# CARBON DATED?

## THE PROSPECTS FOR AN EXIT FROM COAL IN THE MEKONG REGION

## หมดยุคคาร์บอน?
โอกาสการปลดระวางถ่านหิน
ในภูมิภาคลุ่มน้ำโขง

GREENPEACE

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# Executive summary

This report addresses the latest dynamics of the coal industry, seeing both how it sits next to global action for an energy transition and also specifically within the energy systems of countries in the Mekong region, namely Cambodia, Laos, Myanmar, Thailand, and Vietnam.

## Chapter 1
## takes a broad view of recent developments for an energy transition.

- At COP 26, held in November 2021, there were positive, albeit laboured, moves to exit coal, notably calling to 'phase down' rather than 'phase out' the fuel. A series of pledges were signed to address, amongst other issues, methane emissions, the transition from coal to clean power, and forest and land use. The contribution by Mekong countries was poor, with only Vietnam signing up for selected energy-related commitments. The worst performer was Thailand, merely rounding down a net-zero commitment to 2065.

- Recent updates to Nationally Determined Contributions (NDCs) by Mekong countries are also unsatisfactory. At best they flesh out details on unchanged commitments (Cambodia and Laos), whereas the efforts of Thailand and Vietnam have been rated as 'critically insufficient' by Climate Action Tracker. There is a lack of vision and political will to set out a bold strategy for the future, including an energy transition.

- There has been significant progress made through the commitment of key coal financing countries (China, South Korea, and Japan) to end overseas financing of coal plants. This report estimates that 27 proposed plants or plant upgrades (comprising at least 62 units) in countries of the Mekong region could be under threat, with a total capacity of 25.9GW. This compares to an existing capacity (not including small-scale plants) of 32.2GW (42 plants and 102 units). There are also 8 plants under construction having reached financial closure (14 units totalling 8.8GW).

- At the same time, the cost of renewables has decreased significantly. Solar (fixed PV) is now cheaper than gas and coal in Thailand and Vietnam and will soon be followed by (onshore) wind, with both sources to become even cheaper over the coming decades. Together with the potential for job creation, a transition to renewables carries clear economic sense.

- However, despite all this promise, COVID recovery plans have failed to provide a green economic stimulus. There is no Build Back Better here when we consider energy systems and their relation to climate change. Carbon emissions have returned to pre-pandemic levels, there is a rebound in coal trade, and power production from coal could reach an all-time high in 2022.

- Large state power agencies seem reluctant to embrace a clean energy transition, stuck in the known sphere of electricity production using fossil fuels, to which centralised national power systems are set up. The costs of fossil fuel use are propped up by continuing subsidies, and short-term profits remain attractive. In other words, the sector is held back by corporate greed. Meanwhile, coal prices are rising due to post-COVID demand, and sanctions against Russia following the invasion of Ukraine. This can only hurt net importers of coal and gas, such as Vietnam, Thailand, and Cambodia. On the other hand, an initial investment into renewables can quickly pay huge dividends, contributing US$1 trillion and 5–6 million jobs to the region by 2030.

# Chapter 2
## offers a country-by-country update on the state of coal power in each Mekong country.

This takes into account the latest plans for the energy sector for each country, national deposits for coal, existing and planned coal power plants, and the political context around decision-making processes.

## Cambodia

predicts high increases in electricity demand, particularly for its industrial sector. It has been hit by recent price rises as a net importer of fuel for power production, for example due to low coal reserves. With suspicions around the reliability of hydropower, resulting in a moratorium on new projects until 2030, it has shifted towards fossil fuels in its energy planning. This includes rises in coal from 32% in 2018 to 42% in 2030, and with fossil fuels at 74% overall by 2050. Coal power relies on Chinese funding and technology in Cambodia. There are two operating plants, two under construction (including one planned for a Special Economic Zone within a National Park), and two planned but at risk of failing to achieve financial closure. The country also hopes to import electricity from new coal plants in Sekong province, Laos. In positive news, in October 2021, the Minister of Mines and Energy confirmed that Cambodia would not allow any new coal-fired power stations.

## Laos

hopes to be the battery of Southeast Asia, primarily through hydropower exports, with existing contracts of 9,000MW of electricity to Thailand and 5,000MW to Vietnam. Yet with hydropower proving controversial, the country is looking to diversify its energy portfolio, including solar, wind, and also coal. The main coal plant in Hongsa exports electricity to Thailand, while there are hopes to exploit a large reserve in Sekong province to export to Cambodia, despite concerns this could become a stranded asset. Governance of the energy sector is uncoordinated with conflicting plans produced by different departments. While the Ninth Five-Year Energy and Mines Development Plan 5 (2021–2025) calls for an increase in coal to 30% of the power mix (from 18% of installed power in 2021), a recent speech by the Minister for Energy and Mines potentially walked this back to 14% by 2030, albeit then with increased hydropower.

## Myanmar

has an unclear energy status due to the 2021 military coup and ongoing conflict, which has made it difficult to maintain their national grid. Energy projections do not match reality, for example with coal set for a 20–33% share of the power mix in 2030 when it presently contributes around 1% of electricity. There is one main coal plant in Tigyit. In recent years, 11 contracts were signed for plants together with international companies to make use of the significant coal reserves, yet public opposition contributed to all of these being suspended or cancelled. There is incomplete coverage of electricity through a centralised grid in Myanmar, leaving potential for renewables to fill in geographical gaps. The country is a net exporter of energy, with national elites, including the military, looking to profit from the sale of natural gas to Thailand and China.

## Thailand

has one key state-run coal mine and plant in Mae Moh, Lampang province, and several privately run plants serving industrial sites and using imported coal. There is a shift away from plans for new coal plants, although with increases of natural gas, despite access to dwindling supplies that can be imported. A new 2022 Power Development Plan draft increases the share of renewables, but primarily through increased imports of hydropower, and ignoring the clear potential for domestic solar production. A transition to renewables is held back by power overcapacity, and a reluctance to switch to a smart decentralised energy system.

## Vietnam

has a schizophrenic identity as the regional leader in coal power yet also a model in the transition to renewables. It has the world's largest coal pipeline after China and India, in 2021 accounting for 36% of total installed power, supported by a 3.4 billion ton estimated reserve (by far the highest in the region) and a dependency of further imports. In 2020, 55.4 million tons of coal were imported, which compares to 23.9 million tons imported to Thailand. There are:

- 30 large-scale coal plants (>30MW) with 74 units at 22.8GW
- 6 plants under construction with 12 units at 8.0GW
- 21 plants with minimum 50 units at 21.2GW that are under threat from changes in global financing and domestic energy policy

Vietnam still awaits its new Power Development Plan 8, which has been redrafted several times since the first draft in March 2021. The October 2021 draft increased the planned 2030 share of coal to 40.6%. However, commitments from pledges at COP26 must now be incorporated into the plan, such as a pledge to stop all new coal. The positive news concerns the huge growth in solar since 2018, catalysed by a high feed-in tariff, giving Vietnam the 7th highest global capacity. There are now restrictions to further growth due to the inability of grid infrastructure development to keep pace. However, in 2021 3.5GW of wind capacity was added.

## Chapter 3
## concentrates on the case of Thailand, looking at the various ways the country and its private firms engage with the coal industry, in ways not apparent in government planning.

- Many Thai energy companies are moving into renewable energy and electric vehicles but more to gain a foothold in the sector and promote sustainable practices rather than give up core business in fossil fuels. Yet the development of renewables at home is being held back by a stalling economy, power overcapacity, insufficient grid development, the insistence on a centralised power system, and unfavourable domestic policy. This is despite several models showing how a transition can work, including a new model by academics predominantly based at Thammasat University, Bangkok, to phase out all fossil fuel use by 2050 by focusing on solar and battery storage. As a result, Thai companies are investing in renewables abroad, for example, in solar in Vietnam.

- There has been an increasing amount (in absolute and proportional terms) of coal imported into Thailand, feeding private sector power plants and factories. In 2020, 23.9 million tons were imported, the main export countries being Indonesia, Australia, and Russia. Most coal travels to distribution centres in Nakon Luang district, Ayutthaya province, a journey full creating water and air pollution. But there is 0% import tax and no excise tax placed on coal imports, a huge regulatory gap that fails to account for the environmental costs of the fuel.

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- The German NGO Urgewald has collated global investment into its list of around 2,800 coal parent companies and subsidiaries. Using this data, it is possible to extract a list of three types of Thai investors:

    - 12 Thai institutions hold bonds or shares totalling US$6.9 billion in coal companies. The two highest investors by a significant margin are Krung Thai Bank and investment company MFC Asset Management. Both invest over US$2 billion.

    - From January 2019 to November 2021, two commercial banks (Bangkok Bank and TMBThanchart Bank) provide loans totalling US$1.17 billion to coal companies from Indonesia and Vietnam.

    - Over the same period, 18 commercial banks provided underwriting services to six domestic coal companies for a total of US$2.49 billion. The key underwriters are Bangkok Bank, Krung Thai Bank, Siam Commercial Bank, and Kasikornbank.

The report concludes with a warning that there is no immediate prospect for an exit from coal in the Mekong region. Yet the fact is that we have the knowledge, the country experiences, and the power generation models to achieve the transition to a carbon-free energy system. This transition will be beneficial both in terms of the resulting economic return and job creation.

# บทสรุปรายงาน

รายงานนี้แสดงให้เห็นถึงความเป็นไปล่าสุดของอุตสาหกรรมถ่านหินในฐานะความท้าทายของปฏิบัติการระดับโลกว่าด้วยการเปลี่ยนผ่านทางพลังงาน โดยเฉพาะอย่างยิ่งในระบบพลังงานของกลุ่มประเทศลุ่มน้ำโขง 5 ประเทศ คือ กัมพูชา ลาว เมียนมา ไทย และเวียดนาม

## บทที 1
## ภาพรวมของสถานการณ์ล่าสุดว่าด้วยการเปลี่ยนผ่านทางพลังงาน

- ที่ COP 26 ในเดือนพฤศจิกายน ปี 2564 มีการขับเคลื่อนที่ต้องลงแรงและมีผลเชิงบวกเพื่อยุติถ่านหิน โดยใช้คำว่า 'ค่อย ๆ ลด (phase down)' แทนคำว่า 'ปลดระวาง (phase out)' มีการลงนามในปฏิญญาหลายฉบับเพื่อแก้ไขปัญหาต่าง ๆ รวมถึง การปล่อยก๊าซมีเทน การเปลี่ยนผ่านจากถ่านหินสู่พลังงานหมุนเวียน ป่าไม้และการใช้ที่ดิน แต่การมีส่วนร่วมของกลุ่มประเทศลุ่มแม่น้ำโขงนั้นยังไม่ดีนัก มีเพียงเวียดนามเท่านั้นที่ลงนามในพันธกรณีด้านพลังงาน และเป้าหมายที่ช้าที่สุดเป็นของประเทศไทยที่ประกาศเป้าหมายการปล่อยก๊าซเรือนกระจกสุทธิเป็นศูนย์ (Net Zero) ภายในปี 2608

- ความเคลื่อนไหวล่าสุดในเรื่องแผนที่นำทางในการลดก๊าซเรือนกระจกระดับประเทศหรือ Nationally Determined Contributions (NDCs) ของกลุ่มประเทศลุ่มน้ำโขงนั้นยังไม่เป็นที่น่าพอใจ ประเทศเหล่านี้ทำได้ดีที่สุดเพียงให้รายละเอียดถึงพันธกรณีที่ไม่เปลี่ยนแปลง (กัมพูชาและลาว) ในขณะที่ความพยายามของไทยและเวียดนามถูกจัดอยู่ในระดับ 'ไม่เพียงพออย่างยิ่ง' จากการวิเคราะห์ของ Climate Action Tracker (CAT) เนื่องจากยังคงขาดวิสัยทัศน์และเจตจำนงทางการเมืองที่จะกำหนดกลยุทธ์ที่ชัดเจนสำหรับอนาคต ซึ่งรวมถึงการเปลี่ยนผ่านทางพลังงาน

- มีความคืบหน้าอย่างมากจากพันธกรณีของกลุ่มประเทศที่ให้เงินกู้โครงการโรงไฟฟ้าถ่านหิน (จีน เกาหลีใต้ และญี่ปุ่น) ในการยุติการให้เงินกู้โครงการโรงไฟฟ้าถ่านหินนอกประเทศของตน รายงานนี้ประมาณการว่า มีโครงการโรงไฟฟ้าถ่านหินและแผนทดแทนโรงไฟฟ้าถ่านหินเดิม รวมกัน 27 โครงการ (ประกอบด้วย 62 หน่วยผลิตไฟฟ้าเป็นอย่างต่ำ) รวมกำลังผลิตไฟฟ้า 25.9 กิกะวัตต์ ในกลุ่มประเทศลุ่มแม่น้ำโขงอาจได้รับผลกระทบจากการยุติการให้เงินกู้ดังกล่าวนี้เมื่อเปรียบเทียบกับกำลังผลิตไฟฟ้าที่มีอยู่ (ไม่รวมโรงไฟฟ้าถ่านหินขนาดเล็ก) ที่ 32.2 กิกะวัตต์ (42 โรงไฟฟ้าและ 102 หน่วยผลิตไฟฟ้า) นอกจากนี้ ยังมีโรงไฟฟ้าถ่านหินที่อยู่ระหว่างการก่อสร้างอีก 8 แห่งซึ่งเสร็จสิ้นการสนับสนุนงบทางการเงินแล้ว (14 หน่วยไฟฟ้า กำลังการผลิตไฟฟ้ารวม 8.8 กิกะวัตต์)

- ในขณะเดียวกัน ต้นทุนของพลังงานหมุนเวียนก็ลดลงอย่างมาก แผงโซลาร์เซลล์มีราคาถูกกว่าก๊าซฟอสซิลและถ่านหินทั้งในไทยและเวียดนาม และในไม่ช้า ต้นทุนพลังงานลมบนฝั่งก็จะลดลงตามไปด้วย โดยแหล่งพลังงานทั้งสองจะมีต้นทุนลดลงอีกในทศวรรษหน้า เมื่อพิจารณาถึงศักยภาพการจ้างงาน การเปลี่ยนผ่านไปสู่พลังงานหมุนเวียนที่สะอาดจะส่งผลดีต่อเศรษฐกิจอย่างชัดเจน

- หน่วยงานรัฐวิสาหกิจด้านพลังงานขนาดใหญ่ ดูเหมือนลังเลใจที่จะยอมรับการเปลี่ยนผ่านสู่ระบบพลังงานหมุนเวียน ยังคงยึดโยงอยู่กับการผลิตไฟฟ้าโดยใช้เชื้อเพลิงฟอสซิลซึ่งทำให้ระบบพลังงานของประเทศยิ่งรวมศูนย์มากขึ้น ต้นทุนการใช้เชื้อเพลิงฟอสซิลยังคงมาจากเงินสนับสนุนของรัฐบาลมากขึ้นอย่างต่อเนื่องและผลตอบแทนระยะสั้นยังคงน่าดึงดูดกล่าวอีกนัยหนึ่งภาคพลังงานยังคงถูกยึดกุมด้วยความโลภของบริษัท

- ในขณะเดียวกันราคาถ่านหินก็ปรับตัวสูงขึ้นจากความต้องการใช้ที่มากขึ้นหลังการระบาดของโควิด-19และมาตรการคว่ำบาตรต่อรัสเซียภายหลังการรุกรานยูเครน ยังส่งผลกระทบต่อประเทศผู้นำเข้าถ่านหินและก๊าซฟอสซิล เช่น เวียดนาม ไทย และกัมพูชา ในทางกลับกัน การลงทุนเริ่มแรกในพลังงานหมุนเวียนสามารถสร้างผลตอบแทนจำนวนมากได้อย่างรวดเร็วราว 1 ล้านล้านเหรียญสหรัฐ และก่อให้เกิดการจ้างงาน 5-6 ล้านตำแหน่งในภูมิภาคนี้ภายในปี 2573

# บทที่ 2
# ข้อมูลล่าสุดเกี่ยวกับสถานะการใช้ถ่านหินในระบบการผลิตไฟฟ้าของแต่ละประเทศในลุ่มน้ำโขง

โดยพิจารณาถึงแผนพลังงานล่าสุดของแต่ละประเทศ แหล่งสำรองถ่านหิน โรงไฟฟ้าถ่านหินที่ดำเนินการอยู่และที่วางแผนก่อสร้าง และบริบททางการเมืองของกระบวนการตัดสินใจ

## กัมพูชา

คาดการณ์ว่าความต้องการใช้ไฟฟ้าเพิ่มสูงขึ้นโดยเฉพาะในภาคอุตสาหกรรมของกัมพูชา เนื่องจากได้รับผลกระทบจากราคาที่เพิ่มสูงขึ้นในฐานะเป็นประเทศผู้นำเข้าเชื้อเพลิงฟอสซิลในการผลิตไฟฟ้า เนื่องจากมีปริมาณสำรองถ่านหินต่ำ ความคลางแคลงใจต่อความน่าเชื่อถือของเขื่อนผลิตไฟฟ้าส่งผลให้เกิดการชะลอโครงการเขื่อนผลิตไฟฟ้าแห่งใหม่ออกไปจนถึงปี 2573 นำไปสู่การขยายตัวของเชื้อเพลิงฟอสซิลในแผนพลังงาน ซึ่งรวมถึงการเพิ่มถ่านหินจากร้อยละ 32 ในปี 2561 เป็นร้อยละ 42 ในปี 2573 และเชื้อเพลิงฟอสซิลโดยรวมที่ร้อยละ 74 ภายในปี 2593

ในกัมพูชา โรงไฟฟ้าถ่านหินต้องอาศัยเงินกู้และเทคโนโลยีจากจีน ขณะนี้ มีโรงไฟฟ้าถ่านหินที่ดำเนินการแล้ว 2 แห่ง ที่อยู่ในระหว่างการก่อสร้าง 2 โครงการ (รวมถึงโครงการโรงไฟฟ้า 1 โครงการของเขตเศรษฐกิจพิเศษที่ตั้งอยู่ภายในเขตอุทยานแห่งชาติ) ส่วนโครงการโรงไฟฟ้าถ่านหินอีก 2 โครงการนั้นเสี่ยงที่จะล้มเหลวจากการยุติการให้เงินกู้ กัมพูชายังหวังที่จะนำเข้าไฟฟ้าจากโรงไฟฟ้าถ่านหินแห่งใหม่ในจังหวัดเซกอง สปป.ลาว ข่าวดี คือ ในเดือนตุลาคม ปี 2564 รัฐมนตรีว่าการกระทรวงเหมืองแร่และพลังงานยืนยันว่ากัมพูชาจะไม่อนุญาตให้มีการก่อสร้างโรงไฟฟ้าถ่านหินแห่งใหม่

## สปป. ลาว

สปป.ลาววาดหวังที่จะเป็นแบตเตอรี่ของเอเชียตะวันออกเฉียงใต้ โดยการส่งออกไฟฟ้าที่ผลิตจากเขื่อนเป็นหลัก ด้วยสัญญาผลิตไฟฟ้าในปัจจุบันจำนวน 9,000 เมกะวัตต์ส่งให้กับไทย และ 5,000 เมกะวัตต์ส่งให้กับเวียดนาม แต่เขื่อนผลิตไฟฟ้ามีความขัดแย้งมากขึ้น สปป.ลาวจึงพิจารณาถึงการกระจายการผลิตไฟฟ้าในแผนพลังงานของตน รวมถึง แสงอาทิตย์ ลม และถ่านหิน

โรงไฟฟ้าลิกไนต์หงสาผลิตไฟฟ้าส่งออกไปยังไทยเป็นหลัก ในขณะที่มีความหวังที่จะใช้ประโยชน์จากแหล่งสำรองถ่านหินอันกว้างใหญ่ในจังหวัดเซกองสำหรับโครงการโรงไฟฟ้าถ่านหินแห่งใหม่ที่นั่นเพื่อส่งออกไปยังกัมพูชาท่ามกลางข้อกังวลว่าโครงการดังกล่าวนี้อาจกลายเป็นสินทรัพย์ที่เป็นภาระทางการเงินในอนาคต

ระบบธรรมาภิบาลในภาคพลังงานของ สปป.ลาว ไม่สอดประสานและไปคนละทิศคนละทาง แผนการต่างๆ ของแต่ละหน่วยงานรัฐต่างก็ย้อนแย้งกันเอง ในขณะที่แผนพัฒนาพลังงานและเหมืองแร่ 5 ปี ฉบับที่ 9 (2564–2568) ต้องการเพิ่มถ่านหินเป็นร้อยละ 30 ของสัดส่วนพลังงาน (จากร้อยละ 18 ของ กำลังผลิตติดตั้งในปี 2564) คำปราศรัยล่าสุดของรัฐมนตรีว่าการกระทรวงพลังงานและเหมืองแร่ระบุว่าสัดส่วนถ่านหินอาจลดลงมาที่ร้อยละ 14 ภายในปี 2573 โดยขยายการผลิตไฟฟ้าจากโครงการเขื่อนเพิ่มขึ้น

## เมียนมา

สถานะของระบบพลังงานของเมียนมาไม่ชัดเจนอันเนื่องมาจากการรัฐประหารในปี 2564 และความขัดแย้งภายในประเทศที่เกิดขึ้นอย่างต่อเนื่อง ซึ่งทำให้ยากที่จะรักษาระบบสายส่งไฟฟ้าของประเทศให้อยู่ในสภาพที่ดี

