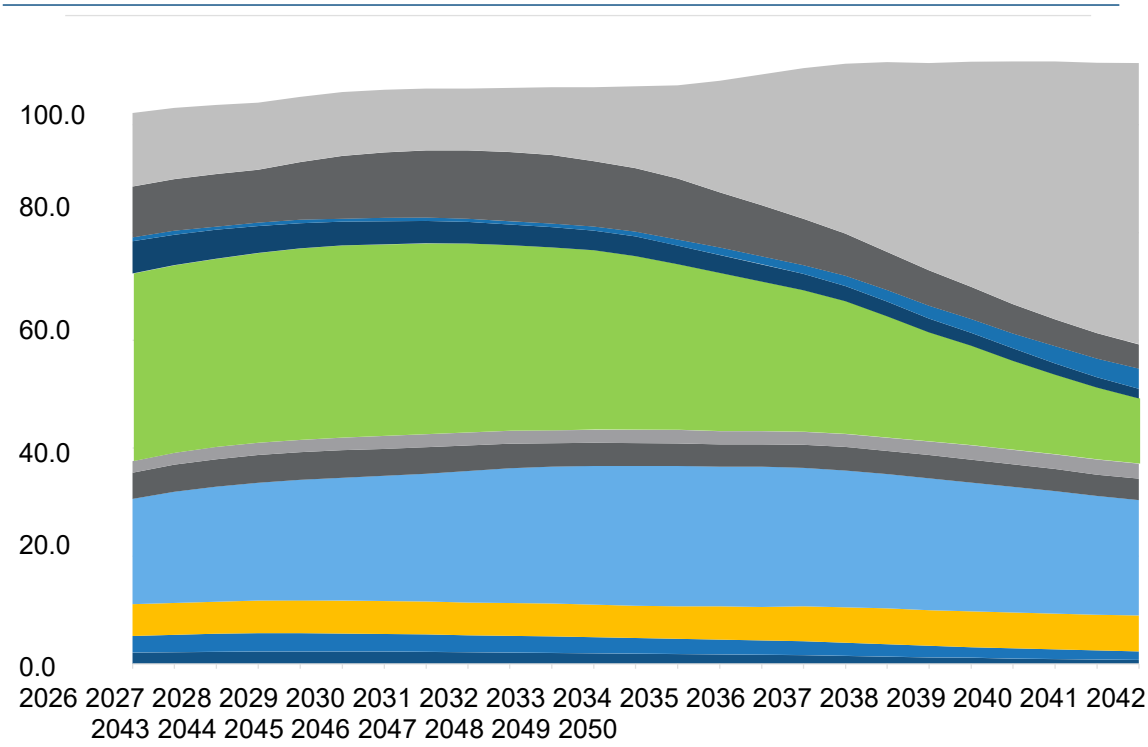


Source: EIA Website: https: //www.eia.gov/dnav/ng/hist/rngwhhdm.htm

During the second half of 2020, Henry Hub prices rebounded significantly as economic recovery from the peak of the pandemic shutdowns stimulated resurgent demand. This was particularly true for LNG demand which recovered very strongly from a low of around 3 billion cubic feet per day (Bcfd) to 10-11 billion cubic feet per day in a year end. As well, dramatically lower oil prices (which went negative in April 2020, for the first time on record) have led lower associated gas production.

The graph below from BTU Analytics shows that the U.S. gas supply is expected to stabilize in the 110 Bcfd range and maintain this flat production plateau for the long-term future. However, a significant amount of the natural gas supply will need to come from additional higher costs basins to supplement the decline in production from the current primary basins in the outer years (2040 and beyond).

The U.S. Dry Natural Gas Supply Long-term Forecasts (Bcfd)



Source: BTU Analytics 2H2020 | Bi-Annual Long Term Gas Outlook

The year of 2020 also saw the election of a new incumbent President of the U.S. President-elected Joseph Robinette Biden and his administration have promised dramatic reform in a variety of policy areas, including achieving a net-zero carbon emissions goal for the U.S. by 2050. While the actual policy measures and mechanisms for achieving such goal are being developed, the incumbent administration has focus on moving the U.S. towards a "greener" future. The Biden administration has further indicated its strong desire to enforce stricter standards for the Energy Industry, with methane emissions and water handling likely to be key focus areas.

Meanwhile, demand growth expectations for the U.S. market continue to be robust and most forecasts predict that natural gas demand will maintain good growth to match with supply needs. The major growth area for the U.S. demand is projected to be from LNG exports and Mexico exports as domestic demand remains stable.

3. Local Basin Gas Markets

In May 2020, Banpu's investment vehicle for the U.S. natural gas in BKV Oil & Gas Capital Partners, L.P. converted from a fund into a corporation. BKV Corporation is now a consolidated entity in which Banpu holds a majority interests and is focused on continuing to grow its portfolio of the U.S. natural gas assets. BKV Corporation currently has two primary basins within its portfolio. Northeast Pennsylvania Marcellus (called "NEPA") and Barnett assets in the Fort Worth Basin of Texas. Since these markets have their own unique fundamentals, we will explore each of these basin markets separately.

- **Northeast Pennsylvania Marcellus**

As of 2020, Banpu produced 62.4 Bcf net or an average of 170.5 million cubic feet per day (MMcfd) with its NEPA portfolio, including both operated and non-operated wells. Within NEPA, like the rest of Appalachia, strong production in the first quarter of 2020, followed by reduction in supply in the second quarter of 2020 due to supply curtailments as prices (including local basis) were extremely low. The second half of the year saw modest rebound in supply as natural gas prices rebounded.

As a result of the oversupply situation in NEPA basis throughout the year, the differentiation between local price and Henry Hub price remained wide throughout most of the year. Only in late of the last quarter of 2020 have local basis narrowed as domestic heating and power generation demand have uplifted local prices to more historic levels.

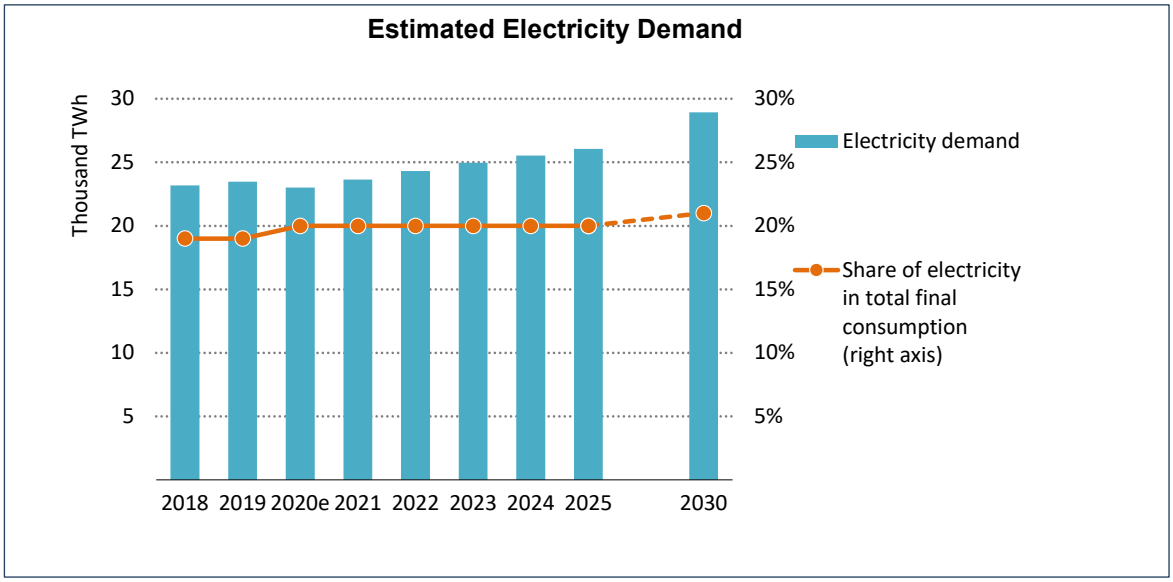
- **Barnett**

  On 1 October, 2020, BKV, an affiliate of Banpu, had closed on the transaction to acquire Devon's Barnett assets. The Barnett position within the overall natural gas portfolio is significant with the last quarter production of 52.7 billion cubic feet equivalent (Bcfe) or approximately 573 million cubic feet equivalent per day (MMcfed). The production from this asset represents 78% BKV Corporations total portfolio of natural gas equivalent production in the last quarter of 2020.

  The Barnett local markets have proximity to major demand centers in the gulf coast where LNG exports, Mexico exports and local petrochemical demand are rapidly growing. Therefore, the local prices for gas in the Barnett trade close to Henry Hub prices. For the Barnett assets, the forecasted production is expected to be approximately 70% dry natural gas and 30% natural gas liquids (NGLs) and condensate. The price of NGLs and condensate closely track oil prices versus natural gas prices, thus pro forma for the consolidation of the Barnett asset. Actual natural gas and NGL compositions vary by location in the overall field and by other factors and are finally determined by local plant statements where the fractionation (separation of the natural gas) occurs.

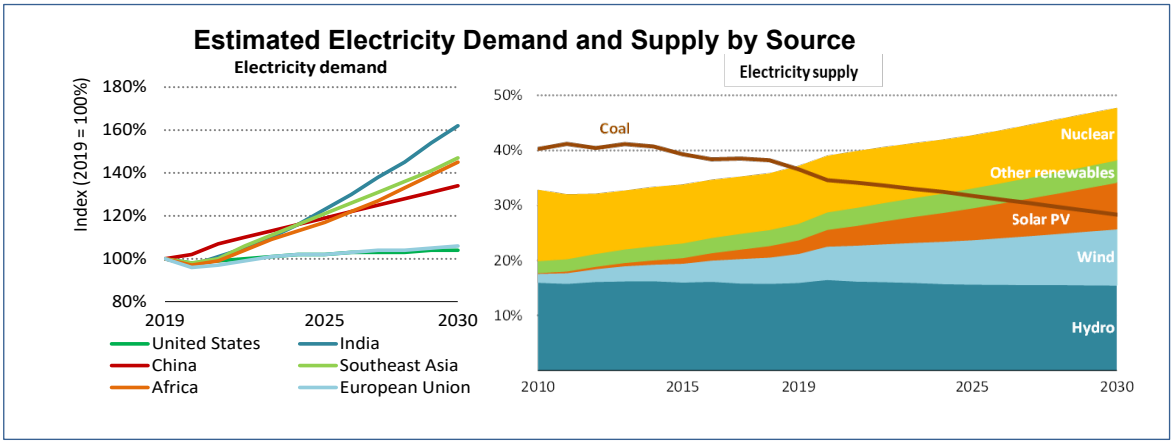
3. Market in Power Business Market

In 2020, the coronavirus disease 2019 (COVID-19) pandemic drove the projected global electricity demand down by about 2% from 2019, or about 500 terawatts per hour (TWh). However, the projected electricity demand in 2025 will grow over the previous year by 10% or more than 26,000 TWh. Global electricity demand is expected to grow continuously to reach 29,000 TWh by 2030. The increased electricity demand in the service and industrial sectors account for a 21.4% share of electricity in total final energy consumption by 2030. Preparation to meet the future electricity demand is thus essential during the COVID-19 outbreak, so the future supply can instantly respond to the power demand once the economy starts to recover.



Source: World Energy Outlook (WEO 2020) by the International Energy Agency (IEA)
Note: 2020e is forecast for the year 2020.

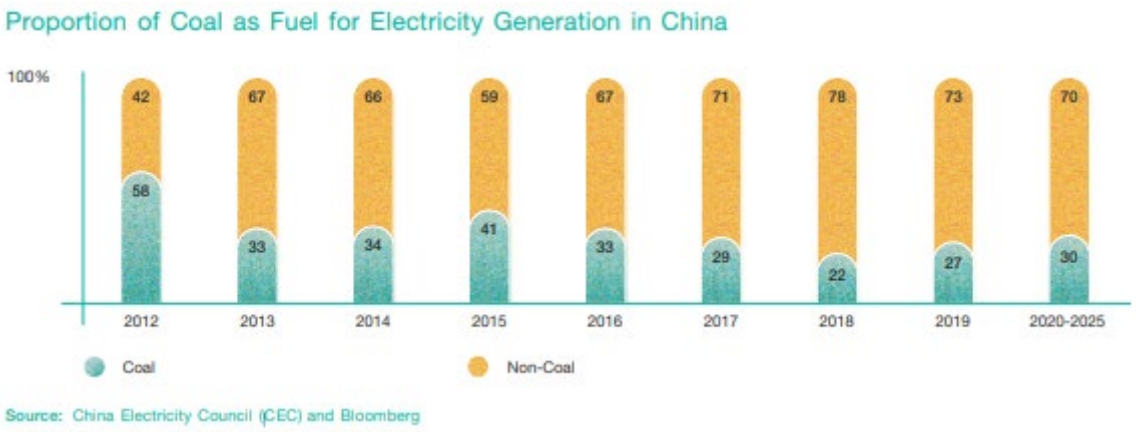
Considering the share of global power generation capacity by fuel source, renewable and nuclear generation capacity exceeded coal capacity for the first time in 2019 and is likely to keep growing. This is driven by technological change and innovation, focus on environmental impact and measures of governments that promote consumption and set targets to increase renewables. Based on the forecast in 2025, a share of renewables in the global electricity capacity will expand to 43%, whilst coal capacity is likely to fall from 35% in 2020 to 28% in 2030. Nevertheless, coal remains the primary fuel for power generation in the Asia-Pacific region, particularly in China, whose energy plan maintains the share of coal-fired power generation at 30% of the net capacity additions to meet peak demand.



Source: World Energy Outlook (WEO 2020) by the International Energy Agency (IEA)

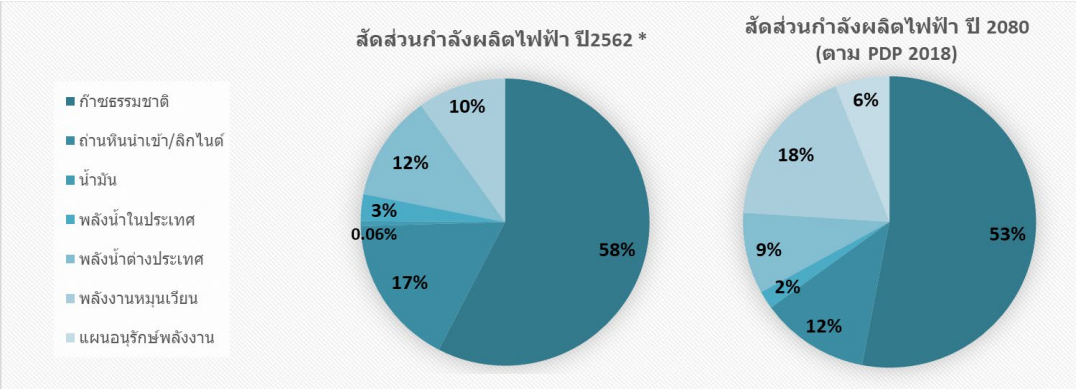
Note: 2020e is forecast for the year 2020.

Meanwhile, gas-fired power capacity is expected to drop by 1% from last year. The fact that natural gas plays a vital role in increasing stability and flexibility of power transmission systems during the COVID-19 outbreak and gas reserves in the United States are large and inexpensive has an influence on the volatility of the natural gas market in the United States, Canada, and Europe. Due to the development of coal-to-gas-switching power plant projects in Asia-Pacific, gas-fired power capacity is expected to remain stable at 22-23% of total generation capacity through the year.



1. Market and Competition in Thailand

In 2020, Thailand's installed power generation capacity totaled 45,478 MW, growing by 0.4% from 2019. In March, when the electricity demand peaked, before the COVID-19 outbreak, at 28,637 MW, yet below the 2019's peak demand at 30,853 MW for 2,217 MW or 7.2%. The shares of electricity capacity by fuel source in 2020 were natural gas 56%, coal 18%, domestic hydropower 2.3%, imported hydropower 14%, renewables 9.8%, and oil 0.1%Comparison of Power Development Plan and Proportion of Power Generation Capacity in 2020



Office (EPPO), Ministry of Energy. *Information as at end-October 2020

Under the Power Development Plan 2018 (PDP 2018), which is the main plan for sufficient energy for national economic growth, with a period of 20 years from 2018-2037. The plan proposes increasing capacity for demand of each region and focuses on connection between investment in electricity generation, the stability of the transmission system and promoting efficient competition. It is aimed that in 2037, the total production capacity shall be 77,211 MW, 56,431 MW of which is new energy, to support demand for 2037 and replaces power plant with expired contract and shall be removed from the system. This plan decreases production from coal from PDP-2015 to reduce Co2 emission in accordance with COP-21 and decreases conflict of people in certain region, and uses natural gas fuel for appropriate pricing. In addition, it promotes renewable energy power plant in accordance with national's promotion policy such as local waste power plant, biomass power plant and solar power project for 100 MW per year, 1000 MW for a total 10 year. The Power Development Plan shall be reviewed every 5 year or upon significant change of factor affecting the purpose of the plan, a study and development plan shall be done to increase stability of power system, increase efficiency, become grid connection in the region and connects with sale system to facility Grid Modernization in the future.

2. Market and Competition in Lao PDR)

Unlike other Southeast Asian countries, Lao PDR's power generation relies mainly on hydropower since the country has no proven oil and natural gas reserves and only limited coal reserves. Since 2016, the situation has improved as all units at HPC power plant, the first coal-fired power plant in Lao PDR, are fully operational. Given the scarcity of coal source, no further plans have been made for the new construction of coal-fired power plant during 2016-2020. Nonetheless, Lao PDR remains a major power exporter in the region. Lao PDR has entered into international power purchase agreements to supply electricity of 9,000 MW to Thailand, 5,000 MW to Vietnam, and 200 MW to Cambodia by 2025. Thailand and Lao PDR trade electricity generated by seven power plants, six of which are hydropower plants, and one is a coal-fired power plant.

3. Market and Competition in China

The power industry in China saw growth in power consumption as follows

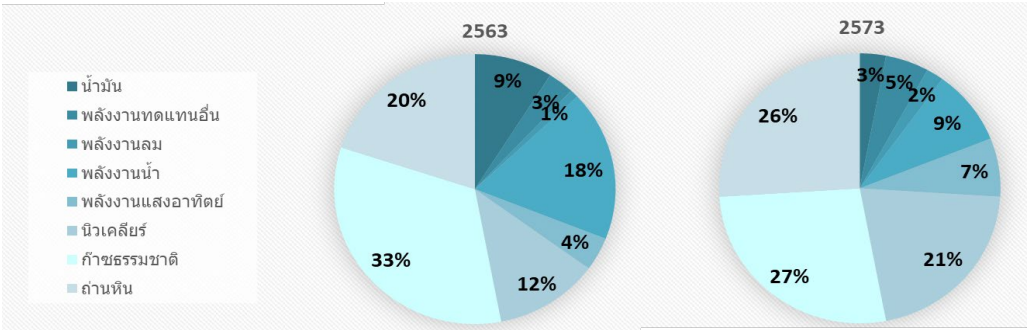
	Unit	2020	2019	2018
Growth rate in generation capacity	%	6.6	6.3	6.7
Total generation capacity	Gigawatts	2,210	2,073	1,949

Source: National Energy Administration (NEA), China

China's ongoing energy reform and development of renewable energy technologies have lowered renewable energy costs, which is favorable for the investment of the private sector. In 2020, the generation capacity growth rate was at 6.6% of total generation capacity, increasing over the previous year. Approximately 53% of the increased capacity in 2020 came from the construction of new renewable power plants (excluding hydropower). The China Electricity Council set to achieve total wind and solar capacity additions of 120 GW in 2021.

4. Market and Competition in Japan

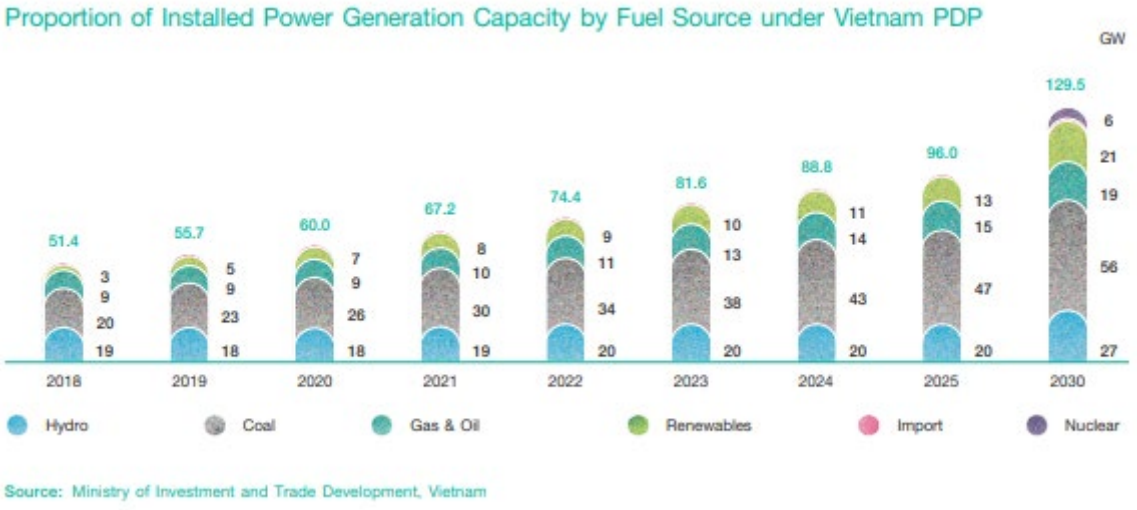
Japan’s electricity consumption has enjoyed a stable growth with the majority of capacity from thermal power generation. Part of the capacity was from renewables, accounting for 24% of the total capacity, or 63,764 MW, comprising 3,580 MW from wind power, 10,549 MW from solar power, and 49,635 MW from hydropower. According to the Fifth Basic Energy Plan, Japan set to achieve a target of 22-24% from renewables by 2030. The Government of Japan has replaced the renewable-based electricity pricing scheme from the Feed-in Tariff (FiT) scheme with the auction scheme since 2017. Based on the auction scheme, newly developed solar power plants will get an average price of JPY 12 per kWh. Besides, there was a regulatory change prescribing that any solar power plant project development of over 40 MW operating capacity must submit an Environmental Impact Assessment (EIA) report. The new regulation has been effective from April 2020 onward



Source: The Fourth Strategic Plan on Energy, Ministry of Economy, Trade and Industry (METI) * Information as at October 2020

5. Market and Competition in Vietnam

Affected by the COVID-19 pandemic, in 2020, Vietnam's Gross Domestic Product (GDP) grew by 3%. However, it is forecast that in 2021 the GDP will grow by 6% thanks to continual economic recovery and the success in combating the spread of the COVID-19 pandemic. According to Vietnam's Power Development Plan 2000 - 2030, coal is the primary fuel for electricity generation. By 2030, the total power generation capacity will comprise 40% from coal-fired power generation capacity, and capacity from renewable power generation, namely 9% from wind, and 6% from solar. The total capacity is expected to reach 130 GW by 2030



Source: Ministry of Investment and Trade Development, Vietnam

Vietnam has set the Feed-in Tariffs (FiT) at US cent 7.09 per kWh for the solar power projects that had achieved commercial operation by December 2020, and US cent 8.5 per kWh for (onshore) wind power projects that will have achieved commercial operation by October 2021. In 2021, the Vietnamese government changed the solar pricing scheme from FiT to the auction scheme with a reserve price of US cent 7.09 per kWh.

4. Energy Technology

4.1 Provision of One-Stop Service of Total Solar Energy

In 2019, the government approved and announced Thailand's Power Development Plan 2018-2037 (PDP2018), with an aim to increase solar power generation capacity from 6,000 MW to 10,000 MW. The plan also promotes greater household consumption of solar power. The National Energy Policy Council (NEPC) passed a resolution for the household solar rooftop scheme, aiming to purchase 100 MW per year. However, due to the COVID-19 pandemic facing Thailand and the world in 2020, household and industrial sectors, which had been formerly interested in using solar rooftops, decided to postpone their investments in the installation of solar PV systems.

Nonetheless, the market for integrated solar power systems is likely to grow as a number of entrepreneurs recognize the vital role and benefits that energy technology can have on livelihood and business operations. Besides, government measures are stimulating solar power production. Last year, the National Energy Policy Council approved the increase of power feed-in tariff for the household solar rooftop scheme to THB 2.20 per unit from THB 1.68 per unit. The scheme targets to purchase up to 100 MW a year over a period of ten years. Effective from 1 January 2021, the scheme, which has been extended to include schools, hospitals, and solar pumping for irrigation (Pilot Project), is expected to encourage more investment in solar power and reduce public and entrepreneurs' financial burden allowing growth in the market of One-Stop Service of Total Solar Energy.

4.2 Design and Smart City Development Plan and Smart City Solutions

The government is focusing on the Smart City Development Plan, which should be of urgent matter in order to be in line with Thailand 4.0 guideline and national 20 year strategy which promotes the use of smart technologies and innovations to enhance quality of services and city administration and reduce cost and use of resources of the city and the targeted population emphasizing on good design and participation of business and people. From the pilot plan in 7 provinces in 2018, The Digital Economy Promotion Agency (DEPA) has set to achieve the development of 100 smart cities across 76 provinces, including Bangkok by 2022 through promotion of participatory city management and technology-based infrastructure development, particularly the energy infrastructure that enables optimal use of energy, such as Energy Management System, Energy Storage System and Electric vehicle (EV))

4.3 Electric Vehicle

Pollution and traffic in daily life is common in people in the city. Public sector and people in Thailand is currently recognizing pollution issue and therefore, electric vehicle becomes an alternative choice in which people starts to take interest in and has a tendency to grow under government support with regards to increasing market demand in Thailand, increases incentive for manufacture and consumers such as corporate income tax exemption, import duty exemption, excise tax reduction for electric vehicle, including increasing number of charging stations via investment from public and private sector as well as increasing uses of electric vehicle in public transport such as short rent or car sharing which shall reduce use of personal car, reduce energy consumption and solve pollution and traffic issues in the city

Integrated Energy Service Marketing Policy

The Company has a clear, transparent, straightforward marketing policy and is responsible to all stakeholders in order to support the Company's sustainable growth policy as follows:

1. To expand the customer base to cover the main markets in Asia.
2. To create added value of products and services by being a fully integrated energy service provider including the installation of solar power systems on the roof and offering a wide range of energy solutions with modern technology in order to appropriately meet the customers' needs in each area and lead be a part of a sustainable smart city including the development of various systems which supports the best after-sales service to customers for the Company to be the best choice of customers.
3. To compete in ethical marketing and respect for customers, business competitors and stakeholders.
4. To be clear, straightforward, demonstrating credibility, honesty and professionalism.