การคาดการณ์พลังงานของเมียนมาเองก็ไม่สอดคล้องกับความเป็นจริง ตัวอย่างเช่น ถ่านหินมีสัดส่วนร้อยละ 20-33 ของระบบการผลิตไฟฟ้าในปี 2573 แต่ในปัจจุบัน การผลิตไฟฟ้าจากถ่านหินมีประมาณร้อยละ 1 มีโรงไฟฟ้าถ่านหินหลัก 1 แห่งที่เมือง Tigyit ในเขตรัฐฉาน ในช่วงไม่กี่ปีที่ผ่านมา มีการลงนามในสัญญา 11 ฉบับเพื่อก่อสร้างโรงไฟฟ้าถ่านหินโดยบริษัทข้ามชาติ เพื่อใช้ประโยชน์จากแหล่งสำรองถ่านหินใต้ดิน แต่การคัดค้านจากสาธารณชนทำให้โครงการโรงไฟฟ้าถ่านหินทั้งหมดถูกระงับหรือยกเลิกอันเนื่องมาจากโครงข่ายไฟฟ้ายังไม่ครอบคลุมพื้นที่ส่วนใหญ่ของเมียนมา จึงมีความเป็นไปได้ที่ระบบพลังงานหมุนเวียนแบบกระจายศูนย์อาจช่วยเติมเต็มช่องว่างนี้ เมียนมาเป็นผู้ส่งออกพลังงานโดยมีชนชั้นนำในประเทศรวมถึงกองทัพแสวงหาผลกำไรจากการขายก๊าซฟอสซิลให้ไทยและจีน

## ไทย

ไทยมีเหมืองถ่านหินลิกไนต์และโรงไฟฟ้าถ่านหินลิกไนต์ที่ดำเนินการโดยการไฟฟ้าฝ่ายผลิตแห่งประเทศไทย(กฟผ.) ที่อำเภอแม่เมาะ จังหวัดลำปาง และมีโรงไฟฟ้าถ่านหินที่ดำเนินการโดยผู้ผลิตไฟฟ้าเอกชน (IPP และSPP) หลายแห่ง ที่ผลิตไฟฟ้าให้กิจการอุตสาหกรรมและใช้ถ่านหินนำเข้าแม้ว่าการเข้าถึงแหล่งถ่านหินที่ลดน้อยลงในประเทศจะชดเชยด้วยการนำเข้าถ่านหินแต่ยังไม่มีข้อเสนอโครงการโรงไฟฟ้าถ่านหินแห่งใหม่ (นอกจากโรงไฟฟ้าทดแทนที่แม่เมาะ) ในขณะที่สัดส่วนของก๊าซฟอสซิลเพิ่มขึ้น

ร่างแผนพัฒนากำลังผลิตไฟฟ้าฉบับใหม่ปี 2565 จะมีสัดส่วนของพลังงานหมุนเวียนมากขึ้น แต่หลัก ๆ เป็นสัดส่วนไฟฟ้านำเข้าจากโครงการเขื่อนขนาดใหญ่ในประเทศเพื่อนบ้าน และละเลยศักยภาพการผลิตไฟฟ้าจากแสงอาทิตย์ในประเทศ การเปลี่ยนผ่านไปสู่ระบบพลังงานหมุนเวียนชะลอตัวลงจากกำลังผลิตสำรองไฟฟ้าที่ล้นเกิน และความกล้า ๆ กลัว ๆ ที่จะเปลี่ยนสู่ระบบโครงข่ายไฟฟ้าอัจฉริยะแบบกระจายศูนย์

## เวียดนาม

เวียดนามมีอัตลักษณ์ที่แปลกแยกในฐานะผู้นำการผลิตไฟฟ้าจากถ่านหินในระดับภูมิภาค และยังเป็นแบบอย่างในการเปลี่ยนผ่านสู่ระบบพลังงานหมุนเวียน เวียดนามมีแผนการก่อสร้างโรงไฟฟ้าถ่านหินมากที่สุดในโลกรองจากจีนและอินเดีย ในปี 2564 การผลิตไฟฟ้าจากถ่านหินมีสัดส่วนร้อยละ 36 ของกำลังผลิตไฟฟ้าที่ติดตั้งทั้งหมด จากการที่มีปริมาณถ่านหินสำรองราว 3,400 ล้านตัน (สูงที่สุดในภูมิภาค) และการพึ่งพาการนำเข้าถ่านหินเพิ่มเติม ในปี 2563 เวียดนามนำเข้าถ่านหิน 55.4 ล้านตัน มากกว่าการนำเข้าถ่านหินของไทยราว 23.9 ล้านตัน

เวียดนามมี

- โรงไฟฟ้าถ่านหินถ่านหินขนาดใหญ่ 30 แห่ง (>30 เมกะวัตต์ขึ้นไป) จำนวน 74 หน่วยผลิต รวมกำลังผลิตไฟฟ้า 22.8 กิกะวัตต์
- โรงไฟฟ้าถ่านหินที่กำลังก่อสร้าง 6 แห่ง จำนวน 12 หน่วยผลิต รวมกำลังผลิตไฟฟ้า 8.0 กิกะวัตต์
- โรงไฟฟ้าถ่านหิน 21 แห่ง รวม 50 หน่วยผลิตและกำลังผลิตไฟฟ้า 21.2 กิกะวัตต์ เผชิญกับความท้าทายของการเปลี่ยนแปลงการให้เงินกู้ในระดับโลกและนโยบายพลังงานในประเทศ

เวียดนามอยู่ระหว่างการร่างแผนพัฒนากำลังผลิตไฟฟ้าฉบับที่ 8 ซึ่งมีการร่างใหม่หลายครั้งตั้งแต่เดือนมีนาคม 2564 ในเดือนตุลาคม 2564 ร่างแผนพัฒนากำลังผลิตไฟฟ้าเพิ่มสัดส่วนของถ่านหินเป็นร้อยละ 40.6 ภายในปี 2573 อย่างไรก็ตาม พันธกรณีจากปฏิญญาที่ COP26 จะต้องผนวกอยู่ในแผน เช่น การยุติโครงการโรงไฟฟ้าถ่านหินใหม่ทั้งหมด

ข่าวดีนี้เกี่ยวข้องกับการเติบโตอย่างมหาศาลของพลังงานแสงอาทิตย์นับตั้งแต่ปี 2561 ซึ่งกระตุ้นโดยมาตรการรับซื้อไฟฟ้าแบบ feed-in-tariff ทำให้เวียดนามมีกำลังผลิตไฟฟ้าจากแสงอาทิตย์สูงสุดอันดับ 7 ของโลก ขณะนี้มีข้อจำกัดในการขยายตัวเนื่องจากไม่สามารถพัฒนาระบบโครงข่ายไฟฟ้าได้ทัน ในปี 2564 เวียดนามมีกำลังผลิตไฟฟ้า 3.5 กิกะวัตต์จากกังหันลม

# บทที่ 3
# กรณีศึกษาของประเทศไทย โดยพิจารณาถึงแนวทางที่ประเทศและบริษัทเอกชนมีส่วนร่วมกับอุตสาหกรรมถ่านหินในรูปแบบที่ไม่ปรากฏอยู่ในการวางแผนของรัฐบาล

บริษัทพลังงานของไทยหลายแห่งมุ่งสู่ธุรกิจพลังงานหมุนเวียนและยานยนต์ไฟฟ้า แต่บริษัทจำนวนมากเพียงเข้ามาชิมลางในภาคธุรกิจนี้และส่งเสริมแนวทางปฏิบัติที่ยั่งยืน แต่ยังดำเนินธุรกิจหลักในด้านเชื้อเพลิงฟอสซิล

การพัฒนาระบบพลังงานหมุนเวียนในประเทศไทยมีแรงฉุดจากภาวะเศรษฐกิจที่ชะงักงัน กำลังผลิตไฟฟ้าที่ล้นเกิน การพัฒนาโครงข่ายไฟฟ้าที่ไม่เพียงพอ การยึดติดอยู่กับระบบพลังงานแบบรวมศูนย์ และนโยบายพลังงานแห่งชาติที่ไม่เอื้ออำนวย แม้ว่ามีข้อเสนอเชิงนโยบายแบบต่างๆ ที่แสดงให้เห็นว่าการเปลี่ยนผ่านพลังงานที่เป็นธรรมนั้นสามารถทำได้อย่างไร รวมถึงข้อเสนอล่าสุดโดยทีมนักวิชาการที่มหาวิทยาลัยธรรมศาสตร์ เพื่อยุติการใช้เชื้อเพลิงฟอสซิลทั้งหมดภายในปี 2593 โดยเน้นที่ระบบพลังงานแสงอาทิตย์และการจัดเก็บพลังงาน ผลคือ บริษัทต่างๆ จากประเทศไทยได้ย้ายฐานการลงทุนด้านพลังงานหมุนเวียนในต่างประเทศ เช่น ธุรกิจพลังงานแสงอาทิตย์ในเวียดนาม เป็นต้น

ยังมีการนำเข้าถ่านหินมายังประเทศไทยในปริมาณและสัดส่วนที่เพิ่มขึ้นเพื่อเป็นเชื้อเพลิงให้กับโรงไฟฟ้าและอุตสาหกรรมการผลิตของภาคเอกชน ในปี 2563 มีการนำเข้าถ่านหิน 23.9 ล้านตัน จากประเทศส่งออกหลักคือ อินโดนีเซีย ออสเตรเลียและรัสเซีย นอกจากการนำไปใช้ในโรงไฟฟ้าถ่านหินที่มาบตาพุด จังหวัดระยอง ถ่านหินนำเข้าส่วนใหญ่ถูกส่งไปยังจุดกองเก็บในอำเภอนครหลวง จังหวัดพระนครศรีอยุธยา เพื่อกระจายต่อไปยังโรงงานอุตสาหกรรมและโรงไฟฟ้าอื่นๆ การขนส่งถ่านหินก่อให้เกิดมลพิษทางน้ำและอากาศ แต่กลับไม่ต้องเสียภาษีนำเข้า และไม่มีภาษีสรรพสามิตสำหรับการนำเข้าถ่านหิน ซึ่งเป็นช่องโหว่ทางกฎหมายที่ล้มเหลวในการคำนึงถึงต้นทุนด้านสิ่งแวดล้อมของถ่านหิน

บริษัทหลายแห่งในไทยเกี่ยวข้องกับการทำเหมืองถ่านหิน การผลิตไฟฟ้า และการขนส่งถ่านหินในต่างประเทศ ตัวอย่างเช่น พวกเขาซื้อเหมืองถ่านหินหลายแห่งในอินโดนีเซีย ซึ่งเป็นผู้ส่งออกถ่านหินรายใหญ่ที่สุดของโลกและมีปริมาณถ่านหินสำรอง 39,000 ล้านตัน นอกจากนี้ ยังมีความพยายามที่ล้มเหลวหลายครั้งในการก่อสร้างโรงไฟฟ้าถ่านหินและเหมืองถ่านหินในเมียนมา สิ่งนี้แสดงให้เห็นความปรารถนาที่จะไปให้ไกลกว่าพรมแดนประเทศอย่างชัดเจน และแสวงหาการลงทุนใหม่ๆ ด้านถ่านหินเพื่อเพิ่มผลกำไรสูงสุด ยกตัวอย่าง เช่น บริษัทบ้านปู บริษัทลานนารีซอร์สเซส (กลุ่มบริษัทปูนซีเมนต์ไทยซึ่งเป็นบริษัทแม่) การไฟฟ้าฝ่ายผลิตแห่งประเทศไทย (กฟผ.) และเอเชีย กรีน เอนเนอจี (Asian Green Energy, AGE) เราจะเห็นได้ว่ามีการค้าขายถ่านหินอย่างไรทั่วทั้งภูมิภาค (ไปยังประเทศต่าง ๆ เช่น จีน อินเดีย ญี่ปุ่น และฟิลิปปินส์) โดยที่ถ่านหินไม่เคยถูกใช้ในไทยเลย

องค์กรพัฒนาเอกชนของเยอรมัน Urgewald ได้รวบรวมรายชื่อบริษัทแม่และบริษัทย่อยที่ลงทุนเกี่ยวกับถ่านหินทั่วโลกจำนวน 2,800 แห่ง การใช้ข้อมูลนี้ทำให้สามารถแยกรายชื่อนักลงทุนไทยได้สามประเภท:

- สถาบันทางการเงินของไทย 12 แห่งถือครองหุ้นกู้หรือหุ้นมูลค่า 6.9 พันล้านเหรียญสหรัฐในบริษัทถ่านหิน กลุ่มนักลงทุนที่สำคัญคือธนาคารกรุงไทยและบริษัท การลงทุน MFC Asset Management ทั้งสองบริษัทลงทุนกว่า 2 พันล้านดอลลาร์สหรัฐ
- ตั้งแต่มกราคม 2562 ถึงพฤศจิกายน 2564 ธนาคารพาณิชย์สองแห่ง (ธนาคารกรุงเทพและธนาคารทีเอ็มบีธนชาติ) ให้สินเชื่อรวม 1.17 พันล้านเหรียญสหรัฐแก่บริษัทถ่านหินจากอินโดนีเซียและเวียดนาม
- ในช่วงเวลาเดียวกัน ธนาคารพาณิชย์ 18 แห่งได้ให้บริการรับประกันการจัดจำหน่ายแก่บริษัทถ่านหินในประเทศ 6 แห่ง มูลค่ารวม 2.49 พันล้านเหรียญสหรัฐ ผู้จัดจำหน่ายหลัก ได้แก่ ธนาคารกรุงเทพ ธนาคารกรุงไทย ธนาคารไทยพาณิชย์ และธนาคารกสิกรไทย

รายงานสรุปด้วยคำเตือนว่า แม้โอกาสที่กลุ่มประเทศในลุ่มแม่น้ำโขงจะปลดระวางถ่านหินไม่อาจเกิดขึ้นในทันที ความจริงก็คือเรามีองค์ความรู้ ประสบการณ์ของประเทศ และแบบจำลองการผลิตไฟฟ้าที่ทำให้เราบรรลุเป้าหมายการเปลี่ยนผ่านไปสู่ระบบพลังงานที่ไร้คาร์บอน การเปลี่ยนผ่านทางพลังงานนี้จะสร้างผลประโยชน์ทั้งในด้านผลตอบแทนทางเศรษฐกิจและการจ้างงาน

# ข้อเสนอหลักเพื่อการเปลี่ยนผ่าน สู่ระบบพลังงานหมุนเวียนที่สะอาด

## สำหรับรัฐบาลประเทศต่าง ๆ ในลุ่มน้ำโขง ;

- ยุติโครงการโรงไฟฟ้าถ่านหินใหม่และเหมืองถ่านหินทันที และตระหนักว่าปฏิบัติการดังกล่าวคือการปลดระวางถ่านหิน ไม่ทำให้โครงการต่างๆ เหล่านั้นกลายเป็นสินทรัพย์ด้อยค่าในอนาคต (stranded asset) และขับเคลื่อนให้เกิดการเปลี่ยนผ่านทางพลังงานที่เป็นธรรม
- ผนวกรวมต้นทุนผลกระทบภายนอกของถ่านหิน เช่น การเก็บภาษีการนำเข้าถ่านหิน เป็นต้น
- นโยบายในระดับประเทศต้องปลดล็อกศักยภาพในการดึงดูดการลงทุนเพื่อการเปลี่ยนผ่านทางพลังงานที่ยั่งยืนและเป็นธรรมจากนักลงทุนทั้งในและต่างประเทศเพื่อเพิ่มโอกาสการสร้างงานและรายได้ให้กับประชาชน
- มีความจำเป็นที่การเปลี่ยนผ่านทางพลังงานที่ยั่งยืนและเป็นธรรมต้องได้รับการสนับสนุนจากกลุ่มประเทศที่ร่ำรวยกว่า แต่ต้องไม่กลายเป็นเงื่อนไขให้ประเทศต่างๆ ในลุ่มน้ำโขงล่าช้าในการปฏิบัติการเพื่อเปลี่ยนผ่านไปสู่ระบบพลังงานหมุนเวียนที่สะอาด ยั่งยืนและเป็นธรรม
- COP27 ในเดือนพฤศจิกายน 2565 ประเทศภาคีต่างๆ จะนำเสนอแผนที่นำทางการลดการปล่อยก๊าซเรือนกระจก ที่ได้รับการปรับปรุงเพื่อให้บรรลุเป้าหมายอุณหภูมิ 1.5 องศาเซลเซียส ตามความตกลงปารีส รัฐบาลของประเทศลุ่มน้ำโขงจำเป็นต้องมีส่วนร่วมอย่างแข็งขันในพันธกรณีต่างๆ ที่นำไปสู่การลดการปล่อยก๊าซเรือนกระจกจากภาคเชื้อเพลิงฟอสซิลในประเทศของตน

## สำหรับภาคธุรกิจ

- ยุติการฟอกเขียว การเปลี่ยนผ่านไปสู่ระบบพลังงานหมุนเวียนที่สะอาด ยั่งยืนและเป็นธรรมจะต้องปลดแอกจากเชื้อเพลิงฟอสซิล ไม่ใช่ธุรกิจที่ดำเนินไปตามปกติ
- การลงทุนด้านพลังงานหมุนเวียนที่สะอาด ยั่งยืนและเป็นธรรม ก่อให้เกิดผลประโยชน์ทางเศรษฐกิจ สังคม/สิ่งแวดล้อม และปกป้องสภาพภูมิอากาศ
- ถึงเวลาที่สถาบันทางการเงินและนักลงทุนควรยุติความสัมพันธ์กับบริษัทอุตสาหกรรมถ่านหินในทันที กำหนดให้เป็นนโยบายภายในองค์กรอย่างถาวร เพื่อหลีกเลี่ยงการสูญเสียมูลค่าของเงินทุนของลูกค้าในสินทรัพย์ด้อยค่าในอนาคต(stranded asset)

## สำหรับผู้บริโภค

- ตระหนักว่าไฟฟ้ามาจากไหน มีทางเลือกแบบใดบ้างในการใช้ไฟฟ้าจากแหล่งพลังงานหมุนเวียนที่สะอาดยั่งยืนและเป็นธรรม เขียนหาผู้ผลิตไฟฟ้าให้มุ่งมั่นต่อการเปลี่ยนผ่านทางพลังงานที่ยั่งยืนและเป็นธรรม
- อาจมีความจำเป็นต้องตระหนักถึงแนวปฏิบัติของธนาคารและสถาบันทางการเงินของเราว่ามีส่วนเกี่ยวข้องกับการให้เงินกู้ในโครงการถ่านหินต่างๆ หรือไม่อย่างไร และเป็นส่วนหนึ่งของพลังผู้บริโภคในการสร้างการเปลี่ยนแปลงนโยบายและแนวปฏิบัติของธนาคารและสถาบันทางการเงินเหล่านั้น
- ทำสิ่งที่เราทำได้จากที่บ้าน รวมถึงการใช้พลังงานอย่างมีประสิทธิภาพที่ช่วยลดค่าใช้จ่ายในครัวเรือน และยังช่วยปกป้องสภาพภูมิอากาศ
- ร่วมเป็นส่วนหนึ่งของการรณรงค์เพื่อการเปลี่ยนผ่านทางพลังงานที่ยั่งยืนและเป็นธรรมกับกรีนพีซ

# Introduction

Asia is the epicentre of the coal sector, in terms of production, usage, and financing. The top three coal producers in 2021 were China, India, and Indonesia, while until that year, China, South Korea, and Japan were the top three countries financing coal projects. Meanwhile, the Asia-Pacific region accounts for around three quarters of world coal consumption (S. Nguyen, 2021). The International Energy Agency (IEA) has calculated that energy demand in Southeast Asia will grow by 60% between 2018 and 2040, particularly in fast-growing and industrialising countries such as Cambodia and Laos (IEA, 2019). This brings both electricity supply and transmission infrastructure demands on an energy provision system.

How we go about catering to this demand, both in terms of the type of fuel used and the maximisation of energy efficiency in the system, requires a bold and immediate response. It bears repeating that we live in a moment of acute urgency, where there is a window to mitigate against severe future impacts of a changing climate. For the Mekong region, this concern is particularly sensitive with the region one of the most vulnerable in the world to climate change. According to the Global Climate Risk Index 2021, Myanmar and Thailand are in the top ten countries most affected from 2000-2019, while Vietnam and Cambodia are in the top twenty (Eckstein et al., 2021). Coal is not the only responsible energy source here, but it is certainly the most critical one, being the largest source of CO2 and responsible for one third of global warming so far (Sausmikat & Ganswindt, 2021).

Yet we are battling an apathy fuelled by greed and laziness. Greed for the 'easy' money that comes from fossil fuels, which fails to acknowledge the environmental costs. Laziness to change to a clean alternative form of energy production, even though cleaner forms are now cheaper than fossil fuels (in the case of renewables). The tide is turning, and the question is now whether public and private sectors around the region can be convinced to embrace an energy transition with its economic and employment potential, and not dwell on established supplies of fossil fuels for short term profits. This does not have to be an insurmountable prospect. In the case of coal, in March 2021, when opening the summit of the Powering Past Coal Alliance (PPCA), UN secretary-general António Guterres provided a roadmap for an exit from usage:

> ***"Today, I am calling on all governments, private companies and local authorities to take three steps," said Guterres. "First, cancel all global coal projects in the pipeline and end the deadly addiction to coal. Second, end the international financing of coal plants and ... third, jump-start a global effort to finally organise a just transition [for coal industry workers], going plant by plant if necessary."***
>
> (Carrington, 2021a)

This report addresses the latest dynamics within the coal industry, seeing both how it sits in global discussions for an energy transition and specifically within the energy systems of countries in the Mekong region.

**Chapter 1** takes a broad view of the recent developments for an energy transition. It starts at COP26, held in November 2021, looking at the latest pledges on coal and other fossil fuels. The specific climate commitments of Mekong states are measured against the broad global trends, namely through Nationally Determined Contributions (NDCs). A contradictory picture is presented. On the one hand, there has been significant progress made through the commitment of key coal financing counties (China, South Korea, and Japan) to end overseas financing of coal plants. At the same time, the cost of renewables has decreased significantly and in many cases is cheaper than fossil fuels, such as for solar in Thailand and Vietnam. On the other hand, as economies start to recover from the COVID-19 pandemic, fossil fuel use, including coal, is seeing stark increases, with producers buoyed by recent price spikes. The chapter ends with a consideration of why coal prevails despite the environmental and economic misgivings around its use.

**Chapter 2** offers a country-by-country update on the state of coal power in each Mekong country, namely Cambodia, Laos, Myanmar, Thailand, and Vietnam. This takes into account the latest plans for the energy sector in each country, national deposits of coal, existing and planned coal power plants, and the political context around decision-making processes. Information in these areas is often not readily available in the public sphere, yet the chapter does its best to give a realistic overview. For example, due to the ongoing political turbulence in Myanmar at the time of writing this report, it is hard to say whether climate commitments and energy policies will be honoured, and what kind of governance will emerge in the future.

**Chapter 3** zooms in further to the case of Thailand. The section looks at the various alternative ways that the country engages with coal, beyond formal pronouncements and regulation for the energy sector.
These include:

- growing imports of coal for private sector industrial use
- the presence of Thai coal companies in overseas production, trade, and use, which never touch Thai soil
- the involvement of Thai financial institutions in the financing of coal companies

The chapter also gives some attention to the renewable sector in Thailand, noting both potentialities and barriers.

The report closes with a short summary discussion, leading to a set of messages to government, the private sector, and energy consumers, through which we can all engage with a carbon-free energy transition.

The report primarily comprises a desk review, taking place from November 2021 to June 2022, supported by several interviews with energy experts operating in each country of the Mekong region. Although it acknowledges some of the scientific modelling around energy systems, particularly in the case of an energy transition to renewables in Thailand, it is not a technical study per se. Instead, the interest is more that of a political economist, looking at the power relations guiding debate on energy and the political decisions framing power generation systems.


# Recent developments for an energy transition in the Mekong region


# Outcomes from COP26

Following a delay due to the COVID-19 pandemic, COP26 (UN Climate Change Conference) took place in Glasgow from October 31st to November 13th, 2021. There was something here for the eternal optimist and abject pessimist, depending how you wanted to perceive the outcome of the conference. As lucidly put by Jennifer Morgan, executive director of Greenpeace International:

> ***It's meek, it's weak and the 1.5°C goal is only just alive, but a signal has been sent that the era of coal is ending. And that matters.***
>
> (Harvey, Carrington, & Brooks, 2021).

There will be more attention paid to coal shortly. But first, here are some of the notable agreements and commitments made at COP26 which relate to a carbon-free energy transition:

- 104 countries and the EU block have signed up to a Global Methane Pledge, aiming to cut emissions by 30% from 2020 levels by 2030. Of the Mekong countries, only Vietnam was a signatory.
- 39 countries signed on to end public financing for fossil fuels in the 'Statement on International Public Support for the Clean Energy Transition'. There were no signatories from Southeast Asia.
- 141 countries signed up to the Glasgow Leaders Declaration on Forest and Land Use, which commits to halting forest loss and land degradation by 2030. Of the Mekong countries, only Vietnam was a signatory.
- An alliance of 11 countries launched the Beyond Oil & Gas Alliance (BOGA), which aims to stop new drilling for oil and gas. There are no members from Southeast Asia.
- In the lead up to COP26, 124 new or updated NDCs (Nationally Determined Contributions) were submitted to cut emissions by 2030 and offer adaptation plans. All countries from the Mekong region have submitted an updated NDC, although with minimal progress (see next section).
- The Glasgow Climate Pact, supported by nearly 200 diplomats, and which represents the culmination of the conference, contains measures to regulate international carbon markets, increase aid for the adaptation of low-income countries to the impacts of climate change, phase down coal and phase out fossil-fuel subsidies. More on coal below.

The commitments from COP26 have been calculated as potentially leading to a 2.5°C temperature increase by the end of the century (den Elzen et al., 2021). This is clearly short of the 1.5°C maximum rise that is the overall aim, although it does show an improvement on projections from before the 2015 Paris Agreement. The onus is now on COP27, planned for November 2022 in Egypt, to close the gap between the latest projections and the maximum aimed-for increase, in particular through more stringent country-based NDCs to cut greenhouse gas emissions by 2030. Yet progress is slow, and in a shift of the official text, countries are 'requested' rather than 'urged' to comply to renew their NDCs in COP27 (Harvey, Carrington, & Morton, 2021). There also remain debates as to how all this can be financed. There is a shortfall in the US$100 billion promised by developed countries in 2009 to commence annually from 2020 onwards. This creates a lack of trust and developing countries are using concerns over the guarantee of climate finance as a reason to delay commitment to change their NDCs (ibid). There is further conflict over the provisions of 'loss and damage' from developed countries to support the fact that many developing countries suffer disproportionate impacts from climate change (Harvey, Carrington, & Brooks, 2021). Developed countries are worried that this funding is being classed as compensation, placing responsibility for climate change upon their shoulders, even if they do indeed bear the majority of this responsibility (Popovich & Plumber, 2021).

Specifically relating to coal, the following commitments emerged from the conference:

- The Glasgow Climate Pact calls for the phasing down of coal.
- In a 'Global Coal to Clean Power Transition Statement', 46 countries agreed to phase out coal, including only Vietnam of Mekong countries. There are four clauses to this statement, calling to:

    1.Scale up clean power generation and energy efficiency.
    2.Phase out coal, during the 2030s (or as soon as possible thereafter) for major economies, and during the 2040s (or as soon as possible thereafter) for other economies.
    3.Halt the construction of new coal-fired plants.
    4.Ensure a just transition for workers and communities in this transition.

COP26 heralds the beginning of the end for coal, with commitments to phase out financing and usage of the fuel. Yet this positive development was tempered by the last-minute watering down of the climate pact text, under lobbying by India and China, with a change from phase out to phase down.[1] Similarly, the phaseout of subsidies for fossil fuels is undermined by the addition of the word 'inefficient', giving nations the room to justify the maintenance of certain subsidies, for example that they support the poor (Harvey, Carrington, & Morton, 2021).

However, it must be remembered that this is the first time that coal and fossil fuels are mentioned explicitly in high-level texts emerging from such a conference. It is remarkable that it took so long, but at least we can say that an exit from coal proceeds, and it is now more a question of when than if. The COP26 text singles out coal as the first fossil fuel to leave (UNFCCC, 2021). The question now is how quickly it can be achieved, and what kind of obstructions will be encountered along the way.

Concerning the 'Global Coal to Clean Power Transition Statement', Chris Littlecott, social director at the thinktank E3G, states that:

> ***This commitment on coal is definitely a big step forward, and would have been unthinkable a year or two ago. It's a real sign of improvement.***
>
> (Harvey, Ambrose, & Greenfield, 2021).

To halt the construction of new coal-fired plants (third clause of the Global Coal to Clean Power Transition statement) is definite progress, but what of existing plants? Finding the political will to shut these down early is a real challenge, although there are some financing options on the table which could be beneficial to southeast Asian countries (see the third section of this chapter). Following COP26, 750 coal plants have now been given a phase out date, an increase of 370. Another 2,600 plants come under carbon neutrality agreements but are yet to have a specified phase out date. This leaves 170 plants not covered by either of these two commitments (Myllyvirta, 2021). A further concern is that the statement addresses coal use in power generation, but does not address industrial usage – which accounts for around a third of the world's consumption (Tsafos, 2021; see also Chapter 3 on private sector industrial coal use in Thailand).

From a regional perspective, Mekong countries are frequently absent in joining these commitments (Table 1). The Myanmar delegation was not given permission to attend COP26 due to questions over its political legitimacy as representatives of the 2021 military coup. Only Vietnam signed up on some of the key coal and emissions-related targets, putting its name to the Global Methane Pledge, the 'Global Coal to Clean Power Transition Statement', and the Glasgow Leaders Declaration on Forest and Land Use. No Mekong country supported the 'Statement on International Public Support for the Clean Energy Transition' or is a member of the Beyond Oil and Gas Alliance (BOGA). Concerning the Glasgow Leaders Declaration on Forest and Land Use, Laos made the excuse that as a developing country it needs access to forest use in order to alleviate poverty (RFA, 2021). Thailand did very little at the event either as a signatory to new initiatives or in projecting its own bold vision for climate policy. The Diplomat magazine lamented that "ultimately, Thailand's COP26 appearance was more for PR and strategic purposes", particularly for the attending prime minister (Sanglee, 2021).

## Table 1: Commitments made by Mekong countries during COP26

| Commitment | Cambodia | Laos | Myanmar | Thailand | Vietnam |
|---|---|---|---|---|---|
| **Net zero commitment** | 2050[2] | 2050 | ? (Net zero deforestation by 2030) | 2065 | 2050 |
| **Global Methane Pledge** | ✖ | ✖ | ✖ | ✖ | ✔ |
| **Global Coal to Clean Power Transition Statement** | ✖ | ✖ | ✖ | ✖ | ✔ |
| **Glasgow Leaders Declaration on Forest and Land Use** | ✖ | ✖ | ✖ | ✖ | ✔ |
| **Statement on International Public Support for the Clean Energy Transition** | ✖ | ✖ | ✖ | ✖ | ✖ |
| **Beyond Oil and Gas Alliance (BOGA)** | ✖ | ✖ | ✖ | ✖ | ✖ |

Laos and Vietnam have made a commitment to net zero emissions by 2050 and were only recently joined by Cambodia through a submission at the end of 2021. Thailand made a negligible shift from 2065-70 to 2065, lagging behind China which has made a commitment for 2060.

[1] For an extended analysis of this lobbying process that led to language changes in the text, the reader is recommended to visit an article in Politico magazine (Mathiesen, 2021).

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# Nationally Determined Contributions (NDCs)

All Mekong countries submitted updates on their Nationally Determined Contributions in 2020 and 2021. Table 2 shows the highlights of these commitments and how they have changed from the first set of NDCs provided in 2016-17. Overall, there is no progress in improving emissions targets with the updates. Improvements by Cambodia and Laos can be ascribed to greater detail that was otherwise lacking in their first set of NDCs. For Thailand and Vietnam, where detail was already given, the updates represent a disappointing lack of progress. Indeed, Climate Action Tracker carries detailed assessments of these latter two countries, leading to a rating of being 'critically insufficient', which is the worst rating they submit (CAT, 2021). In the case of Thailand, the aim to reduce domestic emissions by 20% from the Business-As-Usual (BAU) model by 2030 is a weak target, unchanged since 2016. Krisada Boonchai, the coordinator of Thai Climate Justice for All (TCJA), further questioned the calculations behind emissions plans (Rujivanarom, 2021). The baseline is set at an unrealistically high 354 megatons of carbon equivalent, when he claims a more realistic level would be around 160. This sets an exceptionally low bar against which to compare any subsequent improvement.

For the case of Myanmar, in 2021 two updates to the NDCs were delivered to UNFCCC by the exiled National Union Government (NUG), and the military junta-based State Administration Council (SAC). This reflects a battle for international recognition by the two bodies. It is unclear which version of the update is available on the UNFCCC website, or indeed whether there are any differences in the content of what was submitted. The figures on coal are highly questionable (see Myanmar section in Chapter 2 for further information).

[2] This commitment was not made during COP26 but in a submission to the United Nations Convention on Climate Change (UNFCCC) on the 30th of December 2021.

## Table 2:
## Nationally Determined Contributions (NDCs) for Mekong countries as of December 2021 (data from ASEAN, 2021; CAT, 2021; Climate Watch, 2021; UNFCCC, 2021)

NB: FOLU = Forestry and Other Land Uses; REDD = Reducing Emissions from Deforestation and forest Degradation; tCO2e = tonnes of carbon dioxide equivalent.

| Cambodia | |
|---|---|
| Date First NDC | 06/02/2017 |
| Date updated NDC | 31/12/2020 |
| GHG Emissions target | 42% reduction from baseline scenario |
| Time frame emissions target | 2020-2030 |
| Sector specifications | The contributions to GHG reductions comprise FOLU (59.1% - following aim to halve deforestation rate by 2030, in line with REDD+ strategy), energy (21.3%), agriculture (9.6%), industry (9.1%) and waste (0.9%) |
| Change from First NDC to update | No change in emissions target; more details in sectoral targets, supporting policies, strengthened adaptation and additional info for clarity |
| **Laos** | |
| Date First NDC | 07/09/2016 |
| Date updated NDC | 11/05/2021 |
| GHG Emissions target | 60% reduction from baseline scenario, with aim to achieve net zero emissions by 2050 |
| Time frame emissions target | 2020-2030 |
| Sector specifications | Conditional targets set for land use (increased forest cover), energy (increased share of renewable energy generation), agriculture (e.g., water management projects for rice cultivation), and waste (sustainable management projects) sectors |
| Change from First NDC to update | No overall emissions target in first NDC; more details in sectoral targets, supporting policies, strengthened adaptation and additional info for clarity |

| Myanmar | |
|---|---|
| Date First NDC | 19/09/2017 |
| Date updated NDC | 03/08/2021 |
| GHG Emissions target | Reduction from baseline scenario of 244.52 million tCO2e (unconditional), and 414.75 million tCO2e (conditional on international finance and technical support) |
| Time frame emissions target | 2021-2030 |
| Sector specifications | Sectoral target for FOLU (50% conditional, with 25% reduction in deforestation unconditional), energy (11% share in renewables) |
| Change from First NDC to update | No change in emissions target; more details in sectoral targets, supporting policies, strengthened adaptation and additional info for clarity |
| **Thailand** | |
| Date First NDC | 21/09/2016 |
| Date updated NDC | 26/10/2020 |
| GHG Emissions target | 20% reduction from baseline scenario (unconditional) from 2021 to 2030, or 25% (conditional on adequate and enhanced access to technology development and transfer, financial resources and capacity building support) |
| Time frame emissions target | 2021-2030 |
| Sector specifications | - |
| Change from First NDC to update | According to Climate Action Tracker, updated NDC shows no improvement in |

| Vietnam | |
|---|---|
| Date First NDC | 03/11/2016 |
| Date updated NDC | 11/09/2020 |
| GHG Emissions target | Reduction by 2025 will be 7.3% from baseline scenario<br>Plan for further reduction by 9% by 2030, which can be raised to 27% with international support |
| Time frame emissions target | 2021-2030 |
| Sector specifications | Reductions in five priority sectors are energy (5.5%), agriculture (0.7%), LULUCF (1%), waste (1%), and industrial processes (0.8%) |
| Change from First NDC to update | Emissions targets show a superficial improvement, being easily reachable through existing policies. There is more sectoral detail and additional supporting targets. Rating by Climate Action Tracker as critically insufficient (worst rating). |

It is also worth noting regional commitments to energy. The ASEAN Plan of Action for Energy Cooperation (APAEC) sets the target for the share of renewable energy at 23% of Total Primary Energy Supply (TPES) and 35% of installed power capacity by 2025.[3] In 2019, the share of TPES stood at 13.9% and the installed power capacity at 28.7%, and so a considerable effort from ASEAN countries would be needed to achieve the 2025 targets. Furthermore, the ASEAN Centre for Energy (ACE) forecasts that should national renewable energy and energy efficiency targets set in 2015 be achieved, the rate of CO2 emissions per capita would still rise by 50% by 2040 (Overland et al., 2021). By all appearances, a significant change in mindset and political will is needed for the region to make inroads into its collective emissions.

[3] The Total Primary Energy Supply is the total amount of primary energy that a country has available (including domestic production and imported energy, and minus exported energy). The installed power capacity represents the maximum possible output from domestic energy production.

# The end of overseas financing for coal?

Since the Paris Agreement in 2015, the message to the financial world was clear on the need to divest away from fossil fuels. Yet some of the evidence shows a wholly blinkered reaction. The March 2021 report Banking on Climate Chaos shows that from 2016-2020, the world's biggest 60 banks have provided US$3.8 trillion in financing for fossil fuel companies (RAN et al., 2021). Indeed, only 17 of these banks have committed to net zero emissions by 2050. Some have policies blocking coal financing but nearly two-thirds of the fossil fuel funding is for oil and gas companies.

Yet new research from November 2021 suggests that half of the world's fossil fuel assets will be worthless by 2036 due to a net zero transition (Watts et al., 2021). The implication is that a quick transition to carbon-free energy use and finance will be profitable as renewables become cheaper, more efficient, and stable. Meanwhile, prices for fossil fuels will become far more volatile and unreliable. Indeed, following the agreement at COP26, there were losses in coal stocks (Devdiscourse, 2021). We will return to the question of why financial support for fossil fuels persists despite scientific evidence on the resulting impacts and the declining price for renewable energy. However, other recent news on state-based responses to coal financing is much more promising.

In May 2021, the G7 countries reaffirmed their commitment to phasing out coal, including an end to finance for coal developments overseas (Harvey, 2021). Even more significant are recent pledges by South Korea, Japan, and China to withdraw from overseas coal financing. Since 2013, these three countries alone have been responsible for 95% of foreign financing for coal-fired plants (Liu et al., 2021). In particular, Chinese financial institutions such as China Construction Bank, Bank of China, ICBC, and the Agricultural Bank of China, comprise the top 11 financiers of coal-fired power and the top 10 financiers of coal mining (RAN et al., 2021). South Korea made the pledge to end overseas coal financing in April 2021 (Yi & Taylor, 2021). A month later, it was joined by Japan through the G7 announcement mentioned above, although they have retained the loophole of supporting coal plants with CO2-reducing technologies. Finally, on 21st September, China's president Xi Jinping made a short statement at the United Nations that "China will step up support for other developing countries in developing green and low-carbon energy and will not build new coal-fired power projects abroad" (Geall, 2021). There remains much ambiguity in the precise meaning of this statement. For example, what kind of projects may now be cancelled, namely those: i) under approval; ii) under pre-permit; iii) under financing completion; and/or iv) in construction? It seems that Chinese financial institutions themselves are having to interpret the announcement and the Bank of China responded by stating it would stop future financing (including not just coal power plants but also mines) but honour existing contracts that have been signed (Grimsditch, 2021). Within 24 hours of the announcement, Tsingshan Holding Group, the world's largest steel producer, announced that it would move away from coal to focus on hydropower, wind and solar. The promise of support for 'green and low-carbon energy' is also vague. It should also be noted that despite financing 75% of the world's coal power projects over the last 5 years, many Chinese projects were already being cancelled, including 484GW of plants since 2015. In this sense, the announcement is merely rubber-stamping an ongoing process (Hall, 2021b; Hillman & Sacks, 2021). It also fails to address coal mining and domestic plants within China, where 1,058 stations supply 58% of domestic power and represent nearly half of the global number of plants (Watts, 2021). Nevertheless, the implications of the pledges by South Korea, Japan and China are far-reaching, heralding a collapse in global financing in the coal pipeline. Global Energy Monitor predicts this could impact 44 planned coal plants across 20 countries (Kumar, 2021), including southeast Asian nations. Research for this report highlights a threat to 27 proposed plants or plant upgrades (comprising at least 62 units) in countries of the Mekong region, with a total capacity of 25.9GW (Table 3 - see next chapter for further details in each Mekong country).

## Table 3:
## Installed coal capacity (large-scale plants), plants under threat from withdrawal of international financing, and plants under construction having achieved financial closure (compiled by author from several sources)

| Country | Installed capacity | Plants under threat | Unbuilt units under threat/ capacity | Plants under construction/ with financial closure | Total units/ capacity with financial closure |
|---|---|---|---|---|---|
| **Thailand** | 5,768MW (8 plants/ 17 units) | • Mae Moh power station (upgrade) | 2/ 600MW | - | - |
| **Cambodia** | 655MW (2 plants/ 6 units) | • Botum Sakor coal plant<br>• Hang Seng power plant | 4/ 965MW | • Sihanoukville CIIDG power station 2<br>• Sihanoukville SEZ power station | 2/ 800MW |
| **Laos** | 1,878MW (1 plant/ 3 units) | • Sekong power station<br>• Xekong power station<br>• Hongsa power station (upgrade) | 6/ 3,126MW | - | - |
| **Myanmar** | 120MW (1 plant/ 2 units) | • Unclear | - | - | - |
| **Vietnam** | 22,789MW (30 plants/ 74 unit) | • 21 plants in total (see Appendix 1) | minimum of 50/ 21,210MW | • 6 plants in total | 12/ 8,040MW |
| **Total** | **31,210 MW (42 plants/ 102 units)** | | **minimum of 62 units/ 25,901MW** | | **14 units/ 8,840MW** |

There are further signs of shifting attitudes to coal financing in the Mekong region. In December 2020, Malaysia's CIMB bank announced it would phase out coal from its portfolio by 2040, making it the first bank in Southeast Asia to make such a commitment (Coca, 2021). Then, in May 2021, the Asian Development Bank (ADB) announced that it would end all financing for coal mines and power plants and ban support for oil and gas production, under a new draft energy policy (Farand, 2021). Critics are concerned that the action is not sufficiently pro-renewable, whereby they could still support gas-fired plants and liquefied natural gas under certain conditions, such as when replacing coal. However, ADB is involved in co-funding for various new initiatives that hope to see an end to coal in southeast Asia:

- Under the Energy Transition Mechanism (ETM), ADB plans to accelerate the closure of coal plants in southeast Asia, with public-private partnerships purchasing mines and then winding them down sooner than existing plans (Reuters, 2021). There are pilots planned for Indonesia and the Philippines, with an intention to scale up into Vietnam and Bangladesh. The British insurer Prudential is involved, and the Japanese Ministry of Energy has committed a grant of US$25 million, which is first seed financing. A further funding mechanism through ETM focuses on the deployment of clean energy investments.
- The UK Government, the Italian State lender Cassa Depositi e Prestiti, the EU, and the Green Climate Fund have together pledged US$665 million for a platform to mobilise US$7 billion towards low-carbon and climate-resilient infrastructure projects in Southeast Asia (ADB, 2021). This platform will be managed by ADB.


A further recently announced project is the Accelerating Coal Transition (ACT) program (Shalal, 2021). With funding from the United States, Britain, Germany, Canada, and Denmark, and an endorsement by the G7, the program aims to support developing country's transition away from coal. The first recipients of funding will be South Africa, India, Indonesia, and the Philippines, and while Mekong countries are not yet directly involved, a country like Vietnam could stand to benefit from support. While any project that accelerates an exit from coal is a positive, it is vital that this supports a Just Transition (as championed by Greenpeace) where tax-payers money is not used to bail out or allow profits for the coal companies (i.e., the polluters must pay), and that workers and affected communities are suitably re-trained and/or compensated for loss of livelihoods from the shutting down of a plant or mine (Mey et al., 2019). Although this report does not afford the time to scrutinise the projects named here, it is vital that this scrutiny takes place.