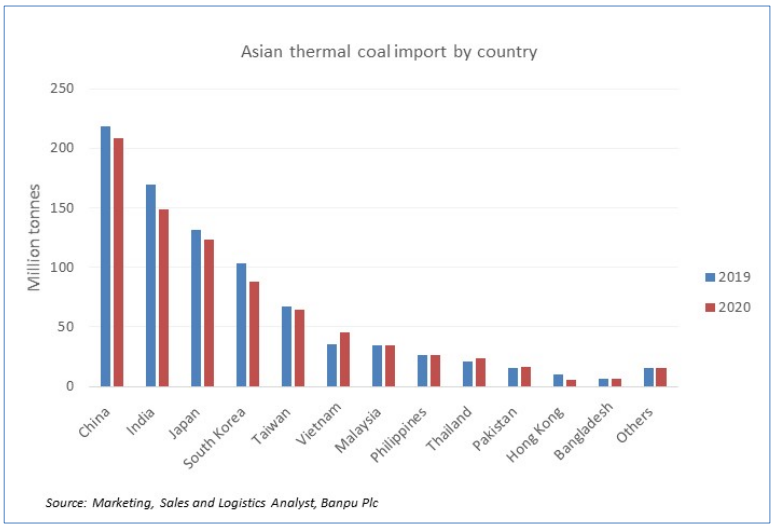
(I) Market and Competition

1. Competition in the Coal Industry

Competition in 2020 had been intense, with a severe contraction of imported coal demand following government lockdown measures in various countries worldwide to cope with COVID-19. Nonetheless, coal production was mildly affected, resulting in an oversupply in the global coal market.

Overall global demand for coal imports in 2020 dropped by 83 million tonnes or 8.1% from 2019, with a total import volume of 939 million tonnes. The Asian countries imported coal at a total volume of 805 million tonnes, down 5.7% from the previous year, accounting for 86% of the global seaborne coal trade.

Despite government's stricter coal import restrictions, China remained the world's largest coal importer with a total import volume of approximately 208 million tonnes, falling 4.6% from the previous year. In the past year, the market has been in tight supply because domestic production had been affected by the government's mining security and corruption inspection measures. Meanwhile, demand for coal increased at year-end due to unusually coal winter, driving up China's coal prices significantly.

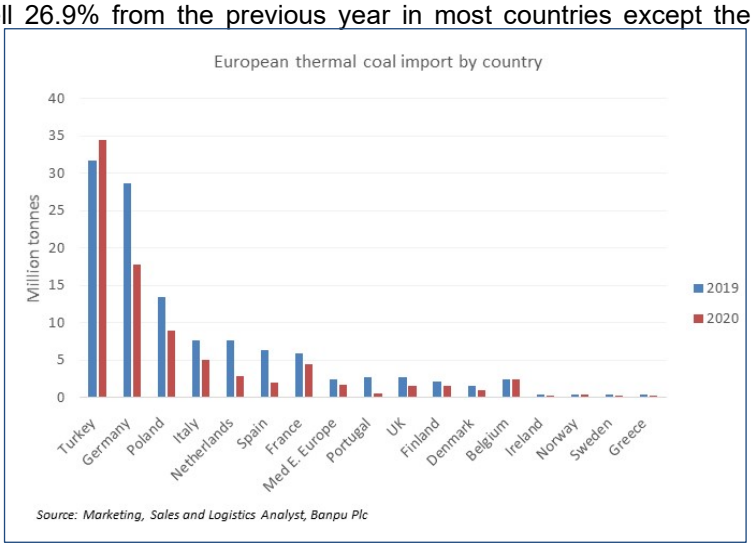


India was the world's second-largest coal importer with an import volume of approximately 148 million tonnes, dropping 12.4% over 2019. The majority of coal imports were low-quality coal from Indonesia due to its low prices. The shares of coal imports comprised 62% from Indonesia and 24% from South Africa, and the rest from countries like the U.S., Australia, and Russia. However, India was a market that absorbed surplus coal, so coal producers and traders vigorously competed to sell surplus coal to the Indian market, making it a highly competitive market in the past year.

North Asian countries, namely Japan, South Korea, and Taiwan, imported more coal from Russia and South Africa in order to depend less on Australian coal. This group of countries imported about 275 million tonnes of coal, decreasing 8.7% from the past year. South Korea's coal imports dropped the most as its government limited coal-fired power generation to reduce fine dust in winter while nuclear electricity generation was increased. Taiwan also restricted operations of coal-fired power plants in some areas to minimize the fine dust during winter. Coal importers in North Asian countries has been focusing more on high-quality coal to mitigate environmental impact.

Southeast Asia was the only region seeing an increase in coal imports with an import volume of 134 million tonnes, growing from the previous year by 9.8%. As the region's largest coal importer, Vietnam increased its coal imports by 26.3% over the past year. Despite Indonesia being the major producer and exporter in this region due to its proximity, the competition among producers in Indonesia was still intense. Furthermore, an increased number of Russian and Australian coal producers entered this market last year, making the market even more competitive.

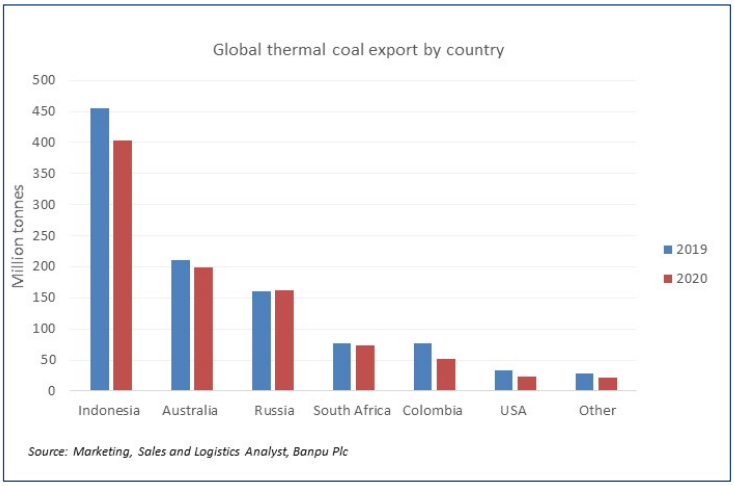
Europe's coal imports in 2020 fell 26.9% from the previous year in most countries except the Republic of Turkey, where coal imports increased because coal-fired power plants' costs were lower than those of gas-fired plants. The dramatic shrink in coal demand led to oversupply in the European market, resulting in fierce competition and a significant decrease in coal prices. Consequently, major coal producers and distributors in Europe, such as Colombia and the U.S., had to reduce their production. Global coal exports in 2020 were at approximately 936 million tonnes, decreasing 10.2% from the previous year, due to contraction of coal demand following lockdown measures against COVID-19. The six major coal exporters were Indonesia, Australia, Russia, South Africa, Colombia, and the U.S. Their combined export volume accounted for more than 97% of global seaborne coal trade.



Indonesia, the world's largest coal exporter, exported approximately 404 million tonnes of coal, decreasing 11.3% from the past year. Indonesian coal exports suffered most among coal exporting countries due to falling demand for coal imports of its major customers. Producers tried to cut costs, while many others had to temporarily suspend their production as sales prices fell far below costs.

Australia, the world's second-largest coal exporter exported approximately 199 million tonnes of coal in 2020, a decline of 5.9% over the previous year. The impact of COVID-19 on Australian coal was relatively low because of its high quality. Major impact on the country coal exports, however, came from the Australian-Chinese trade disputes. China, Australia's major coal buyer, imposed tightened restrictions on Australian coal imports which caused significant delays in customs clearance process for Australian coal cargoes compared to those from other countries, incurring additional costs to Australian coal. Despite restrictions, Australian coal could still compete in the Chinese market because of its high quality and competitive prices. At the end of the year, China unofficially imposed a ban on Australian coal by telling coal importers to stop imports from Australia. Australian producers had to sell coal into other markets instead, yet the volume could not fully offset the huge decline of exports to Chinese market.

Russian coal exports to Non-CIS countries were at approximately 162 million tonnes, increasing 0.9% over the past year. The country attempted to export more coal to Asia to offset shrinking demand from the European market. Ruble depreciation has made Russian coal more competitive in the Asian market. Although Russian premium coal could replace Australian coal in the North Asian market, the lack of rail capacity kept Russian coal from penetrating into the Asian market.



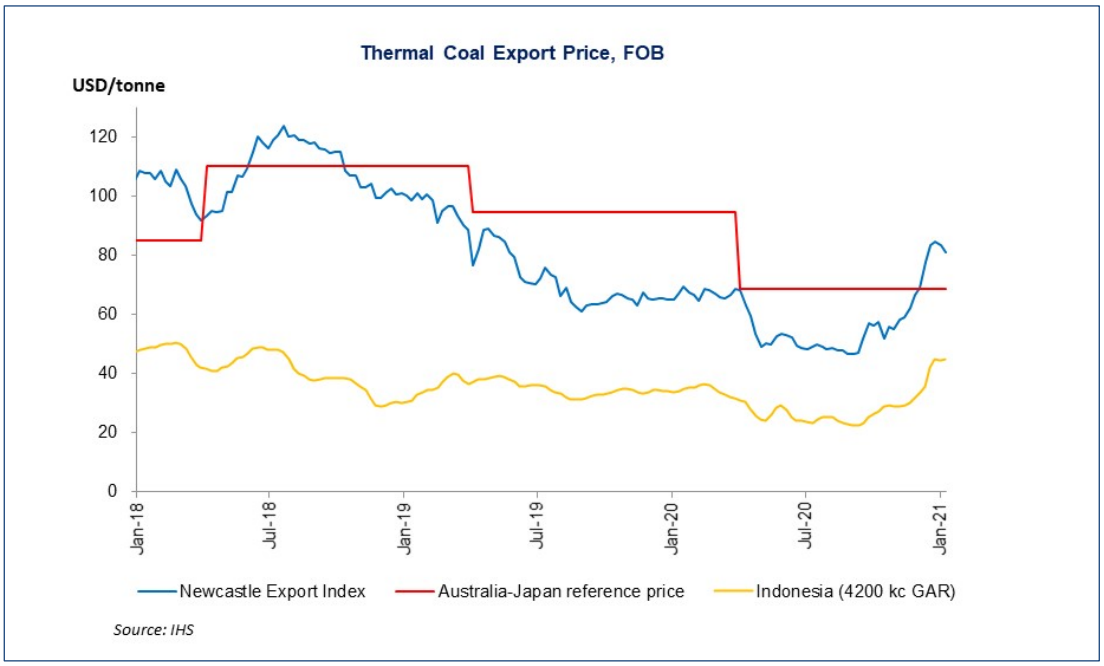
South Africa's coal exports totaled about 74 million tonnes, down by 3.7% from the previous year, given decreasing coal demand in the global market. Some miners had to shut down their operations temporarily in response to the government's preventive measures against COVID-19, especially the underground mines. South Africa has been exporting more low-quality coal due to the country's dwindling reserves of premium coal. Exports of premium coal were at around 10% of its total coal exports. South Africa's premium coal was preferred by Indian steel producers, sending its prices up.

Colombian coal exports in 2020 were at approximately 52 million tonnes, down 32% from the previous year. The decrease was driven by shrinking demand in Europe, Colombia's major market, coupled with Colombian government's lockdown measures. In addition, extremely low coal prices in the European market forced several producers to halt their production. Colombian producers tried to increase sales in Asian market. However, being geographically distant from Asian users, they failed to compete with producers who are closer to the market.

The U.S. exported 23 million tonnes of coal (excluding exports to Canada), plunging 29.5% from the past year owing to a drastic decline in global coal prices, making the U.S. coal uncompetitive. Coal prices in 2020 suffered from COVID-19 lockdowns since late April and fell rapidly in May due to a plunge in global demand for coal while recovery only began late in the year. The annual average price at Newcastle Port was at USD 58.6 per tonne, falling 24% from the past year

Coal prices in 2020 suffered from COVID-19 lockdowns since late April and fell rapidly in May due to a plunge in global demand for coal while recovery only began late in the year. The annual average price at Newcastle Port was at USD 58.6 per tonne, falling 24% from the past year

China banned on imports of Australian coal in late 2020 but ordered coal from other countries instead. This had tightened supply of other coal producers because there was insufficient supply to meet China's coal demand. As a result, coal prices in other reference markets have increased. Meanwhile, other coal buyers from other countries bought more coal from Australia because of its



lower prices, which consequently led to the increase in Australian coal prices.

Around the end of 2020, North Asia faced unusually cold winter weather, leading to higher demand for coal. Meanwhile, Australian coal producers planned to extend the Christmas holidays to reduce

supply in the market. As a result, premium coal prices at Newcastle Port rose to above USD 80 per tonne at year-end

Coal imports in 2021 are expected to rebound from 2020 as global economy is set to recover after the rollout of COVID-19 vaccinations. Most world economies are expected to pick up from its lowest point affected by COVID-19 outbreak in 2020 with Asia, especially Southeast Asia and South Asia at the forefront of global recovery.

North Asian countries, comprising Japan, South Korea, and Taiwan, will turn more to premium coal, particularly South Korea and Taiwan, to minimize air pollution. Demand for premium coal will remain high, and prices will be stable. These countries will also continue their restrictions on coal-fired power generation in winter to reduce fine dust in the air.

European coal demand in 2021 is also expected to recover from significant contraction in 2020 due to the impacts of the COVID-19. However, the coal demand will gradually decrease as European countries plan to shut down coal-fired power plants to reduce carbon dioxide emissions. The plan will affect producers in the U.S. and Colombia, who may have to lower production because of lower demand and inability to compete in the Asian market as their coal sources are too distant from Asian consumers.

In the long run, investment in new coal mines will face challenges in seeking financing as many financial institutions have cut off fossil business funding. On top of that, future development of new coal reserves are likely to be affected by more stringent environmental policies and increasing public opposition. While existing coal reserves are gradually depleting, if there are no new reserves available in time, a tight supply can be expected in the future. Therefore, coal prices should remain high enough to attract investment in new coal projects to replace depleting reserves.

1.1 Competition in Australia

Coal Market in Australia

- The main demand for thermal coal used in Australia is for the power generation business. Australian coal prices are based on world market prices. It will be the price that reflects the quality of the energy value and the qualifications of the coal. World demand and supply are as a result of global economic growth and contraction. As Australia is a major coal exporter, Newcastle FOB reference price is the spot market price from Newcastle Port, Australia without including the relevant shipping costs. As for the domestic coal price, it will be negotiated between the coal company and the customers using the price referenced to the export price (Export Parity Pricing). However, if the companies have long-term coal sales contracts to customers, the actual price received by each company may differ from the world market price.
- Subject to coal supply, coal resources can be found throughout Australia, with Queensland and New South Wales having Black Coal resources, which consist of the most subbituminous, bituminous and anthracite coal in the country. According to the Australian Resource Assessment, Australia has more than 100 coal mines today and more than 35 mines in development. Australia is the second largest coal exporter after Indonesia. But coal from Australia is considered to be good quality coal with high calorific value and low sulfur.
- Infrastructure Assessment

  Good infrastructure is a key factor in Australia's coal export leadership, with coal business infrastructure comprising ports, roads, conveyors and railways. Long-established coal mines located near the coast have domestic transportation systems available while the newly discovered coal mine may be located far from the port and there must be an infrastructure for moving coal to the port. Australia faces export restrictions which the

government has tried to solve the problem by building more ports and allowing companies to jointly invest shares.

One of the strengths of Centennial's mines is the capability and availability of efficient logistics available to supply coal to domestic power plants by using a conveyor belt system which makes the shipping cost low.

- Substitute Products

  For power plants being a major consumer of the thermal coal industry, natural gas discoveries are currently increasing in the U.S., especially in shale gas which makes natural gas prices in the U.S. cheaper. In addition, the U.S. already has a comprehensive natural gas pipeline system so that this causes many power producers increasing their production capacity in natural gas plants and reducing the use of coal. The market will continue to be like this only if there is enough natural gas found and the natural gas pipeline system available as well as low natural gas prices. Therefore, this market condition mainly occurs in the U.S. Apart from these, the installation of solar roof top has increased in Australia. This may result in a decrease in electricity demand from the National Electricity Market (NEM). However, it is also a very small and insignificant proportion compared to the total electricity demand.

1.2 Export Coal Market in Australia

- For international customers, Centennial uses coal transportation through the Port of Kembla and the Port of Newcastle in the last couple of years. Port congestion at Newcastle is an ongoing problem which Australian coal producers are facing. Thus, in September 2009, the New South Wales State Government and two ports, which are Waratah Coal Services Port and Newcastle Coal Infrastructure Group (NCIG), agreed to the Capacity Framework Agreements to look after port expansion which is increasingly needed to keep up with rising demand.
- Waratah Coal Services (PWCS) has expanded its shipping capacity from 133 million tonnes per annum to 145 million tonnes per annum.
- Currently, NCIG has expanded the port's shipping capacity by 66 million tonnes per year, which has been completed since June 2013.
- Kembla Port was established to support coal exports from coal mines in the southern and western parts of New South Wales. It currently handles approximately 15 million tonnes of coal exported annually.

1.3 Competition in Thailand

In 2020, competition in Thailand was extremely intense as more than 99% of the coal used in the private sector was imported coal, thus attracting numerous coal traders to enter the Thai market. With oversupply in the global market, coal traders were trying to sell off their inventory into Thailand, thus, further intensifying market competition.

In the first ten months of 2020, consumption of imported coal was at 18.7 million tonnes, decreasing 1% year-on-year due to economic contraction following the country’s lockdown measures to curb the spread of the COVID-19. Consumption of domestically produced coal was at only 0.16 million tonnes, down 45% year-on-year because of depleting coal reserves. Whereas coal consumption declined, coal imports increased. The coal import volume in the first ten months of 2020 was at 20.6 million tonnes, growing 5.7% year-on-year, as importers imported large volume of coal to refill their stocks when coal prices were low. Around end of 2019, expecting coal prices to go down further, coal users decided to keep their stock low by using their existing stock and delayed coal imports. Therefore, in 2020, they had to import coal to replenish their stocks.

2. Competition in natural gas

The competitive dynamics for natural gas in the U.S. market center around three core dimensions

1. Local producer competition

The first source of competition is from local competitor upstream oil and gas producers located in Appalachia, Barnett and other competition basins. The chronic oversupply situation forces local gas-on- gas competition as producers seek to access the most attractive sales points. Within the NEPA, there were approximately 10 natural gas producer competitors which it benchmarks its performance against. These competitors are typically publicly listed companies with significant assets in Appalachia either focusing on the Marcellus shale or Utica plays. BKV has competitive cash costs and margins when compared against these peers, which are generally much larger in size on a production basis.

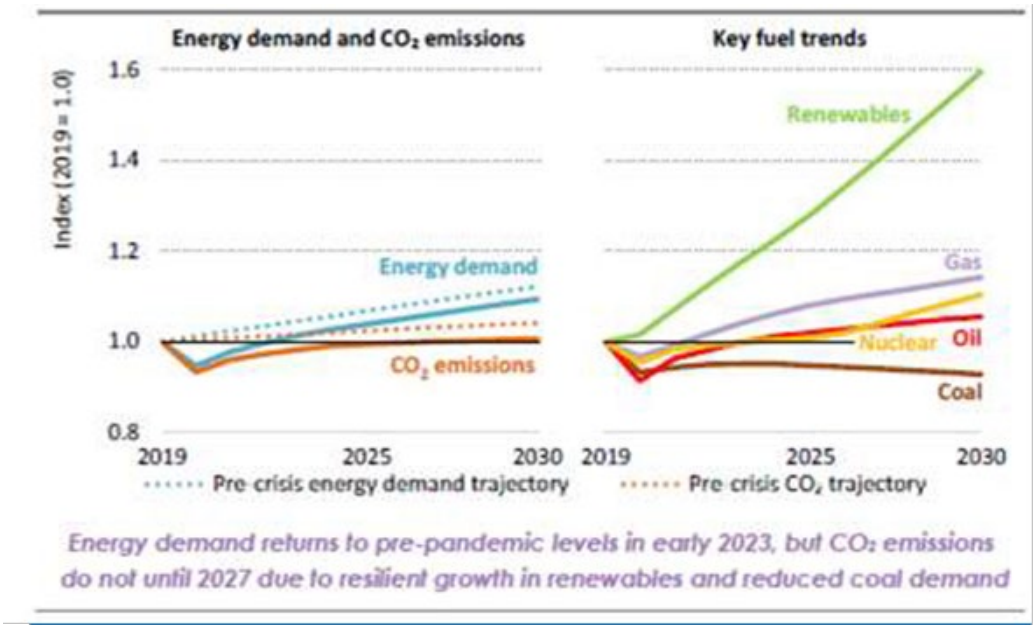
2. Associated Gas production

The competitive dynamic for gas production comes from associated gas production. Associated gas production represents the natural gas production occurring from oil focused plays which the natural gas is a by-product of oil production; therefore, not the primary product being pursued. The economics of natural gas production in these plays is mostly irrelevant to the capital deployment focus of these producers, and the marginal costs to produce this natural gas can be negative (making it the lowest source of gas production). For 2020, the expectation of abundant amounts of virtually costless associated gas was greatly reduced due to the decline in oil prices and corresponding oil demand. Further, as the incoming Biden administration has indicated a policy shift towards more stringent and rigorous environmental standards, it has created some uncertainty as to the potential for additional associated gas competition e.g., from historically flared gas, and/or how likely it will be for additional infrastructure to be built to support bringing this associated gas to liquid markets (as in the case of the Permian basin). Overall, it appears the expectation of very significant associated gas supply from oily basins has been greatly reduced in 2020; therefore, marginal dry gas will likely set the price for natural gas in the foreseeable future.

3. Alternative sources of primary energy

The competition from other primary energy sources within the U.S. i.e., coal and renewable energy which compete for local demand, and especially local power generation demand. This competition is concentrated in local coal production and renewable energy production. Both competitive sources of primary energy competition are threats to the continued growth of the U.S. natural gas demand in the power generation sector. However, as carbon neutral goals are increasingly adopted across the globe (including in the U.S.), it is looking increasingly likely that the share of renewables in the global primary energy production will increase rapidly. Natural gas will also increase rapidly versus the current baseline but likely at a slower pace for the renewables. This may be especially true in the power sectors, where significant renewables investment is targeted by the incoming Biden administration. Regardless, renewables and natural gas will be in competition to move towards its stated carbon emission targets. The graph below illustrates IEA's forecasts of renewable energy demand growth (post and pre- COVID-19 pandemic) versus the corresponding primary fuels utilized to supply that demand growth.

Global energy demand and CO_2 emissions trends in the States policies Scenario to 2030



In the long run, we believe natural gas is competitive as main source of power production and other uses as it is capable of competition and has many benefits.

Competitive Strategies The market for 2020 by record supply levels in the first quarter of 2020, followed by reductions in supply into the second quarter as prices fell dramatically, leading to an extremely volatile year for all producers. Banpu focused on strong production management, capital efficiency and operating costs management to drive improved margins are one of the most challenging price environments we have yet faced

1. **Production Management**

   Focused on maintaining base production and deploying capital with only the most efficient returns on capital employed to maintain strong performance in a low commodity price environment.

2. **Hydrocarbon Transmission**

   Executed a number of compressor projects which lowering line pressure by increasing compressor capacity has allowed older wells to flow more gas as a result of lower inlet (or suction pressure) into the system.

3. **Operations Automation**

   Deployed the auto tune initiative in all targeted wells by utilizing computer systems and algorithms to optimize the variable settings on plunger lift systems for producing as wells to create very high efficiency and returns on investment.

4. **Marketing Arrangements**

   An agreement made by BKV with major pipeline facilities in its markets to provide access to a variety of liquid markets for selling gas to improve its access to natural gas end-customers.

Major Competitors

Within Northeast Pennsylvania, there are several competitors, who are both public and private companies, seeking to develop and produce natural gas to similar end markets. These competitors vary in their economic profiles and acreage positions. Examples of some of these potential competitors include Cabot Oil and Gas Corp., Chesapeake Energy Corporation, Chief Oil and Gas, Southwestern Energy Company, Seneca Resources Company, Repsol, etc.

In the Barnett, there are several both public and private producers that will compete with our business. Examples of these potential competitors included Total S.A., XTO Energy Inc. (ExxonMobil), Fleur de Lis, EOG, Lime Rock etc.

3. Competitive Strategies

3.1 Competitive Strategies in Thailand

Competitive Strategies in Thailand is conducted through Banpu Power, whereas Banpu Power holds a 50% stake in BLCP power plant with a 1,434 MW total capacity and a 717 MW equity capacity. BLCP, which is located in Map Ta Phut Industrial Estate, is a major power producer who sells electricity directly to the Electricity Generating Authority of Thailand (EGAT). BLCP's dispatch rate in 2020 was at 99.1%, reflecting the power plant's capability to manage operational efficiency. BLCP's production output accounts for 5.2% of total EGAT installed and purchased power capacity.

Competitive Strategies

1) Maintaining Operational Efficiency and Readiness of Power Plants

Banpu Power consistently conducts the efficiency improvement and equipment maintenance of power plants according to the maintenance schedule to secure the Availability Factor (AF) and Contracted Available Hours (CAH) in accordance with the power purchase agreement (PPA). In 2020, BLCP reported the Equivalent Availability Factor (EAF) of 89.9%

2) Seeking Opportunities for Business Expansion

Banpu Power has always been seeking growth opportunities by aligning the plan to expand the domestic power business with the national Power Development Plan for 2018-2037 (PDP 2018), approved by the National Energy Policy Council (NEPC) on 24 January 2019. The plan proposes to increase capacity from the Isolated Power Supply (IPS) groups and efficient energy-saving policies. The PDP proposal will result in lower-than-expected power demand, while the new policy promotes renewable power generation, which tends to increase. Banpu projected that the development of new thermal and renewable power plants would face higher competition in project bidding and in applying for electricity retail supply licenses. Hence, the Company has prepared competent and experienced employees from the Business and Project Development Department to monitor the policies of the government and related government agencies and evaluate the Company's competitiveness. This business development team also prepares for the Company's participation in the government's project, which allows private investment such as the Eastern Economic Corridor (EEC) and responds to the government's promotion of the business sector's role in the Isolated Power Supply (IPS) projects that use renewable energy sources.

3) Stakeholder Relations Management

The Company has supported activities and enhances understanding in the communities in all locations where the Company operates, resulting in healthy community relations.

Major Competitors

- Banpu Power's thermal power plants that are commercially operational have no direct competition from other power producers because the company entered into a long-term power purchase agreement with the Electricity Generating Authority of Thailand.
- Major domestic power producers such as Electricity Generating Plc., Ratchaburi Electricity Generating Holding Plc., Global Power Synergy Plc., Gulf Energy Development Plc., and international investors.

3.2 Competitive Strategies in Lao PDR

Competitive Strategies in Lao PDR is conducted through Banpu Power, whereas Banpu Power holds a 40% stake in Hongsa Power Company Limited, which operates HPC power plant, the only mine-mouth power plant in Lao PDR. HPC power plant has a total capacity of 1,878 MW and an equity capacity of 751 MW. The power plant sells the majority of electricity solely to the Electricity Generating Authority of Thailand under the Independent Power Producer (IPP) scheme and some of its output to Lao PDR. The HPC power plant's production output constitutes 29% of the total electricity that Lao PDR supplies to Thailand.

Competitive Strategies

1) Maintaining Operational Efficiency and Readiness of Power Plants

The HPC power plant's all three production units have been fully operational since 2016, with 82% Equivalent Available Factor (EAF) and with 100% dispatch in 2020. This demonstrates the operational stability and low operating costs, which are crucial for both countries' electricity systems.

2) Managing Relationship with Local Government Agencies and Communities

Banpu Power places importance on community development by promoting community engagement while improving the quality of life of people in the communities. Such development approach materializes into community development initiatives, for example, infrastructure development (water supply, electricity, and roads), prompt construction of houses for relocated people in appropriate areas, vocational training and promotion of local employment, contract for project design and equipment procurement.

3) Cost Management and Efficiency

In 2020, the HPC power plant to improve its efficiency and capacity readiness in power generation and distribution. The improvements covered equipment refurbishment and coal transportation to the power plant, which helped maintain the Equivalent Availability Factor (EAF) at 85.6%. Moreover, the power plant increased readiness by stocking equipment parts and improving the speed and efficiency of maintenance, contributing to smooth power generation.

Major Competitors

Banpu's thermal power plant that is commercially operational has no direct competitors because the Company has a long-term power purchase agreement with the Electricity Generation Authority of Thailand and Électricité du Laos (EDL)

3.3 Competitive Strategies in China

Competitive Strategies in China is conducted through Banpu Power, whereas its combined heat and power (CHP) plants and solar power plants in China are more highly efficient than average power plants and meet environmental control standards. Hence, they enjoy various supports from the Chinese government, such as guaranteed electricity sales to local electricity

authorities, exclusive rights to sell steam and heat in permitted zones, and local government subsidies.

Competitive Strategies

1) Cost and Efficiency Management

The Chinese government continued the policy to reduce electricity and steam prices in all provinces as well as other relevant policies. Banpu Power has assessed the impact on the pricing in power purchase agreements and adjusted the prices accordingly. For instance, Zouping CHP plant had agreed to sell steam to customers at a reference price of CNY 125 per tonne, and when there is any change in the coal cost, plus or minus, for every CNY 0.01 per kilocalorie (tax and transportation cost inclusive), the price of steam can be raised or lowered for CNY 5 per tonne. This risk management on the price fluctuation enabled Banpu to lessen the impact of higher fuel costs.

Banpu Power still maintains its profitability by improving production efficiency and strictly controlling the costs using the inventory management strategy buying and stocking up coal when coal prices decline and utilizing it during the time coal prices increase. Banpu Power also follows its plan to expand capacity to neighboring areas to respond to an increase in steam and electricity demand driven by local economic growth.

2) Environmental Management

The Chinese government has a stringent policy on environment and pollution control, which restricts the use of coal as a major fuel source in factories. Banpu Power uses highly efficient generation processes that comply with current environmental standards with regular maintenance of all equipment and machinery. It also has a plan to upgrade environmental control equipment to be able to meet future standards. Apart from that, Banpu monitors and assesses environmental impacts to ensure that its business operations are in full compliance with environmental laws, rules, and regulations.

Banpu Power has considered deployment of the state-of-the-art technology called Ultra-Supercritical (USC), which is High Efficiency, Low Emissions (HELE) technology, in such a new project as Shanxi Lu Guang power plant to minimize environmental impacts in accordance with international standards. Such technology can trap sulfur dioxide, nitrogen oxide, carbon monoxide, and other pollutants before being emitted to the environment.

3) High Adaptability

Banpu Power has a specific team to closely monitor changing market conditions and align business operations to the market conditions or situations in order to embrace business opportunities and mitigate negative impacts. Banpu Power is prepared to adjust the distribution of power, steam, hot and chilled water in response to the factors affecting the demand. For instance, Zhengding CHP plant would produce electricity, steam, and hot water for sale during winter. In summer, when customer demand shifted, it would swap to produce chilled water for sale, which helped generate more income and reduce the impacts of the seasonal decrease in electricity and steam sales.

4) Service Quality and Stakeholder Relations Management

Banpu Power prioritizes the quality of products and services and strives to assure readiness and security in the generation and distribution of electricity and steam to respond to customer's needs at all times, especially the distribution of steam and hot water in wintertime. Banpu Power always maintains a good relationship with customers based on mutual trust and benefits, which has earned trust and confidence from customers.

Relationship management with local government agencies and communities is on the basis of mutual benefits by providing basic utility services (electricity and steam) to local

communities, building trust and equity as well as lending continued support to the community. This has brought acceptance from local government agencies and communities as an exemplary local enterprise. Despite a setback from external factors, the Company still enjoys full support from local governments, for instance, financial subsidies or approval to raise steam prices when coal prices increased.

5) Seeking Opportunities for Business Expansion and Added Value Creation

Banpu Power puts greater emphasis on investment in renewable energy to align with the government's policy to promote renewable energy. It also focuses on creating added value by expanding investment into related businesses while considering the costs of different fuel sources and appropriate technology. For example, the location of the Luannan CHP plant is in the urban-industrial area, which gives it a strategic advantage to become the sole distributor of steam. Banpu Power is also considering expanding its customer base to new industrial areas to offer service of the rooftop solar power generation system. Moreover, it is conducting a feasibility study for the development of the Company's existing land to develop biomass power plant project together with the combined heat and power plant.

Major Competitors

- Domestic and international power producers and investors

3.4 Competitive Strategies in Japan

Banpu's competitive strategies is through Banpu Power whereas its investment in solar power plant projects in Japan has a total capacity of 88 MW from fully operational plants and a 132-MW capacity from under-development power projects. Banpu Power's business expansion to Japan started from investment in solar power generation together with feasibility study and preparation for assessment of investment and project development opportunities. The Company focuses on teamwork and human resource management as well as establishing trust with business partners to seek significant opportunities for real growth in Japan's renewable energy business. The government's support and investment incentives from financial institutions are still vital factors accelerating Banpu Power's business expansion into Japan.

Competitive Strategies

1. Capability in Investment Management

Banpu Power has a strategy to collaborate with partners in seeking new investment opportunities as well as managing financial costs by utilizing from several sources, especially from domestic financial institutions, to achieve long-term investment goals.

2. Project Development

Banpu Power closely monitors policy and regulatory changes of the Japanese government related to energy industry, with a specific team to follow up and study the changes in detail as well as impacts on under-development projects to ensure that all projects achieve commercial operation date as planned.

3. Seeking Opportunities for Business Expansion and Added Value Creation

Since Japan's energy management is governed by a clear energy policy, Banpu Power faces low investment risk and can keep the risk to a manageable level although the Japanese government reduced the Feed-In Tariff (FIT) for solar power and turned to the auction scheme. To achieve target return on investment, Banpu Power has adapted by focusing on cautious cost management, procuring important equipment to improve efficiency, and seeking appropriate funding sources. For the new investment, Banpu will

prioritize projects under the Feed-in Tariff scheme (FIT) or acquire projects that already achieved commercial operation.

Banpu Power also constantly seeks investment opportunities in related businesses by building upon the existing power generation business to create added value, such as energy trading and retail electricity by expanding business opportunities with retail customers as well as a solar rooftop to fulfill demands of business and industrial sectors and renewable energy consumers.

Major Competitors

- Domestic and international power producers and investors

3.5 Competitive Strategies in Vietnam

Banpu, via Banpu Power has expanded investment in power business into Vietnam since 2016 under an MOU signed with Soc Trang Provincial People's Committee to carry out a feasibility study of investment in a renewable power project. In 2018, Banpu was awarded an Investment Registration Certificate (IRC) and set up a subsidiary company in Soc Trang Province. The company has prepared an experienced team with a good understanding of Vietnam's business environment to develop the project toward achieving a planned commercial operation date. Currently, Vinh Chau wind power plant project Phase 1 is under construction, and a feasibility study is being conducted to further expand generation capacity.

It is also expanding investment through the acquisition of the 37.6-MW El Wind Mui Dinh wind farm in Ninh Thuan Province. The operational wind farm is under a Feed-in-Tariff (FiT) scheme of US cent 8.5 per kWh for a period of 20 years. The investment is under the approval process by the relevant government agencies, which is expected to be completed during the first quarter of 2021 and will realize revenue immediately. Located in the South Central Coast of Vietnam, Ninh Thuan Province has the highest potential and investment opportunities in renewable energy due to government support.

Competitive Strategies

1. **Managing Relationship with Local Government Agencies and Communities**

   Banpu Power builds a relationship with local government agencies on the basis of understanding of social and cultural differences. The Company focuses on becoming a mutually responsible partner with government agencies to sustainably engage in local community development by providing continuous support for community activities.

2. **Project Development and Management**

   Banpu Power is fully aware of significant factors contributing to a wise investment decision. Thus, the Company always conducts a preliminary analysis and a feasibility study of every project. The Company also seeks advice from experts in many fields, such as engineering consultants, environmental consultants, legal consultants, financial consultants, and accounting and taxation consultants, in order to conduct feasibility options in a correct manner before investing and to ensure compliance with regulations and investment conditions in Vietnam. In addition, the feasibility study helps monitor the progress of project development and execution of each construction phase against the plan.

3. **Seeking Opportunities for Business Expansion and Added Value Creation**

   Vietnam has enjoyed a continuous growth rate in recent years and is expected to achieve a 6-7% gross domestic product (GDP) growth for the next ten years. Such a high growth rate implies an increase in power demand. The Vietnamese government also has a clear energy management plan to increase thermal power generation as well as renewable

power generation. Seeing the investment potential, Banpu has leveraged its strengths and expertise in thermal and renewable power generation as well as sourcing fuel supply to expand investment opportunities.

Major Competitors

- Domestic and international power producers and investors

4. Competition in Energy Technology

Solar Power and All in one smart city solution

Competition Strategy

The increasing needs of rooftop solar power in the market and the support from public sector increases the number of players in the industry. The Company's competitive strategy is to be different in integrated energy services using appropriate and up to date technology, to move Thailand towards sustainable use of clean energy and towards smart city in the future. Key strategy of the Company, through Banpu NEXT are as follows;

- ***Customer-focused***

  In developing service and solution, Banpu NEXT solves the customer pain points in use of energy and customer's needs. The Company visited local areas and discussed with customers with a team of experts, using modern technologies and innovations to collect data, analyses and evaluate, to offer efficient and effective energy solution, thus meeting the needs of the customers.

- ***All in one energy service provider for smart city***

  Banpu NEXT does not only offers solar power installation system but also other energy solution to promote uses of technology and clean energy for the development of smart city in Thailand, including Micro Grid system, Energy Management System, Energy Storage System to be used in manufacturing, transmission and storage for an efficient use of energy. Banpu NEXT also offers Electric Vehicle and other accessories that comes with the smart platform in energy management, such as smart pole, solar kiosk and off-grid system, which can be used with household and solar powered electricity and 100% solar-powered furniture. This cater to diverse customer's needs in different location.

- ***Product quality***

  Banpu NEXT uses tools which are well known brands and are considered a tier-1 as well as receiving guaranteed industrial standard. Banpu NEXT has a team of engineer with expertise in designing system appropriate with each project, in international standards installation and in development of quality control and using modern technology such as using thermal scan to ensure safe, cost-effective and efficient clean energy.

- ***Service quality***

  Banpu NEXT focus on customer service by developing various systems to support customer service such as (i) creating real time monitoring system via a control room, enabling the team of engineer and customer relations to monitor and solve issues immediately, (ii) developing Banpu Application to be used on smartphone where customer can monitor the operation of power generating system, amount generated and energy saving results both in real-time and records, including being notified of any system errors. In addition, Banpu NEXT have a customer service team which is available to give information, receives report of issues, and responses to queries via various channel. Customer may report problems to customer service 24 hours a day every day, allowing issues to be solved quickly.

- ***Branding***

Banpu NEXT operate business under our 'Greener & Smarter' strategy and focuses on working with partner in energy technology, clean energy and other business to improve business potential and strengthen energy technology and business ecosystem. It is also open to receiving technology and ideas from start-ups that will fulfil the all in one clean energy service as well as funding and joint uses of innovation to create new business and boost business growth.

- ***Communication and brand building strategy***

In 2020, Banpu NEXT focuses on brand recognition with the Banpu group's 'Greener & Smarter' strategy, spreading knowledge on international approved standard of energy technology and platform integrated with Internet of Things to use in the management of the system, increasing efficiency in services and promote sustainable living and better quality of life. Services offered are more efficient and promote sustainable living and provide various solutions to accommodate customers' needs and corresponding to future use of energy, assuring the company's status as a leading clean energy solution provider in Asia Pacific with objective of developing system and solution for sustainability and moving Thailand towards smart city.

Banpu NEXT communicates to all target groups and stakeholders through various activities, including news and public relations media, marketing promotion activities, participation in national seminars and organising seminars to educate entrepreneurs about energy technology trends , energy management for cost-effectiveness and sustainability as follows;

- advertising projects and services of the Company to emphasis the company's status as a leading clean energy solution provider such as the joint Banpu Next EV Car Sharing for Caring project with HAUPCAR, that offered FOMM electric vehicles to medical personnel caring for COVID-19 patients free of charge for 3 months, allowing safe and convenient transportation. Medical personnel includes King Chulalongkorn Memorial Hospital, the Thai Red Cross Society, Navamin 9 Hospital, Ladkrabang Hospital, Phyathai-Paolo Hospital Group and Piyavate Hospital

- Banpu NEXT build on the success of Banpu NEXT EV Car Sharing for Caring and introduced '**Banpu NEXT EV Car Sharing'**, FOMM EV renting service via HAUP application, assuring the strength of Banpu NEXT's electric vehicle business and helps drive the progress of smart mobility, implements personal mobility with greater convenience. It corresponds to city people preferring to use clean-energy EV. The first EV car sharing station has been established at Samyan Mitrtown with a plan to set up more service stations in more locations across Bangkok metropolitan well as in provincial cities

- launch of the Thailand's First Marine Marine Tour e-Ferry, starting its first route with Phuket – Phang-nga tour. Tourists are welcomed to embark on a clean energy ferry to take pleasure in a new experience of green tourism. Banpu NEXT e-Ferry will enrich tourism with sustainability and give a stronger momentum to quality tourism that takes account of long-term impacts on communities and the environment.

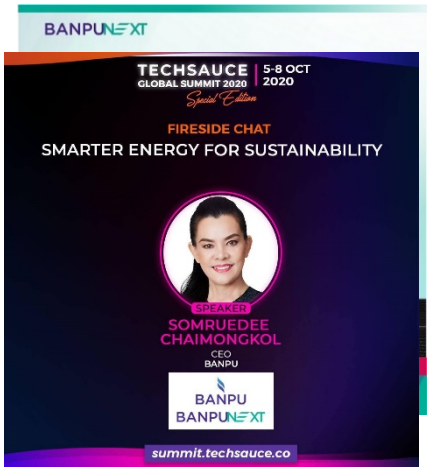
- Banpu NEXT signed a memorandum of understanding (MoU) for Khon Kaen Smart City Development with Khon Kaen City Development Network. Under this MoU, Banpu NEXT will join a feasibility study on Khon Kaen's adoption of clean energy technology to boost clean energy usage in response to Energy 4.0 policy and Khon Kaen Smart City 2029 master plan. This new move will contribute to better energy efficiency and sustainability, positively create long-term impacts on the environment, and pave way for a better quality of life of Khon Kaen residents.

- Banpu NEXT signed an agreement with Tribeca Enterprise, the developer of LK Rubber Industrial City Hub (LK-RICH) in Rayong, in a pivotal partnership to set up a solar floating that will be the largest privately-owned development of its kind in Thailand with total capacity of 16 megawatts. The solar capacity will equip LK-RICH with greater energy efficiency in support of its endeavour to be an eco-industrial town.

- Introduced Banpu NEXT e-PromptMove, first all-in one mobile solution for clean electricity, a prototype off-grid solar power generation and storage system which is mobile, ready to reach out to any place any time, even in disaster areas. Multidisciplinary team of researchers, engineers and specialists jointly conceptualized the solution and sourced the right technologies to put together in a well-thought design, aiming at a solution with complete features and safety in a compact form factor. Moreover, this trailer meets the standards set by the Department of Land Transport, and the system have undergone verification and test runs to ensure that it is ready to be used with full functionality and performance.

- Banpu NEXT" Showcases 2020 Business Achievements in Customer Base Expansion for Solar-Rooftop and Floating Solar Both in Thailand and Asia-Pacific including Tribeca Enterprise, Betagen, UOB Thailand (Chiang Mai–Highway Branch), Toyota (Sukhothai Showroom), and many more. It aimed to upgrade the after-sales service and mobile application with the use of IoT technology to increase efficiency and develop new feature. Customers can now monitor the electricity consumption of solar-grid power, national power grid and battery systems in a real-time manner. In line with the growing tendency of solar projects, Banpu NEXT aims to continue winning new customers for 2021, as well as driving additional projects among the company's existing customers.

- A Promotion campaign “Share Friends, Go Solar”, promotion campaign that rewards referrers of Banpu NEXT’s solar rooftop solutions in cash starting from 100,000 baht per project. The larger project is, the higher referral reward will get to offer alternative solutions for enterprises to save their electricity and other operating costs while promoting the use of clean energy and thus increasing customer base of Banpu NEXT.



- Attended Techsauce Global Summit 2020, showcasing leading technology of Southeast Asia, introducing new contents, trends, use of innovations and technology on the current COVID-19 situation and digital disruption by experts of different areas. Mrs. Somruedee Chaimongkol had a chance to be one of the speaker for talks regarding trend of energy and development of smart city as well as sharing of experience in energy management, digital integration towards Smart Energy as smart city solutions and sustainable living.

- Arranging a seminar for sustainable savings of energy for food and packaging business operators in Nakorn Pathom and nearby provinces at Mida Grande Hotel Dhavaravat Nakorn Pathom. In the seminar, advisor for energy technology development, National Science and Technology Development Agency and Banpu NEXT’s customer representative shares and suggests useful information for the development of production process and ideas on cost saving using clean energy technology solution. Vice president of Nakon Pathom Chamber of Commerce and many food and packaging business operators in Nakorn Pathom and nearby provinces participated in the seminars.

Major Competitors

There is no major competitors offering the same type of service as Banpu NEXT, with all in one service for smart city. Competitors in the market focuses on offering installation of rooftop solar power business. There are three types of competitors in the market; (i) retail operator offering installation service, (ii) large operator offering installation service as well as investment package and (iii) foreign investors. More than 50 percent of competitors are retail operator.

Competitor of Banpu NEXT offering rooftop solar power installation services is large operator providing installation and investment for such installation as they are financially stable and offers various services. In addition, retail operator receiving funds from foreign investors may offer the same type of services as large operator, including competition in residential market where many company are pursuing with an objective to obtain large portion of customer base.

Pricing policy

Banpu NEXT offers many packages appropriate to the needs of customers. There are two type of services offered to customers for rooftop solar power, installation invested by Banpu NEXT and installation where customers invest in the cost of installation, the cost of which depends on the tools, size and type of installation chosen by the customer. Banpu NEXT regularly survey market prices and cost of installation. In 2018-2020, there is a continuous reduction of cost of installation as well as rapid development of PV Panel for higher generation per panel, Banpu NEXT therefore, reduce the price accordingly and thus able to offer more choices to customers and using PV Panel in smaller projects for most efficient solar power solution.

Customer Profiles

Banpu NEXT customers includes businesses requiring alternative energy management or medium and large sized business operator requiring electricity during daytime such as industrial factories and commercial buildings. In 2020, 70% of customers signing solar power installation contract with Banpu NEXT choses a service where Banpu NEXT invested and customers may benefit from energy savings without making any investment, 30% of customers chose to invest in the installation cost and enjoy the free use of solar energy generated from their rooftops. There are variety of demands from customers, whether reduction of installation price, short term of contract as well as other service needs, Banpu NEXT therefore adapt their proposal in accordance with such demand and needs.

Distribution and Distribution Channel

Banpu NEXT will introduce its rooftop solar power solutions via bidding channels announce by customers, direct negotiation and proposal submitted to official or organization relevant to alternative energy. Banpu NEXT shall attended meeting with potential customer to introduce the company and gain knowledge on the customers' needs, a team of engineer enters the area to design the system and solutions, whether EV, energy storage or management, as appropriate with the customers and prepared project proposal. In this connection, sales channel is expanded to events and happy customer referrals.

2.4 Product sourcing

I) Product sourcing

1. Location of Coal mine, natural gas and power plant

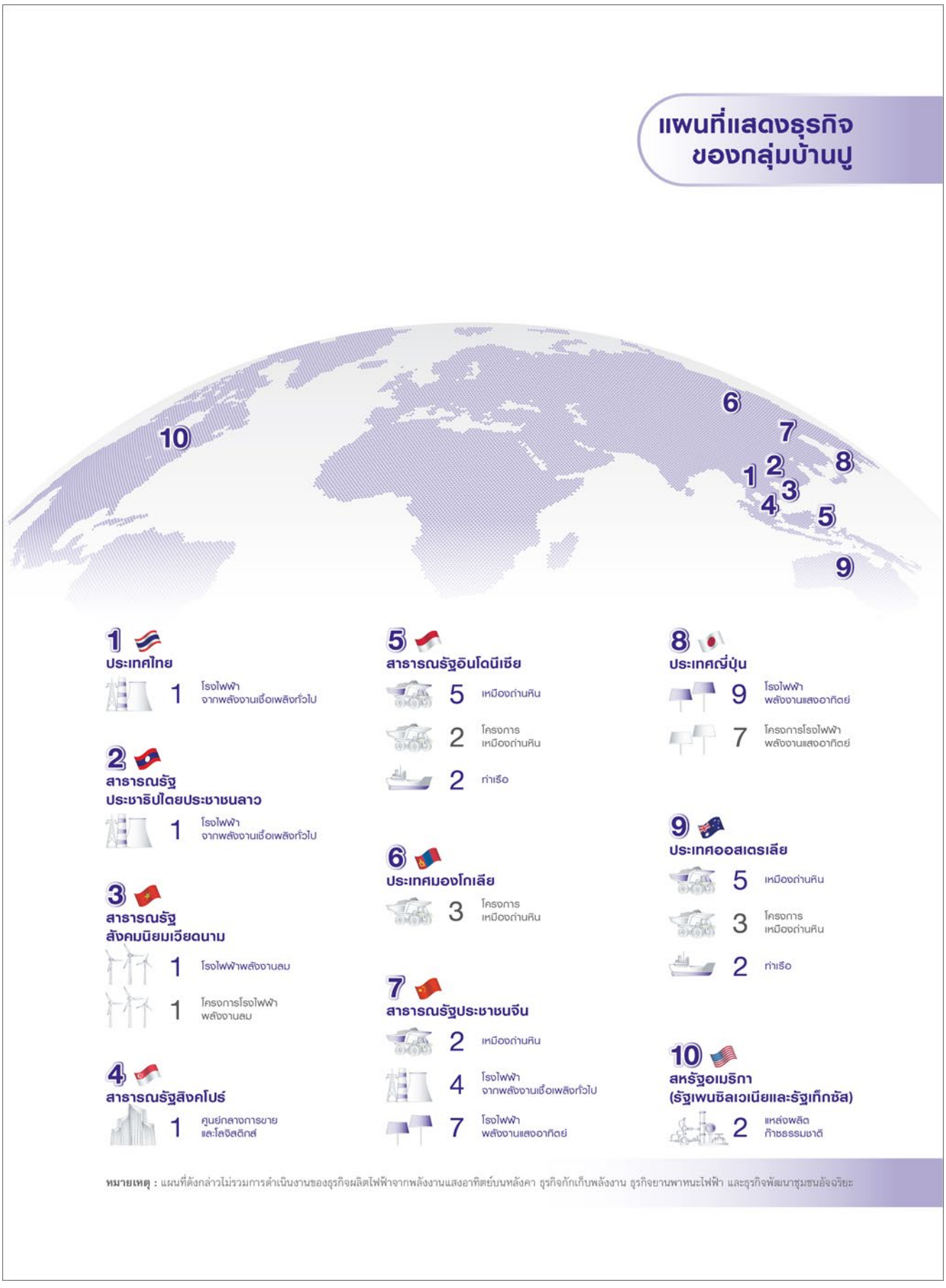
Coal mine	
Indonesia	1. Jorong mine, South Kalimantan Province 2. Indominco mine, East Kalimantan Province 3. Trubaindo mine, East Kalimantan Province 4. Kitadin mine, East Kalimantan Province 5. Bharinto mine, East Kalimantan Province 6. TIS **collier**, East Kalimantan Province 7. NPR **collier**, Central Kalimantan Province
Australia	1. Airly mine, New South Wales 2. Angus Place mine, New South Wales 3. Clarence mine, New South Wales 4. Ivanhoe North mine, New South Wales 5. Mandalong mine, New South Wales 6. Myuna mine, New South Wales 7. Newstan mine, New South Wales 8. Springvale mine , New South Wales
People's Republic of China	1. Hebi mine, Henan Province 2. aohe mine, Shanxi Province
Mongolia	1. Unst Khudag collier 2. Tsant Uul collier I 3. Altai Nuurs collier

Natural Gas Source	
Pennsylvania, United States of America **Texas**	1. Chaffee Corners JEA, Marcellus 2. NEPA Corners-1 JEA, Marcellus 3. NEPA Corners-2 JEA, Marcellus 4. NEPA Corners-3 JEA, Marcellus 5. NEPA Corners-4 JEA, Marcellus 6. NEPA Corners-5 JEA, Marcellus 7. Barnett, Texas