# The price of renewable energy

A report from the International Renewable Energy Agency (IRENA), published in June 2021, notes that most new solar and wind projects are now cheaper than coal, with two-thirds of such plants cheaper in 2020 (IRENA, 2021). Francesco La Camera, Irena's director general, states that:

> ***Today renewables are the cheapest source of power. Renewables present countries tied to coal with an economically attractive phase-out agenda that ensures they meet growing energy demand, while saving costs, adding jobs, boosting growth and meeting climate ambitions.***
>
> (Ambrose, 2021b)

In theory, the recent price spikes in oil, gas, and coal should only make renewables even more competitive, even if the latter sector faces its own price rises in equipment and logistics (Wood Mackenzie, 2022). A recent academic paper looking at incentives for climate policy action asserts that the narrative that pursuing a climate policy would be economically detrimental is clearly mistaken (Mercure et al., 2021). Instead, net importers of fossil fuels would be better off de-carbonising, a fact underlined by sharp price rises due to sanctions against Russia over its invasion of Ukraine (see next section). Meanwhile, there is a huge potential for employment in a transformed energy sector, which could provide 122 million jobs by 2050, including 43 million jobs in renewable energy (IRENA, 2021).

Bloomberg New Energy Finance (BloombergNEF) conducts research and provides data looking at global commodity markets in relation to the transition to a low-carbon economy. Amongst their datasets they calculate the Levelized Cost of Energy (LCOE) in different countries that allows a comparison between power production using different fuels. Since the latter half of 2018, the global benchmarks for solar (both fixed-axis and tracking) and onshore wind have been cheaper than coal and gas (Figure 2).

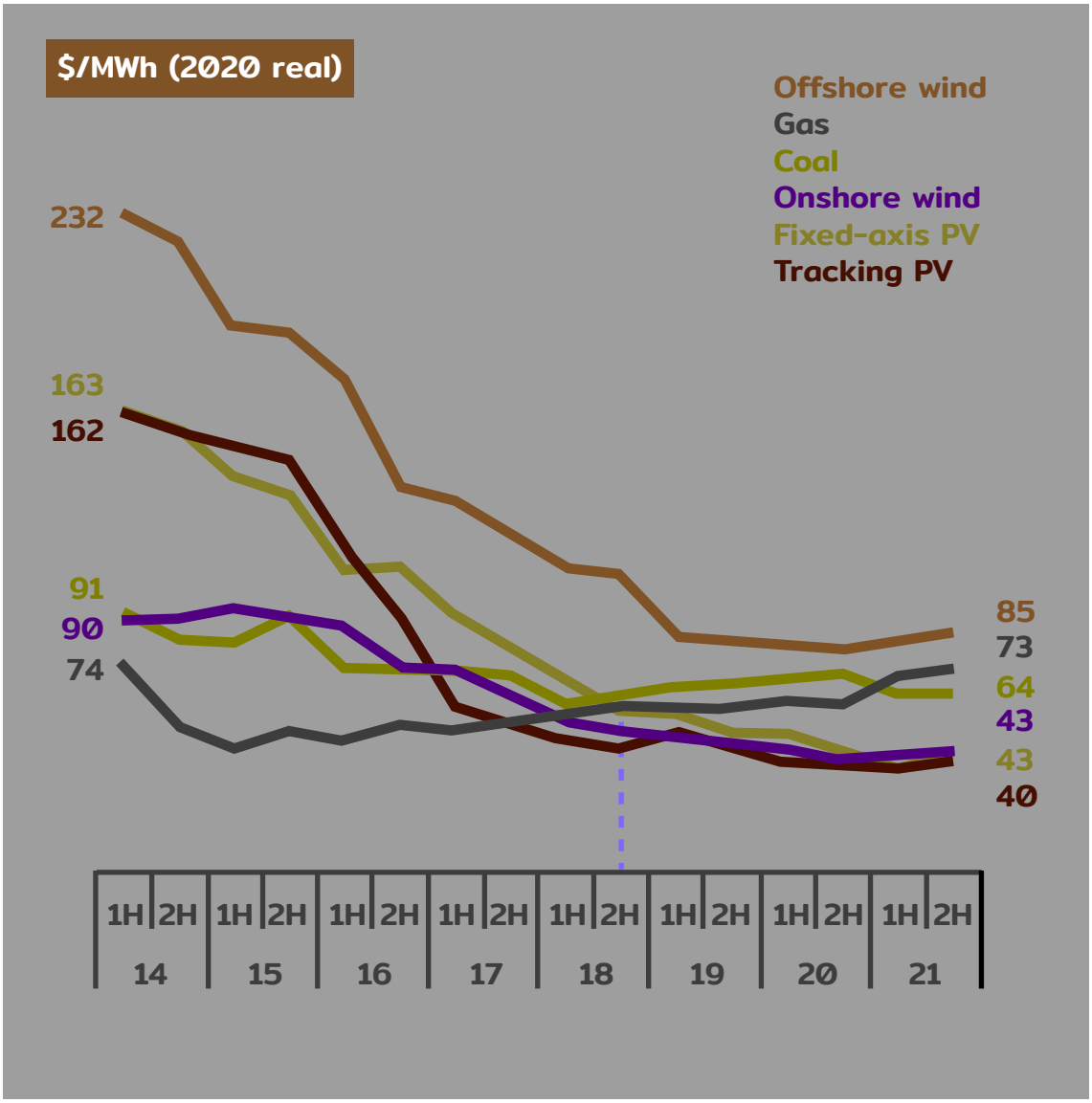



*Figure 2: The Global LCOE benchmarks for bulk power, 2014-2021 (Brandily & Vasdev, 2021)*

Unfortunately, the latest data from BloombergNEF specifies only for Thailand and Vietnam rather than all Mekong countries. However, this still acts as a useful marker. Figures 3 and 4 show historical and projected LCOE for fixed PV (i.e., solar using panels in a fixed position rather than tracking the sun), onshore wind, natural gas, and coal in Thailand and Vietnam. The costing estimates are provided as a range from low to high estimates, but the mid-level figures are shown here as a convenient and simplified indicator. At the end of 2020, the mid-level LCOE for new-build fixed PV in Thailand became cheaper than new-build coal. Meanwhile, onshore wind is projected to become cheaper than both gas and coal in 2024. For Vietnam, mid-level LCOE for fixed PV became cheaper than coal in the first half of 2021, while wind is projected to become cheaper than gas and coal in 2028. These cheaper prices include the initial capital costs for a project, where solar and wind have traditionally been more expensive. However, the initial outlay is becoming increasingly competitive year-on-year, and so this argument no longer holds in favour of fossil fuels. Indeed, Wood Mackenzie predicts that by 2030, the cost of electricity from renewable sources in Asia pacific region (primarily solar) will be 28% cheaper than from coal across the region (Wood Mackenzie, 2022).

There are broad implications for consumers from these trends in pricing. A 2021 report by BloombergNEF states that 46% of the world's population could reduce their fuel bills from newly installed solar and wind farms instead of using power from existing coal and gas-fired plants (Hall, 2021a). Although Southeast Asia would need $2 trillion of investment to build the necessary infrastructure to reduce carbon emissions (for example for the development of renewable energy), if action were taken today, the region's green economy could contribute $1 trillion in economic opportunities (from new growth and efficiency gains) and 5-6 million jobs by 2030 (Bain & Company, 2021).

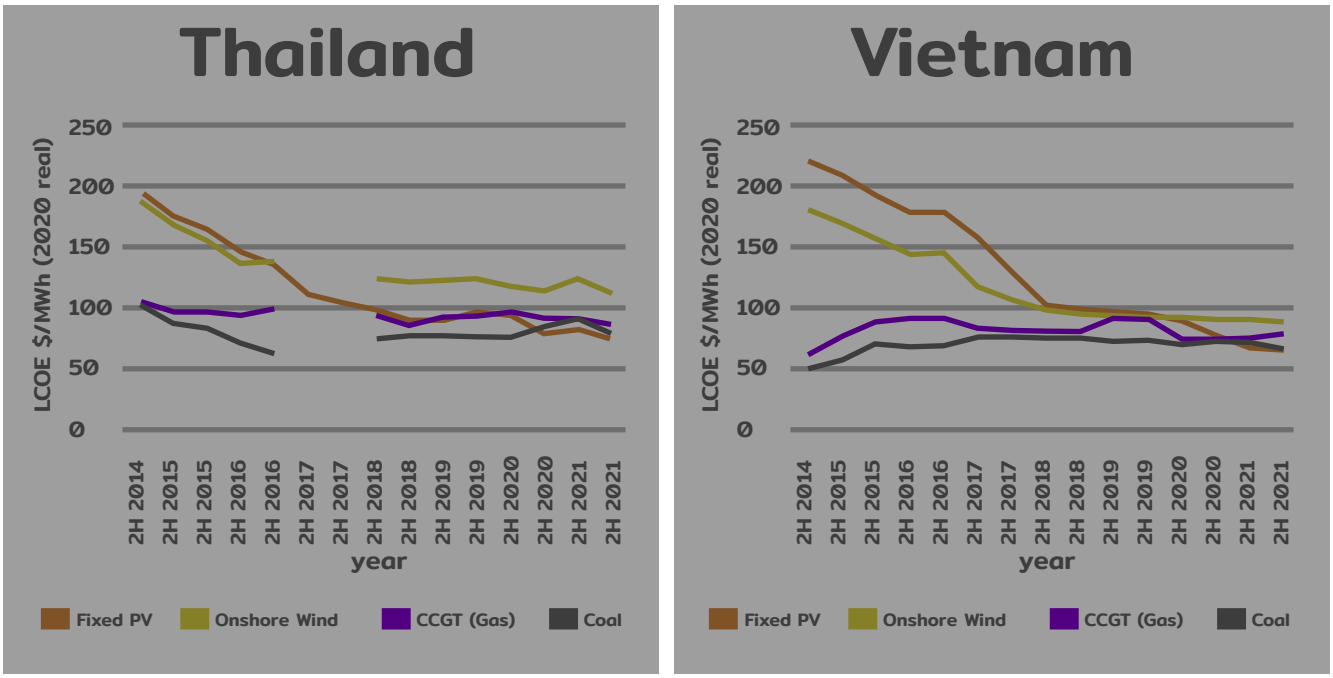



*Figure 3: Mid-level Levelized Costs of Electricity in Thailand and Vietnam 2014-2021 (data source: BloombergNEF)*

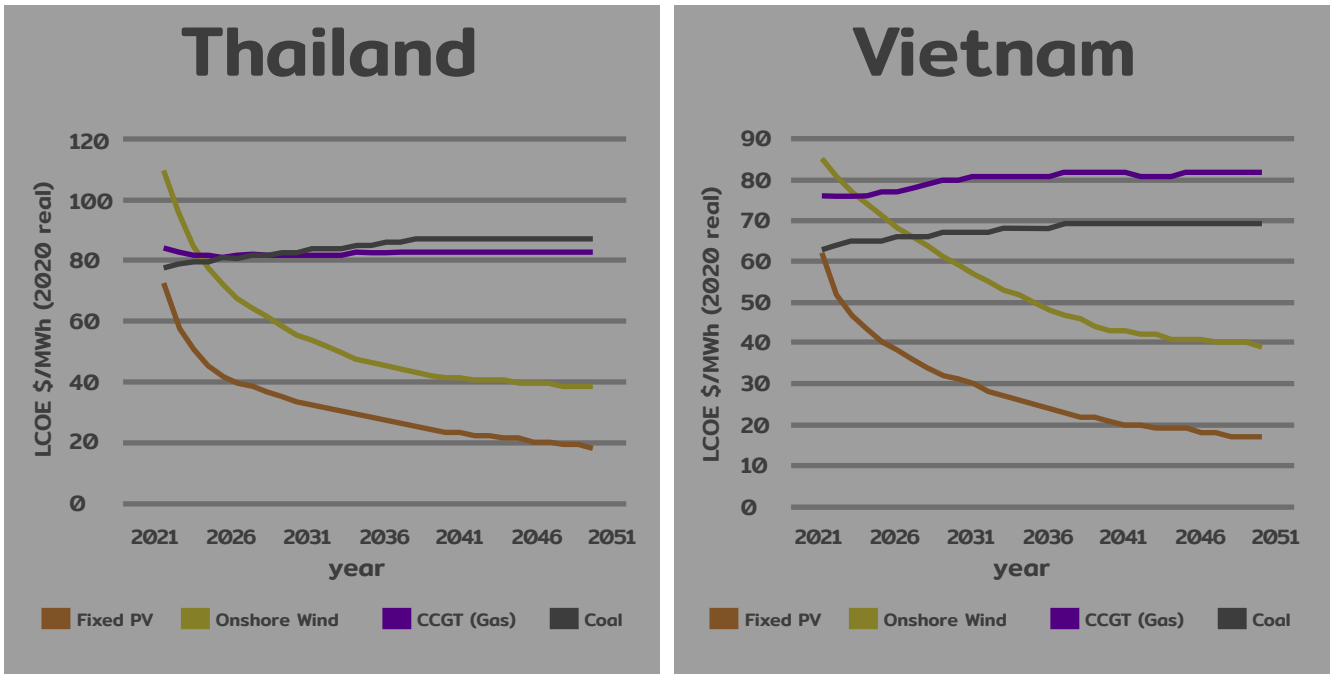
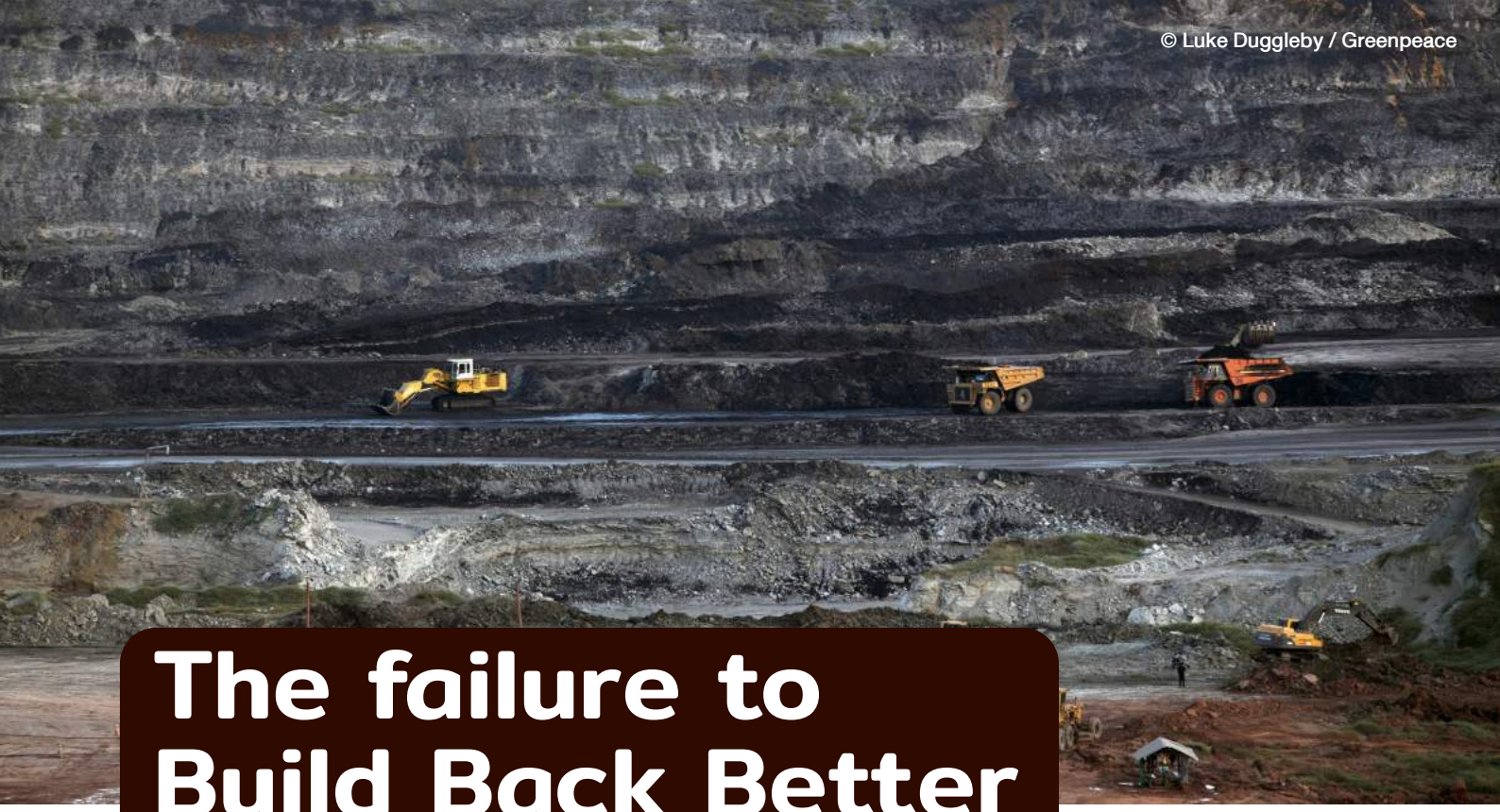



*Figure 4: Projections of mid-level Levelized Costs of Electricity in Thailand and Vietnam 2021-2050 (data source: BloombergNEF)*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# The failure to Build Back Better

The concept of Building Back Better has been used at different moments by different agencies. This includes the UN in relation to the creation of disaster resilience, the US government for its COVID-recovery package, and more recently by the G7 as a development alternative pathway to China's Belt and Road Initiative. However, it has become a generic term to signal the idea of creating a better world in the wake of the COVID pandemic, open to interpretation and application in several ways. One way is to highlight an accelerated energy transition to renewables in a post-COVID world. Yet judging by the evidence in 2021, the opposite has taken place.

In March 2021, the International Energy Agency (IEA) noted that carbon emissions were about to exceed pre-pandemic levels having steeply risen in the latter part of 2020 (Ambrose, 2021a). Criticism was made of governments not including sufficient green energy policies within their COVID recovery packages. There has been a stark rise in power generation from coal plants, which could reach an all-time high in 2022 (Ambrose, 2021c). Coal production in China reached record levels in 2021, with 4.07 billion tons produced. For example, in October officials ordered 72 mines in Inner Mongolia to increase production, and there was a call to increase imports to the country (Aizhu et al., 2021). Despite pledging to reach peak emissions by 2030 and achieve carbon neutrality by 2060, China is planning to build more coal-fired plants and intensify exploration for oil and gas (Davies, 2021). On Monday 24th January, 2022, Xi Jinping stated that a low-carbon future should not come at the expense of the 'normal lives' of ordinary people, seemingly placing jobs and growth over climate commitments (Ni, 2022). Coal remains an attractive short-term driver of economic growth in the country, and despite pulling out from overseas investment, provincial governments approved 24 new coal-fired plants in the first half of 2021, a decrease from 2020 but nevertheless still a significant number.

Why the rise in coal use? Firstly, in 2021 there was a surge in energy demand to kickstart economies following the onset of COVID-19. This has led to a power crunch, with demand for electricity outpacing the ability of many countries to develop new low-carbon sources, and thereby deepening the reliance on fossil fuels. Fuel prices in gas and oil soared, causing a subsequent rise in thermal coal prices, which hit US$270 per ton in October 2021 after being around $50 per ton in mid-2020 (Trading Economics, 2022). Figure 5 shows the prices for Australia's Newcastle Futures, which acts as a benchmark for Asian prices. With an interlinking supply chain crisis together with COVID, there has been an energy deficit in countries like China and India, compounded by a harsh winter in north Asia. On 1st January 2022, Indonesia, the world's largest coal exporter, announced a one-month ban on coal exports, in order to shore up domestic supply and counter power outages (Nangoy & Christina, 2022). This drove up prices further in China, although the ban was already temporarily lifted on 11th January. From Figure 5, we also see that the price of coal more than doubled at the end of February 2022, due to the Russian invasion of the Ukraine and Western sanctions making it difficult to trade coal from Russia (the world's third largest exporter).