Power Plant	
Conventional Power Plant	
Thailand	1. BLCP Map Ta Phut Industrial Estate, Rayong Province
Lao PDR	1. Hongsa power plant Hongsa District, Xayabouly Province
People's Republic of China	1. Luannan power plant, Hebei Province 2. Zhengding power plant, Hebei Province 3. Zouping power plant, Shandong Province 4. Shanxi Lu Guang power project, shanxi Province
Renewable Based Power Plant	
People's Republic of China	1. Jinshan solar power plant, Weifang City, Shandong Province 2. Huineng solar power plant, Weifang City, Shandong Province 3. Haoyuan solar power plant, Taian City, Shandong Province 4. Hui'en solar power plant, Weifang City, Shandong Province 5. Deyuan solar power plant, Jiashan County, Zhejiang Province 6. Xingyu solar power plant, Taian City, Shandong Province 7. Jixin solar power plant, Jinhu City, Jiangsu Province
Japan	1. Olympia Project includes as follow: a. Hitachi Omiya power plant, Ibaraki Province b. Hitachi Omiya power plant 2, Ibaraki Province c. Oseno Sato Katashina power plant, Gunma Province d. Sakura power plant 1, Tochigi Province e. Sakura power plant 2, Tochigi Province 2. Hino solar power plant, Shiga Province 3. Awaji solar power plant, Hyogo Province 4. Mukawa solar power plant, Hokkaido Province 5. Nari Aizu solar power plant, Fukushima Province 6. Kurokawa solar power plant , Miyagi Province 7. Tenzan solar power plant, Saga Province 8. Muroran I solar power plant, Hokkaido Province 9. Muroran II solar power plant, Hokkaido Province 10. Takeo II solar power plant, Saga Province 11. Kawanishi Dahilia solar power plant (formerly Yamagata Project), Yamagata Province 12. Sawadee Yabuki Hatsudensho solar power plant (formerly Yabuki Project), Fukushima Province

Power Plant	
Renewable Based Power Plant	
Japan	13. Shirakawa Project, Fukushima Province 14. Kessennuma Project, Miyagi Province 15. Yamagata Aide Project, Yamagata Province
Vietnam	1. El Wind Mui Dinh wind power plant, Ninh Thuan Province 2. Soc Trang wind power plant Project, Soc Trang Province

Group's map of operations



2. Capacity and Productivity

The Company had coal production capacity and coal production in 2018-2020 below

Mine	Unit	1 Jan – 31 Dec 2020	1 Jan – 31 Dec 2019	1 Jan – 31 Dec 2018
Indominco Mine*				
Production Capacity	Thousand Tonnes	15,000	15,000	15,000
Actual Production	Thousand Tonnes	9,001	12,591	12,528
Capacity utilization	Percent	60.01	83.94	83.52
Change in actual production	Percent	-28.51	0.50	-3.73
Trubaindo Mine *				
Production Capacity	Thousand Tonnes	7,000	7,000	8,000
Actual Production	Thousand Tonnes	4,232	4,708	6,214
Capacity utilization	Percent	60.46	58.86	77.68
Change in actual production	Percent	-10.11	-24.23	28.02
***Bharinto Mine** *				
Production Capacity	Thousand Tonnes	3,000	3,000	3,000
Actual Production	Thousand Tonnes	2,736	2,858	3,003
Capacity utilization	Percent	91.20	95.27	100.10
Change in actual production	Percent	-4.27	-4.83	25.92
Jorong Mine *				
Production Capacity	Thousand Tonnes	2,000	2,000	2,000
Actual Production	Thousand Tonnes	1,213	1,554	1,459
Capacity utilization	Percent	60.65	77.72	72.95
Change in actual production	Percent	-21.94	6.54	63.00
Kitadin Embalut Mine *				
Production Capacity	Thousand Tonnes	1,000	1,000	2,000
Actual Production	Thousand Tonnes	1,197	1,386	1,122
Capacity utilization	Percent	119.70	69.28	56.10

Change in actual production	Percent	-13.64	23.48	19.74
Australia Mine				
Production Capacity	Thousand Tonnes	15,000	15,000	15,000
Actual Production	Thousand Tonnes	12,722	10,500	11,705
Capacity utilization	Percent	84.81	70.00	78.03
Change in actual production	Percent	21.16	-10.29	-4.98

Note:* 100% basis

** equity basis

The Company had Power capacity and electricity generation in 2018-2020 below

Power Plant	Unit	1 Jan – 31 Dec 2020	1 Jan – 31 Dec 2019	1 Jan – 31 Dec 2018
1.) Luannan Power Plant				
Installed Capacity	Mwh	227.00	175.00	123.00
Capacity utilization*	Percent	67.79	52.63	85.72
Net generation **	Mwh	708,750	691,529	609,103
Change in net generation	Percent	2.49	13.53	19.53
Streaming generation	Ton	2,220,254	1,722,095	1,431,905
Change in net streaming generation	Percent	28.93	20.27	16.65
2.) Zhengding Power Plant				
Installed Capacity	Mwh	139.00	139.00	139.00
Capacity utilization*	Percent	57.86	65.76	83.28
Net generation **	Mwh	414,850	420,492	416,111
Change in net generation	Percent	-1.34	1.05	-0.86
Streaming generation	Ton	1,675,076	1,668,899	1,641,644
Change in net streaming generation	Percent	0.37	1.66	16.84
3.) Zouping Power Plant				
Installed Capacity	Mwh	173.00	173.00	173.00
Capacity utilization*	Percent	38.55	35.04	77.68
Net generation **	Mwh	439,597	383,733	465,877
Change in net generation	Percent	14.56	-17.63	-17.83
Streaming generation	Ton	2,341,912	1,929,305	2,641,690
Change in net streaming generation	Percent	21.39	-26.97	-18.81
4.) BLCP Power Plant				
Installed Capacity	Mw	1,434.00	1,434.00	1,434.00
Utilization ***	Percent	89.88	91.99	88.70
Net generation **	Mwh	11,284,045	10,912,011	10,383,581
Change in net generation	Percent	3.41	10.14	2.89
5.) Hongsa Power Plant				
Installed Capacity	Mw	1,878.00	1,878.00	1,878.00
Utilization ***	Percent	81.71	80.83	86.52
Net generation **	Mwh	11,355,052	11,406,241	12,511,709
Change in net generation	Percent	-0.45	-8.84	9.84
6.) Jinshan Solar Power Plant				
Installed Capacity	Mw	28.95	28.95	28.95
Capacity utilization*	Percent	14.63	15.52	15.61
Net generation **	Mwh	37,201	39,432	39,594
Change in net generation	Percent	-5.66	-0.04	0.07
7.) Hui'en Solar Power Plant				

Power Plant	Unit	1 Jan – 31 Dec 2020	1 Jan – 31 Dec 2019	1 Jan – 31 Dec 2018
Installed Capacity	Mw	19.70	19.70	19.70
Capacity utilization*	Percent	15.05	16.13	16.01
Net generation **	Mwh	26,173	28,025	27,760
Change in net generation	Percent	-6.61	0.95	45.20
8.1) Huineng 1 Solar Power Plant				
Installed Capacity	Mw	10.43	10.43	10.43
Capacity utilization*	Percent	14.63	15.55	15.62
Net generation **	Mwh	13,402	14,206	14,267
Change in net generation	Percent	-5.66	-0.43	8.07
8.2) Huineng 2 Solar Power Plant				
Installed Capacity	Mw	11.08	11.08	11.08
Capacity utilization*	Percent	14.78	15.84	16.13
Net generation**	Mwh	14,392	15,374	15,662
Change in net generation	Percent	-6.39	-1.84	11.75
9.) Haoyuan Solar Power Plant				
Installed Capacity	Mw	20.00	20.00	20.00
Capacity utilization*	Percent	15.54	15.44	15.35
Net generation **	Mwh	25,485	27,103	25,595
Change in net generation	Percent	-5.97	5.89	-4.84
10.) Deyuan Solar Power Plant				
Installed Capacity	Mw	51.64	51.64	51.64
Capacity utilization*	Percent	13.06	13.22	13.73
Net generation **	Mwh	59,229	59,999	62,095
Change in net generation	Percent	-1.28	-3.38	9.04
11.) Xingyu Solar Power Plant				
Installed Capacity	Mw	10.30	10.30	10.30
Capacity utilization*	Percent	14.07	15.19	15.14
Net generation **	Mwh	12,718	13,727	13,658
Change in net generation	Percent	-7.35	0.51	126.84
12.) Jixin Solar Power Plant				
Installed Capacity	Mw	25.2	25.2	-
Capacity utilization*	Percent	13.96	14.4	-
Net generation **	Mwh	30,937	16,042	-
Change in net generation	Percent	92.85	-	-
13.1) Olympia (Hitachi 1) Solar Power Plant				
Installed Capacity *(DC)*	Mw	2.12	2.12	2.12
Installed Capacity *(AC)*	Mw	2.00	2.00	2.00
Capacity utilization*	Percent	13.88	14.08	13.75
Net Generation**	Mwh	2,590	2,619	2,558
Change in net generation	Percent	-1.11	2.38	-4.34

Power Plant	Unit	1 Jan – 31 Dec 2020	1 Jan – 31 Dec 2019	1 Jan – 31 Dec 2018
13.2) Olympia (Hitachi 2) Solar Power Plant				
Installed Capacity *(DC)*	Mw	3.00	3.00	3.00
Installed Capacity *(AC)*	Mw	2.00	2.00	2.00
Capacity utilization*	Percent	13.17	13.31	13.74
Mwh	Mwh	3,471	3,498	3,610
Change in net generation	Percent	-0.78	-3.10	1.35
13.3 Olympia (Sakura 1) Solar Power Plant				
Installed Capacity *(DC)*	Mw	2.39	2.39	2.39
Installed Capacity *(AC)*	Mw	2.00	2.00	2.00
Capacity utilization*	Percent	13.85	13.80	14.16
Net generation **	Mwh	2,909	2,892	2,968
Change in net generation	Percent	0.60	-2.56	-0.57
13.4) Olympia (Sakura 2) Solar Power Plant				
Installed Capacity *(DC)*	Mw	2.67	2.67	2.67
Installed Capacity *(AC)*	Mw	2.00	2.00	2.00
Capacity utilization*	Percent	13.77	13.95	14.10
Net generation **	Mwh	3,227	3,259	3,296
Change in net generation	Percent	-0.99	-1.12	-0.03
13.5) Olympia (Katashina) Solar Power Plant				
Installed Capacity *(DC)*	Mw	2.31	2.31	2.31
Installed Capacity *(AC)*	เมกะวัตต์	2.00	2.00	2.00
Capacity utilization*	Percent	14.63	14.63	14.66
Net generation**	Mwh	2,964	2,956	2,963
Change in net generation	Percent	0.28	-2.36	3.75
14.) Hino Solar Power Plant				
Installed Capacity *(DC)*	Mw	4.59	4.59	4.59
Installed Capacity *(AC)*	Mw	3.50	3.50	3.50
Capacity utilization*	Percent	12.52	12.53	13.23
Net generation **	Mwh	5,052	5,037	5,322
Change in net generation	Percent	0.29	-5.35	7.21
15.) Awaji Solar Power Plant				
Installed Capacity *(DC)*	Mw	9.87	9.87	9.87
Installed Capacity *(AC)*	Mw	7.92	7.92	7.92
Capacity utilization*	Percent	14.64	14.72	14.99
Net Generation**	Mwh	12,694	12,723	12,962
Change in net generation	Percent	-0.23	-1.84	48.34
16.) Mukawa Solar Power Plant				
Installed Capacity *(DC)*	Mw	22.00	22.00	22.00

Power Plant	Unit	1 Jan – 31 Dec 2020	1 Jan – 31 Dec 2019	1 Jan – 31 Dec 2018
Installed Capacity *(AC)*	Mw	17.00	17.00	17.00
Capacity utilization*	Percent	13.11	12.64	9.50
Net generation **	Mwh	25,330	24,361	7,672
Change in net generation	Percent	3.98	217.53	-
17.) Nari Aizu Solar Power Plant				
Installed Capacity *(DC)*	Mw	26.20	26.20	26.20
Installed Capacity *(AC)*	Mw	20.46	20.46	20.46
Capacity utilization*	Percent	12.58	13.40	4.81
Net generation **	Mwh	28,957	30,745	938
Change in net generation	Percent	-5.82	3,177.71	-
18.) Kurokawa Solar Power Plant				
Installed Capacity *(DC)*	Mw	28.81	28.81	-
Installed Capacity *(AC)*	Mw	18.90	18.90	-
Capacity utilization*	Percent	12.19	6.21	-
Net generation **	Mwh	30,842	1,332	-
Change in net generation	Percent	2,215	-	-
19.) Tenzan Solar Power Plant				
Installed Capacity *(DC)*	Mw	2.74	-	-
Installed Capacity *(AC)*	Mw	1.96	-	-
Capacity utilization*	Percent	11.93	-	-
Net generation **	Mwh	2,872	-	-
Change in net generation	Percent	2.74	-	-
20.) Muroran 1 Solar Power Plant				
Installed Capacity *(DC)*	Mw	2.25	-	-
Installed Capacity *(AC)*	Mw	1.73	-	-
Capacity utilization*	Percent	13.01	-	-
Net generation **	Mwh	2,565	-	-
Change in net generation	Percent	n.a.	-	-
21.) Muroran 2 Solar Power Plant				
Installed Capacity *(DC)*	Mw	1.93	-	-
Installed Capacity *(AC)*	Mw	1.63	-	-
Capacity utilization*	Percent	13.01	-	-
Net Generation**	Mwh	2,200	-	-
Change in net generation	Percent	n.a.	-	-
22.) Takeo II Solar Power Plant				
Installed Capacity *(DC)*	Mw	1.40	-	-
Installed Capacity *(AC)*	Mw	1.00	-	-
Capacity utilization*	Percent	13.71	-	-
Net generation **	Mwh	1,728	-	-
Change in net generation	Percent	n.a	-	-

Note:

- Power plant in China (Luannan, Zhengding, Zouping, Jinshan, Hui'en Huineng1, Huineng2, Haoyuan, Deyuan, Xingyu and Jixin Power Plant), in Thailand (BLCP Power Plant), in Laos (Hongsa Power Plant) and in Japan (the 5 Olympia Power Plants, Hino Power Plant and Awaji Power Plant, Mukawa Power Plant, Nari Aizu Power Plant, Kurokawa Power Plant, Tenzan Power Plant, Muroran 1 Power Plant, Muroran 2 Power Plant, Takeo II Power Plant).

  *The percentage ratio of the actual amount of energy produced in a year compared to the product of the installed capacity and the total number of hours in a year.

  **The amount of production at the power plant that generates electricity and distributes electricity to the system including the amount of electricity supplied directly to nearby industries (if any).

  ***Availability rate is an index that shows the efficiency, maintenance of power generation capability and maintaining the availability of power plants. The power plant must be able to produce electricity at full capacity. and maintain readiness to produce electricity to enter the electricity system according to the specified production plan.

3. Material procurement method

   - The Company process on coal production from all five company's mines in Indonesia that are Indominco, Trubaindo, Jorong, Kitadin, and Bharinto. There are six mines in Australia such as Airly mine, Angus Place mine, Charbon mine, Clarence mine, and Mandalong mine, and two coal production mines in People's Republic of China such as Hebi mine, and Gaohe mine.

   - In finding more coal sources, company give an important development of coal mine possessed by the Company and there is exploration on good quality of coal mines in other countries in order to match with customers need.

   - The Company set up a purchasing sector to buy coal from other companies to sell, this will increase company's capability in responding to customers need and also the way to rise stability in product's delivery of the Company at the sea port before deliveries to the customers.

4. Controlling of company raw materials and products that are produced

   the Company makes an agreement on coal quality with their customers. The information of coal quality such as heat value, sulfur value, humidity value and etc. will be transported to mining sector to set the production plan both in quantity and quality in accordance with the requirement. They will randomly check the quality of coals in each steps starting from the mine to warehouse of the port that will deliver to customers to make sure that coal that will deliver to customer meet the requirements. In each delivery time, there will be the outside professional who comes to check products quality. Therefore, the Company has been certificated by a number of institutions both from domestic and international.

II Environmental impact from production process

The production process of Banpu group can be divided into two processes which is Open pit mine and underground production process and electricity and steam generation. The production of electricity from both coal fuel and renewable energy. In addition, the Company has invested in the natural gas business, which is the production of natural gas from shale gas in the U.S. which such Company's production process may cause environmental impacts as follows:

- Emission of greenhouse gas from fuel, electricity, as well as Methane gas in coal seam
- Landscape change. forest ecosystem and biodiversity from the mining business and electricity business from using space to install solar panels
- Subsidence from underground mining. and leaching of the soil surface from the process of uncovering the soil to coal mining
- The use of water in the mining process, electricity and steam generation and natural gas production from shale
- Water quality such as pH and Total Suspended Solid (TSS) from leaching water in the mine. power plant coolant temperature and contamination of groundwater in natural gas production processes
- Air quality such as dust in the air. from uncovering the soil, collecting piles, and transporting coal, and emissions from the power generation process which consists of small dust sulfur dioxide and nitrogen oxides
- Waste generated from operations consists of general waste non-hazardous waste, hazardous waste and waste from the production process. It is the waste generated by the mining process such as soil from overburden, tailings, and waste from power generation processes such as bottom ash, fly ash, synthetic gypsum, and unusable solar panels.

The Company ensures that business operations correspond to enforcing environmental regulations and regulations on other standards related to business operation namely, water quality standard, air quality, and protection measure and reduction on environmental impact which are the conditions that specify on Environmental Impact Assessment (EIA). Moreover, the Company also set environmental management standard in many fields in order to apply with entire organization and also adjusted to suit with each production sectors including to environmental management system (ISO 14001) and Occupational Health and Safety Management Systems (OHSAS 18001) to apply in business units to achieve ongoing development in the areas they have high risk on environmental quality

The Company have set the standard to use only in specific areas by selecting modern technology with high efficiency and install all time quality surveillance system such as, real time treatment system and continuously monitor water quality in Australian and Indonesia and all time air surveillance quality in power plant in Thailand and People’s Republic of China, etc.

the Company operates on the reduction of greenhouse gas emission together with the production process improvement to reduce energy consumption, along with the improvement of production processes to reduce energy consumption. The goal is to reduce greenhouse gas emissions in coal business by 25% per unit of production and electricity business by 15% per unit of production by 2020 starting from the base year in 2012. Currently, one of the Company's greenhouse gas management measures is a study on the possibility of using methane from underground mining as a fuel for electricity generation for use inside the mine which is one way to reduce the purchase of electricity from the transmission line. The project is currently under construction and setting up various systems and is expected to be fully operational by 2021.

For performance in the past year, the Company has fully complied with the law. There were no significant environmental complaints from government agencies and communities in every countries where the Company operates.

In addition, the Company has prepared a mine rehabilitation plan and budget in each area in order to be able to restore the completed land after the completion of the mining. In 2017, the Company announced a biodiversity policy with the goal of creating a Net Positive Impact after the closure of the mines in all areas of the Company. The Company has considered a biodiversity value in high biodiversity areas for mines in Indonesia namely, the Bharinto and Indominco mines, and the underground mines in Australia include the Airlie Mines, Springvale Mines, Clarence Mine, Mandalong mine and the Myuna mine continuously every year with various measures to create positive impacts such as avoidance measures, rehabilitation and offset, Additionally, there are plans to closely monitor the operations and assess such impacts in order to achieve the goals that the Company has set.

2.5 Important assets of the Company and subsidiary

(1) Fixed assets

Lands, Buildings, and constructions on 31 December 2020

Lands, building, and equipment stated at cost less accumulated depreciation and allowance for asset impairment.

The depreciation is calculated by using straight-line method to reduce carrying amount of each asset type over the estimation of assets' useful life of as follows:

Lands improvement	10 year
Building, construction and building improvement	By mine ages or 5 to 30 years and the age of the power plant 30 years
Machine and factory equipment	5 to 40 year
Decorating Equipment	3 and 5 year
Office equipment and stationary Office	3 and 5 year
Car	4 and 5 year
Equipment under financial lease	5 to 15 year

-The details of company and subsidiary lands

Location	Possessor	Size (Rai)	Acquisition Type	Objective	Book Value (US Dollar)
1. Li district, Lamphun	Banpu	345-3-74	No obligation	Operate mine (BP-1)	642,753.97
2. Mae-Tha district, Lampang	Banpu	209-3-62	No obligation	Operate mine (LP-2)	74,036.13
3. Li district, Lamphun	BMC	412-3-62	No obligation	Operate mine	62,820.01
4. Tha Maka district, Kanchanaburi	Banpu	221-2-71	No obligation	Warehouse	2,028,022.32
Total					**2,807,632.43**

- The details of building and construction of the Company and subsidiaries

Lists	Company	Ownership Characteristic	Book value (US Dollar)	Obligation
1. Office building and residence at Li district, Lumphun	Banpu	Banpu company is the owner	9,172.14	None
2. Material storage office building and residence at Sopprab district, Mae Tha province, Lampang	Banpu	Banpu company is the owner	0.15	None
3. Office building and residence of Jorong Indonesia mine	Jorong	Jorong company is the owner	175,540.16	None
4. 4. Port of Jorong Indonesia mine	Jorong	Jorong company is the owner	905,659.62	None
5. Machinery and equipment of Jorong Indonesia	Jorong	Jorong company is the owner	1,135,745.25	None
6. Office building and residence of Indomico Indonesia mine	Indominco	Indomico company is the owner	2,760,897.59	None
7. Port of Indomico Indonesia mine	Indominco	Indomico company is the owner	15,208,363.26	None
8. Machinery and equipment of Indomico Indonesia mine	Indominco	Indomico company is the owner	33,134,487.44	None
9. Office building and residence of Kitadin Indonesia mine	Kitadin	Kitadin company is the owner	73,532.84	None
10. Machinery and equipment of Kitadin Indonesia mine	Kitadin	Kitadin company is the owner	104,505.00	None
11. Office building and residence of Turbaindo Indonesia mine	Trubaindo	Turbaindo company is the owner	4,944,512.11	There are obligation under loan agreement with bank
12. Port of Turbaindo Indonesia mine	Trubaindo	Turbaindo company is the owner	216,008.30	There are obligation under loan agreement with bankr
13. Machinery and equipment of Turbaindo Indonesia mine	Trubaindo	Turbaindo company is the owner	7,364,029.56	None
14. Office building and residence of Bharinto Indonesia mine	Bharinto	Bharinto company is the owner	770,486.58	None
15. Machinery and equipment of Bharinto Indonesia mine	Bharinto	Bharinto company is the owner	7,841,394.86	None
16. Office building and residence of Trust mine	Trust	Tambang Raya Usaha Tama company is the owner	2,715,104.87	None
17. Machinery and equipment of Trust mine	Trust	Tambang Raya Usaha Tama is the owner	42,236,663.00	None

Lists	Company	Ownership Characteristic	Book value (US Dollar)	Obligation
18. Office building and residence of BKV mine	BKV	BKV Oil & Gas is the owner	13,560,450.47	None
19. Machinery and equipment of BKV mine	BKV	BKV Oil & Gas is the owner	1,155,030,099.90	None
Total			**1,288,186,653.10**	

- The details of major fixed assets of group company in Australia

Lists	Company	Ownership Characteristic	Book value (AUD million)	Obligation
1. Office building and residence	Airly Coal Pty	Airly Coal Pty is the owner	2.3	None
2. Factory and machine in mine operating	Airly Coal Pty	Airly Coal Pty is the owner	142.8	None
3. Office building and residence	Charbon Coal Pty	Charbon Coal Pty is the owner	9.4	None
4. Factory and machine in mine operating	Charbon Coal Pty	Charbon Coal Pty is the owner	0.9	None
5. Office building and residence	Clarence Coal Pty	Clarence Coal Pty is the owner	0.4	None
6. Factory and machine in mine operating	Clarence Coal Pty	Clarence Coal Pty is the owner	96.4	None
7. Factory and machine in mine operating	Centennial Drilling Pty Limited	Centennial Drilling Pty Limited is the owner	3.6	None
8. Office building and residence	Centennial Fassifern Pty	Centennial Fassifern Pty is the owner	40.1	None
9. Factory and machine in mine operating	Centennial Fassifern Pty	Centennial Fassifern Pty is the owner	2.3	None
10. Factory and machine in mine operating	Centennial Coal Infrastructure Pty	Centennial Coal Infrastructure Pty is the owner	26.7	None
11. Office building and residence	Centennial Inglenook Pty	Centennial Inglenook Pty is the owner	0.5	None
12. Factory and machine in mine operating	Centennial Inglenook Pty	Centennial Inglenook Pty is the owner	0.3	None
13. Office building and residence	Ivanhoe Coal Pty	Ivanhoe Coal Pty is the owner	9.9	None
14. Factory and machine in mine operating	Ivanhoe Coal Pty	Ivanhoe Coal Pty is the owner	47.0	None

Lists	Company	Ownership Characteristic	Book value (AUD million)	Obligation
15. Factory and machine in mine operating	Centennial Mandalong Pty	Centennial Mandalong Pty is the owner	258.3	None
16. Factory and machine in mine operating	Centennial Myuna Pty	Centennial Myuna Pty is the owner	59.1	None
17. Factory and machine in mine operating	Centennial Northern Coal Service Pty	Centennial Northern Coal Service Pty is the owner	32.9	None
18. Factory and machine in mine operating	Centennial Newstan Pty	Centennial Newstan Pty is the owner	60.7	None
19. Office building and residence	Centennial Springvale Pty	Centennial Springvale Pty is the owner	3.5	None
20. Factory and machine in mine operating	Centennial Springvale Pty	Centennial Springvale Pty is the owner	165.8	None
Total			**963**	

- The details of major fixed assets of group company in China

Lists	Company	Ownership Characteristic	Book value (US dollar)	Obligation
Building and construction	Shijiazhuang Chengfeng	Owner	34,443,902	None
Machine and factory equipment	Shijiazhuang Chengfeng	Owner	36,705,605	None
Decorating Equipment	Shijiazhuang Chengfeng	Owner	49,785	None
Equipment and stationary	Shijiazhuang Chengfeng	Owner	61,152	None
Vehicle	Shijiazhuang Chengfeng	Owner	89,032	None
Assets under construction	Shijiazhuang Chengfeng	Owner	1,752,531	None
Building and construction	Tangshan Banpu	Owner	21,729,478	None
Machine and factory equipment	Tangshan Banpu	Owner	87,280,229	None
Decorating Equipment	Tangshan Banpu	Owner	136,359	None
Equipment and stationary	Tangshan Banpu	Owner	356,308	None
Vehicle	Tangshan Banpu	Owner	117,131	None
Assets under construction	Tangshan Banpu	Owner	737,405	None
Building and construction	Zouping Peak	Owner	15,434,076	None

Lists	Company	Ownership Characteristic	Book value (US dollar)	Obligation
Machine and factory equipment	Zouping Peak	Owner	61,109,030	None
Equipment and stationary	Zouping Peak	Owner	84,479	None
Vehicle	Zouping Peak	Owner	35,417	None
Assets under construction	Zouping Peak	Owner	5,155,437	None
Total amount of book value			**265,277,357**	

The information about patent permit and right in business operation

1. The details about patent permit and the investment promotion of company, subsidiary, and joint venture

- The details about patent permit of subsidiary in Indonesia

Project	Patent permit No.	District	Province	Area	Expiration	Company	Note
Jorong	06PB0318	Tanah Laut	South Kalimantan	4,883 Hectares	9 Dec 2029	PT. Jorong Barutama Greston (Jorong)	Production Stage
Indominco	01PB0435	Bontang, Kutai Timur	East Kalimantan	24,121 Hectares	31 Mar 2028	PT. Indominco Mandiri	Production Stage
Kitadin (Embalut)	KTN 2013 006 OP	Embalut, Kutai Kartanegara	East Kalimantan	2,973 Hectares	25 Feb 2022	PT. Kitadin	Production Stage
Trubaindo	96PB0160	Kutai Barat	East Kalimantan	22,687 Hectares	27 Feb 2035	PT. Trubaindo Coal Mining	Production Stage
Bharinto	04PB0081	Barito Utara &Kutai Barat	Central & East Kalimantan	17,311 Hectares	29 Jun 2041	PT. Bharinto Ekatama	Production Stage
TIS	64.07.14.08 (Code/Block Area)	Kutai Barat	East Kalimantan	2,065 Hectares	11 Apr 2029	PT. Tepian Indah Sukses	Exploration Stage
NPR	188.45/277/2013	Barito Utara	Central Kalimantan	4,291 Hectares	20 May 2033	PT. Nusa Persada Resources	Exploration Stage

- The details about patent permit of subsidiary in Australlia

Project	Patent permit No.	District	Province	Area (Hectares)	Expiration	Company	Note
AIRLY	ML1331	AIRLY, COCO, MORUNDUREY & BANDAMORA	NSW	2,745	11 Oct 2035	CENTENNIAL AIRLY PTY LIMITED	Production
ANGUS PLACE	ML1424	WOLGAN, COX, COOK & MARANGAROO	NSW	7,735	18 Aug 2024	CENTENNIAL SPRINGVALE PTY LTD and BOULDER MINING PTY LTD	Care & Maintenance
ANGUS PLACE	CCL704	COX & LIDSDALE	NSW	2,541	14 Jan 2023	CENTENNIAL SPRINGVALE PTY LTD and BOULDER MINING PTY LTD	Care & Maintenance
ANGUS PLACE	ML1699	COOK	NSW	30.6	26 June 2035	CENTENNIAL SPRINGVALE PTY LTD and BOULDER MINING PTY LTD	Care & Maintenance
ANGUS PLACE	ML1720	COOK	NSW	158.9	23 Nov 2036	CENTENNIAL SPRINGVALE PTY LTD and BOULDER MINING PTY LTD	Care & Maintenance
BLUE MOUNTAINS	CCL738	LETT	NSW	1,116	28 Sep 2025	HARTLEY VALLEY COAL COMPANY PTY LIMITED	Closed
BLUE MOUNTAINS	ML1457	LETT & MARANGAROO	NSW	185.1	3 Nov 2020 Renewal Submitted	HARTLEY VALLEY COAL COMPANY PTY LIMITED	Closed
CHARBON	MPL505	CLANDULLA	NSW	0.4097	11 Aug 2026	CHARBON COAL PTY LIMITED#	Closed
CHARBON	MPL526	WELLS, CLANDULLA & RYLSTONE	NSW	7.106	14 Dec 2024	CHARBON COAL PTY LIMITED#	Closed
CHARBON	MPL499	CLANDULLA	NSW	0.7917	28 May 2026	CHARBON COAL PTY LIMITED#	Closed
CHARBON	ML1318	CLANDULLA	NSW	983	29 Jun 2026	CHARBON COAL PTY LIMITED#	Closed
CHARBON	ML1384	CLANDULLA	NSW	195.5	18 Jan 2038	CHARBON COAL PTY LIMITED#	Closed
CHARBON	ML1501	CLANDULLA	NSW	13	21 Dec 2022	CHARBON COAL PTY LIMITED#	Closed
CHARBON	ML1545	CLANDULLA	NSW	204.65	9 Jan 2025	CHARBON COAL PTY LIMITED#	Closed
CHARBON	CCL732	CLANDULLA	NSW	1024	2 Dec 2025	CHARBON COAL PTY LIMITED#	Closed
CHARBON	MPL670	RYLSTONE & CLANDULLA	NSW	9.92	26 Mar 2024	CHARBON COAL PTY LIMITED#	Closed
CHARBON	ML1524	CLANDULLA	NSW	20.26	28 Oct 2023	CHARBON COAL PTY LIMITED#	Closed
CHARBON	MPL964	CLANDULLA	NSW	4.932	20 Nov 2023	CHARBON COAL PTY LIMITED#	Closed
CHARBON	MPL270	CLANDULLA	NSW	213.7	29 Apr 2026	CHARBON COAL PTY LIMITED#	Closed
CHARBON	ML1647	CLANDULLA	NSW	570.9	17 Dec 2031	CHARBON COAL PTY LIMITED#	Closed
CHARBON	ML1663	CLANDULLA	NSW	52.5	9 Jan 2033	CHARBON COAL PTY LIMITED#	Closed
CLARENCE	CCL705	CLWYDD, MARANGAROO & ROCK HILL	NSW	3,210	20 Dec 2026	COALEX PTY LIMITED and CLARENCE COAL INVESTMENTS PTY LIMITED	Production
CLARENCE	ML1354	CLWYDD & COOK	NSW	155.3	21 Jul 2036	COALEX PTY LIMITED and CLARENCE COAL INVESTMENTS PTY LIMITED	Production
CLARENCE	ML1353	CLWYDD, COOK & ROCK HILL	NSW	1,075	21 Jul 2036	COALEX PTY LIMITED and CLARENCE COAL INVESTMENTS PTY LIMITED	Production
CLARENCE	ML1583	CLWYDD, MARANGAROO, LETT	NSW	3,331	9 Jul 2027	COALEX PTY LIMITED	Production
CLARENCE	ML1721	CLWYDD	NSW	5.11	7 Dec 2036	COALEX PTY LIMITED and CLARENCE COAL INVESTMENTS PTY LIMITED	Production
IVANHOE	ML1627	CULLEN BULLEN	NSW	79.78	2 Feb 2030	IVANHOE COAL PTY LTD	Closed
IVANHOE	CCL712	CULLEN BULLEN, COX & FALNASH	NSW	1,628	12 Nov 2006 Renewal pending	IVANHOE COAL PTY LTD	Closed
IVANHOE	ML1301	COX	NSW	5.131	28 Sep 2034	IVANHOE COAL PTY LTD	Closed
IVANHOE	MPL348	COX	NSW	9.45	24 May 2025	IVANHOE COAL PTY LTD	Closed

Project	Patent permit No.	District	Province	Area (Hectares)	Expiration	Company	Note
MANDALONG	ML1443	MORISSET, DORA & MANDOLONG	NSW	3,648	1 Mar 2020 Renewal Submitted	CENTENNIAL MANDALONG PTY LTD	Production
MANDALONG	ML1543	MANDOLONG	NSW	172.5	25 Nov 2024	CENTENNIAL MANDALONG PTY LTD	Production
MANDALONGMPL 191 COORUMBUNGN SW0.561525 Feb 2023CENTENNIAL MANDALONG PTY LTD Production MANDALONG	CCL762	DORA, AWABA, MANDOLONG, MORISSET & WALLARAH	NSW	2,940	13 Oct 2022	CENTENNIAL MANDALONG PTY LTD	Production
MANDALONG	ML1553	MORISSET	NSW	64.32	7 Sep 2025	CENTENNIAL MANDALONG PTY LTD	Production
MANDALONG	ML1722	MANDOLONG, MORISSET, WYONG & MUNMORAH	NSW	3206	17 Dec 2036	CENTENNIAL MANDALONG PTY LTD	Production
MANDALONG	ML1744	MANDOLONG, WYONG, OLNEY	NSW	409	6 Oct 2037	CENTENNIAL MANDALONG PTY LTD	Production
MANDALONG	ML1793	COORUMBUNG	NSW	6.4	16 Jul 2040	CENTENNIAL MANDALONG PTY LTD	Production
MUNMORAH	CCL720	WALLARAH & MUNMORAH	NSW	3,720	16 Feb 2023	CENTENNIAL MUNMORAH PTY LTD	Closed
MUNMORAH	CCL722	MORISSET, WALLARAH, MUNMORAH & TUGGERAH	NSW	5,140	5 Jul 2019 Part renewal submitted	CENTENNIAL MUNMORAH PTY LTD	Closed and Part Subleased to Chain Valley Colliery
MYUNA	MPL334	AWABA	NSW	33.3	19 Oct 2036	CENTENNIAL MYUNA PTY LTD	Production
MYUNA	ML1370	WALLARAH	NSW	635	7 Mar 2033	CENTENNIAL MYUNA PTY LTD	Production - Part Subleased to Chain Valley Colliery
MYUNA	ML1632	AWABA, COORUMBUNG, WALLARAH & MORISSET	NSW	7,426	13 Oct 2022	CENTENNIAL MYUNA PTY LTD	Production - Part Subleased to Chain Valley Colliery
NEUBECKS PROJECT	CCL756	COX	NSW	101	6 Dec 2024	CENTENNIAL SPRINGVALE PTY LTD and BOULDER MINING PTY LTD	Project
NEWSTAN	CCL746	AWABA & COORUMBUNG	NSW	3,308	31 Dec 2028	CENTENNIAL NEWSTAN PTY LTD	Care & Maintenance
NEWSTAN	CCL764	TERALBA & AWABA	NSW	108.8	18 May 2021 Renewal Submitted	CENTENNIAL NEWSTAN PTY LTD	Care & Maintenance
NEWSTAN	CCL763	AWABA	NSW	190.9	9 Jun 2022	CENTENNIAL NEWSTAN PTY LTD	Care & Maintenance
NEWSTAN	PLL497	AWABA	NSW	20.23	24 Aug 2038	CENTENNIAL NEWSTAN PTY LTD	Care & Maintenance
NEWSTAN	ML1587	AWABA	NSW	3	23 Oct 2027	CENTENNIAL NEWSTAN PTY LTD	Care & Maintenance
NEWSTAN	ML1586	AWABA & COORUMBUNG	NSW	449.1	13 Oct 2022	CENTENNIAL NEWSTAN PTY LTD	Care & Maintenance
NEWSTAN	ML1452	AWABA & COORUMBUNG	NSW	1587	6 Jul 2020 Renewal Submitted	CENTENNIAL NEWSTAN PTY LTD	Care & Maintenance
NEWSTAN	CCL727	TERALBA & AWABA	NSW	2,194.08	12 Aug 2027	CENTENNIAL NEWSTAN PTY LTD	Care & Maintenance
NEWSTAN	MPL328	AWABA	NSW	0.397	5 Aug 2036	CENTENNIAL NEWSTAN PTY LTD	Care & Maintenance
NEWSTAN	ML1380	AWABA	NSW	78	18 Sep 2037	CENTENNIAL NEWSTAN PTY LTD	Care & Maintenance
NEWSTAN	MPL304	TERALBA	NSW	0.07	25 Mar 2035	CENTENNIAL NEWSTAN PTY LTD	Care & Maintenance
NEWSTAN	MPL305	AWABA	NSW	0.4044	25 Mar 2035	CENTENNIAL NEWSTAN PTY LTD	Care & Maintenance
NEWSTAN	ML1480	AWABA	NSW	14.49	20 Jul 2023	CENTENNIAL NEWSTAN PTY LTD	Care & Maintenance
NEWSTAN	MPL327	AWABA	NSW	1.041	5 Aug 2036	CENTENNIAL NEWSTAN PTY LTD	Care & Maintenance
SPRINGVALE	ML1303	LIDSDALE & MARANGAROO	NSW	713	15 Dec 2034	CENTENNIAL SPRINGVALE PTY LTD and BOULDER MINING PTY LTD	Production
SPRINGVALE	ML1588	COOK & CLWYDD	NSW	976	19 Oct 2027	CENTENNIAL SPRINGVALE PTY LTD and BOULDER MINING PTY LTD	Production
SPRINGVALE	CL377	LIDSDALE & MARANGAROO	NSW	1,105	9 Mar 2025	CENTENNIAL SPRINGVALE PTY LTD and BOULDER MINING PTY LTD	Production

Project	Patent permit No.	District	Province	Area (Hectares)	Expiration	Company	Note
SPRINGVALE	MPL314	LIDSDALE	NSW	95.98	3 Aug 2035	CENTENNIAL SPRINGVALE PTY LTD and BOULDER MINING PTY LTD	Production
SPRINGVALE	ML1323	LIDSDALE & MARANGAROO	NSW	30.1	3 Aug 2035	CENTENNIAL SPRINGVALE PTY LTD and BOULDER MINING PTY LTD	Production
SPRINGVALE	ML1537	MARANGAROO	NSW	4.125	16 Jun 2024	CENTENNIAL SPRINGVALE PTY LTD and BOULDER MINING PTY LTD	Production
SPRINGVALE	ML1326	CLWYDD, COOK , COX & MARANAGROO	NSW	2157	18 Aug 2024	CENTENNIAL SPRINGVALE PTY LTD and BOULDER MINING PTY LTD	Production
SPRINGVALE	ML1352	COX & LIDSDALE	NSW	7.6	23 Jun 2036	CENTENNIAL SPRINGVALE PTY LTD and BOULDER MINING PTY LTD	Production
SPRINGVALE	ML1448	LIDSDALE	NSW	95.16	31 May 2020 Renewal Submitted	CENTENNIAL SPRINGVALE PTY LTD and BOULDER MINING PTY LTD	Production
SPRINGVALE	ML1670	COOK	NSW	0.3	17 Feb 2033	CENTENNIAL SPRINGVALE PTY LTD and BOULDER MINING PTY LTD	Production
SPRINGVALE	ML1727	CLWYDD, COOK, MARANAGROO	NSW	1256	4 Feb 2037	CENTENNIAL SPRINGVALE PTY LTD and BOULDER MINING PTY LTD	Production
WESTERN MAIN	CL361	LIDSDALE	NSW	14.26	16 Jul 2032	CENTENNIAL SPRINGVALE PTY LTD and BOULDER MINING PTY LTD	Closed
WESTERN MAIN	PLL133	LIDSDALE	NSW	16.51	10 Aug 2024	CENTENNIAL SPRINGVALE PTY LTD and BOULDER MINING PTY LTD	Closed
WESTERN MAIN	ML204	LIDSDALE & COOK	NSW	10.12	27 May 2033	CENTENNIAL SPRINGVALE PTY LTD and BOULDER MINING PTY LTD	Closed
WESTERN MAIN	CL394	LIDSDALE	NSW	17	27 May 2034	CENTENNIAL SPRINGVALE PTY LTD and BOULDER MINING PTY LTD	Closed
WESTERN MAIN	ML564	LIDSDALE	NSW	19.75	2 May 2023	CENTENNIAL SPRINGVALE PTY LTD and BOULDER MINING PTY LTD	Closed
WESTERN MAIN	CCL733	COX & LIDSDALE	NSW	678.86	3 Jul 2027	CENTENNIAL SPRINGVALE PTY LTD and BOULDER MINING PTY LTD	Closed
WESTERN MAIN	ML1319	COX	NSW	1.476	5 Jul 2035	CENTENNIAL SPRINGVALE PTY LTD and BOULDER MINING PTY LTD	Closed

Note: NSW: New South Wales, Australia

- # JV holds the patent permit

- Details of patent permit of subsidiary in People's Republic of China

Project	Patent permit No.	District	Province	Area (Square Kilometer)	Expiration	Company	Note
Gaohe Mine	C100000201010 1110077581	Changzhi County, Changzhi City	Shanxi	65.4	14 Oct 2040	Shanxi Gaohe Energy Company Ltd.	Production Stage
Hebi Mine	1000000520080	Hebi City,	Henan	23.4825	14 July 2035	Hebi Zhong Tai Mining Co.,Ltd.	Production Stage

- Details of use of Land for energy business in People's Republic of China at 31 December 2020:

Location	Patent permit h older	Size (Square Metre)	Start date	End date	Objective	Book value of righto use land (Baht thousand)
Zhengding County, Shijiazhuang, Hebei Province, P.R.China	Shijiazhuang Chengfeng Cogen Co., Ltd.	7,132	27 December 2006	2 September 2053	Zhengding power plant	91,554
		67,354	16 February 1998	30 November 2047		
		17,665	28 December 2016	26 March 2062		
		23,135	18 April 2001	17 April 2031		
Luannan County, Tangshan City Hebei, P.R.China	Tangshan Banpu Heat & Power Co., Ltd.	225,172	18 April 2020	18 April 2070	Luannan power plant	404,206
		2,100	22 ก.ย. 2018	21 September 2068		
		90,370	1 January 2017	31 December 2066		
		40,960	1 January 2017	Under consideration from public authority		
		105,831	30 August 2001	3 July 2051		
		18,190	29 December 2007	29 December 2056		
Zouping County, Binzhou City, Shandong Province, P.R.China,	Zouping Peak	24,315	29 December 2008	3 ธ.ค. 2601	Zouping Peak power plant	48,047

The information about geology and ore reserves

1. The amount of resources and coal reserves

   The amount of company's coal reserves and company's subsidiary that operate coal mines in Republic of Indonesia, People's Republic of China, and Australia is evaluated as of 31 December 2019. The evaluated data will be used in planning, production, and development of company's coal mines in the future. For the report of coal reserves, the evaluation results divided coal into two types are Reserves and Resources by the guideline of International Coal Reports Standards, which can compare with the standard of The Australian Code for Reporting Mineral Resources and Ore Reserves or so called "JORC Code" report. The relevant competent persons under JORC Code are as follows;

   1. India, examined by PT. DMT Exploration Engineering Consultant (IND) in the report 'Coal Resources and Reserves Audit for ITM Coal Mines Report' in February 2019
   2. Australia, evaluated and examined by competent persons
   3. People's Republic of China, examined by Marshall Miller & Associates (USA) in the report 'Independent Coal Resources & Reserves Audit Report' in February 2011 without any further major update on the mine.

   In the study of coal reserves, the Coal Resources part means the total amount of coals that already evaluated by the exploring method. This amount of coal reserves is calculated only the amount that have economic potential and get accepted internationally. The amount Marketable Coal Reserves is included in as a part of Coal Resources. There is an engineering study together with the evaluation of coal reserves amount that estimated to commercially produce by concerning with income and capital factors. Such coal reserve amount is marketable coal reserves, considering production and transport of coal.

Coal Reserve and Resources of company at 31 December 2020

Unit: million tonnes

Coal Mine/Project	Coal Reserve At 31 December 2019	Coal Sale January – December 2020	Coal Reserve At 31 December 2020
1. Indonesia	**330.85**	**19.64**	**311.17**
1.1 Jorong	10.24	1.21	9.03
1.2 Indominco	46.93	9.14	37.76
1.3 Kitadin	3.01	1.23	1.78
1.4 Trubaindo	43.89	4.71	39.18
1.5 Bharinto	149.37	3.35	146.02
1.6 NPR Project	77.40	-	77.40
2. Australia	**282.48**	**12.50**	**269.95**
2.1 Airly	26.50	1.44	25.06
2.2 Angus Place	53.00	-	53.00
2.2 Clarence	33.50	1.74	31.76
2.3 Mandalong	61.74	5.10	56.63

2.4 Myuna	35.40	0.98	34.42
2.5 Springavale	22.14	3.24	18.89
2.6 Newstan	42.70	-	42.70
2.7 Neubeck (Project)	7.50	-	7.50
3. China	**141.19**	**9.29**	**131.86**
3.1 Gaohe	125.54	8.07	117.43
3.2 Hebi Zhongtai	15.65	1.22	14.43
Total	**754.52**	**41.43**	**712.98**

Estimated sales and reserves of natural gas as of 31 December 2020

Estimated sales and reserves of natural gas	Natural gas
	(Unit: million square feet)
Estimated reserves at 31 December 2019	1,185,0,29
Revised estimate	(236,138)
Additional resources from Barnett	2,720,930
Reserves sales	(113,255)
Estimated reserves at 31 December 2020	3,556,566

***Estimated sales and reserves of natural gas at Marcellus and Barnett from Ryder Scott's Reserve Report

2.6 Revenue Structure

[To add Revenue Structure]

3. The List of Executives and Major Shareholders

3.1 Board of Directors

Management Structure as of 31 June 2021

Management Structure as of 31 August 2021 consists of the Board of directors and executive officers. The Board of Directors has 13 members and consist of five independent directors, seven non-executive directors, and one executive director. Independent directors account for 38% of The Board membership.

The Board set up three sub-committee namely, the Audit Committee three persons, Corporate Governance and Nomination Committee four persons, and Compensation Committee four persons.

The Board also requires that the Chairman of the Audit Committee, Chairman of the Corporate Governance and Nomination Committee, Chairman of the Compensation Committee should be independent directors and that all directors in the Audit Committee are independent directors.

The Board of Directors consists of:

1.	Mr. Chanin Vongkusolkit	Chairman of the Board of Directors
2.	Mr. Teerana Bhongmakapat	Chairman of the Audit Committee / Independent Director
3.	Mr. Rawi Corsiri	Chairman of the Corporate Governance and Nomination Committee / Director
4.	Mr. Buntoeng Vongkusolkit	Chairman of the Compensation Committee / Director
5.	Mr. Suthad Setboonsarng	Independent Director
6.	Mr. Pichai Dusdeekulchai	Independent Director
7.	Mr. Teerapat Sanguankotchakorn	Independent Director
8.	Mr. Piriya Khempon	Independent Director
9.	Mr. Anon Sirisaengtaksin	Director
10.	Mr. Metee Auapinyaku	Director
11.	Mr. Ongart Auapinyakul	Director
12.	Mr. Verajet Vongkusolkit	Director
13.	Mrs. Somruedee Chaimongkol	Director

Remarks:

1. *Meeting of the Board of Directors No. 4/2020 appointed Mr. Piriya Khempon to be a new director in place of Mr. Sudiarso Prasetio who has resigned from directorship (retirement), effective from 8 April 2020 onwards.*
2. *Information and biography of the member of the Board of Directors can be found in appendix 1*

3.2 The Management

The management* consists of

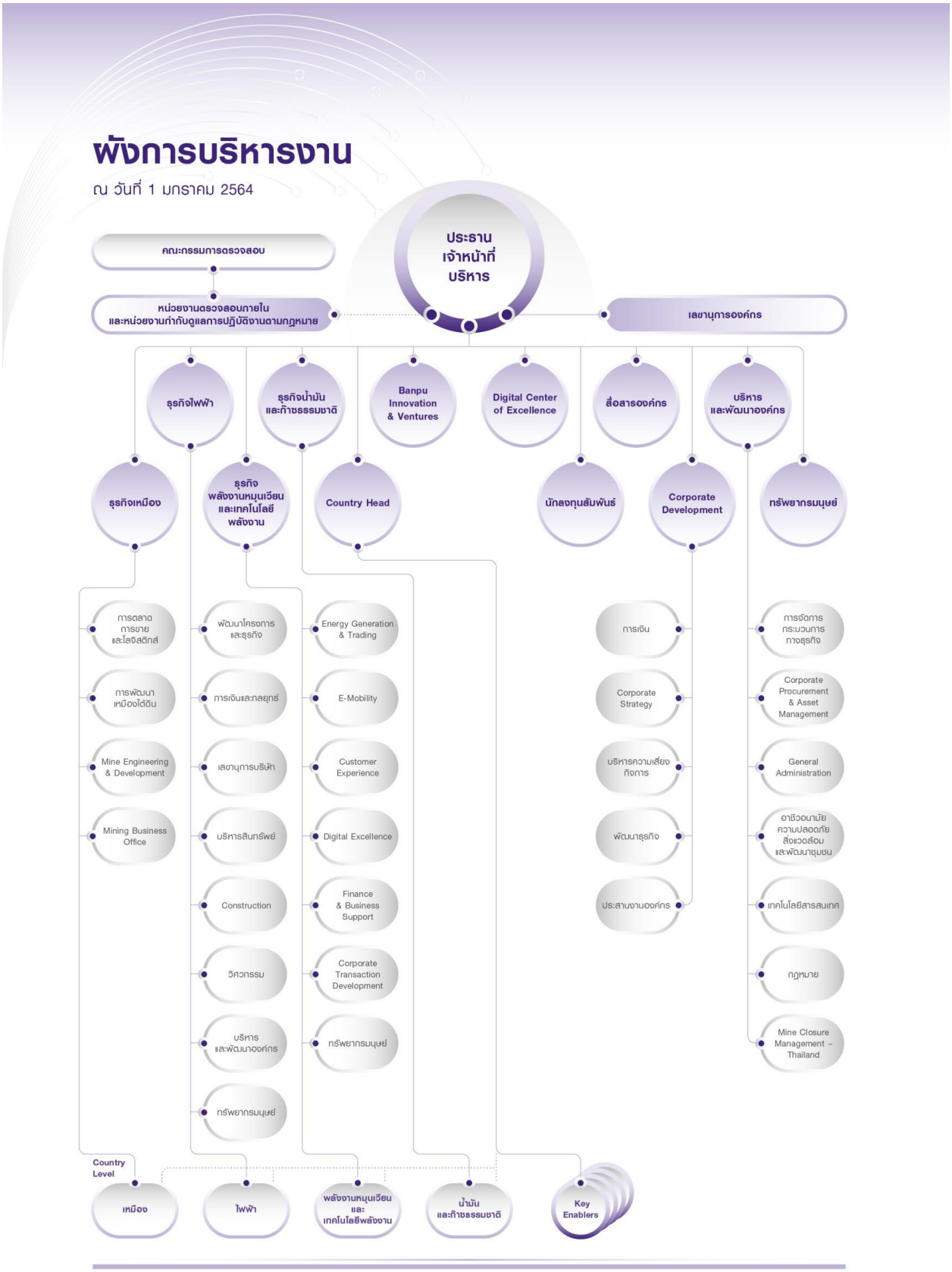
1.	Mrs. Somruedee Chaimongkol	Chief Executive Officer
2.	Mr. Somsak Sithinamsuwan	Head of Mining Business
3.	Mr. Kirana Limpaphayom	Head of Power Business
4.	Mr. Thiti Mekavichai	Head of Oil and Gas Business**

5.	Mr. Sutee Sukruan	Head of Corporate Development
6.	Ms. Arisara Sakoongaravek	Chief Financial Officer
7.	Mr. Varoj Limjaroon	Head of Human Resources
8.	Mr. Jirameth Achcha	Head of Corporate Services
9.	Mrs. Udomlux Olarn	Head of Corporate Communications***

Remarks:

- ** Top executives are the next four executives after the Chief Executive Officer.*
- *** Mr. Thiti Mekavichai was registered as company's executive management with the Securities and Exchange Commission on 1 February 2021.*
- **** Mrs. Udomlux Olarn retirement on 1 January 2021.*
- *Information and biography of the member of the management can be found in appendix 1*

Banpu Organization Structure



3.3 Major Shareholders

Top 10 Major Shareholders, as of 31 August 2021

Major Shareholders	No. of Shares	Percentage
1. The Vongkusolkit Family	482,055,820	9.50
Mitr Phol Sugar Corp., Ltd.	288,309,528	5.68
TME Capital Co., Ltd.	73,210,200	1.44
City Holding Co., Ltd.	41,251,700	0.81
United Farmer and Industry Co., Ltd.	35,611,300	0.70
MP Particle Board Co., Ltd.	30,438,448	0.60
Mid-Siam Capital Co., Ltd.	14,916,382	0.29
Pacific Sugar Corporation Ltd.	13,646,682	0.27
Mitr Phol Bio-Power Phu Viang Co., Ltd.	12,311,744	0.24
Ufinves Co., Ltd.	11,633,000	0.23
Mitr Kalasin Sugar Co., Ltd	9,606,042	0.19
2. Thai NVDR Company Limited	262,398,055	5.17
3. Social Security office	146,165,700	2.88
4. Mr. Prateep tangmatitham	96,625,500	1.90
5. South East Asia UK (Type C) Nominees Limited	85,955,335	1.69
6. Credit Suisse AG, Singapore Branch	78,551,450	1.55
7. State Street Europe Limited	51,830,152	1.02
8. N.C.B. Trust Limited-Polunin Developing Countries Fund, LLC	34,220,500	0.67
9. East Fourteen Limited-Dimensional Emer MKT value FD	32,925,150	0.65
10. Bualuang Long - Term Equity Fund	31,760,600	0.63
Total	**1,833,423,288**	**36.11**

Notes:

- Mitr Phol Sugar Corp., Ltd.