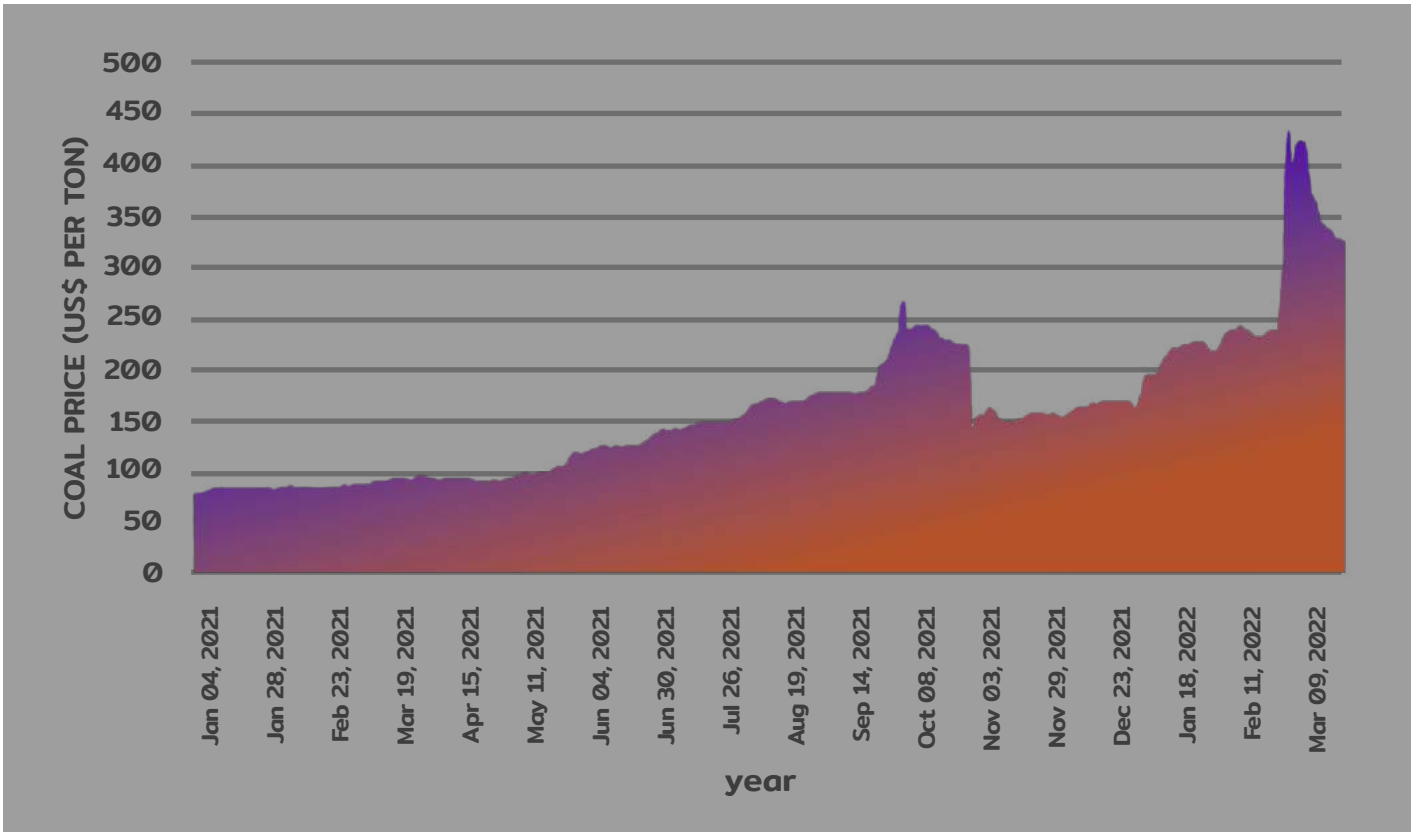



*Figure 5: Thermal coal prices (based on Newcastle Futures) from 1st January 2021 to 24th March 2022 (Data source: https://www.investing.com/)*

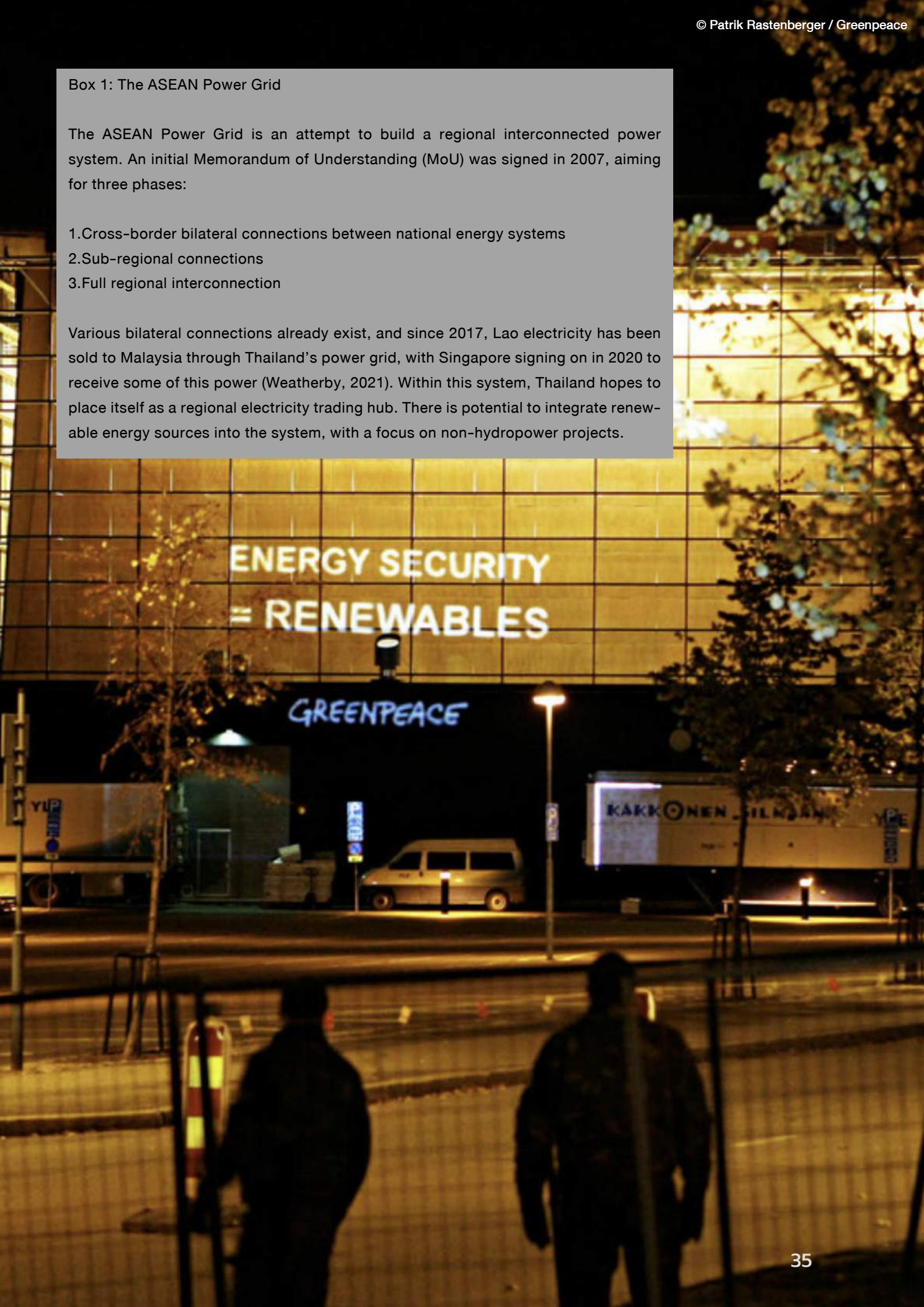
The upshot of all this is that coal may well remain a prime source of power in Southeast Asia and Australia over the coming years. In times of spiralling demand, there is a risk the drive to renewables is side-lined, with post-COVID short-term economic recovery coming at any cost. This is the most pessimistic view, and unsurprising in a volatile trade system that does nothing to protect the energy security of countries. However, it should be balanced against actual gains in renewable energy sources that do enshrine domestically-fuelled power systems (for example, see the Vietnam section of Chapter 2).

# Why stick with coal?

There are two contrasting stories appearing in our assessment of developments for an energy transition to renewable power. On the one hand, countries are committing to phasing out coal and halting overseas financing of new power plants, while the costs of renewable energy make it more and more an economically favourable option. This could be a big advantage for countries who are net importers of coal and gas, such as Vietnam, Thailand, and Cambodia. In this scenario the writing is on the wall for coal. But on the other hand, with a surge in demand for energy in 2021 as economies look to recover from the COVID-19 pandemic, carbon emissions are set to reach an historical high, with more coal produced and consumed than ever in 2022. What is going on here? Why stick with coal when the evidence points to a necessary and immediate phase out?

Firstly, we must look at institutional barriers in the transition to renewables. It is still perceived that sticking coal into a furnace is an easy way to make power. The technology is well-established, and so traditional fuels like coal remain attractive to growing economics with rising demand for electricity. Energy provision has been constructed on this basis, represented by centralised monopolies. In three countries the main operator is a state-owned enterprise (Cambodia with Electricité du Cambodge/EDC, Laos with Électricité du Laos/EDL, and Thailand with Electricity Generating Authority of Thailand/EGAT). In Myanmar, the domestic grid is run by the Ministry of Electricity and Energy while distribution is through private companies. In Vietnam, the main power company (Vietnam “Electricity/EVN) was set up as a state-owned enterprise but has operated as a one-member limited liability company since 2010. Such an institutional setup lends itself well to a traditional centralised grid based around large-scale power stations. But less so to a dynamic, decentralised system where there may be multiple providers including the surplus from consumer power units entering the grid. As a result, it does not seem that these profit-driven entities are in a rush torelinquish central control of national power systems. The lack of commitment to progressive policy at COP26, coupled with negligible progress on NDCs, reflects such an attitude. Progress on decommissioning coal plants has been painfully slow, even if this is an affliction not unique to the Mekong region.

The reluctance of Mekong states to shift to renewables is further reflected in the lack of regulatory support. For example, there is little support for small businesses to set up solar projects, unaided by policy to adapt transmission infrastructure. So even though financing for coal is becoming restrictive, and the cost of renewable energy cheaper, potential investment suffers from the lack of an enabling environment. In a further issue, the Greenpeace Southeast Asia Power Sector Scorecard notes an overcapacity in fossil fuel supply in Southeast Asia, including from coal-fired power plants, which makes it difficult for renewables to gain a foothold in the region (Greenpeace, 2020). The report argues that achieving a baseload energy generation is becoming less important due to more flexible and widely distributed global energy systems. What could help here is the development of the ASEAN Power Grid (Box 1). Although an interconnected grid does not guarantee a full shift to renewables, it does allow for energy access and resource sharing where oversupply in one country can compensate for a shortfall in another. This has potential to support the kind of dynamic decentralised system to which renewables lend themselves so well and save investment costs in the long run. The question is whether the power grid, which has shown slow progress, can be a force towards an energy transition to non-carbon sources, taking advantage of the economic opportunities on offer. Or will a regional grid become monopolised by large agencies in a drive for short-term profit through continued exploitation of fossil fuel power sources?

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Box 1: The ASEAN Power Grid

The ASEAN Power Grid is an attempt to build a regional interconnected power system. An initial Memorandum of Understanding (MoU) was signed in 2007, aiming for three phases:

1.Cross-border bilateral connections between national energy systems
2.Sub-regional connections
3.Full regional interconnection

Various bilateral connections already exist, and since 2017, Lao electricity has been sold to Malaysia through Thailand's power grid, with Singapore signing on in 2020 to receive some of this power (Weatherby, 2021). Within this system, Thailand hopes to place itself as a regional electricity trading hub. There is potential to integrate renewable energy sources into the system, with a focus on non-hydropower projects.

A final barrier to an exit from coal are the conditions under which financing and investment take place. Firstly, coal and other fossil fuels remain undervalued due to the continued subsidies they are afforded. The International Monetary Fund has estimated that fossil fuel production and consumption received $11 million a minute in 2020 (Carrington, 2021b). Not a single country prices its fuels with consideration of the full supply and environmental costs. Instead, it is calculated that prices for 99% of coal in 2020 were at least 50% below their true cost. Major economic powers, such as China, the US, Russia, India, and Japan, remain guilty parties here distributing two thirds of subsidies. In a similar manner to institutional inertia on an exit from coal, financiers are comfortable with an established set-up for the fuel, with sizeable payoffs for achieving lucrative power purchase agreements (PPAs) and other high-profit deals. As Sudhir Sharma, a regional UNEP (UN Environment Programme) expert puts it:

> ***A lot of big financiers are willing to finance coal, but there is no such financing at large scale for renewables. Banks are very risk-averse by nature, and reluctant in the absence of clear policies.***
>
> (Faulder, 2021)

While many companies are investing in renewables, they are playing it both ways, latching onto traditional fossil fuel use for as long as possible, while projecting a progressive image in the renewables market to which they eventually hope to capture a share. It is also the case that the interest lies not directly in the fuel itself, but the lucrative business of providing the accompanying infrastructure. Chapter 2 highlights some examples, such as transmission lines transporting coal energy from Laos to Cambodia, and within the latter country.

Finally, there is a perception that switching to renewable energy requires a prohibitive initial investment. It is calculated that Southeast Asia needs US$2 trillion of investment over the next decade to build the necessary sustainable infrastructure to reduce carbon emissions, for example in renewable energy, electric vehicles, and waste management. Yet in 2020 green investments in the region totalled a mere US$9 billion (Bain & Company, 2021). However, this ignores the economic opportunities of investment, and if action were taken today, the region's green economy could contribute US$1 trillion and 5-6 million jobs by 2030.


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# The state of coal power: country by country overview

Using data from the Mekong Infrastructure Tracker and the International Renewable Energy Agency (IRENA), the Stimson Centre compiled the installed power generation mix in 2021 for countries in the Mekong region (Figure 6). By installed power generation mix, we mean the total capacity of power plants by fuel in each country. Therefore, this does not represent actual power production (which may be below capacity for any given plant) or include power imported from other countries (such as the transmission of electricity through hydropower or coal plants from Laos to Thailand). Vietnam heads the field, both in terms of coal and solar power generation. Cambodia, Laos, and Myanmar show high dependence on hydropower, while Myanmar and Thailand have a focus on natural gas. Table 3 in Chapter 1 sums up information on installed coal capacity for large-scale plants in each Mekong country. It also compiles a list of plants under threat due to the withdrawal of international financing, and plants under construction having achieved financial closure.

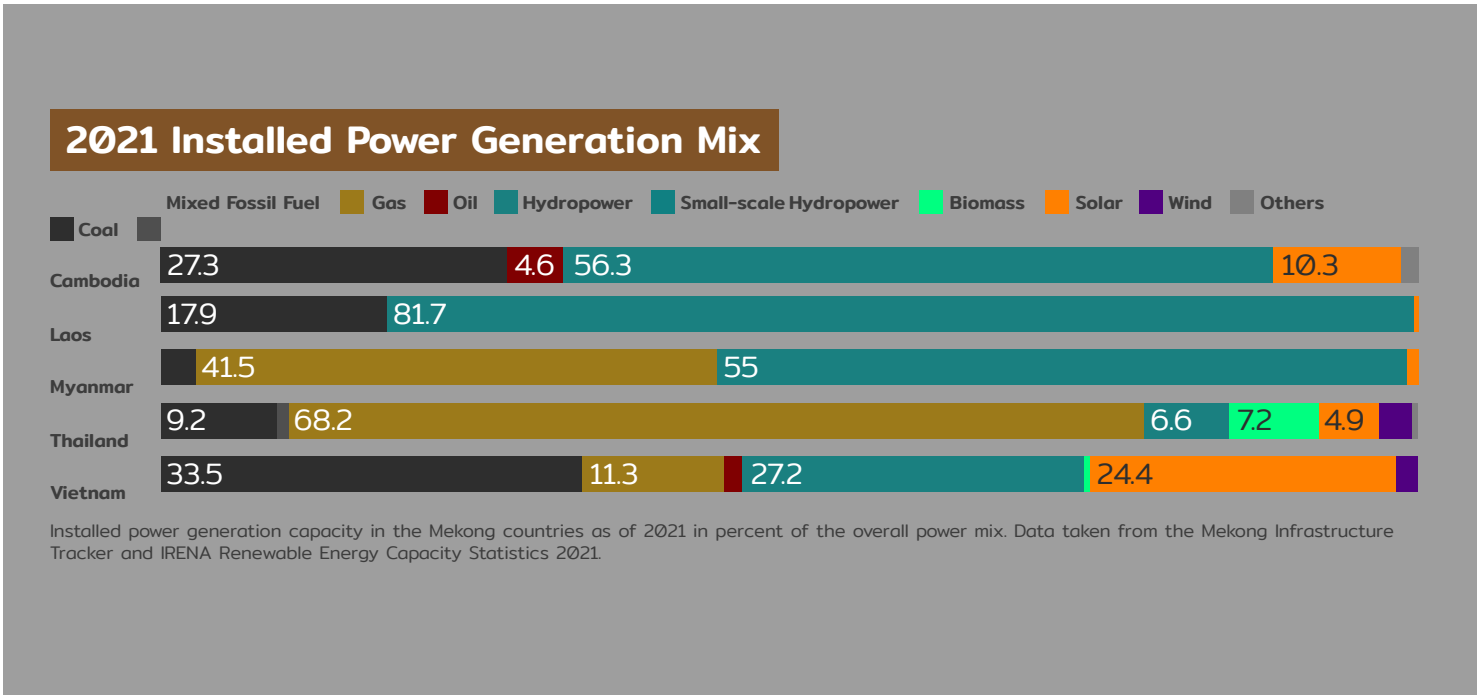



*Figure 6: Installed power generation mix for countries in the Mekong region, 2021 (Weatherby, 2021, p. 12)*

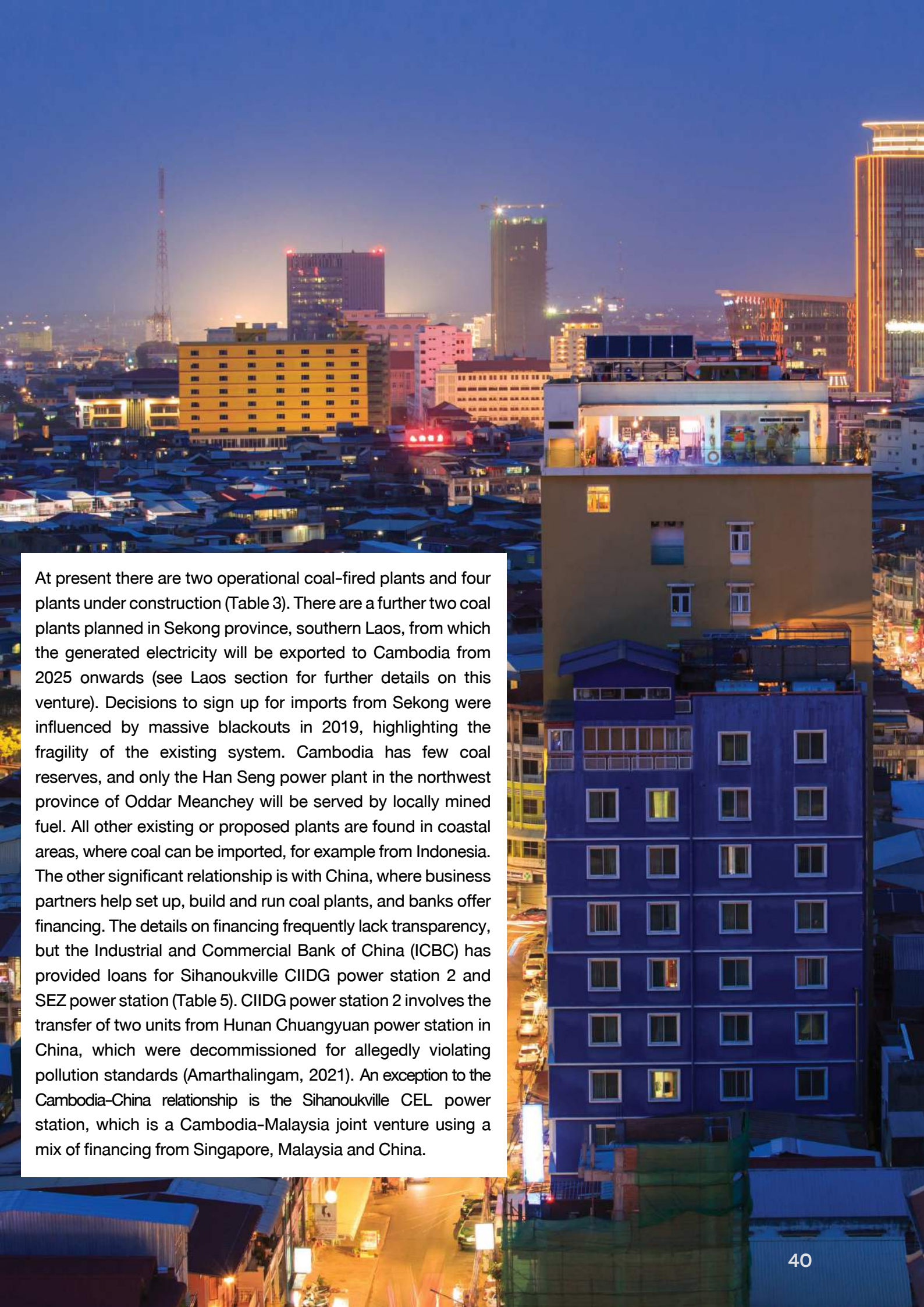
Supplementary information is provided in Table 4 below. Firstly, estimated coal reserves are given for each country. While reserves for Thailand and Vietnam are given in annual statistics provided by BP (Vietnam showing the highest collection of deposits in the region), estimates for other countries are less authoritative. For example, the Laos estimate could be undervalued if reporting on discovered deposits in Sekong province is correct (see section on Lao PDR). Table 4 also gives information on state projections for coal as a proportion of their future energy mix. For Cambodia, Laos and Vietnam, coal use is set to rise although such figures may change. For example, a recent talk given by the Lao Minister of Energy and Mines could indicate a U-turn on the role of coal, while the final draft for the Power Development Plan 8 in Vietnam is unclear. For the case of Thailand, a drop in the proportion of coal in the energy mix reflects the same absolute capacity but within a higher overall capacity. Further information on the energy mix in each country, and their future plans, is given in the following sections.

## Table 4:
## Information on coal production and consumption in countries of the Mekong region (data compiled by author from various sources – see country sections for references)

| | Coal reserves (tons) | Projected proportion of coal in power mix |
|---|---|---|
| **Cambodia** | Unspecified but deemed small | 42% in 2030 and 28% in 2050 |
| **Laos** | 600-700 million (2013 estimate) | 30% in 2025 (recent unofficial suggestion of 14% in 2030) |
| **Myanmar** | 543 million (2017 estimate) | Unclear |
| **Thailand** | 1.1 billion (BP estimate as of end 2020) | 4% in 2030 (following draft PDP 2022) |
| **Vietnam** | 3.4 billion (BP estimate as of end 2020) | 40.6% in 2030 (following draft PDP8 from October 2021) |

# Cambodia

In 2020, Cambodia imported 32% of its energy from Thailand, Vietnam and Laos, and suffered from increased prices as a result (Amarthalingam, 2021). There is a desire for energy sovereignty, with demand likely to outstrip other regional countries in the coming years through urbanisation and industrialisation (Weatherby & Eyler, 2020). Hydropower has proved controversial and unreliable due to drought, resulting in a moratorium on new projects until 2030. Therefore, Cambodia has shifted towards a power generation through fossil fuels. This includes an expansion of plans for coal. The Power Development Master Plan 2020-30 foresees a large increase in demand (at 8% per year), particularly from the industrial sector. The plan projects a rise to 99.56 TWh (Terawatt-hours) in 2050, which compares to 8.48 TWh in 2018 (Theangseng, 2021). Coal has a prominent place in the growth of power generation, and although its share would rise from 32% in 2018 to 42% in 2030 and then drop to 28% by 2050, the drop in percent share would occur with no loss to capacity. Rather than a significant increase in renewables, the projections see a large increase in the use of natural gas, which would generate 46% of power by 2050. Therefore, fossil fuels are projected to contribute 74% of power generation by 2050.