  Mid-Siam Sugar Corp., Ltd. holds 99.99% of its paid-up capital.

- TME Capital Co., Ltd.

  1. The Vongkusolkit Family holds 80.01% of its paid-up capital.
  2. Ufinves Co., Ltd. holds 15.23% of its paid-up capital.
  3. The Kanjanakumnerd Family holds 3.82% of its paid-up capital.
  4. The Putpongsiriporn Family holds 0.94% of its paid-up capital.

- City Holding Co., Ltd.

  1. The Vongkusolkit Family holds 90.50% of its paid-up capital.

2. The Kanjanakumnerd Family holds 6.00% of its paid-up capital.
3. The Putpongsiriporn Family holds 2.00% of its paid-up capital.
4. The Jenlapwattanakul Family holds 1.50% of its paid-up capital.

- United Farmer and Industry Co., Ltd.

  Mitr Phol Sugar Corp., Ltd. holds 87.56% of its paid-up capital.
- MP Particle Board Co., Ltd.

  United Farmer and Industry Co., Ltd. holds 99.99% of its paid-up capital.
- Mid-Siam Capital Co., Ltd.

  Mid-Siam Sugar Corp., Ltd. holds 99.99% of its paid-up capital.
- Pacific Sugar Corporation Ltd.

  Mitr Phol Sugar Corp., Ltd. holds 99.99% of its paid-up capital.
- Ufinves Co., Ltd.

  TME Capital Co., Ltd. holds 100% of its paid-up capital.
- Mitr Phol Bio-Power Phu Viang Co., Ltd.

  United Farmer and Industry Co., Ltd. holds 51.04% of its paid-up capital.
- Mitr Kalasin Sugar Co., Ltd.

  United Farmer and Industry Co., Ltd. holds 99.99% of its paid-up capital.

4. Capital Increase and Dividend History

4.1 Capital increase history in past three years

the Company has not increase its capital during the past 3 years.

4.2 Dividend payment policy and dividend payment during past three years

the Company's policy is to pay dividend in 50 percent of total financial budget net profit after deducts all types of reserve money that company specify. However, the dividend payment rate will depend on cash flow and investment conditions of the Company and subsidiary including to legal and other restrictions.

The subsidiary company policy is to pay dividend from business operation net profit after provident as the law prescribe. The board of direction will consider profits from the operation, financial condition, and capital requirement, and propose to shareholders to approve dividend payment of the past 3 years of Banpu Public Company Limited as follows:

Year	Yearly Dividend Payment (Baht per Stock)	Net Profit (Loss) (Million Baht)	First Half Year Dividend (Million Baht)	Second Half Year Dividend (Million Baht)	Yearly Dividend Payment (Million Baht)	Dividend Payment Rate per Net Profit (%)
2018	0.70	6,693.73	1,806.67	1,806.67	3,613.34	54%
2019	0.60	(395.26)	1,806.67	1,268.65	3,075.32	n.a.
2020	0.30	(1,786.32)	761.19	761.19	1,522.38	n.a.

5. General Information and Other Key Information

5.1 Banpu Group Structure

[To add diagrams]

5.2 Name and Address of juristic person in which the Company holds 10% or more of the total shares

	Company	Type of Business	Authorized Capital	Paid-up Capital	No. of Paid-up Capital (Shares)	Par Value per Share	% of Holding	Address
1	Banpu Public Company Limited	Energy	Baht 5,074,581,515	Baht 5,074,581,515	5,074,581,515	1	-	1550, Thanapoom Tower, 27th Floor, New Petchburi Road, Makkasan, Ratchathewi, Bangkok 10400, Thailand Tel: 0 2694 6600
	Subsidiaries Companies							
	Thailand							
2	Banpu Minerals Co., Ltd.	Coal mining and trading	Baht 3,200,000,000	Baht 3,200,000,000	3,200,000	1,000	100.00% (held by Banpu Public Company Limited)	58/1, Moo 1, Tambon Thungkwaw, Amphoe Muang Phrae, Phrae Province 54000, Thailand Tel : 0 2694 6600
3	Chiang Muan Mining Co., Ltd.	Coal mining and trading	Baht 57,837,500	Baht 57,837,500	5,783,750	10	100.00% (held by Banpu Minerals Co., Ltd.)	1550, Thanapoom Tower, 27th Floor, New Petchburi Road, Makkasan, Ratchathewi, Bangkok 10400, Thailand Tel : 0 2694 6600
4	Banpu Coal Sales Co., Ltd.	Coal trading	Baht 320,000,000	Baht 320,000,000	3,200,000	100	100.00% (held by Banpu Minerals Co., Ltd.)	1550, Thanapoom Tower, 27th Floor, New Petchburi Road, Makkasan, Ratchathewi, Bangkok 10400, Thailand Tel : 0 2694 6600
5	Banpu International Ltd.	Investment studying	Baht 1,040,000,000	Baht 1,040,000,000	104,000,000	10	100.00% (held by Banpu Minerals Co., Ltd.)	1550, Thanapoom Tower, 27th Floor, New Petchburi Road, Makkasan, Ratchathewi, Bangkok 10400, Thailand Tel : 0 2694 6600

	Company	Type of Business	Authorized Capital	Paid-up Capital	No. of Paid-up Capital (Shares)	Par Value per Share	% of Holding	Address
6	Banpu NEXT Co., Ltd.	Investment in renewable energy and energy technology	Baht 11,087,000,000	Baht 11,087,000,000	1,108,700,000	10	50.00% (held by Banpu Public Company Limited) 50.00% (held by Banpu Power Public Company Limited)	1550, Thanapoom Tower, 24th Floor, New Petchburi Road, Makkasan, Ratchathewi, Bangkok 10400, Thailand Tel : 0 2095 6595
7	BOG Co., Ltd.	Investment in energy business	Baht 33,506,000,000	Baht 30,924,700,000	335,060,000	100	100.00% (held by Banpu Public Company Limited)	1550, Thanapoom Tower, 27th Floor, New Petchburi Road, Makkasan, Ratchathewi, Bangkok 10400, Thailand Tel : 0 2694 6600
8	Banpu Engineering Services Co., Ltd.	Investment in alternative energy	Baht 247,000,000	Baht 247,000,000	24,700,000	10	100.00% (held by Banpu Public Company Limited)	1550, Thanapoom Tower, 27th Floor, New Petchburi Road, Makkasan, Ratchathewi, Bangkok 10400, Thailand Tel : 0 2694 6600
9	Banpu Energy Services (Thailand) Co., Ltd.	Investment in alternative energy	Baht 236,124,430	Baht 236,124,430	23,612,443	10	100.00% (held by Banpu Engineering Services Co., Ltd.)	1550, Thanapoom Tower, 27th Floor, New Petchburi Road, Makkasan, Ratchathewi, Bangkok 10400, Thailand Tel : 0 2694 6600
10	Banpu Innovation & Ventures Co., Ltd.	Research and development in disruptive technology	Baht 112,000,000	Baht 112,000,000	1,120,000	100	100.00% (held by Banpu Public Company Limited)	1550, Thanapoom Tower, 27th Floor, New Petchburi Road, Makkasan, Ratchathewi, Bangkok 10400, Thailand Tel : 0 2694 6600
11	Banpu Power Public Company Limited	Energy generation business	Baht 31,044,920,000	Baht 30,510,217,000	3,051,021,700	10	78.66% (held by Banpu Public Company Limited)	1550, Thanapoom Tower, 26th Floor, New Petchburi Road, Makkasan, Ratchathewi, Bangkok 10400, Thailand Tel : 0 2007 6000
12	Banpu Coal Power Ltd.	Investment in energy business	Baht 5,921,587,160	Baht 5,921,587,160	592,158,716	10	100.00% (held by Banpu Power Public Company Limited)	1550, Thanapoom Tower, 26th Floor, New Petchburi Road, Makkasan, Ratchathewi, Bangkok 10400, Thailand Tel : 0 2007 6000

	Company	Type of Business	Authorized Capital	Paid-up Capital	No. of Paid-up Capital (Shares)	Par Value per Share	% of Holding	Address
13	Banpu Power (Japan) Co., Ltd.	Investment in renewable energy business	Baht 5,000,000	Baht 5,000,000	500,000	10	100.00% (held by Banpu Power Public Company Limited)	1550, Thanapoom Tower, 26th Floor, New Petchburi Road, Makkasan, Ratchathewi, Bangkok 10400, Thailand Tel : 0 2007 6000
14	Power Vietnam Co., Ltd.	Investment in energy business	Baht 400,000,000	Baht 400,000,000	40,000,000	10	100.00% (held by Banpu Coal Power Ltd.)	1550, Thanapoom Tower, 26th Floor, New Petchburi Road, Makkasan, Ratchathewi, Bangkok 10400, Thailand Tel : 0 2007 6000
15	Banpu NEXT Green Leasing Co., Ltd.	Investment in energy business and leasing	Baht 50,000,000	Baht 50,000,000	5,000,000	10	100.00% (held by Banpu NEXT Co., Ltd.)	1550, Thanapoom Tower, 24th Floor, New Petchburi Road, Makkasan, Ratchathewi, Bangkok 10400, Thailand Tel : 0 2095 6595
	Indonesia							
16	PT. Indo Tambangraya Megah Tbk	Construction, trading, transportation, industry, repair and services related to coal mining and electricity business	IDR 1,500,000,000,000	IDR 564,962,500,000	1,129,925,000	500	67.13% (held by Banpu Minerals (Singapore) Pte. Ltd.)	Pondok Indah Office Tower 3, 3rd floor, Jl. Sultan Iskandar Muda, Pondok Indah Kav. V-TA, Jakarta 12310, Indonesia Tel : 6221 29328100
17	PT. Kitadin	Coal Mining and related business	IDR 1,000,000,000,000	IDR 377,890,000,000	188,945	2,000,000	100.00% (held by PT. Indo Tambangraya Megah Tbk)	Pondok Indah Office Tower 3, 3rd floor, Jl. Sultan Iskandar Muda, Pondok Indah Kav. V-TA, Jakarta 12310, Indonesia Tel : 6221 29328100
18	PT. Indominco Mandiri	Coal Mining in Indonesia	IDR 20,000,000,000	IDR 12,500,000,000	12,500	1,000,000	100.00% (held by PT. Indo Tambangraya Megah Tbk)	Pondok Indah Office Tower 3, 3rd floor, Jl. Sultan Iskandar Muda, Pondok Indah Kav. V-TA, Jakarta 12310, Indonesia Tel : 6221 29328100

	Company	Type of Business	Authorized Capital	Paid-up Capital	No. of Paid-up Capital (Shares)	Par Value per Share	% of Holding	Address
19	PT. Jorong Barutama Greston	Coal Mining in Indonesia	IDR 4,500,000,000	IDR 318,855,000,000	21,257	15,000,000	100.00% (held by PT. Indo Tambangraya Megah Tbk)	Pondok Indah Office Tower 3, 3rd floor, Jl. Sultan Iskandar Muda, Pondok Indah Kav. V-TA, Jakarta 12310, Indonesia Tel : 6221 29328100
20	PT. Trubaindo Coal Mining	Coal Mining in Indonesia	IDR 100,000,000,000	IDR 63,500,000,000	63,500	1,000,000	100.00% (held by PT. Indo Tambangraya Megah Tbk)	Pondok Indah Office Tower 3, 3rd floor, Jl. Sultan Iskandar Muda, Pondok Indah Kav. V-TA, Jakarta 12310, Indonesia Tel : 6221 29328100
21	PT. Bharinto Ekatama	Coal Mining in Indonesia	IDR 68,000,000,000	IDR 17,000,000,000	17,000	1,000,000	100.00% (held by PT. Indo Tambangraya Megah Tbk)	Pondok Indah Office Tower 3, 3rd floor, Jl. Sultan Iskandar Muda, Pondok Indah Kav. V-TA, Jakarta 12310, Indonesia Tel : 6221 29328100
22	PT. ITM Indonesia	Trading, land transportation, industry, agriculture, construction, repair and services	IDR 40,000,000,000	IDR 11,000,000,000	11,000	1,000,000	100.00% (held by PT. Indo Tambangraya Megah Tbk)	Pondok Indah Office Tower 3, 3rd floor, Jl. Sultan Iskandar Muda, Pondok Indah Kav. V-TA, Jakarta 12310, Indonesia Tel : 6221 2932810
23	PT. Tambang Raya Usaha Tama	Mining Support services	IDR 500,000,000,000	IDR 353,980,000,000	35,398	10,000,000	100.00% (held by PT. Indo Tambangraya Megah Tbk)	Pondok Indah Office Tower 3, 3rd floor, Jl. Sultan Iskandar Muda, Pondok Indah Kav. V-TA, Jakarta 12310, Indonesia Tel : 6221 29328100
24	PT. ITM Batubara Utama	Coal mining business	IDR 40,000,000,000	IDR 11,000,000,000	11,000	1,000,000	100.00% (held by PT. Indo Tambangraya Megah Tbk)	Pondok Indah Office Tower 3, 3rd floor, Jl. Sultan Iskandar Muda, Pondok Indah Kav. V-TA, Jakarta 12310, Indonesia Tel : 6221 29328100

	Company	Type of Business	Authorized Capital	Paid-up Capital	No. of Paid-up Capital (Shares)	Par Value per Share	% of Holding	Address
25	PT. ITM Energi Utama	Energy business	IDR 1,200,000,000,000	IDR 300,000,000,000	300,000	1,000,000	99.99% (held by PT. Indo Tambangraya Megah Tbk)	Pondok Indah Office Tower 3, 3rd floor, Jl. Sultan Iskandar Muda, Pondok Indah Kav. V-TA, Jakarta 12310, Indonesia Tel : 6221 29328100
26	PT. ITM Banpu Power	Investment in power business	IDR 1,200,000,000,000	IDR 300,000,000,000	300,000	1,000,000	70.00% (held by PT. Indo Tambangraya Megah Tbk) 30.00% (held by Banpu Power Public Company Limited)	Pondok Indah Office Tower 3, 3rd floor, Jl. Sultan Iskandar Muda, Pondok Indah Kav. V-TA, Jakarta 12310, Indonesia Tel : 6221 29328100
27	PT. Gas Emas	Fuel Distributor for Mining business	IDR 38,900,000,000	IDR 16,532,500,000	1,700,000	9,725	91.99% (held by PT Indo Tambangraya Megah Tbk) 6.01% (held by PT ITM Indonesia)	Wisma 46 Kota BNI 50th Fl., Suite 50.06, Jl. Jend Sudirman Kav. 1, Karet Tengsin, Tanah abang, Jakarta Pusat **Operational office:** Pondok Indah Office Tower 3, 3rd floor, Jl. Sultan Iskandar Muda, Pondok Indah Kav. V-TA, Jakarta 12310, Indonesia Tel : 6221 29328100
28	PT. Tepian Indah Sukses	Coal Mining in Indonesia	IDR 3,000,000,000	IDR 1,000,000,000	1,000	1,000,000	100.00% (held by PT. Indo Tambangraya Megah Tbk)	Jl. A.M. Sangaji No. 38F No. 9-10, Kel. Bandara, Kec. Sungai Pinang, Prov. Samarinda **Corresponding office**: Pondok Indah Office Tower 3, 3rd floor, Jl. Sultan Iskandar Muda, Pondok Indah Kav. V-TA, Jakarta 12310, Indonesia Tel : 6221 29328100
29	PT. Nusa Persada Resources	Coal Mining in Indonesia	IDR 10,000,000,000	IDR 3,700,000,000	37,000	100,000	100.00% (held by PT. Indo Tambangraya Megah Tbk)	Jl. A.M. Sangaji No. 38F No. 9-10, Kel. Bandara, Kec. Sungai Pinang, Samarinda **Corresponding office:** Pondok Indah Office Tower 3, 3rd floor, Jl. Sultan Iskandar Muda, Pondok Indah Kav. V-TA, Jakarta 12310, Indonesia Tel : 6221 29328100

	Company	Type of Business	Authorized Capital	Paid-up Capital	No. of Paid-up Capital (Shares)	Par Value per Share	% of Holding	Address
30	PT. Energi Batubara Perkasa	Coal Trading	IDR 1,000,000,000	IDR 1,000,000,000	1,000	1,000,000	100.00% (held by PT. Indo Tambangraya Megah Tbk)	Jl. A.M. Sangaji No. 38F No. 9-10, Kel. Bandara, Kec. Sungai Pinang, Prov. Samarinda **Corresponding office:** Pondok Indah Office Tower 3, 3rd floor, Jl. Sultan Iskandar Muda, Pondok Indah Kav. V-TA, Jakarta 12310, Indonesia Tel : 6221 29328100
31	PT. Sentral Mutiara Energy	Major trading of solid, liquid and gas fuel and other related products	IDR 150,000,000,000	IDR 131,897,000,000	1,318,970	100,000	100.00% (held by PT. Indo Tambangraya Megah Tbk)	Gd. Menara Pertiwi Lt.28 Unit C-D Jl.Mega Kuningan Barat III Kav.10.1 No.3 Kel.Kuningan Timur, Kec. Setiabudi Jakarta Selata -12950 Tel : 6221 25983737
32	PT. Graha Panca karsa	Coal mining and major trading of metal goods for construction material	IDR 500,000,000	IDR 270,000,000	270	1,000,000	75.00% (held by PT Sentral Mutiara Energy)	Gd. Menara Pertiwi Lt.28 Unit C-D Jl.Mega Kuningan Barat III Kav.10.1 No.3 Kel.Kuningan Timur, Kec. Setiabudi Jakarta Selata -12950 Tel : 6221 25983737
Australia								
33	Banpu Australia Co. Pty Ltd	Investment in coal mining in Australia	AUD 2,428,021,000	AUD 2,428,021,000	2,428,021,000	1	100.00% (held by Banpu Singapore Pte., Ltd.)	Level 18, 1 Market Street, Sydney NSW 2000, Australia Tel : 61 2 9266 2700
34	Centennial Coal Co., Ltd.	Coal Mining and Marketing	AUD 2,599,783,562	AUD 2,599,783,562	545,126,381	4.80	100.00% (held by Banpu Australia Co. Pty., Ltd.)	Level 18, 1 Market Street, Sydney NSW 2000, Australia Tel : 61 2 9266 2700
35	Centennial Northern Coal Services Pty Ltd.	Employer Company for Newstan Washery	AUD 1	AUD 1	1	1	100.00% (held by Centennial Coal Co., Ltd.)	Level 18, 1 Market Street, Sydney NSW 2000, Australia Tel : 61 2 9266 2700
36	Berrima Coal Pty Ltd.	Dormant	AUD 2	AUD 2	2	1	100.00% (held by Centennial Coal Co., Ltd.)	Level 18, 1 Market Street, Sydney NSW 2000, Australia Tel : 61 2 9266 2700

	Company	Type of Business	Authorized Capital	Paid-up Capital	No. of Paid-up Capital (Shares)	Par Value per Share	% of Holding	Address
37	Centennial Airly Pty Ltd.	Coal Mining	AUD 2	AUD 2	2	1	100.00% (held by Centennial Coal Co., Ltd.)	Level 18, 1 Market Street, Sydney NSW 2000, Australia Tel : 61 2 9266 2700
38	Centennial Angus Place Pty Ltd.	Coal Mining	AUD 1	AUD 1	1	1	100.00% (held by Centennial Coal Co., Ltd.)	Level 18, 1 Market Street, Sydney NSW 2000, Australia Tel : 61 2 9266 2700
39	Centennial Coal Infrastructure Pty Ltd.	Coal exporting logistics and infrastructure	AUD 2	AUD 2	2	1	100.00% (held by Centennial Coal Co., Ltd.)	Level 18, 1 Market Street, Sydney NSW 2000, Australia Tel : 61 2 9266 2700
40	Centennial Coal Services and Marketing Pty Ltd.	Coal Marketing	AUD 1	AUD 1	1	1	100.00% (held by Centennial Coal Co., Ltd.)	Level 18, 1 Market Street, Sydney NSW 2000, Australia Tel : 61 2 9266 2700
41	Centennial Northern Mining Services Pty Ltd.	Dormant	AUD 1	AUD 1	1	1	100.00% (held by Centennial Coal Co., Ltd.)	Level 18, 1 Market Street, Sydney NSW 2000, Australia Tel : 61 2 9266 2700
42	Centennial Inglenook Pty Ltd.	Coal Mining	AUD 1	AUD 1	1	1	100.00% (held by Centennial Coal Co., Ltd.)	Level 18, 1 Market Street, Sydney NSW 2000, Australia Tel : 61 2 9266 2700
43	Centennial Mandalong Pty Ltd.	Coal Mining	AUD 1	AUD 1	1	1	100.00% (held by Centennial Coal Co., Ltd.)	Level 18, 1 Market Street, Sydney NSW 2000, Australia Tel : 61 2 9266 2700
44	Centennial Mannering Pty Ltd.	Coal Mining	AUD 1	AUD 1	1	1	100.00% (held by Centennial Coal Co., Ltd.)	Level 18, 1 Market Street, Sydney NSW 2000, Australia Tel : 61 2 9266 2700
45	Centennial Munmorah Pty Ltd.	Coal Mining (now Dormant)	AUD 1	AUD 1	1	1	100.00% (held by Centennial Coal Co., Ltd.)	Level 18, 1 Market Street, Sydney NSW 2000, Australia Tel : 61 2 9266 2700
46	Centennial Myuna Pty Ltd.	Coal Mining	AUD 1	AUD 1	1	1	100.00% (held by Centennial Coal Co., Ltd.)	Level 18, 1 Market Street, Sydney NSW 2000, Australia Tel : 61 2 9266 2700
47	Centennial Newstan Pty Ltd.	Coal Mining	AUD 1	AUD 1	1	1	100.00% (held by Centennial Coal Co., Ltd.)	Level 18, 1 Market Street, Sydney NSW 2000, Australia Tel : 61 2 9266 2700

	Company	Type of Business	Authorized Capital	Paid-up Capital	No. of Paid-up Capital (Shares)	Par Value per Share	% of Holding	Address
48	Charbon Coal Pty Ltd.	Coal Mining	AUD 2	AUD 2	2	1	100.00% (held by Centennial Coal Co., Ltd.)	Level 18, 1 Market Street, Sydney NSW 2000, Australia Tel : 61 2 9266 2700
49	Centennial Clarence Pty Ltd.	Coal Mining - Clarence JV	AUD 8,800,000	AUD 8,800,000	8,800,000	1	100.00% (held by Centennial Coal Co., Ltd.)	Level 18, 1 Market Street, Sydney NSW 2000, Australia Tel : 61 2 9266 2700
50	Centennial Fassifern Pty Ltd.	Coal Mining	AUD 2	AUD 2	2	1	100.00% (held by Centennial Coal Co., Ltd.)	Level 18, 1 Market Street, Sydney NSW 2000, Australia Tel : 61 2 9266 2700
51	Powercoal Pty Ltd.	Dormant Holding company	AUD 4,590,001	AUD 4,590,001	4,590,001	1	100.00% (held by Centennial Fassifern Pty Ltd.)	Level 18, 1 Market Street, Sydney NSW 2000, Australia Tel : 61 2 9266 2700
52	Powercoal Superannuation Pty Ltd.	Superannuation Company (Dormant)	AUD 2	AUD 2	2	1	100.00% (held by Powercoal Pty Ltd.)	Level 18, 1 Market Street, Sydney NSW 2000, Australia Tel : 61 2 9266 2700
53	Coalex Pty Ltd.	Coal Mining - Clarence JV	AUD 7,500,000	AUD 7,500,000	750,000	10	100.00% (held by Centennial Coal Co., Ltd.)	Level 18, 1 Market Street, Sydney NSW 2000, Australia Tel : 61 2 9266 2700
54	Clarence Coal Investments Pty Ltd.	Coal Mining - Clarence JV	AUD 19,500,002	AUD 19,500,002	15,500,002 Ord A shares 4,000,000 Ord B shares	1	100.00% (held by Coalex Pty Ltd.)	Level 18, 1 Market Street, Sydney NSW 2000, Australia Tel : 61 2 9266 2700
55	Clarence Colliery Pty Ltd.	Coal Mining - Clarence JV	AUD 10,000	AUD 10,000	10,000	1	100.00% (held by Coalex Pty Ltd.)	Level 18, 1 Market Street, Sydney NSW 2000, Australia Tel : 61 2 9266 2700
56	Clarence Coal Pty Ltd.	Coal Mining - Clarence JV	AUD 2	AUD 2	2	1	100.00% (held by Coalex Pty Ltd.)	Level 18, 1 Market Street, Sydney NSW 2000, Australia Tel : 61 2 9266 2700
57	Collieries Superannuation Pty Ltd.	Superannuation Company (Dormant)	AUD 2	AUD 2	2	1	100.00% (held by Powercoal Pty Ltd.)	Level 18, 1 Market Street, Sydney NSW 2000, Australia Tel : 61 2 9266 2700
58	Elcom Collieries Pty Ltd.	Dormant	AUD 1,500,000	AUD 1,500,000	750,000	2	100.00% (held by Powercoal Pty Ltd.)	Level 18, 1 Market Street, Sydney NSW 2000, Australia Tel : 61 2 9266 2700
59	Huntley Colliery Pty Ltd.	Dormant	AUD 354,000	AUD 354,000	177,000	2	100.00% (held by Powercoal Pty Ltd.)	Level 18, 1 Market Street, Sydney NSW 2000, Australia Tel : 61 2 9266 2700
60	Mandalong Pastoral	Dormant	AUD 2,736,028	AUD 2,736,028	10,000,000 Ord partly paid shares - $0.20	2	100.00%	Level 18, 1 Market Street, Sydney NSW 2000, Australia

	Company	Type of Business	Authorized Capital	Paid-up Capital	No. of Paid-up Capital (Shares)	Par Value per Share	% of Holding	Address
	Management Pty Ltd.				368,014 Ord Shares - $2.00		(held by Powercoal Pty Ltd.)	Tel : 61 2 9266 2700
61	Powercoal Employees Entitlements Company Pty Ltd.	Employee Trust Company Ex Powercoal	AUD 2	AUD 2	2	1	100.00% (held by Centennial Coal Co., Ltd.)	Level 18, 1 Market Street, Sydney NSW 2000, Australia Tel : 61 2 9266 2700
62	Hartley Valley Coal Co Pty Ltd.	Dormant	AUD 1,000,000	AUD 1,000,000	1,000,000	1	100.00% (held by Centennial Coal Co., Ltd.)	Level 18, 1 Market Street, Sydney NSW 2000, Australia Tel : 61 2 9266 2700
63	Ivanhoe Coal Pty Ltd.	Coal Mining	AUD 2	AUD 2	2	1	100.00% (held by Centennial Coal Co., Ltd.)	Level 18, 1 Market Street, Sydney NSW 2000, Australia Tel : 61 2 9266 2700
64	Centennial Drilling Services Pty Ltd.	Drilling Services	AUD 1,250,000	AUD 1,250,000	750,000 A Class Shares 250,000 B Class shares 250,000 C Class shares	1	100.00% (held by Centennial Coal Co., Ltd.)	Level 18, 1 Market Street, Sydney NSW 2000, Australia Tel : 61 2 9266 2700
65	Centennial Springvale Holdings Pty Ltd.	Coal Mining	AUD 1	AUD 1	1	1	100.00% (held by Centennial Coal Co., Ltd.)	Level 18, 1 Market Street, Sydney NSW 2000, Australia Tel : 61 2 9266 2700
66	Centennial Springvale Pty Ltd.	Coal Mining	AUD 1,000,000	AUD 1,000,000	1,000,000	1	100.00% (held by Centennial Springvale Holdings Pty Ltd.)	Level 18, 1 Market Street, Sydney NSW 2000, Australia Tel : 61 2 9266 2700
67	Springvale Coal Pty Ltd.	Coal Mining	AUD 2,000,000	AUD 2,000,000	2,000,000	1	100.00% (held by Centennial Springvale Holdings Pty Ltd.)	Level 18, 1 Market Street, Sydney NSW 2000, Australia Tel : 61 2 9266 2700
68	Boulder Mining Pty Ltd.	Coal Mining	AUD 1,000	AUD 1,000	1,000	1	100.00% (held by Centennial Springvale Holdings Pty Ltd.)	Level 18, 1 Market Street, Sydney NSW 2000, Australia Tel : 61 2 9266 2700
69	AFE Investments Pty Limited	Mining Investment	AUD 2	AUD 2	2	1	100.00% (held by Banpu Australia Co. Pty Ltd.)	Level 18, 1 Market Street, Sydney NSW 2000, Australia Tel : 61 2 9266 2700
70	Banpu Australia Resources Pty Ltd.	Investment in coal mining	AUD 2	AUD 2	2	1	100.00% (held by Banpu Australia Co. Pty Ltd.)	Level 18, 1 Market Street, Sydney NSW 2000, Australia Tel : 61 2 9266 2700

	Company	Type of Business	Authorized Capital	Paid-up Capital	No. of Paid-up Capital (Shares)	Par Value per Share	% of Holding	Address
71	Springvale Coal Sales Pty Limited	Coal Marketing	AUD 2	AUD 2	2	1	100.00% (held by Centennial Springvale Holdings Pty Ltd.)	Level 18, 1 Market Street, Sydney NSW 2000, Australia Tel : 61 2 9266 2700
72	Centennial Energy Pty Limited	Renewable Energy	AUD 2	AUD 2	2	1	100.00% (held by Banpu Australia Co. Pty Ltd.)	Level 18, 1 Market Street, Sydney NSW 2000, Australia Tel : 61 2 9266 2700
73	Airly Solar Pty Limited	Renewable Energy	AUD 2	AUD 2	2	1	100.00% (held by Centennial Energy Australia Pty Limited.)	Level 18, 1 Market Street, Sydney NSW 2000, Australia Tel : 61 2 9266 2700
74	Centennial Wallarah Pty Limited	Mining Investment	AUD 2	AUD 2	2	1	100.00% (held by Centennial Coal Co., Ltd.)	Level 18, 1 Market Street, Sydney NSW 2000, Australia Tel : 61 2 9266 2700
75	Banpu Renewable Australia Pty. Limited	Renewable Energy	AUD 2	AUD 2	2	1	100.00% (held by Banpu NEXT Co., Ltd.)	Level 18, 1 Market Street, Sydney NSW 2000, Australia Tel : 61 2 9266 2700
76	Hunnu Coal Pty Ltd.	Coal mining and trading	AUD 284,688,631	AUD 284,688,631	400,752,717	No par value*	100.00% (held by Banpu Minerals (Singapore) Pte. Ltd.)	Level 18, 1 Market Street, Sydney NSW 2000, Australia Tel : 61 2 9266 2700
China								
77	Banpu (Shanghai) Trading Co., Ltd.	Coal Trading	CNY 50,000,000	CNY 50,000,000	NA	NA	100.00% (held by Banpu Minerals (Singapore) Pte. Ltd.)	Unit 507, No.20 Jiafeng Road, Pilot Free Trade Zone (Shanghai), P.R.China Tel : (8610) 57580337
78	Shijiazhuang Chengfeng Cogen Co., Ltd.	Power and steam generation and sales	USD 30,516,000	USD 30,516,000	NA	NA	100.00% (held by Banpu Power Investment Co., Ltd.)	East of Jingshen Highway, Zhengding County, Shijiazhuang City, Hebei Province, P.R.China, 050800 Tel : (836311) 85176918
79	Banpu Investment (China) Ltd.	Investment in power business	USD 30,000,000	USD 30,000,000	NA	NA	100.00% (held by Banpu Power Investment Co., Ltd.)	Unit 508, 5th Floor, Tower 21, No. 10 Jiuxianqiao Road, Chaoyang District, Beijing, P.R.China Tel : (8610) 57580388

	Company	Type of Business	Authorized Capital	Paid-up Capital	No. of Paid-up Capital (Shares)	Par Value per Share	% of Holding	Address
80	Tangshan Banpu Heat and Power Co., Ltd.	Power and steam generation and sales	USD 78,082,200	USD 78,082,200	NA	NA	87.92% (held by Pan-Western Energy Corporation LLC) 12.08% (held by Banpu Investment (China) Ltd.)	West of Gujiaying Villiage, Bencheng Town, Luannan County, Tangshan City, Hebei Province, P.R.China, 063500 Tel : (86315) 4168274
81	Zouping Peak CHP Co., Ltd	Power and steam generation and sales	CNY 261,800,000	CNY 261,800,000	NA	NA	70.00% (held by Zouping Peak Pte. Ltd.)	Handian Town, Zouping County, Binzhou City, Shandong Province, P.R.China, 256209 Tel : (86543) 4615655
82	BPP Renewable Investment (China) Co., Ltd	Investment in renewable energy business	USD 160,000,000	USD 97,620,000	NA	NA	100.00% (held by Banpu NEXT Co., Ltd.)	Unit 108, No. 26 Jiafeng Road, Pilot Free Trade Zone, Shanghai Province, P.R.China Tel : (8610) 57580388
83	Anqiu Huineng Renewable Energy Co., Ltd.	Solar power generation	CNY 66,000,000	CNY 66,000,000	NA	NA	100.00% (held by BPP Renewable Investment (China) Co., Ltd.)	1st Floor, Unit 1, Dafugou Villiage, Wushan Town, Anqiu County, Weifang City, Shandong Province, P.R.China Tel : (8610) 57580310
84	Weifang Tian'en Jinshan Comprehensive Energy Co., Ltd.	Solar power generation	CNY 83,000,000	CNY 83,000,000	NA	NA	100.00% (held by BPP Renewable Investment (China) Co., Ltd.)	2nd Floor, Unit 1, Dafugou Villiage, Wushan Town, Anqiu County, Weifang City, Shandong Province, P.R.China Tel : ((8610) 57580310
85	Dongping County Haoyuan Solar Power Generation Co., Ltd.	Solar power generation	CNY 69,000,000	CNY 69,000,000	NA	NA	100.00% (held by BPP Renewable Investment (China) Co., Ltd.)	East side of the north section of Xishan Road, Dongping County, Taian City, Shandong Province, P.R.China Tel : (8610) 57580310
86	Anqiu County Hui'en PV Technology Co., Ltd.	Solar power generation	CNY 62,000,000	CNY 62,000,000	NA	NA	100.00% (held by BPP Renewable Investment (China) Co., Ltd.)	Unit 2, Longwangmiao Village, Dasheng Town, Anqiu County, Weifang City, Shandong Province, P.R.China Tel : (8610) 57580310
87	Jiaxing Deyuan Energy-Saving Technology Co., Ltd.	Solar power generation	CNY 150,740,000	CNY 150,735,586	NA	NA	100.00% (held by BPP Renewable Investment (China) Co., Ltd.)	No. 999 Xianghu Road, Yaozhuang Town, Jiashan County, Jiaxing City, Zhejiang Province, P.R.China Tel : (8610) 57580310
88	Banpu Power Trading (Shandong) Co., Ltd.	Power Trading	CNY 20,00,000	CNY 0	NA	NA	100.00% (held by Banpu	Unit 2608, Tower C, No.11 Jingshi Road, Shizhong District, Jinan Province, P.R.China

	Company	Type of Business	Authorized Capital	Paid-up Capital	No. of Paid-up Capital (Shares)	Par Value per Share	% of Holding	Address
							Investment (China) Ltd.)	Tel : (86543) 4866099
89	Banpu Power Trading (Hebei) Co., Ltd.	Power Trading	CNY 20,000,000	CNY 0	NA	NA	100.00% (held by Banpu Investment (China) Ltd.)	(West Wing, 3rd Floor, Office Building of Shijiazhuang Chengfeng CogenCo., Ltd.) North of Beiguan Village, Zhengding County, Shijiazhuang City, Hebei Province, P.R.China Tel : (86311) 85176969
90	Feicheng Xingyu Solar Power PV Technology Co., Ltd.	Solar power generation	CNY 55,000,000	CNY 55,000,000	NA	NA	100.00% (held by BPP Renewable Investment (China) Co., Ltd.)	Huangtuling Village, Anzhan Town, Feicheng County, Tai'an City, Shandong Province, P.R.China Tel : (8610) 57580310
91	Banpu (Beijing) Energy Trading Ltd.	Coal Trading	CNY 80,000,000	CNY 40,000,000	NA	NA	100.00% (held by Banpu Minerals (Singapore) Pte. Ltd.)	Unit 508A, 5th Floor, Tower 21, No.10 Jiuxianqiao Road, Chaoyang District, Beijing, P.R.China Tel : (8610) 57580337
92	Jiangsu Jixin Electric Power Co., Ltd.	Solar power generation	CNY 64,000,000	CNY 64,000,000	NA	NA	100.00% (held by BPP Renewable Investment (China) Co., Ltd.)	Zhengwei Villiage, Qianfeng Town, Jinhu County, Huai'an City, Jiangsu Province, P.R.China Tel : (8610) 57580310
	Mongolia							
93	Hunnu Altai LLC	Foreign trade, investment in coal mining	MNT 94,143,561,104.47	MNT 94,143,561,104.47	676,785	138,490	100.00% (held by Hunnu Investment Pte. Ltd.)	Suite 1502, Fides Tower, Gegeenten Complex, 15th khoroo, Khan-Uul district, Ulaanbaatar-17011, Mongolia Tel : (976) 75551221, (976) 755115
94	Hunnu Gobi Altai LLC	Foreign trade, minerals exploration, mining	MNT 155,000,000	MNT 155,000,000	155,000	1,000	80.00% (held by Hunnu Altai LLC)	Suite 1502, Fides Tower, Gegeenten Complex, 15th khoroo, Khan-Uul district, Ulaanbaatar-17011, Mongolia Tel : (976) 75551221, (976) 755115
95	Hunnu Altai Minerals LLC	Foreign trade, minerals mining	MNT 17,242,032,000	MNT 17,242,032,000	17,242,032	1,000	100.00% (held by Hunnu Altai LLC)	Suite 1502, Fides Tower, Gegeenten Complex, 15th khoroo, Khan-Uul district, Ulaanbaatar-17011, Mongolia Tel : (976) 75551221, (976) 755115

	Company	Type of Business	Authorized Capital	Paid-up Capital	No. of Paid-up Capital (Shares)	Par Value per Share	% of Holding	Address
96	Hunnu Resources LLC	Foreign trade, investment in coal mining	MNT 358,566,594,196.57	MNT 358,566,594,196.57	223,465,465	1,604.57	100.00% (held by Hunnu Coal Pty Ltd.)	Suite 1502, Fides Tower, Gegeenten Complex, 15th khoroo, Khan-Uul district, Ulaanbaatar-17011, Mongolia Tel : (976) 75551221, (976) 755115
97	Munkh Sumber Uul LLC	Foreign trade	MNT 3,148,769,582.83	MNT 3,148,769,582.83	314,876	10,000	100.00% (held by Hunnu Resources LLC)	Suite 1502, Fides Tower, Gegeenten Complex, 15th khoroo, Khan-Uul district, Ulaanbaatar-17011, Mongolia Tel : (976) 75551221, (976) 755115
98	Golden Gobi Mining LLC	Foreign Trade , Mineral exploration	MNT 18,417,657,766.51	MNT 18,417,657,766.51	1,841,764	10,000	100.00% (held by Hunnu Resources LLC)	Suite 1502, Fides Tower, Gegeenten Complex, 15th khoroo, Khan-Uul district, Ulaanbaatar-17011, Mongolia Tel : (976) 75551221, (976) 755115
99	Bilegt Khairkhan Uul LLC	Foreign Trade, Mineral exploration	MNT 30,465,045,204.99	MNT 30,465,045,204.99	3,046,504	10,000	100.00% (held by Hunnu Resources LLC)	Suite 1502, Fides Tower, Gegeenten Complex, 15th khoroo, Khan-Uul district, Ulaanbaatar-17011, Mongolia Tel : (976) 75551221, (976) 755115
100	Hunnu Power LLC	Foreign Trade	MNT 40,702,000	MNT 40,702,000	4,070	10,000	100.00% (held by Hunnu Resources LLC)	Suite 1502, Fides Tower, Gegeenten Complex, 15th khoroo, Khan-Uul district, Ulaanbaatar-17011, Mongolia Tel : (976) 75551221, (976) 755115
101	Munkhnoyon Suvraga LLC	Foreign trade, minerals mining, tourism, construction material sale	MNT 184,702,055,850	MNT 184,702,055,850	184,702,055	1,000	100.00% (held by Hunnu Resources LLC)	Suite 1502, Fides Tower, Gegeenten Complex, 15th khoroo, Khan-Uul district, Ulaanbaatar-17011, Mongolia Tel : (976) 75551221, (976) 755115
	Singapore							
102	Banpu Minerals (Singapore) Pte. Ltd.	Investment in coal mining	NA	SGD 17,670,002 USD 11,000,000	17,670,002 17,670,002	No par value*	50.00% Ordinary Shares	One Marina Boulevard, #28-00 Singapore 018989

	Company	Type of Business	Authorized Capital	Paid-up Capital	No. of Paid-up Capital (Shares)	Par Value per Share	% of Holding	Address
							(held by Banpu Minerals Co., Ltd.) 50.00% Preference Shares (held by Banpu Coal Investment Co., Ltd.)	Tel : 65 6890 7188
103	BMS Coal Sales Pte. Ltd.	Coal trading including coal agent and coal blending	NA	USD 5,000,000	5,000,000	No par value*	100.00% (held by Banpu Minerals (Singapore) Pte. Ltd.)	One Marina Boulevard, #28-00 Singapore 018989 Tel : 65 6890 7188
104	Banpu Singapore Pte. Ltd.	Investment in coal business	NA	SGD 1,500,000 USD 2,636,094,931.94	1,500,000 2,608,711,709	No par value*	100.00% (held by Asian American Coal, Inc.)	One Marina Boulevard, #28-00 Singapore 018989 Tel : 65 6890 7188
105	Hunnu Investments Pte. Ltd.	Investment in coal business	NA	SGD 100 USD 35,100,188.82	100 35,100,188	No par value*	100.00% (held by Hunnu Coal Pty Ltd)	One Marina Boulevard, #28-00 Singapore 018989 Tel : 65 6890 7188
106	Banpu Power Investment Co., Ltd.	Investment in power business	NA	USD 90,177,391	83,132,663	No par value*	100.00% (held by Banpu Power International Limited)	8 Marina Boulevard #05-02, Marina Bay Financial Centre, Singapore 018981 Tel : 65 6338 1888
107	Zouping Peak Pte. Ltd.	Investment in power business	NA	SGD 2 CNY 140,495,758	2 140,495,758	No par value*	100.00% (held by Banpu Power Investment Co., Ltd.)	8 Marina Boulevard #05-02, Marina Bay Financial Centre, Singapore 018981 Tel : 65 6338 1888
108	Banpu Renewable Singapore Pte. Ltd.	Investment in renewable energy business	NA	JPY 9,760,029,719.80 USD 55,987,676.69	9,760,029,719 55,987,675	No par value*	100.00% (held by Banpu NEXT Co., Ltd.)	8 Marina Boulevard #05-02, Marina Bay Financial Centre, Singapore 018981 Tel : 65 6338 1888
109	BRE Singapore Pte. Ltd.	Investment in renewable energy business	NA	USD 17,110,001	17,110,001	No par value*	100.00% (held by Banpu NEXT Co., Ltd.)	8 Marina Boulevard #05-02, Marina Bay Financial Centre, Singapore 018981 Tel : 65 6338 1888
110	Banpu Innovation & Ventures (Singapore) Pte. Ltd.	Research and development in disruptive technology	NA	USD 3,000,000	3,000,000	No par value*	100.00% (held by Banpu Innovation & Ventures Co., Ltd.)	8 Marina Boulevard #05-02, Marina Bay Financial Centre, Singapore 018981 Tel : 65 6338 1888
	Mauritius							

	Company	Type of Business	Authorized Capital	Paid-up Capital	No. of Paid-up Capital (Shares)	Par Value per Share	% of Holding	Address
111	Banpu Coal Investment Company Limited	Investment in coal mining	USD 11,050,500	USD 11,050,500	11,050,500	1	100.00% (held by Banpu Minerals Co., Ltd.)	4th Floor, Ebene Skies, Rue de L' Institut, Ebene, Republic of Mauritius Tel : 230 404 8000
112	BP Overseas Development Company Limited	Investment in coal mining	USD 515,533,002	USD 515,533,002	515,533,002	1	100.00% (held by Banpu Public Co., Ltd.)	4th Floor, Ebene Skies, Rue de L' Institut, Ebene, Republic of Mauritius Tel : 230 404 8000
113	BPIN Investment Company Limited	Investment in renewable energy	USD 212,497,600	USD 212,497,600	212,497,600	1	100.00% (held by Banpu NEXT Co., Ltd.)	4th Floor, Ebene Skies,Rue de L' Institut, Ebene, Republic of Mauritius Tel : 230 404 8000
114	Banpu Power International Limited	Investment in power business	USD 85,050,000	USD 85,050,000	85,050,000	1	100.00% (held by Banpu Power Public Company Limited)	4th Floor, Ebene Skies,Rue de L' Institut, Ebene, Republic of Mauritius Tel : 230 404 8000
	British Virgin Islands							
115	Asian American Coal, Inc.	Investment in coal mining	USD 50,000,000	USD 40,917,026	40,917,026	1	100.00% (held by BP Overseas Development Company Limited)	Geneva Place, 2nd Floor, #333 Waterfront Drive, Road Town, Tortola, British Virgin Islands Tel : 284 494 4388
	Cayman Islands							
116	Pan-Western Energy Corporation LLC	Investment in power business	USD 100,000	USD 100,000	10,000,000	0.01	100.00% (held by Banpu Power Investment Co., Ltd.)	PO Box 309, Ugland House, Grand Cayman, KY1-1104 Cayman Islands Tel : 1 345 949 8066
	Japan							
117	Aizu Land Solar G.K.	Land owner of Solar project	NA	JYP 100,000	NA	No par value*	100.00% (held by Aura Land Development Pte., Ltd.)	Kasumigaseki Building, 33rd Floor, 3-2-5, Kasumigaseki, Chiyoda-ku, Tokyo, Japan 100-6033 Tel : 81 3 6205 4665
118	Banpu Power Trading G.K.	Energy Trading	NA	JYP 100,000,000	NA	No par value*	100.00% (held by Banpu Renewable Singapore Pte. Ltd.)	Kasumigaseki Building, 33rd Floor, 3-2-5, Kasumigaseki, Chiyoda-ku, Tokyo, Japan 100-6033 Tel : 81 3 6205 4665

	Company	Type of Business	Authorized Capital	Paid-up Capital	No. of Paid-up Capital (Shares)	Par Value per Share	% of Holding	Address
119	Banpu Japan K.K..	Investment in renewable energy business	NA	JYP 83,500,000	13,700	No par value*	100.00% (held by Banpu NEXT Co., Ltd.)	Kasumigaseki Building, 33rd Floor, 3-2-5, Kasumigaseki, Chiyoda-ku, Tokyo, Japan 100-6033 Tel : 81 3 6205 4665
	United States of America							
120	Banpu North America Corporation	Investment in oil and gas business	USD 938,000,100	USD 938,000,100	938,000,100	1	100.00% (held by BOG Co., Ltd.)	2711 Centerville Road, Suite 400, Wilmington, Delaware 19808 Tel : 1 302 654 7584
121	BKV Corporation	Investment in oil and gas business	USD 3,000,000,000	USD 1,170,840,000	117,084,000	0.01	96.30% (held by Banpu North America Corporation)	1200 17th Street, Suite 2100, Denver, Colorado 80202 Tel : 1 720 375 9680
122	Kalnin Venture LLP	Investment in oil and gas business	USD NA	USD 18,576,245	NA	No par value*	100.00% (held by BKV Corporation)	1200 17th Street, Suite 2100, Denver, Colorado 80202 Tel : 1 720 375 9680
123	BKV LLP	Investment in oil and gas business	USD NA	USD 228,906,976	NA	No par value*	100.00% (held by BKV Corporation)	1200 17th Street, Suite 2100, Denver, Colorado 80202 Tel : 1 720 375 9680
124	BKV Chaffee Corners, LLC	Investment in oil and gas business	USD NA	USD 109,529,841	NA	No par value*	100.00% (held by BKV LLP)	1200 17th Street, Suite 2100, Denver, Colorado 80202 Tel : 1 720 375 9680
125	BKV Chelsea, LLC	Investment in oil and gas business	USD NA	USD 205,285,594	NA	No par value*	100.00% (held by BKV LLP)	1200 17th Street, Suite 2100, Denver, Colorado 80202 Tel : 1 720 375 9680
126	BKV Operating, LLC	Investment in oil and gas business	USD NA	USD 195,541,343	NA	No par value*	100.00% (held by BKV LLP)	1200 17th Street, Suite 2100, Denver, Colorado 80202 Tel : 1 720 375 9680
127	BKV Barnett, LLC	Investment in oil and gas business	USD NA	USD 406,000,000	NA	No par value*	100.00% (held by BKV LLP)	1200 17th Street, Suite 2100, Denver, Colorado 80202 Tel : 1 720 375 9680
128	Banpu Innovation & Ventures LLC	Research and development in disruptive technology	USD 1,000,000	USD 1,000,000	1,000,000	No par value*	100.00% (held by Banpu Innovation & Ventures (Singapore) Pte. Ltd.)	1150 North Market Street, Suite 1300, Wilmington, Delaware 19801 Tel : 1 302 427 7650
	Vietnam							

	Company	Type of Business	Authorized Capital	Paid-up Capital	No. of Paid-up Capital (Shares)	Par Value per Share	% of Holding	Address
129	BPP Vinh Chau Wind Power Limited Liability Company	Wind Power Production, Power transmission and distribution	VND 427,395,900,000	VND 427,395,900,000	NA	No par value*	100.00% (held by BRE Singapore Pte. Ltd.)	22 Bui Thi Xuan Street, Quarter 1, Ward 2, Soc Trang City, Soc Trang Province, Vietnam Tel : 849 0988 5015
130	Banpu Vietnam LLC	Management consulting services (Except for financial, accounting and legal consultancy)	VND 23,000,000,000	VND 23,000,000,000	NA	No par value*	100.00% (held by Banpu Public Company Limited)	8th Floor, Friendship Tower, 31 Le Duan Street, Ben Nghe Ward, District 1, Ho Chi Minh City, Vietnam Tel : 849 0748 4047
	Associated Companies							
	Australia							
131	Port Kembla Coal Terminal Limited	Ship loading Coal Port	AUD 600,000	AUD 600,000	600,000	1	16.66% (held by Centennial Coal Co., Ltd.)	Port Kembla Road, Inner Harbour , Wollongong NSW 2520, Australia Tel : 61 2 4288 0288
	Japan							
132	FOMM Corporation	Planning, developing, manufacturing and selling of compact electric vehicle	NA	JPY 3,505,170,250	2,046,635	No par value*	21.45% (held by Banpu NEXT Co., Ltd.)	7-7 Shinkawasaki, Saiwai-ku, Kawasaki-shi, Kanagawa 212-0032 Tel : 81 4 4200 4020
133	Global Engineering Co., Ltd.	Electricity sales and resource aggregator of virtual power plant	NA	JYP 304,000,000	3,620,000	No par value*	19.90% (held by Banpu Renewable Singapore Pte. Ltd.)	Nishiko Living Kashii 2nd Floor, 1-1-1, Kashii, Higashi-ku, Fukuoka city, Fukuoka pref. Japan 813-0011 Tel : 81 92 692 7547
	Singapore							
134	Durapower Holdings Pte. Ltd.	Manufacturing of Lithium-Ion Battery (LiB) for EV and Energy Storage System (ESS)	NA	SGD 59,737,835.50	385,699	No par value*	47.68% (held by BPIN Investment Company Limited)	66 Kallang Pudding Road, #05-02 Hor Kew Business Centre, Singapore 349324 Tel : 65 6846 0180
	Thailand							