At present there are two operational coal-fired plants and four plants under construction (Table 3). There are a further two coal plants planned in Sekong province, southern Laos, from which the generated electricity will be exported to Cambodia from 2025 onwards (see Laos section for further details on this venture). Decisions to sign up for imports from Sekong were influenced by massive blackouts in 2019, highlighting the fragility of the existing system. Cambodia has few coal reserves, and only the Han Seng power plant in the northwest province of Oddar Meanchey will be served by locally mined fuel. All other existing or proposed plants are found in coastal areas, where coal can be imported, for example from Indonesia. The other significant relationship is with China, where business partners help set up, build and run coal plants, and banks offer financing. The details on financing frequently lack transparency, but the Industrial and Commercial Bank of China (ICBC) has provided loans for Sihanoukville CIIDG power station 2 and SEZ power station (Table 5). CIIDG power station 2 involves the transfer of two units from Hunan Chuangyuan power station in China, which were decommissioned for allegedly violating pollution standards (Amarthalingam, 2021). An exception to the Cambodia-China relationship is the Sihanoukville CEL power station, which is a Cambodia-Malaysia joint venture using a mix of financing from Singapore, Malaysia and China.

## Table 5:
## Existing and proposed coal plants in Cambodia (data sources: Cambodia Constructors Association, 2021; GEM, 2022a; Ham, 2021; Pisei, 2021; Stimson, 2022)

| Plant Name | Location | Starting year of operation | Capacity | Operating company | Operating licence | Destination of power | Source of coal |
|---|---|---|---|---|---|---|---|
| **Existing plants** | | | | | | | |
| **Sihanoukville CIIDG power station** | Preah Sihanouk province | 2014-17 | 405MW (3 units) | CIIDG Erdos Hongjun Electric Power Company, comprising:<br>• Cambodia International Investment Development Group (CIIDG)<br>• Erdos Group (China) | 33 years | Purchase agreement with EDC & supply to Sihanoukville SEZ | Imported coal from Indonesia |
| **Sihanoukville CEL power station** | Preah Sihanouk province | 2014 (CEL 1) and 2020 (CEL 2) | 250MW (CEL 1: 2 units; CEL 2: 1 unit) | Cambodian Energy Co Ltd (CEL) with Leader Universal Holdings (Malaysia) | 30 years (CEL 2) | Purchase agreement with EDC | Imported coal |
| **Plants in construction** | | | | | | | |
| **Sihanoukville CIIDG power station 2** | Preah Sihanouk province | Delayed to 2022-3 | 700MW (2 units) | CIIDG Erdos Hongjun Electric Power Company, comprising:<br>• CIIDG<br>• China Huadian | 35 years | National grid & supply to Sihanoukville SEZ | Imported coal |
| **Sihanoukville SEZ power station** | Preah Sihanouk province | Imminent | 100MW (2 units) | CIIDG and Jiangsu Taihu Cambodia International Economic Cooperation Zone Investment Co., Ltd (China) | Unknown | Supply to Sihanoukville SEZ | |
| **Plant under preparation** | | | | | | | |
| **Botum Sakor coal plant** | Koh Kong province | Delayed to 2025 | 700MW (2 units) | Royal Group (Cambodia) with construction support from Sinosteel (China) | 35 years | 80% purchase by EDC | Imported coal |
| **Han Seng power plant** | Oddar Meanchey province | Delayed to 2022 | 265MW (2 units) | Han Seng Coal Mines (Cambodia) with indications of support from Guodian Kangneng (China) | 25 years | 85% purchase by EDC | Han Seng coal mine (operating from Jan 2021) |

Coal plants are mostly set up using power purchase agreements with the state power authority EDC (Électricité du Cambodge). Coastal power plants are frequently located within Special Economic Zones (SEZs), to which they provide power as well as to the national grid. A 230km transmission line links Han Seng power plant to a sub-station in Siem Reap province. A consistent narrative around the construction of coal plants reflects public concerns over the lack of transparency. Environmental Impact Assessments frequently do not involve public consultation. Protests arise over land displacement and compensation levels, environmental impacts (see Box 2), and the working conditions and wage rate for construction labour.

**Box 2: Swapping conservation for coal in Botum Sakor**

Botum Sakor is the largest national park in Cambodia, situated on its southern coastline and with an area over 170,000 hectares. Over the past three decades, over 30,000 hectares have been lost to both formal concessions for commercial plantations and tourist infrastructure, and to illegal deforestation (Fair, 2021). In 2020, the government granted permission for a Special Economic Zone with an accompanying coal plant to be located within the park, using an area of 10,000 hectares. The government initially donated 168 hectares of land for the coal plant, which will be run by domestic conglomerate Royal Group (owned by the tycoon Kith Meng) with construction by Chinese company Sinosteel. Due to delays, the plant is now scheduled to be operational in 2025. Campaigners fear the development will undermine local biodiversity (the park containing at least 500 species of bird and 44 species of mammal), the potential for ecotourism, as well as infringing on the land rights of local communities (Keeton-Olsen, 2021). Yet many NGOs are reluctant to speak out against such projects, in the fear that they will suffer reprisals by Cambodian authorities and be unable to operate in the country. For more information on this case, readers are recommended to consult the following story from Danielle Keeton-Olsen for China Dialogue.

On October 29th 2021, the Minister of Mines and Energy, Suy Sem, confirmed that Cambodia would not allow any new coal-fired power stations (Niseiy, 2021). Although the continuation of "low" carbon sources was stressed through natural gas, and hydrogen, Suy Sem did call for a new energy master plan with a 59% share of renewables. This is promising and makes strategic sense in line with China's announcement to stop overseas financing of coal plants. There are two further reasons why Cambodia might wish to back away from coal. Firstly, the rise in thermal coal prices makes the economics of coal plants inviable, with domestic deposits resulting in a dependency on imports. Secondly, as the country looks to rapid industrialisation, foreign companies may be put off using coal-based power that impacts upon their carbon footprint targets (Turton, 2021). However, recently permitted coal power stations are far enough along in construction to avoid the moratorium. The Sihanoukville CIIDG power station 2 and SEZ power station have achieved financial closure and will likely reach operational status (Table 5). Meanwhile, the financing behind plants in Koh Kong and Oddar Meanchay provinces is less clear, and so could still fall foul of Xi Jinping's announcement to cease Chinese overseas funding of plants (Grimsditch, 2021).

# Lao PDR

Laos has banked significant economic growth through its energy sector on the back of becoming a battery to Southeast Asia, exporting power principally through the provision of hydropower. The country has already signed memoranda to export 9,000MW of electricity to Thailand (with talks ongoing for an additional 1,200MW), and 5,000MW to Vietnam. In 2020, 72% of all power generated was exported to neighbouring countries (Theangseng, 2021). There is a hope that increased infrastructure through the ASEAN Power Grid will facilitate a broader range of exports, but how does this support a modern, efficient domestic power system? There is a planned 600MW wind farm project in the south of the country, which would be the largest such farm in ASEAN (Kyodo News, 2021). But it is a joint Thai-Japanese development under agreement to supply power to Electricity Vietnam (EVN). Where is the domestic progress in renewable technology? Indeed, with hydropower continuing to prove controversial, and under risk from drought, the country has been looking to diversify its energy portfolio, including solar, wind, and also coal to cover a shortage in the baseload, particularly during the dry season. According to the Ninth Five-Year Energy and Mines Development Plan 5 (2021–2025), aims include the:

- Diversification of power generation (hydropower, coal, solar, wind), meeting both domestic demand and export needs
- Reaching a power mix of 65% hydropower, 30% coal, and 5% renewables
- Improving of the transmission and distribution system, aligning with the ASEAN Power Grid
- Reduction of (re-)imports, improving supply during the dry season

*(Theangseng, 2021)*

Beyond any short-term financial benefits of coal, there is a high risk that investments will quickly become stranded assets, deterring investors in a variety of sectors. It remains to be seen who will finance new coal projects, and in the search for foreign investment, there is a risk that Laos leaves itself open to corporate opportunists, who extract a return and then lumber a stranded investment back onto the Lao government and its people. This would be the case under the present system of concessions where after a 20-30 year agreement is completed, a public entity would be obliged to take over the project (Ha, 2020). In a slightly more positive development, a recent speech by H.E. Dr. Daovong Phonekeo, Minister for Energy and Mines, introduced an energy vision for 2030 looking to a power generation mix of 75% hydropower, 14% coal and 7% renewables (Phonekeo, 2022). This would see a movement away from the planned increases in coal, although further increases in hydropower undermine the potential to invest in renewables, which see a small increase.

It does not help that governance of the energy sector is uncoordinated. For example, there are different plans from different departments within the Ministry of Energy and Mines that remain unharmonized. These include the Power Development Plan as produced by state corporation Électricité du Laos, the 5-year Power Development Plan produced through the Department of Energy Policy and Planning, and the Power System Master Plan produced with support from Japan International Cooperation Agency (JICA).

There are no clear estimates on coal reserves in Laos. A 2019 report by the Asian Development Bank notes an estimate of 600-700 million tons (ADB, 2019). The principal known mining deposit is at Hongsa, with around 440 million tons lignite. However, a large deposit is also claimed in Sekong province (Finney, 2020), and so the overall reserve figure could be higher. The Vieng Phou Kha mine in Luang Namtha Province, Northwest Laos, is Thai-owned under Vieng Phou Kha Coal Mine Company Limited. It covers 800 hectares, with a capacity around 300,000 tons per year, that is transported 120km by truck to the Thai border (USGS, 2016). In 2020, the Centre for Development and Environment (CDE) through Bern University published an updated inventory of land deals in Laos as of 2016-17 (Hett et al., 2020). They note that 16,536 hectares of land have been granted under 16 coal mining land deals. These deals are focused in Phongsaly, Luang Namtha, and Huaphanh provinces in the north of the country, Vientiane and Vientiane capital, and then Sekong and Saravane provinces in the south.[4]

[4] It is interesting to note that the Hongsa coal mine is not represented in this inventory of land deals as a coal mine in the report, raising questions as to how it is accounted for.

At present there is one coal-fired station in northwest Laos, namely the 1,878MW Hongsa power plant in Xayabouri Province (Box 3 and Table 6). There are also proposals for further coal plants in the southern province of Sekong, which would take advantage of significant local mineral deposits. Unfortunately, there are no clear details on such projects, and the information provided in Table 6 represents the latest reporting rather than a definitive entry. There is no clarity on whether any of these proposed plants will proceed, particularly since it is unclear whether financial closure has been reached in the case of plants where Chinese financing is involved. However, hundreds of families are already being forcibly displaced to clear for the expansion of the Hongsa plant, regardless of the financing risks (Whong, 2021).

For the proposed plants in Sekong province, the implications of Cambodia's announcement that it will cease new domestic coal plants is unclear. It could be that Sekong represents a loophole to receive coal power. Nevertheless, the focus in Laos remains on an export business. Whether coal will be part of this approach – despite the risk of creating stranded assets – remains to be seen. However, one way of understanding the motivation behind projects in Sekong is the lucrative deal for the connected infrastructure to construction companies, namely transmission lines transporting the power to Cambodia. It is this kind of financing which can drive a project, regardless of the risks of operation in the future.[5]

**Box 3: Displacing Lao communities for Thai energy**

Utilising a significant local mineral deposit, the Hongsa coal plant and mine is majority Thai-owned and exports nearly 80% of generated power to Thailand under an agreement with EGAT. The initial project phases involved the relocation of 2,000 local residents (The Mekong Eye, 2016). During this period, NGOs were barred from meeting with villagers in order to hear their grievances. Phase III of the project aims for a fourth unit (626MW), capitalising on the discovery of a wider reserve than previously estimated. A compensation package of 1,200 kip (US$0.12) per m2 of farmland and 2,000 kip (US$0.2) per m2 of land with constructed facilities has been put forward by the plant company and local authorities, but residents claim this vastly undervalues the land. In an interview with Radio Free Asia, one resident asserted that:

> When that power plant expands, it will displace all the residents of our two villages. We're losing our farms, cattle, livestock, our forest and our water source. All of these resources are going to be taken away by this project *(Whong, 2021).*

[5] This situation is similar to the Han Seng power plant in Cambodia, with a proposed 230km transmission line linking it to Siem Reap province.

## Table 6:
## Existing and proposed coal plants in Laos (data sources: Asia News Network, 2019; GEM, 2022a; Hongsa Power, 2011; Khmer Times, 2021; Stimson, 2022)

| Plant Name | Location | Starting year of operation | Capacity | Operating company | Operating licence | Destination of power | Source of coal |
|---|---|---|---|---|---|---|---|
| **Existing plants** | | | | | | | |
| **Hongsa power station** | Xayaburi province | 2015-16 | 1,878 MW (3 units) | Hongsa Power Company Ltd<br>• Ratchaburi Electricity (40%-Thai)<br>• Banpu (40%-Thai)<br>• Lao Holding State Enterprise (20%) | 25 years (2016-41) | 1,473MW to Thailand, 100-175MW to EDL (Electricité du Laos) | Hongsa coal mine (Ratchaburi 37.5%; Banpu 37.5%; Lao Holding State Enterprises 25%) |
| **Proposed plants** | | | | | | | |
| **Hongsa power station Unit 4** | Xayaburi province | Unknown | 626MW (1 unit) | See above | See above | | See above |
| **Sekong Power Station** | Sekong province | 2025-6 | 700MW (2 units) | TSBP Sekong Power and Mineral Co Ltd to be built by unnamed Chinese company | 30 years | Purchase agreement with EDC in Cambodia | Locally mined coal |
| **Xekong Power Station** | Sekong province | 2024-27 | 1,800 MW (3 phases) | Xekong Thermal Power Plant Co Ltd to be built by Phonesack Group Co Ltd | 30 years | Purchase agreement with EDC in Cambodia | Locally mined coal |

# Myanmar

Energy system updates from both the exiled National Union Government (NUG), and the military junta-based State Administration Council (SAC) (see NDC section in Chapter 1 of this report) called on a reduction from a 33% business-as-usual share of coal power in the total power generation mix in 2030 to 20% (Wallace & Liu, 2021). These figures are highly problematic. The 33% refers to a National Energy Plan dating from 2014 (National Energy Management Committee, 2014), which was put together with assistance from the Japan International Cooperation Agency (JICA), while the 20% alludes to an ADB-supported Energy Master Plan from 2015 (IES, 2015). Yet the present contribution of coal to the energy mix is around 1%, completely at odds with the overinflated projections of increased demand in these plans. Indeed, such is the unreliable nature of investment into Myanmar, with little cross-government consensus on the fuel, that the country is already littered with cancelled coal projects. In recent years, 11 contracts were signed for plants together with international companies, yet public opposition contributed to all of these being suspended or cancelled (author's calculation using information provided by Global Energy Monitor - GEM, 2022b). Many such projects involve Thai companies in joint ventures with domestic partners. Examples of such ventures are highlighted in the section on overseas production and distribution of coal in Chapter 3 of this report. There is also a description of the controversial construction of a coal power plant at Mawlamyine cement factory in Mon State, which is part-owned by the Thai Siam Cement Group.

In this light the NDC looks like an attempt to game the system and leave options open for large increases in coal capacity, while making it look like a reduction. As it stands, the future of the energy system in Myanmar remains considerably unclear due to the political turbulence in which the country is presently enveloped. Aside from environmental considerations, sector workers have gone on strike against the junta, making it difficult to maintain the national grid (Bociaga, 2021). Meanwhile, there is lobbying for all prospective investors to pull out of their ventures. The present political turmoil denies any new coal plant projects, although this does not mean they remain off the table indefinitely.

There is incomplete coverage of electricity through a centralised grid in Myanmar. Myanmar is a net exporter of energy, with national elites, including the military, looking to profit from the sale of natural gas to Thailand and China. Companies with clear affiliations to the Burmese military are prominent in mining operations, such as Myanmar Economics Holding Public Company Limited (MEHPCL) and The Myanmar Economic Corporation (MEC) (MEITI, 2019). The existing domestic grid is governed by the Ministry of Electricity and Energy (MOEE). Distribution is implemented by three companies, the Yangon Electricity Supply Corporation (YESC), Mandalay Electricity Supply Corporation (MESC), and Electricity Supply Corporation (ESC), while power plants are run by a mix of State-Owned Enterprises and private companies. As of the end of 2021, there exists only one significant coal power plant in Myanmar (Tigyit in Shan State), which has a capacity of 120MW (see Table 7 and Box 4). Meanwhile, there are small-scale private generation plants, particularly in the south of the country, away from the central grid. For example, the 6MW Kawthaung plant started operation in 2012, located at the southern tip of Tanintharyi Region, using coal from a local mine in Bokpyin Township.

## Table 7:
## Existing large-scale coal plant in Myanmar (data sources: GEM, 2022a; Shan Herald Agency for News, 2020; Stimson, 2022; Zin Mar Win, 2019)

| Plant Name | Location | Starting year of operation | Capacity | Operating company | Operating licence | Destination of power | Source of coal |
|---|---|---|---|---|---|---|---|
| Existing large-scale plant | | | | | | | |
| **Tigyit power station** | Shan State | 2005 | 120MW (2 units) | China National Heavy Machinery Corporation with Burmese companies Eden Group and Shan Yoma Nagar. Upgrading work by Wuxi Huaguang Electric Power. | Latest operating license until 2022 | Bought by Shan state government for state use | Tigyit coal mine |

**Box 4: Tigyit coal plant**

Nearly 20 years ago, 60 hectares of land were confiscated to set up the mine and power plant at Tigyit in Taunggyi District, southern Shan State. The project was a joint venture between China National Heavy Machinery Corporation (CHMC) and Burmese business-men affiliated to the ruling junta. During this initial grab, communities belonging to Pa'O and Taungyo ethnic groups were affected, who received no compensation for their loss of land (Bociaga, 2021a).

Operations at the plant were suspended in 2014. This may have been influenced by local protests over air and water pollution caused by the plant, which was affecting nearly 12,000 local residents, with 50% suffering from skin rashes (Aung Shin, 2016). However, more likely the shutdown was because the plant was failing to generate the targeted electricity, thereby requiring an upgrading of its facilities. With Chinese company Wuxi Huaguang Electric Power stepping in to improve facilities, the plant restarted in 2017. The adjoining coal mine accesses a 20 million ton lignite deposit. It recently increased its area to over 300 hectares (beyond the original 200 hectares granted for mine and power plant), burdening the local population with more waste by-products dumped out-side their homes (Zin Mar Win, 2019). A report by the Myanmar Alliance for Transparen-cy and Accountability (MATA) condemned the operating conditions at Tigyit, with con-tinued pollution failing international standards. Yet their calls for the plant to be shut were ignored by the Union government.

One consequence of an incomplete national grid is that there is an opportunity to develop renewable energy sources that bypass the need for infrastructural network connectivity across geographical and political fragmentations. Indeed, in May 2020, before the coup, a first round of solar auctions took place in Myanmar, with a total capacity of 1.06GW (Wiriyapong & Tisnadibrata, 2021). In this context, a decentralised system does make sense, although work has been delayed due to conflict in the country.

Beyond power generation, there are significant proven coal reserves through Myanmar, with one estimate from 2017 standing at 543 million tons (Tin Zaw Myint, 2021). There is extensive but predominantly small-scale coal mining in Myanmar. In 2019, the Myanmar Extractive Industries Transparency Initiative (MEITI) released details on permits given out for coal mining and the companies involved (MEITI, 2019). Of active

coal mining permits as of 2018, there are 48 for large production, 97 for small production (serving local consumption), and 128 for exploration. These are based in Sagaing, Tanintharyi, Magwe and Mandalay Regions and Shan State. An active permit does not necessarily represent an active mine, although in many cases there is clear enough reporting of activity. There is also a trail of reporting over mining operations that have resulted in land loss by local communities, compounded by environmental violations polluting the vicinity. Key sites of controversy include:

- **Nan Ma coal mines**, Kyaukme District, northern Shan State – mining first started in the 1980s and there are now several mines found in the Nan Ma area (Shan Human Rights Foundation, 2021). Despite complaints about pollution (including mining waste blocking local irrigation systems), land loss and land collapse, the Mandalay conglomerate Ngwe Yi Pale (to feed sugar and cement factories) and the Burmese army have expanded operations.
- **Ban Chaung coal mine** in Dawei district, Tanintharyi Region – the coal mine is located in a territory under contestation between the Myanmar Union government and the Karen National Union (KNU). Operated by Mayflower Mining (with close links to national elites) together with two Thai partner companies, the project was pushed through without an environmental impact assessment or consultation with local communities (Tarkapaw Youth Group et al., 2015). The community has already suffered from air and water pollution and land confiscations. A planned expansion of the site from 60 to 2,100 acres would strip the community of its agricultural land.
- **Tigyit coal mine,** Taunggyi District, southern Shan State (see Box 4).
- **Coal mines in Sagaing Region** – media reports indicate concerns over working conditions through several industrial accidents. The Irrawaddy news site reports that in May 2019, four workers were killed and four injured in Kale Township when an oxygen cylinder exploded at a mine (Zue Zue, 2019). Meanwhile, in August 2018 five workers, including a Chinese national, were killed by a methane explosion in a mine in Kalewa Township. A local labour activist lamented at the lax conditions at local mines, where operations are frequently carried out by third-party contractors.

# Thailand

There is one key state-owned coal power plant in the north of Thailand (Mae Moh), completed in the late 1970s, and served by a large local deposit of the fuel (Table 8). Since the 2000s, several privately-owned coal-fired plants were built, many connected to industrial estates within Rayong Province. These private plants come under three categories:

- Independent Power Producers (IPPs): Capacity of over 90 megawatts (MW), using natural gas or coal as a fuel type, and with a long-term power purchase agreement with EGAT.
- Small Power Producers (SPPs): Out of total capacity, 10-90 MW is sold to EGAT, the rest to industrial customers commonly nearby the plant. Contracts with EGAT are up to 25 years long.
- Very Small Power Producers (VSPPs): Out of total capacity, up to 10 MW is sold to a Metropolitan Electricity Authority (MEA) or Provincial Electricity Authority (PEA). In principle, VSPPs produce electricity through renewables. This powers a local grid system or factory, and the scheme allows excess to be sold to EGAT under a non-firm contract. In this way, such projects overlap the function of industrial production and power generation. Regulations allow for the supplementary use of other fuel types (such as coal) up to 25% of consumption, due to the seasonal availability of biomass. It is possible that power producers are manipulating this loophole to maximise fossil fuel usage, potentially beyond its regulatory quota.