	Company	Type of Business	Authorized Capital	Paid-up Capital	No. of Paid-up Capital (Shares)	Par Value per Share	% of Holding	Address
135	Urban Mobility Tech Co., Ltd.	Electric vehicle business	Baht 1,442,120	Baht 1,442,120	144,212	10	30.66% Preference Shares (held by Banpu NEXT Co., Ltd.)	256 Soi Soonvijai, Rama IX Soi 17 Road, Bangkapi, Huaykwang, Bangkok 10310, Thailand Tel : 086 887 4796
	Joint Ventures							
	Indonesia							
136	PT Nusantara Timur Unggul	Fuel Distributor	IDR 1,000,000,000	IDR 600,000,000	600	1,000,000	33.34% (held by PT. ITM Indonesia)	Gedung Graha Indramas 4th Fl., Jalan AIP II K.S. Tubun Raya No. 77, Palmerah, West Jakarta Corresponding office: Pondok Indah Office Tower 3, 3rd floor, Jl. Sultan Iskandar Muda, Pondok Indah Kav. V-TA, Jakarta 12310, Indonesia Tel : 6221 29328100
	China							
137	Shanxi Gaohe Energy Co., Ltd.	Coal minig in China	CNY 1,519,860,000	CNY 1,519,860,000	NA	NA	45.00% (held by Asian American Coal, Inc.)	Haojiazhuang Town, Changzhi County, Changzhi City, Shanxi Province, P.R.China Tel : (8610) 5820 3663
138	Hebi Zhong Tai Mining Co., Ltd	Investment in coal mining	CNY 783,330,000	CNY 783,330,000	NA	NA	40.00% (held by Banpu Minerals Co., Ltd.)	Sikuang Industrial Park, Hebiji, Hebei City, Henan Province, P.R.China Tel : (8639) 2291 7401-2
139	Shanxi Lu Guang Power Co., Ltd.	Power generating and sales	CNY 1,745,818,000	CNY 1,500,000,000	NA	NA	30.00% (held by Banpu Power Investment Co., Ltd.)	Songcun Town, Zhangzi County, Changzhi City, Shanxi Province, P.R.China Tel : (86355) 8580511
	Japan							
140	Hokkaido Solar Estate G.K.	Land owner of solar project	NA	JYP 10,000,000	NA	No par value*	60.00% (held by Banpu Energy Services (Thailand) Co., Ltd.)	1-1-7 Moto-akasaka, Minato-ku, Tokyo, Japan Tel : 81 3 3560 1115

	Company	Type of Business	Authorized Capital	Paid-up Capital	No. of Paid-up Capital (Shares)	Par Value per Share	% of Holding	Address
141	Digital Energy Solutions Corporation	Electricity sales and management	NA	JYP 50,000,000	5,000	No par value*	49.00% (held by Banpu Renewable Singapore Pte. Ltd.)	Kasumigaseki Building, 33rd Floor, 3-2-5, Kasumigaseki, Chiyoda-ku, Tokyo, Japan 100-6033 Tel : 81 3 6205 4665
	Lao PDR							
142	Hongsa Power Company Limited	Power generating and sales	USD 927,000,000	USD 927,000,000	92,700,000	10	40.00% (held Banpu Power Public Company Limited)	NNN Building 4th Floor, Room No.D5 Bourichan Road, Phonsinouane Village, Sisattanak District, Vientiane Capital, Lao PDR Tel : 856 (0) 2122 483
143	Phu Fai Mining Company Limited	Mining concession	USD 50,000	USD 50,000	5,000	10	37.50% (held by Banpu Power Public Company Limited)	NNN Building 4 th Floor, Room No.D5 Bourichan Road, Phonsinouane Village, Sisattanak District, Vientiane Capital, Lao PDR Tel : 856 (0) 2122 483
	Singapore							
144	Aura Land Development Pte. Ltd.	Investment in property for solar energy business	NA	USD 3,840,989.20	3,840,988	No par value*	75.00% (held by Banpu Energy Services (Thailand) Co., Ltd.)	8 Marina Boulevard #05-02 Marina Bay Financial Centre, Singapore 018981 Tel : 65 6338 1888
145	Aizu Energy Pte. Ltd.	Investment in renewable energy business	NA	USD 2,271,979,544.11 JPY 17,630,952.87	2,271,979,543 17,630,949	No par value*	75.00% (held by Banpu NEXT Co., Ltd.)	8 Marina Boulevard #05-02 Marina Bay Financial Centre, Singapore 018981 Tel : 65 6338 1888
146	Sunseap Group Pte. Ltd.	Investment in renewable energy business	NA	SGD 13,496,103.63 SGD 323,031,364.05	1,192,407 2,366,387	No par value*	48.63% (held by BPIN Investment Company Limited)	2 Boon Leat Terrace, #04-03/04 Harbourside Building 2, Singapore 119844 Tel : 65 6816 1000
	Thailand							
147	BLCP Power Ltd.	Power generation and sales	Baht 12,010,000,000	Baht 12,010,000,000	120,100,000	100	50.00%	9 I-8 Road, Map Ta Phut Industrial Estate, Muang District, Rayong, Thailand

	Company	Type of Business	Authorized Capital	Paid-up Capital	No. of Paid-up Capital (Shares)	Par Value per Share	% of Holding	Address
							(held by Banpu Coal Power Ltd.)	Tel : 038 925 100
148	G.E.P.P. SA-ARD Co., Ltd.	Integrated waste management platform	Baht 2,666,700	Baht 2,666,700	26,667	100	25.00% (held by Banpu NEXT Co., Ltd.)	559/186 Nonsi Road, Chong Nonsi Subdistrict, Yannawa District, Bangkok, Thailand Tel : 08 4360 2928

Remark: * under Corporate Law

Part 3

Financial information

Comparative financial information for the past 3 years

1. Banpu Consolidated Financial Statement

Starting on January 1, 2013, the Company has determined the currency used in operations (Functional Currency) as the US dollar. (US$), which pursuant to Accounting Standard No. 21 (revised 2009) in topic of the Effects of Changes in Foreign Exchange Rates. The Company Reported financial statements under accounting standard Thai Financial Reporting Standard (TFRS) was first used by the US dollar currencies in preparing the financial statements.

Therefore, The Company offers financial year 2018, year 2019 and year 2020 were denominated in US dollars. (US $)

Banpu Public Company Limited
Statement of Financial Position
As at 31 December 2018,2019 and 2020

US Dollar'000

	31 December 2020	%	31 December 2019 Restated	%	31 December 2018	%
Assets						
Current assets						
Cash and cash equivalents	730,456	7.79	433,183	5.37	607,344	7.18
Investment in debt instruments measured at fair						
Value through profit or loss	11,071	0.12	-	-	-	-
Investment in debt instruments measured at						
amortised cost	156	0.00	-	-	-	-
Short-term investments	-	-	110,302	1.37	7,887	0.09
Trade accounts receivable and notes receivable	249,100	2.66	245,899	3.05	394,731	4.67
Amounts due from related parties	1,104	0.01	168	0.00	205	0.00
Current portion of dividend receivables from						
related parties	25,819	0.28	-	-	10,170	0.12
Inventories, net	101,389	1.08	124,645	1.54	149,632	1.77
Spare parts and machinery supplies, net	29,622	0.32	33,925	0.42	28,196	0.33
Financial derivative assets due in one year	29,961	0.32	17,886	0.22	6,599	0.08
Short-term loans to related parties	60,572	0.65	16,287	0.20	87	0.00
Short-term loans to other companies	558	0.01	2,908	0.04	2,803	0.03
Current portion of deferred exploration and						
overburden expenditures/stripping costs, net	64,505	0.69	97,168	1.20	30,796	0.36
Other current assets	270,450	2.88	280,469	3.48	155,905	1.84
Total current assets	1,574,763	16.79	1,362,840	16.89	1,394,355	16.49
Non-current assets						
Dividend receivables from a related party	9,616	0.10	21,186	0.26	209,642	2.48
Long-term loans to related parties	20,888	0.22	20,132	0.25	17,054	0.20
Investments in joint ventures and associates						
accounted for using the equity method	1,689,950	18.02	1,484,759	18.40	1,374,119	16.25
Other investments, net	-	-	143,674	1.78	148,487	1.76
Investments in equity instruments measured at fair						
value through other comprehensive income	153,415	1.64	-	-	-	-
Investment in equity instrument measured at fair						
Value through profit or loss	-	-	-	-	-	-
Investment property, net	1,549	0.02	1,573	0.02	1,873	0.02
Property, plant and equipment, net	2,580,897	27.52	1,949,862	24.16	1,859,390	22.00
Deferred income tax assets, net	165,679	1.77	158,084	1.96	113,499	1.34
Financial derivative assets, net	9,391	0.10	11,269	0.14	11,125	0.13

Banpu Public Company Limited
Statement of Financial Position
As at 31 December 2018,2019 and 2020

US Dollar'000

	31 December 2020	%	31 December 2019 Restated	%	31 December 2018	%
Non-current assets (continued)						
Deferred exploration and development expenditures and deferred overburden expenditures/stripping costs, net	1,015,594	10.83	920,063	11.40	869,257	10.28
Mining property rights, net	1,358,941	14.49	1,317,836	16.33	1,710,766	20.24
Right-of-use assets, net	71,536	0.76	-	-	-	-
Goodwill	446,748	4.76	397,593	4.93	524,120	6.20
Other non-current assets	277,693	2.96	280,112	3.47	219,906	2.60
Total non-current assets	7,801,897	83.21	6,706,143	83.11	7,059,238	83.51
Total Asset	**9,376,660**	**100.00**	**8,068,983**	**100.00**	**8,453,593**	**100.00**

Banpu Public Company Limited
Statement of Financial Position
As at 31 December 2018,2019 and 2020

US Dollar'000

	31 December 2020	%	31 December 2019 Reatated	%	31 December 2018	%
Liabilities and equity						
Current liabilities						
Short-term loans from financial institutions	827,518	8.83	454,861	5.64	511,873	6.06
Trade accounts payable	67,425	0.72	59,632	0.74	115,797	1.37
Accrued interest expenses	25,336	0.27	27,632	0.34	27,735	0.33
Accrued royalty expenses	22,720	0.24	9,828	0.12	11,746	0.14
Accrued overburden and coal transportation costs	60,341	0.64	74,178	0.92	143,001	1.69
Accrued income taxes	4,141	0.04	13,187	0.16	16,909	0.20
Accrued employee benefits	102,798	1.10	87,581	1.09	69,813	0.83
Financial derivative liabilities due in one year	20,727	0.22	2,237	0.03	4,587	0.05
Current portion of long-term borrowings, net	675,305	7.20	363,115	4.50	369,681	4.37
Current portion of debentures, net	133,161	1.42	175,725	2.18	87,818	1.04
Current portion of deferred unfavourable						
contract liabilities, net	7,868	0.08	5,603	0.07	-	-
Current portion of lease liabilities, net	33,482	0.36	-	-	-	-
Other current liabilities	229,947	2.45	285,951	3.54	350,120	4.14
Total current liabilities	2,210,769	23.58	1,559,530	19.33	1,709,080	20.22
Non-current liabilities						
Long-term loans from other company	-	-	-	-	584	0.01
Long-term borrowings, net	2,230,367	23.79	1,796,453	22.26	1,654,831	19.58
Debentures, net	1,516,955	16.18	1,644,182	20.38	1,397,130	16.53
Deferred income tax liabilities, net	150,844	1.61	178,735	2.22	272,031	3.22
Employee benefit obligations	38,875	0.41	57,692	0.71	45,272	0.54
Deferred unfavourable contract liabilities, net	3,126	0.03	12,803	0.16	41,537	0.49
Financial derivative liabilities, net	25,983	0.28	20,827	0.26	18,443	0.22
Lease liabilities, net	17,474	0.19	-	-	-	-
Provision for decommissioning, restoration, and						
mine and natural gas rehabilitation	300,788	3.21	-	-	-	-
Other liabilities	66,452	0.71	163,846	2.03	140,157	1.66
Total non-current liabilities	4,350,864	46.40	3,874,538	48.02	3,569,985	42.23
Total liabilities	6,561,633	69.98	5,434,068	67.35	5,279,065	62.45

Banpu Public Company Limited
Statement of Financial Position
As at 31 December 2018,2019 and 2020

US Dollar'000

	31 December 2020	%	31 December 2019 Restated	%	31 December 20218	%
Liabilities and equity (continued)						
Equity						
Share capital						
Registered share capital						
5,074,581,515 ordinary shares						
at par of Baht 1 each						
(31 December 2019:						
5,161,925,515 ordinary shares						
Issued and paid-up share capital						
5,074,581,515 ordinary shares						
at paid-up of Baht 1 each						
(31 December 2019:						
5,161,925,515 ordinary shares	147,424	1.57	149,961	1.86	149,961	1.77
Premium on share capital	443,624	4.73	443,624	5.50	443,624	5.25
Share-based payment	1,651	0.02	1,562	0.02	1,343	0.02
Retained earnings						
Appropriated						
- Legal reserve	95,543	1.02	95,976	1.19	95,976	1.14
- Other reserves	107,317	1.14	149,089	1.85	83,399	0.99
Unappropriated	1,630,812	17.39	1,749,684	21.68	1,942,779	22.98
Less Treasury stocks	-	-	(38,138)	(0.47)	-	-
Other components of equity	(350,806)	(3.74)	(523,272)	(6.48)	(157,422)	(1.86)
Equity attributable to owners of the Parent	2,075,565	22.14	2,028,486	25.14	2,559,660	30.28
Non-controlling interests	739,462	7.89	606,429	7.52	614,868	7.27
Total equity	2,815,027	30.02	2,634,915	32.65	3,174,528	37.55
Total liabilities and equity	**9,376,660**	**100.00**	**8,068,983**	**100.00**	**8,453,593**	**100.00**

Banpu Public Company Limited
Statement of Comprehensive Income
As at 31 December 2018,2019 and 2020

US Dollar'000

	31 December 2020	% Of income	31 December 2019 Restated	% Of income	31 December 2018	% Of income
รายได้รวม	**2,572,597**	**100.00**	**3,138,471**	**100.00**	**3,809,671**	**100.00**
Sales and service income	2,282,635	88.73	2,759,217	87.92	3,481,442	91.38
Cost of sales and services	(1,822,239)	(70.83)	(2,051,191)	(65.36)	(2,252,967)	(59.14)
Gross profit	**460,396**	**17.90**	**708,026**	**22.56**	**1,228,475**	**32.25**
Dividend income from other investments	-	-	1,129	0.04	999	0.03
Dividend income from investments in equity	1,794	0.07	-	-	-	-
Management fee and other income	39,550	1.54	126,192	4.02	55,246	1.45
Interest income	9,539	0.37	12,736	0.41	8,322	0.22
Selling expenses	(141,477)	(5.50)	(194,732)	(6.20)	(181,614)	(4.77)
Administrative expenses	(224,001)	(8.71)	(244,505)	(7.79)	(237,222)	(6.23)
Indemnity payment	-	-	-	-	(86,049)	(2.26)
Investment restructuring expense	(30,842)	(1.20)	-	-	-	-
Royalty fee	(182,561)	(7.10)	(240,626)	(7.67)	(290,940)	(7.64)
Net gains (losses) from financial derivatives	22,681	0.88	33,352	1.06	(62,587)	(1.64)
Net gains (losses) on exchange rate	81,063	3.15	(95,050)	(3.03)	(18,980)	(0.50)
Interest expenses	(173,153)	(6.73)	(182,206)	(5.81)	(170,311)	(4.47)
Other finance costs	(6,375)	(0.25)	(5,428)	(0.17)	(4,977)	(0.13)
Share of profit from joint ventures and associates	135,335	5.26	205,845	6.56	263,662	6.92
Profit (loss) before income taxes	(8,051)	(0.31)	124,733	3.97	504,024	13.23
Income taxes	(8,679)	(0.34)	(78,212)	(2.49)	(189,141)	(4.96)
Profit (loss) for the year	(16,730)	(0.65)	46,521	1.48	314,883	8.27
Other comprehensive income (expense), net of taxes:						
Items that will not be reclassified to profit or loss						
- Remeasurements of post-employment benefit obligations	(1,027)	(0.04)	(2,643)	(0.08)	2,397	0.06
- -Changes in fair value of equity instruments at fair value through OCI	(7,928)	(0.31)	-	-	-	-
- Share of other comprehensive income (expense) from a joint venture and associates for using the equity method	4,966	0.19	(434)	(0.01)	(2)	(0.00)
- Translation differences	-	-	-	-	-	-
Total items that will not be reclassified to profit or loss, net of taxes	(3,989)	(0.16)	(3,077)	(0.10)	2,395	0.06

Banpu Public Company Limited
Statement of Comprehensive Income
As at 31 December 2018,2019 and 2020

US Dollar'000

	31 December 2020	% Of income	31 December 2019 Restated	% Of income	31 December 2018	% Of income
Items that will be reclassified subsequently to profit or loss						
- Gains on remeasuring available-for-sale	-	-	23	0.00	(1,934)	(0.05)
- Losses on cash flow hedge reserve	(1,351)	(0.05)	(18,171)	(0.58)	(10,246)	(0.27)
- Gains (losses) on net investment hedge	(77,815)	(3.02)	-	-	-	-
- Share of other comprehensive income (expenses) from joint ventures and associates for using the equity method	42,796	1.66	61,127	1.95	(11,612)	(0.30)
- Translation differences	194,395	7.56	(19,513)	(0.62)	(125,432)	(3.29)
Total items that will be reclassified subsequently to profit or loss, net of taxes	158,025	6.14	23,466	0.75	(149,224)	(3.92)
Other comprehensive income (expense) for the year, net of taxes	154,036	5.99	20,389	0.65	(146,829)	(3.85)
Total comprehensive income (expense) for the year	137,306	5.34	66,910	2.13	168,054	4.41
Attributable to:						
Owners of the Parent	(55,739)	(2.17)	(14,478)	(0.46)	205,475	5.39
Non-controlling interests	39,009	1.52	60,999	1.94	109,408	2.87
	(16,730)	(0.65)	46,521	1.48	314,883	8.27
Total comprehensive income (expense) attributable to:						
Owners of the Parent	85,348	3.32	(9,994)	(0.32)	61,168	1.61
Non-controlling interests	51,958	2.02	76,904	2.45	106,886	2.81
	137,306	5.34	66,910	2.13	168,054	4.41
Gain (Losses) per share						
Basic losses per share	(0.01)		(0.00)		0.04	
Diluted earnings per share					0.04	

Banpu Public Company Limited
Statement of Cash flows
As at 31 December 2018,2019 and 2020

US Dollar'000

	2020	2019 Restated	2018
Cash flows from operating activities			
Profit for the year before income taxes	(8,051)	124,733	504,024
Adjustment to reconcile profit before taxes to			
-cash receipts from (payments in) operations	432,767	339,259	326,334
-Depreciation and amortization	2,857	1,129	1,863
-Write-off property, plant and equipment	2,326	-	
-Write-off of right-of-use assets	4,492	-	-
-Write-off of deferred exploration and development expenditures	-	94	-
-Write-off other investment	996	(2,554)	2,131
-Allowance for slow-moving of spare parts and machinery supplies	-	(4,042)	4,042
-Allowance for net realisable value of inventory	2,951	-	-
-Expected credit loss	173,153	182,206	170,311
-Interest expenses	6,375	5,428	4,977
-Other finance costs	(9,539)	(12,736)	(8,322)
-Interest income	(135,335)	(205,845)	(263,662)
-Share of profit from joint ventures and associates	-	3	-
-Loss from liquidation of a joint venture	-	(1,129)	(999)
-Dividend income from other investments	(1,794)	-	-
-Dividend income from investments in equity instruments	(2,856)	(84)	(2,828)
-Net gains on disposal of property, plant and equipment	-	-	-
-Gains from measuring fair value of financial asset through profit or loss	-	(40,096)	-
-Gains from disposal of asset held for sales	-	318	-
-Donation of investment property	(11,471)	(50,451)	-
-Net gain from acquisition of additional interest	-	-	(30,672)
-Bargain purchase from business acquisition	30,842	-	-
-Investment restructuring expense	109	260	404
-Share based payment expenses	(22,681)	(33,352)	62,587
-Net (gains) losses from financial derivatives	8,523	116,181	(45,036)
Cash flow before changes in working capital	473,664	419,322	725,154
Changes in working capital (net of effects from acquisition and disposal of subsidiaries)			
-Trade accounts receivable and notes receivable	3,737	168,063	(84,282)
-Amounts due from related parties	(14)	149	398
-Advances to related parties	-	3	314
-Inventories	37,411	37,171	(28,252)

Banpu Public Company Limited
Statement of Cash flows
As at 31 December 2018,2019 and 2020

US Dollar'000

	2020	2019 Restated	2018
-Spare parts and machinery supplies	4,566	(2,889)	(1,200)
-Other current assets	(65,712)	(39,878)	(1,772)
-Deferred exploration and development expenditures and deferred overburden expenditures/stripping costs	49,270	31,844	(71,216)
-Other non-current assets	15,373	14,514	6,778
-Trade accounts payable	3,715	(73,467)	2,152
-Accrued overburden and coal transportation costs	(13,837)	(68,823)	39,800
-Accrued royalty expenses	12,892	(1,918)	(7,204)
-Employee benefits obligation	(13,259)	20,730	2,856
-Other current liabilities	(68,076)	(64,275)	85,009
-Other non-current liabilities	20,811	9,182	1,605
Cash generated from operating activities	460,541	449,728	670,140
-Interest paid and financial charges paid	(183,389)	(186,283)	(174,652)
-Income tax paid	(77,826)	(139,711)	(135,029)
-Income tax refund	11,408	242	51,225
Net cash receipts from operating activities	210,734	123,976	411,684

Banpu Public Company Limited
Statement of Cash flows
As at 31 December 2018,2019 and 2020

US Dollar'000

	2020	2019 Restated	2018
Cash flows from investing activities			
Cash receipts from short-term investments	-	54,011	1,427
Cash payments for short-term investments	-	(154,930)	-
Cash receipts from financial assets measured at fair value through profit or loss	27,969	-	-
Cash payments for financial assets measured at fair value through profit or loss	(35,363)	-	-
Cash receipts from financial assets measured at amortised cost	102,334	-	-
Cash receipts from short-term loan to a related party	7,101	6,383	749
Cash payments for short-term loan to related parties	(48,411)	(22,535)	(825)
Cash receipts from long-term loan to a related party	15	2,093	2,622
Cash payments for long-term loan to a related party	-	(424)	(797)
Cash payments for short-term loan to other company	-	(104)	(2,803)
Net cash payments for business combination	-	-	-
Cash payments for additional of investments in joint ventures and an associate	(85,829)	(59,847)	(176,887)
Cash receipts from reduction of other investments	-	16,905	-
Cash payments for purchase of other investments	-	(15,581)	(32,801)
Cash receipts from financial assets measured at fair value through other comprehensive income	18,924	-	-
Cash payments for financial assets measured at fair value through other comprehensive income	(11,487)	-	-
Cash payments for investment restructuring	(8,243)	-	-
Cash payments for purchase of property, plant and equipment	(629,084)	(297,491)	(273,176)
Cash receipts from disposal of property, plant and equipment	15,819	14,564	12,882
Cash payments for right-of-use assets	(3,770)	-	-
Cash payments for deferred exploration and development expenditures deferred overburden expenditures/stripping costs	(183,395)	(239,005)	(130,508)
Interest received	8,806	12,388	8,538
Cash receipts from dividends from joint ventures and associates	60,000	413,008	148,273
Cash receipts from dividends from other investments	-	1,129	999
Cash receipts from dividends from investments in equity instruments	1,794	-	-
Cash payments for placement of restricted deposits at banks	69,247	(78,958)	(10,401)
Net cash payments in investing activities	(693,573)	(348,394)	(452,708)

Banpu Public Company Limited
Statement of Cash flows
As at 31 December 2018,2019 and 2020

US Dollar'000

	2020	2019 Restated	2018
Cash flows from financing activities			
Cash receipts from short-term loans from financial institutions	1,389,176	1,057,991	872,232
Repayments of short-term loans from financial institutions	(1,032,162)	(1,130,829)	(775,225)
Cash payments for finance leases	-	(3,944)	(9,930)
Cash repayment of short-term loans from a related party	-	-	(1,248)
Cash receipts from long-term loans from financial institutions	1,023,507	335,306	497,644
Repayments of long-term loans from financial institutions	(301,141)	(212,197)	(276,349)
Cash receipts from debentures	-	313,983	50,000
Cash payments for debentures	(170,076)	(89,485)	(177,867)
Cash receipts from increase in share capital of a subsidiary from non-controlling interests	-	-	2,023
Cash payments for treasury shares of a subsidiary	(1,320)	(38,138)	-
Dividend paid to shareholders	(63,758)	(115,615)	(112,483)
Dividend paid to non-controlling interests of subsidiaries	(33,541)	(83,959)	(94,191)
Cash payments for lease liabilities	(39,116)	-	-
Net cash receipts from (payments in) financing activities	771,569	33,113	(25,394)
Net increase (decrease) in cash and cash equivalents	288,730	(191,305)	(66,418)
Exchange gains (losses) on cash and cash equivalents	8,543	17,144	(9,314)
Cash and cash equivalents at beginning of the year	433,183	607,344	683,076
Cash and cash equivalents at end of the year	730,456	433,183	607,344
Supplementary of cash flows			
Significant non-cash transactions are as follows:			
Other payables and finance lease from purchase of property, plant and equipment	28,990	28,205	20,909
Purchase consideration for business acquisition			
- Other payables from business acquisition	-	2,182	-
Options over non-controlling interests from restructuring activities in gas business	42,288	-	-
Other receivables from disposal of assets held for sale	-	29,398	-
Transfer of advance payment for developing solar power plant projects	-	-	9,149
Increase in deferred exploration and development expenditures	-	-	6,486
Other receivables from disposal of machinery and equipment	-	-	2,053
Acquisitions and remeasurement of right-of-use assets	-	-	-