In 2019, Mae Moh contributed 62.8% of Thailand's coal use for electricity, a downward proportional contribution of coal used in Thailand but still a dominant position. Nearly all coal used in IPPs, SPPs and VSPPs is imported. In 2018, there were a total of 937 SPPs and VSPP projects (Tunpalboon, 2019). A list of the coal-fired plants under firm (defined provision) contracts to EGAT is provided in Table 8, although there are other small-scale plants serving local industrial plants and factories, before selling excess power to local electricity authorities. Indeed, these VSPPs are registered as renewable energy producers (solar, wind, biomass, biogas, and waste), even though in actuality they may be using fossil fuel power including coal.

## Table 8:
## Existing and proposed coal plants in Thailand (data sources: GEM, 2022a; Praiwan, 2018; Stimson, 2022; Tunpalboon, 2019; Watchalayann et al., 2018)

| Plant Name | Location | Year of operation | Capacity | Operating company | Destination of power | Source of coal |
|---|---|---|---|---|---|---|
| **State-owned plant** | | | | | | |
| **Mae Moh power station** | Lampang province | First units installed 1978-81 | 2,455 MW (7 units; 7 units retired) | Electricity Generating Authority of Thailand (EGAT) | National grid | Mae Moh coal mine |
| **Independent Power Producers (IPPs)** | | | | | | |
| **BLCP** | Map Ta Phut Industrial Estate, Rayong province | 2006 | 1,434 MW (2 units) | Banpu PCL; EGCO Group (50:50 share) | Industrial estate & national grid | Imported coal |
| **Gheco One** | Map Ta Phut Industrial Estate, Rayong province | 2012 | 660 MW (1 unit) | Glow Energy PCL; WHA Energy 2 Co., Ltd | Industrial estate & national grid | Imported coal |
| **Small Power Producers (SPPs) – Contracts with EGAT with defined provision of electricity** | | | | | | |
| **Glow SPP 2/ Glow SPP 3** | Map Ta Phut Industrial Estate, Rayong | 2000 | 444 MW (2 hybrid units allowing coal) | Glow Energy PCL | Industrial estate & national grid | Imported coal |
| **Glow Energy CFB 3** | Map Ta Phut Industrial Estate, Rayong | 2010 | 85 MW (1 unit) | Glow Energy PCL | Industrial estate & national grid | Imported coal |
| **Tha Tum power station** | 304 Industrial Park, Prachinburi | 1999 | 328 MW (2 units) | National Power Supply PCL (Double A Power) | Double A, industrial customers, & national grid | Imported coal |
| **IRPC** | IRPC Industrial Zone, Rayong | 2015 | 307 MW (1 unit) | IRPC PCL | Industrial customers | Imported coal |
| **TPT** | Map Ta Phut Industrial Estate, Rayong | 1995 | 55 MW (1 unit) | TPT Petrochemicals PCL | On site plant & surplus power to EGAT | Imported coal |
| **Prospective unit replacement under pre-permit** | | | | | | |
| **Mae Moh power station** | Lampang province | Unknown | 600MW (2 units) | EGAT | National grid | Mae Moh coal mine |

The 2015 Power Development Plan (PDP) called for the construction of three new plants in Krabi and Thepa, Surat Thani Province. The plants were subsequently omitted from the 2018 revision to the PDP, and in July 2021 were confirmed abandoned, to be replaced by a 1,400MW natural gas plant in Surat Thani (Yeap, 2021). This latter point is instructive, showing how the prevailing shift is still to fossil fuels rather than to renewables. Yet Thailand has dwindling domestic natural gas supplies, and is becoming dependent on imports, with the state-owned gas and oil company PTT hoping to take control of access to the Myanmar Yadana gas field as other multinationals exit from Myanmar (Reuters, 2022).

A new National Energy Plan (NEP) 2022, presently under finalisation, does temper this trend to an extent, although serious questions remain on Thailand's energy approach. The NEP 2022 comprises five separate plans:

1. National Power Development Plan (PDP) 2022
2. Natural Gas Management Plan or Gas Plan
3. Renewable and Alternative Energy Development Plan (AEDP)
4. Energy Efficiency Plan (EEP)
5. Fuel Management Plan (Oil Plan)

The PDP 2022 proposes to increase the share of 'renewables' from the previous PDP 2018 (Table 9), keeping in mind that some of the energy sources included as so-called 'renewables' are problematic and should not be used as a primary method to achieve renewable targets (e.g. hydropower, biomass, biogas, and waste-to-energy). There is a decrease in the solar capacity, although this is partially compensated by a rise in wind energy. However, the major increase in the government's 'renewables' plan is attributed to a rise in imported hydropower, a far from satisfactory approach that seems to ignore the continuing controversy of dam projects in the region, including their negative environmental and social impacts, as well as increasing unreliability as an energy source in the face of a changing climate.

## Table 9:
## Comparison of Thai Power Development Plans (PDPs) from 2018 and 2022, with their targeted power generation capacity for 2030 (data from Kaohoon, 2021)

| | PDP 2018 (MW) | PDP 2022 (MW) | Change (MW) |
|---|---|---|---|
| Natural gas | 5,550 | 4,850 | -700 |
| Coal | 600 | 600 | 0 |
| **Total fossil fuels** | **6,150** | **5,450** | **-700** |
| Imported hydropower | 1,400 | 2,766 | +1,366 |
| Solar | 5,194 | 4,455 | -739 |
| Wind | 270 | 1,500 | +1,230 |
| Biomass | 1,120 | 485 | -635 |
| Biogas | 783 | 335 | -448 |
| Waste | 400 | 600 | +200 |
| Small hydropower | 26 | 52 | +26 |
| **Total 'renewables'** | **9,193** | **10,193** | **+1,000** |
| **Share of 'renewables'** | **60.0%** | **65.2%** | |
| ***Total Solar & Wind*** *(non-problematic renewable sources)* | ***5,464*** | ***5,955*** | ***+491*** |
| ***Share Solar & Wind*** *(non-problematic renewable sources)* | ***35.6%*** | ***38.1%*** | |
| **Total** | **15,343** | **15,643** | **+300** |

The new PDP revision shows no change in power production by coal, remaining at 600MW. However, this masks a missed opportunity, failing to look towards the closure of the Mae Moh plant and instead planning to build two new 300MW units (which would be units 8 and 9), which will replace two units set to be decommissioned in 2022. The consolation here is that financial closure has not yet been reached for this renewal and so the plan must remain under question (Suarez & Gray, 2021). A further unaddressed issue is that of overcapacity. Thailand has an overly high reserve margin of 55%, which remains a barrier to adding renewables in the short-term (Chua, 2022). In 2019, EGAT bought 4,000MW from Laos, the vast majority from hydropower sources (Pajai, 2021). This was 10% of Thailand's installed capacity, and around half the electricity generated in Laos. While EGAT plans to shut down its coal mines in the north of Thailand once renewable energy can replace it, the massive overcapacity denies space to develop domestic renewables. A new PDP could bring an opportunity to scale down the overall capacity, for example, by limiting hydropower imports or rebuilds at Mae Moh coal plant, and think in terms of an alternative to gas imports. Indeed, in 2021, 75% of Thailand's electricity, crude oil, coal and natural gas needs were imported (Setboonsarng, 2022). With spiralling prices, and a depleted gas supply from the Erawan field offshore of Myanmar (which could further be affected by US sanctions on the Burmese military), never has there been a clearer need to develop a secure domestic energy system. The new proposed plan fails to achieve this, despite the availability of progressive models based on renewable power (see section on developments in renewable energy in Chapter 3).

Alongside state energy plans to continue coal production at Mae Moh, there are also smaller mines around the country serving private sector industrial needs. For example, there are plans to establish coal mines in Omkoi District, Chiang Mai Province (using 284.3 rai or 45.3 hectares of land),

and Mae Tha District, Lampang Province (using around 900 rai or 144 hectares), to serve a plant run by Siam Cement Group in Lampang (Hayward, 2021). This could displace local communities, cause loss of forestland and associated biodiversity, and trigger air pollution and further greenhouse gas emissions.

There are other ways to look at power production and financing that show how the Thai energy sector works against a broad exit from coal. Further details on this are found in Chapter 3 of this report. Such an approach typifies Thailand's stance to adapt rather than mitigate against the impacts of climate change. This could have devastating implications. Indeed, the country already shows significant environmental vulnerabilities, which could quickly translate into economic contraction. In 2020 the country suffered its worst drought in four decades, while there are also fears that Bangkok could all but be underwater by 2050 (Sanglee, 2021).

## Vietnam

Vietnam has a schizophrenic identity as the regional leader in coal power yet also a model in the transition to renewables. First to the negative side. Vietnam has the world's largest coal pipeline after China and India. It is the highest source of power within the country, in 2021 accounting for 36% of total installed power (VietNamNet, 2021). There are at least 30 large-scale coal plants in Vietnam with a capacity of at least 30MW, which feed power to the national grid, primarily through power purchase agreements with Vietnam Electricity (EVN). There are also smaller plants, many of which are privately owned, and which are often focused at onsite power needs. In 2019 and 2020, electricity generated through coal catered to half of the nation's needs, which grew at an average rate of 10% per annum over the last decade (S. Nguyen, 2021). Most plants are found in the northeast of the country, using a key deposit in Quang Ninh province (Box 5). However, despite proven reserves of 3.4 billion tons of coal as of end 2020, Vietnam also has a dependency on imports to maintain its numerous plants which will only increase should new capacity be added in the country (BP, 2021; Hai Van, 2021). According to data from Trade Map (ITC, 2022), in 2020, 55.4 million tons of coal were imported, which compares to 23.8 million tons imported to Thailand (see Chapter 3). The main exporting countries to Vietnam are Australia, Indonesia, South Africa, and Russia. Appendix 1 to this report gives details on coal plants in Vietnam.

- 30 large-scale coal plants (>30MW) with 74 units at 22.8GW
- 6 plants under construction with 12 units at 8.0GW
- 21 plants with minimum 50 units at 21.2GW that are under threat from changes in global financing and domestic energy policy

The number of planned plants under threat because of financing issues is considerable, further vulnerable due to potential government plans to convert some from coal to natural gas, pledges made at COP26, and a commitment not to allow new plants that are not mentioned in PDP7. There are additional dynamics working against coal plants. For example, Long Phu 1 is presently under construction, but the project is now frozen since the Russian contractor, the engineering firm Power Machines, is under US sanctions (Hoang, 2022).

**Box 5: The toxic legacy of coal in Vietnam**

A 2015 report on the Third Pole platform speaks about Vietnam's obsession with coal as an environmental disaster (Ives, 2015). As an example, it highlights the conditions of local residents in the northern province of Quang Ninh, which supplies 90% of domestic coal output. The report lists dust, acid drainage, and heavy metal pollution as outcomes of mining and power production. This affects groundwater and thereby drinking supplies, paddy-rice soils, and human health. In Cam Pha city, summer rains in 2015 caused flooding and landslides. Mining has left the landscape broken up and precarious to such weather. Even worse, the rain breaks up large heaps of coal waste from local power plants, sending sludge through nearby settlements and destroying houses. In dry conditions, the coal slag also expels considerable dust. Nguyen Trong Minh, chair of Cam Pha City People's Council, noted that the city dumping site was full so that the operating company of Cam Pha power station, Vinacomin, started to dump waste in Van Don Island district. He commented that:

*We breathe the seriously polluted air every day and we are surrounded by mining sites, thermal power plants and cement plants from all sides (NLD, 2015).*

Schools, hospitals and residential homes were all becoming covered in dust. Local beaches were becoming contaminated, a point of concern with Cam Pha adjacent to Ha Long Bay, UNESCO World Heritage Site and one of the most important tourist stops in the country. As a result of these impacts, there was strong opposition to a third phase of Cam Pha power station, which would involve the construction of two new units totalling 404MW. It appears that the new phase will be cancelled in the Power Development Plan 8.


In March 2021, the Vietnamese government published the first draft for the Power Development Plan 8 (PDP8), which covers the period 2021–2030 with a vision until 2045 and will be implemented by the Ministry of Industry and Trade. Although the PDP was originally meant to be approved soon after, there have been delays due to the COVID pandemic, national elections in May 2021, and debates on the content. There have been four revisions of the draft, although changes are not always shared in the public domain. In a draft from October 2021, a 37.3% share on coal power by 2030 was revised up to 40.6%, requiring 41GW installed coal power. With its overemphasis on fossil fuels, the draft does little to alleviate the impact of high prices and the need to achieve national energy security, such as through improving grid infrastructure (Pham, 2022). Instead, new power plants for imported fossil fuels could easily become stranded assets.

Targets from the October draft were effectively nullified by new energy commitments made during COP26. Therefore, new revisions were needed to incorporate pledges, including the 2050 net zero commitment and the aim to stop developing new coal plants beyond those already approved by the prime minister through PDP7. A government meeting was held in February 2022. It is hoped that there will be a shift away from coal. After all, having committed to phase out coal plants around 2040, it makes no sense to build new plants now that would only have a limited life span and carry no economic logic. However, there are discussions to switch coal capacity to natural gas or even return to nuclear power. Although many details were unclear concerning the new revisions at the time of writing, the plan for installed capacity in 2030 had been reduced to 146,000MW, which is 9,000MW less than in the October 2021 draft, and then to 352,000MW by 2045 (Tachev, 2022). It is hoped that PDP8 will finally be approved before the start of COP27 in November, 2022.

The plan must also account for the remarkable growth in renewable capacity. Since 2018, there has been huge growth in solar in Vietnam, placing it 7th in the world in terms of solar capacity (D. T. U. Nguyen et al., 2021). As context, Thu Vu, a Hanoi-based analyst with the Institute for Energy Economics & Financial Analysis, claims that:

> ***The government was in favour of coal for a long time, but they've realized it's not reliable anymore. At the same time, Vietnam's economy continued to grow very fast, so they had to explore other options, so they pivoted to renewables.***
>
> (D. T. U. Nguyen et al., 2021)

More specifically, solar expansion took off due to the introduction of high feed-in tariffs, in 2017 set at 9.35 US cents per kilowatt by the Ministry of Industry and Trade (EVN, 2017). One consequence is that grid infrastructure development was not able to keep pace with the accelerated expansion of solar. So, the high feed-in tariff was stopped and since 2020, there has been no specified policy for solar. Indeed, in the February 2022 meeting for PDP8, it was argued that solar capacity is still too high and needs reducing for the period 2031-2045 (Rai-Roche, 2022). One result is that there has been a shift towards both onshore and offshore wind energy in the renewable sector, and in 2021 3.5GW of wind capacity was added (Chua, 2022). The October 2021 draft of PDP8 planned for a share of renewables in the energy mix at 31.5% in 2030, rising to over 36.3% in 2045 (L. Nguyen, 2022). This is an improvement from PDP7 which projected a 23% share of renewables by 2030. During COP26, the Minister for Industry and Trade announced an aim to double installed wind and solar capacity to 31-38GW by 2030, but this is not yet represented in the PDP8 drafts (Dezan Shira & Associates, 2021).

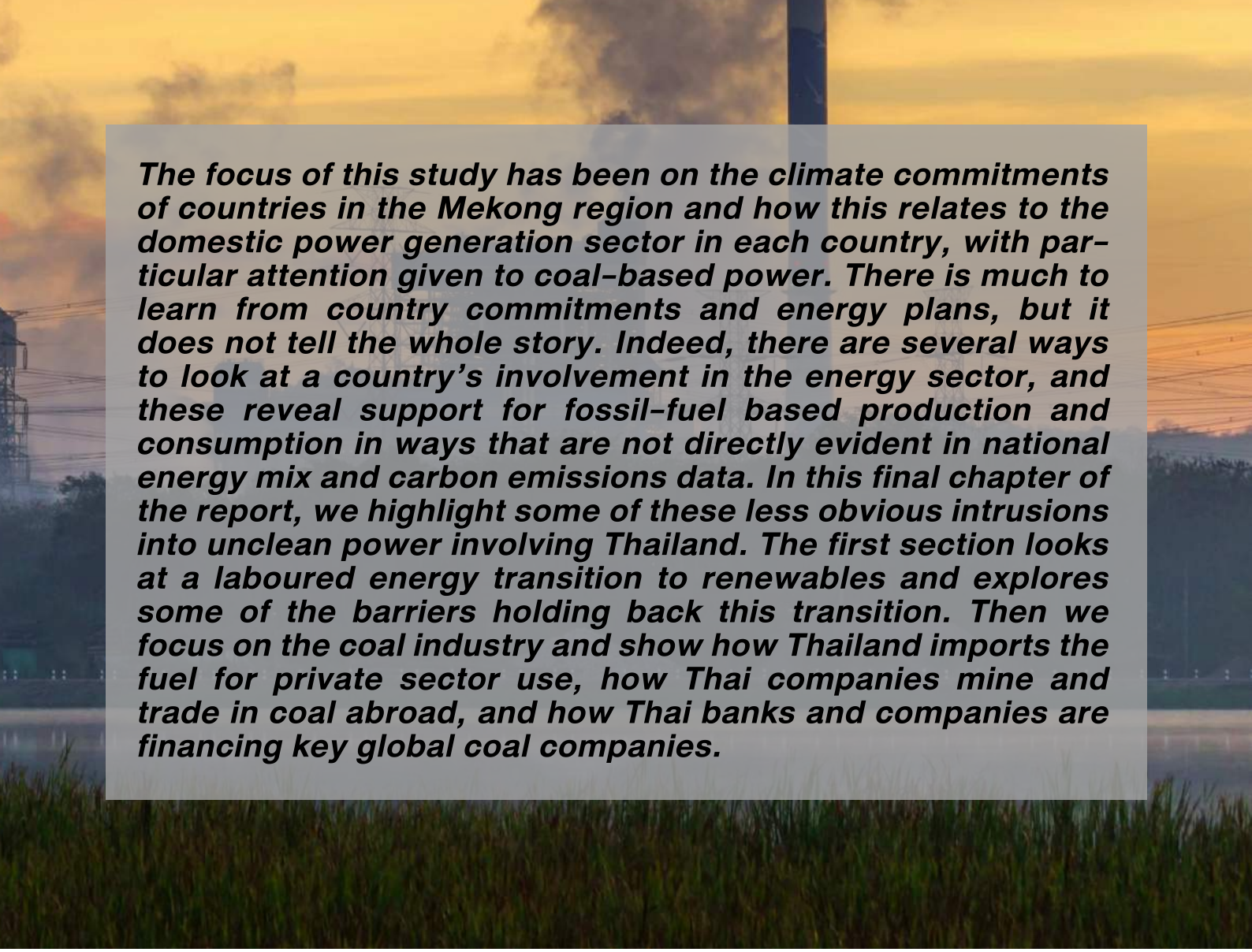
Why did Vietnam shift to renewables in a way that has not taken place in other Mekong countries? There are competing interests in government, including those who support a clean energy transition as opposed to those who wish to maintain a strong base in fossil fuel usage. However, the former group has been backed up by multiple interests in the private sector, support from development agencies and international advisory groups, as well as a strong voice from civil society urging the transition. This has allowed a space for renewables to thrive through policies such as the high feed-in tariff for solar. There has been an influx of investment to set up factories in Vietnam, including multinationals such as H&M and Adidas, in part to retain market access because of a US-China trade war. With domestic power sources limited, companies are choosing to install rooftop solar panels to produce energy and conform to green corporate strategies (Janssen, 2021). Such practices are important in the light of a recent vote by the European Parliament for an emissions tax on goods imported to the block that are produced under an unfriendly energy source (VietnamPlus, 2021). In a 'Joint Statement of Support for High-Ambition Power Development Planning in Vietnam', as organised by the public-private partnership Clean Energy Investment Accelerator, a group of domestic and international companies call for the Vietnamese government to prioritise renewable energy in a transition to a clean energy system (CEIA, 2021). The statement calls for:

- Increased solar and wind energy targets
- Expanded long-term mechanisms for corporate and industrial zone clean energy purchases
- Greater emphasis on energy storage and flexibility solutions
- Expanded opportunities for private sector investment in grid infrastructure
- Reduced coal and natural gas targets
- Accelerated progress toward a net-zero power system

It is also interesting that Thai companies are at the forefront of renewable development in Vietnam, due to the more open market in the latter country (see the section on developments in renewable energy in Chapter 3 for more information).

The space for civil society engagement with a clean energy transition comes with a proviso. In January 2022, Nguy Thi Khanh, the founder of GreenID (Green Innovation and Development Centre) and recipient of the prestigious Goldman environmental prize, was arrested for tax evasion (Brown, 2022). There are concerns that the detention relates to the organisation's campaign for Vietnam to adopt a clean energy strategy, an antagonism to those government voices pushing for increases in coal and other fossil fuel consumption. The arrest acts as a reminder that speaking up against the state in Vietnam can be a precarious occupation.

# Focus on Thailand



***The focus of this study has been on the climate commitments of countries in the Mekong region and how this relates to the domestic power generation sector in each country, with particular attention given to coal-based power. There is much to learn from country commitments and energy plans, but it does not tell the whole story. Indeed, there are several ways to look at a country's involvement in the energy sector, and these reveal support for fossil-fuel based production and consumption in ways that are not directly evident in national energy mix and carbon emissions data. In this final chapter of the report, we highlight some of these less obvious intrusions into unclean power involving Thailand. The first section looks at a laboured energy transition to renewables and explores some of the barriers holding back this transition. Then we focus on the coal industry and show how Thailand imports the fuel for private sector use, how Thai companies mine and trade in coal abroad, and how Thai banks and companies are financing key global coal companies.***

# Why stick with coal?

On the surface, there appear to be promising movements towards renewable energy in Thailand. In June 2021, the world's largest floating solar farm came into operation on the Siringhorn Dam, Ubon Ratchatani province. Using 144,000 separate solar panels, and covering the equivalent of 100 football fields, the farm can produce 45MW at peak power, compared to 36MW produced by the dam itself (Board, 2021). EGAT has further plans for floating solar farms at 9 more dams over the next decade (Roney, 2021). While such developments are welcomed, floating farms do represent low-hanging fruit. and a greater commitment to wider integration of solar power is still needed. Therefore, while Thailand has also become a significant manufacturer of solar panels, many of these are for export, with little domestic use. Indeed, there remains a ban on ground-mounted solar projects from being connected to the national grid in Thai energy policy (ibid), and the country suffers from the lack of a net-metering system. The reduction in projected solar from the 2018 to 2022 Power Development Plans (see Table 9) shows a regressive attitude to a clean energy transition.

Many fossil fuel companies have entered the renewable energy sector. For example, in 2021 PTT, the state-owned oil, gas, and (to a lesser extent) coal company, went on a spending spree acquiring renewable energy and electric vehicle (EV) companies. It is expected to invest over US$16 billion in this area over the next decade (Muramatsu, 2021b). Such corporate movements are based on economic strategy, and while the recognition of future profits lying in green energy rather than fossil fuels is positive, the movement away from dirty energy is too slow and lacks conviction.

Furthermore, while Thailand hopes to attract multinational green companies, Thai companies themselves are investing abroad, as they question whether the supporting infrastructure and grid technology is in place for a domestic energy transition. PTT is chasing assets in China, India, and Vietnam, as well as looking to electricity in Europe. In January 2022, the Thai renewable energy company Impact Energy Asia Limited signed a Memorandum of Understanding with the Government of Laos to develop a 1,000MW wind farm in Sekong province, to combine with a 600MW wind project already in construction that will send electricity to Vietnam under a Power Purchase Agreement with EVN (ENC, 2022). Thai energy companies are also at the forefront of renewable developments in Vietnam. They engaged in new solar projects during the recent surge in capacity which reached 16,640MW in 2020. This compares to domestic aims in Thailand to reach 4,455MW by 2030 according to the 2022 Power Development Plan proposal. Reflecting this trend, Chaphamon Chantarapongphan, secretary-general of Thailand's Renewable Energy Industry Club and senior executive vice-president at Super Energy Group, stated in June 2021 that:

> ***For Thai investors in Vietnam we already have more than 5 gigawatts [5,000MW] there … Now we are looking at the Philippines, Indonesia and many places because Thailand does not have a clear policy [on renewable energy].***
>
> (Janssen, 2021)


As observed in Chapter 1 of this report, there remain serious institutional barriers to a clean energy transition. EGAT seems reluctant to disrupt a fossil-fuel based national power surplus. The monopoly of EGAT (with affiliates PEA and MEA) over electricity generation and sales does little to aid private sector investment in the country and the liberalisation of the energy sector. In particular, natural gas carries significant political collateral, and any shift away from coal tends to move in this direction rather than to clean renewable power. The energy sector inhibits a transition to a smart decentralised energy grid, obstructing rooftop solar power and the accompanying need for a net-metering scheme. In the meantime, Thailand's call for an EV revolution may reduce urban air pollution, primarily in crowded areas, and reduce running costs for users. But it can hardly be called a clean venture when the electricity used to run these vehicles is dirty.

To highlight the rocky terrain of clean energy integrity, one must only look at the palpably ridiculous application of Environmental, Social and Governance (ESG) ratings for companies. There are 58 companies listed on the Stock Exchange of Thailand (SET) Thailand Sustainability Index (THSI), yet 16 of these derive revenue from fossil fuels or petrochemical products, including PTT and Gulf Energy Development (LNG company) (Hicks, 2021). There is no clear downgrading of companies should they fail to reach emissions targets. Indeed, Greenpeace has pointed out that companies are not even obliged to reveal their emissions levels, should it be deemed to expose 'trade secrets'. Banpu has an excellent ESG rating, yet draws 70% of its revenue from coal, operating 6 plants and 21 mines worldwide. The company aims to reduce coal revenue to 50%, not by reducing the number of coal plants, but by increasing natural gas and with a little additional income from renewable energy plants. This expansion of fossil fuels while claiming improved emissions is practised by many companies, reflecting sham economics, bad science and misleading reporting. It is greenwashing at its worst.

This is not because an energy system based on renewables is not possible. A previous report by this author (Hayward, 2021) compiles various models that promote the potential of renewables in both specified areas of Thailand, and on a wider scale:

- 2018 study by Greenpeace putting forward a model for 100% renewable electricity in Krabi province by 2026
- 2015 study by the German Fraunhofer Institute for Solar Energy Systems (ISE) and the Thai Ministry of Energy, which proposes 100% renewable energy in Nan Province by 2036
- 2016 study by the World Wide Fund for Nature (WWF) that provides a model for 100% Renewable Energy in the Greater Mekong Region by 2050

In 2022, a new model was put forward by a group of academics (predominantly based at Thammasat University, Bangkok) and energy specialists, offering a transition to 100% renewables by 2050 (Kansuntisukmongkol et al., 2022). The model carries a focus on solar (both in large-scale farms and small-scale rooftop installations) with daytime peaks balanced against battery storage and a little wind. Figure 7 maps out the transition showing the daily composition of energy every 5 years up to 2050. Figure 8 shows the general shift in the energy mix in the model. It should be noted that coal is phased out completely by 2040 while natural gas follows by 2050. The group also undertook modelling for a more rapid decarbonization by 2040, but in economic terms such a transition proves much more costly, due to the stranded costs of oversupply. Indeed, the presentation highlighted the continuing overestimation of demand forecasts through a succession of power development plans. Figure 9 measures these forecasts against actual demand, which have resulted in the oversupply that holds back the transition to a renewable energy system.

## Figure 7: The proportion of energy sources in daily production (new model to decarbonize by 2050), 2022–2050 (Kansuntisukmongkol et al., 2022)

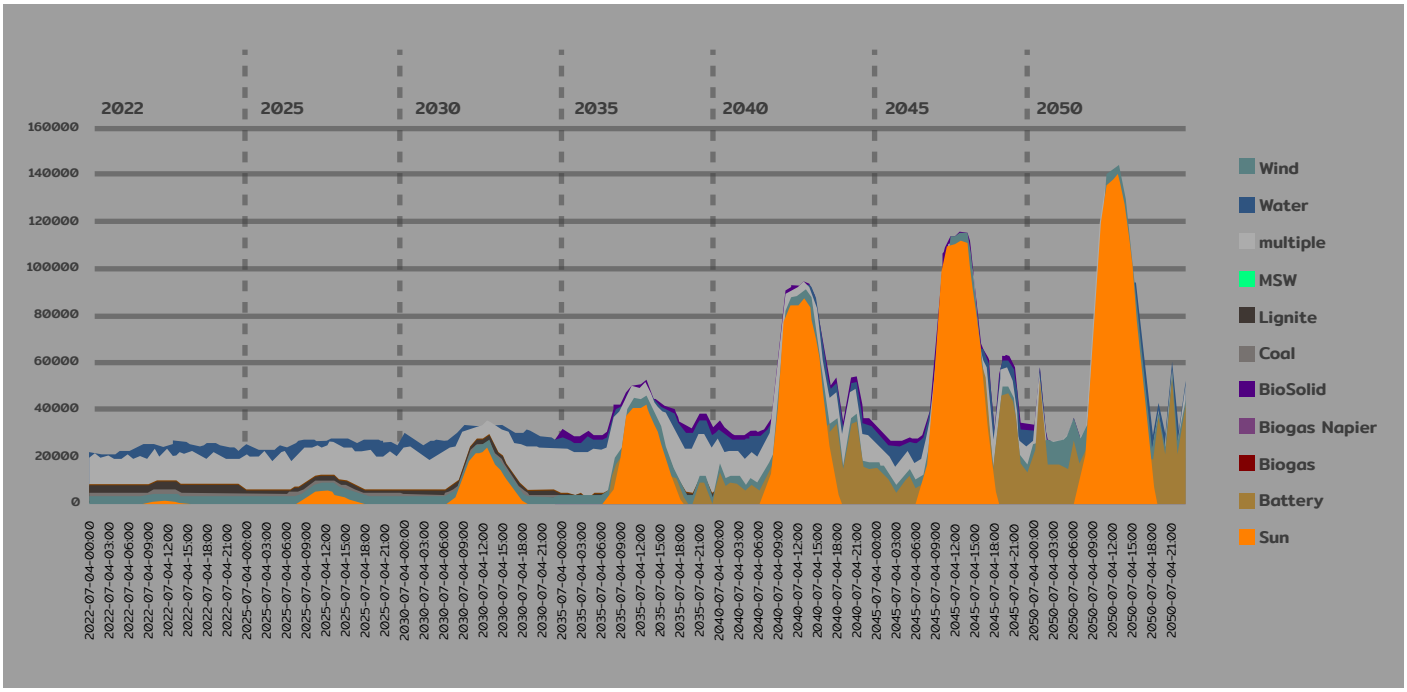


Figure 8: Energy mix by type (from new model to decarbonize by 2050), 2022-2050 (Kansuntisukmongkol et al., 2022)

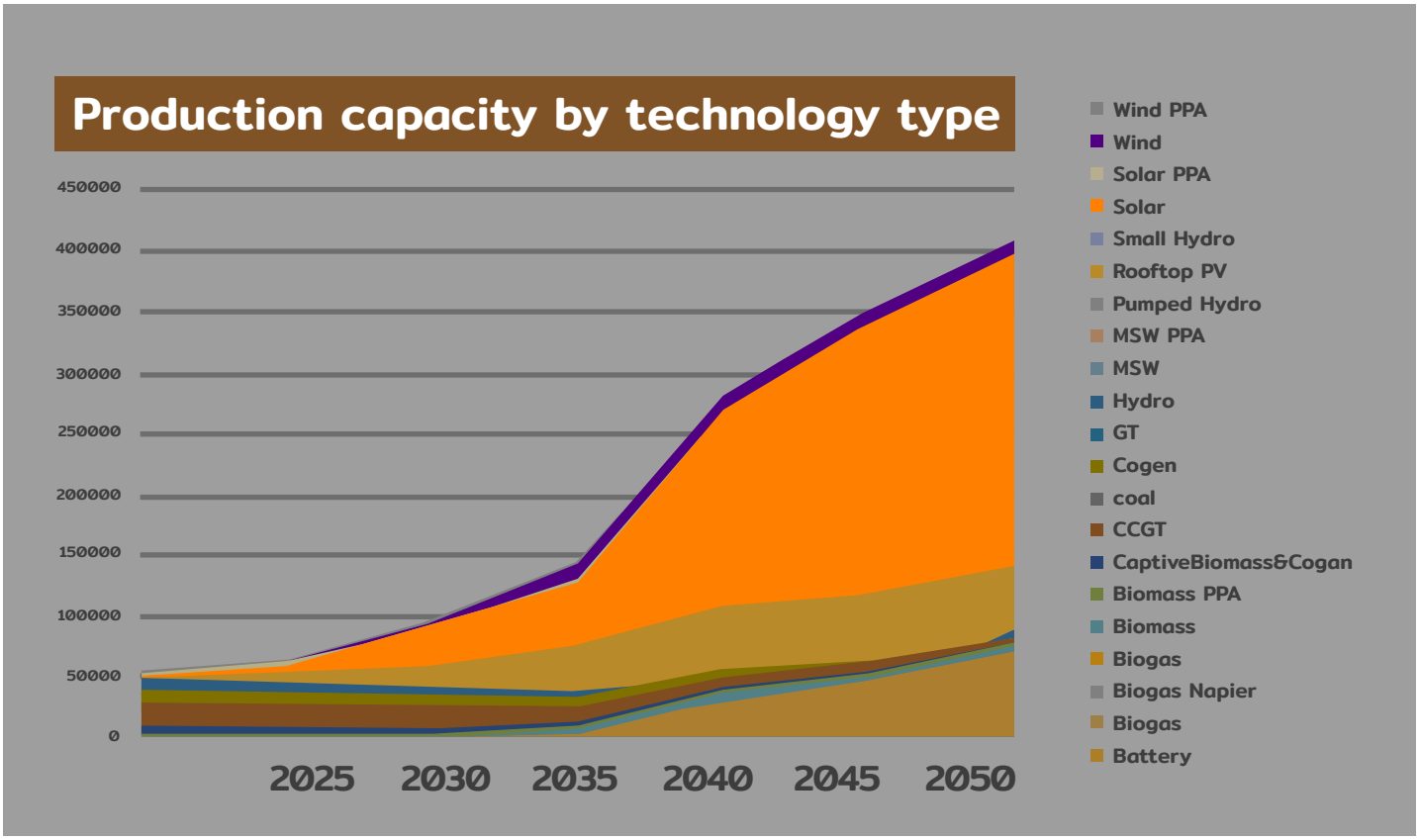
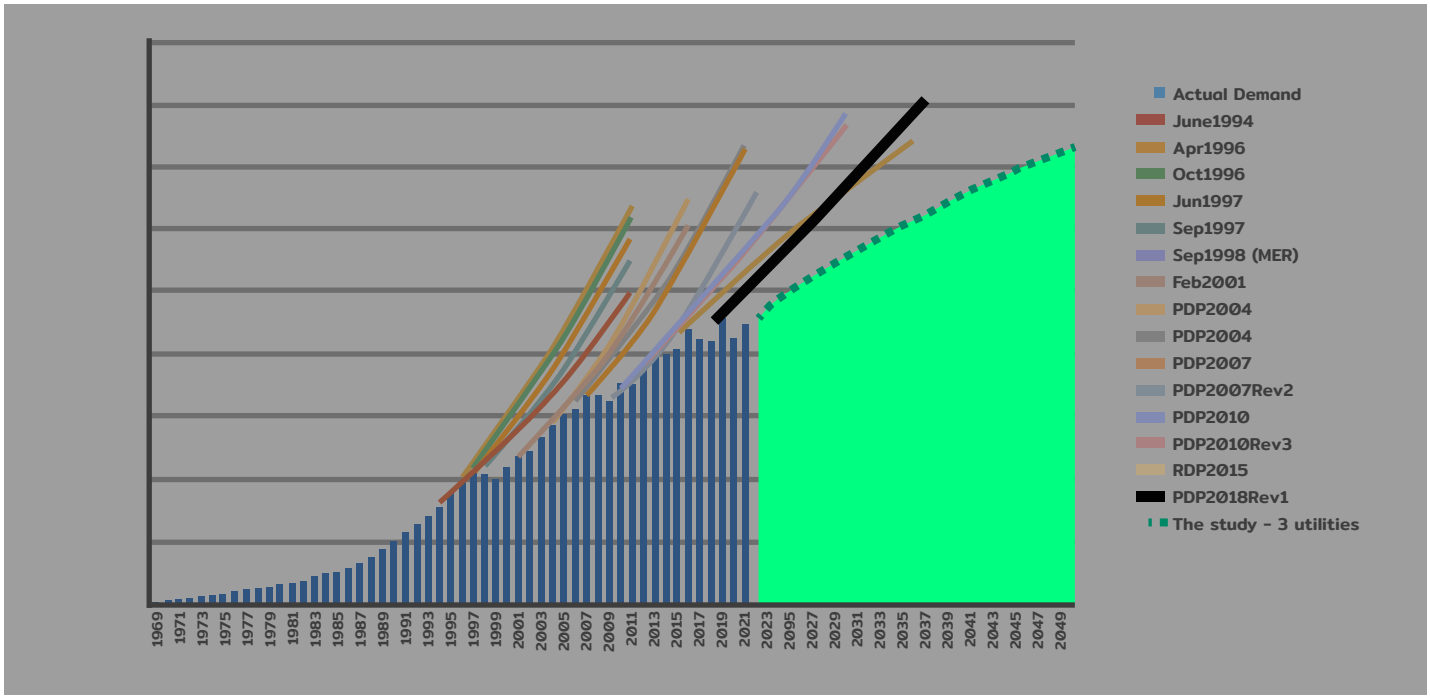
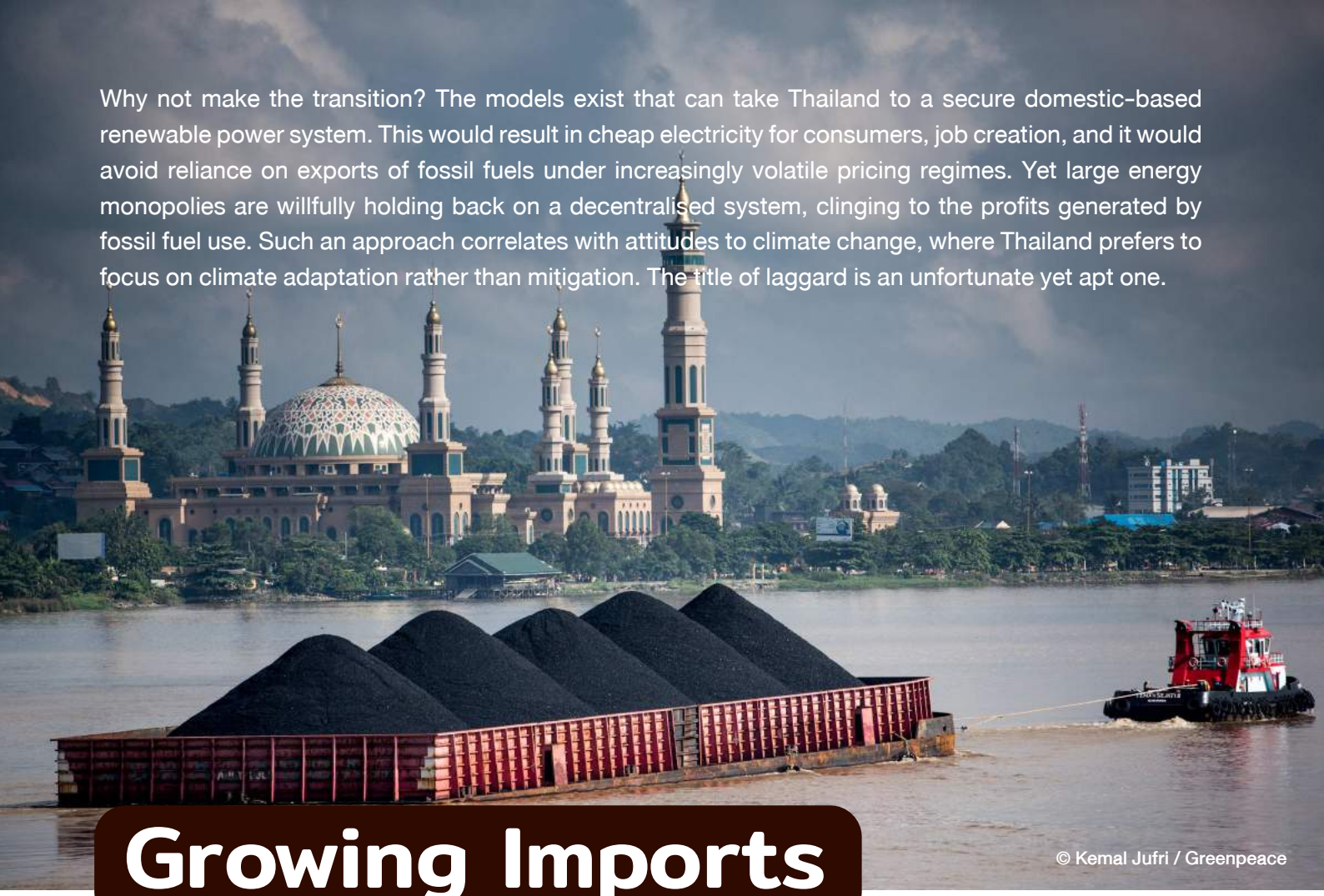



Figure 9: Demand forecasts (in MW), with actual demand (blue bars) placed against forecasts. This represents a 3 utilities system, not including the EV load, independent power supply (IPS), self-generated power, and captive power. (Kansuntisukmongkol et al., 2022).



Why not make the transition? The models exist that can take Thailand to a secure domestic-based renewable power system. This would result in cheap electricity for consumers, job creation, and it would avoid reliance on exports of fossil fuels under increasingly volatile pricing regimes. Yet large energy monopolies are willfully holding back on a decentralised system, clinging to the profits generated by fossil fuel use. Such an approach correlates with attitudes to climate change, where Thailand prefers to focus on climate adaptation rather than mitigation. The title of laggard is an unfortunate yet apt one.



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# Growing Imports

In one sense, there is no proposed domestic expansion of coal in the power sector of Thailand. Plans for new coal-fired plants in the south of the country have been abandoned, and new developments in the north are for replacement units at Mae Moh station. Coal is not projected as the energy source of the future, even if there is no clear timetable for a full exit. However, there is another growing influence of coal within Thailand that challenges this perspective, namely the increasing use of imported coal by private sector actors. The recent Greenpeace report "Gathering Dust" traces the arrival of coal from abroad (Hayward, 2021). Some of it lands at Map Tha Phut industrial estate for onsite use, and there is a further port in the southern province of Trang supplying imports for a cement factory in neighbouring Nakhon Si Thammarat. But most imported coal lands at Ko Si Chang Anchorage Area, loaded onto barges for transport up the River Chao Phraya to storage and distribution centres in Nakhon Luang District, Ayutthaya. In 2020, 13.8 million tons of coal were transported this way, which is 57.9% of all imports (Marine Department, 2021). It is then distributed around the industrial heartlands of Central Thailand, onto sites including cement, quicklime, food, petrochemicals, textiles, and paper factories.

Figure 10 notes the growth of coal imports to Thailand since the mid-1990s, outstripping domestic coal consumption since 2014 (Figure 11). The overall growth has been unaffected by the COVID-19 pandemic. In 2020, over 24 million tons of coal were imported to Thailand, which is 61% of the total 40 million tons of coal consumed that year. However, when looking at imports by sector, privately run power stations have seen a decrease in consumption, compensated by increases in industrial usage (Figure 12). For the first ten months of 2020, the cement industry consumed 6.4 million tons of coal or 54.2% of all industrial use (Banpu, 2020, p. 42).

**Figure 10: Coal imports to Thailand in million tons, 1986–2021 (dataset: The Thai Customs Department, compiled by EPPO)**

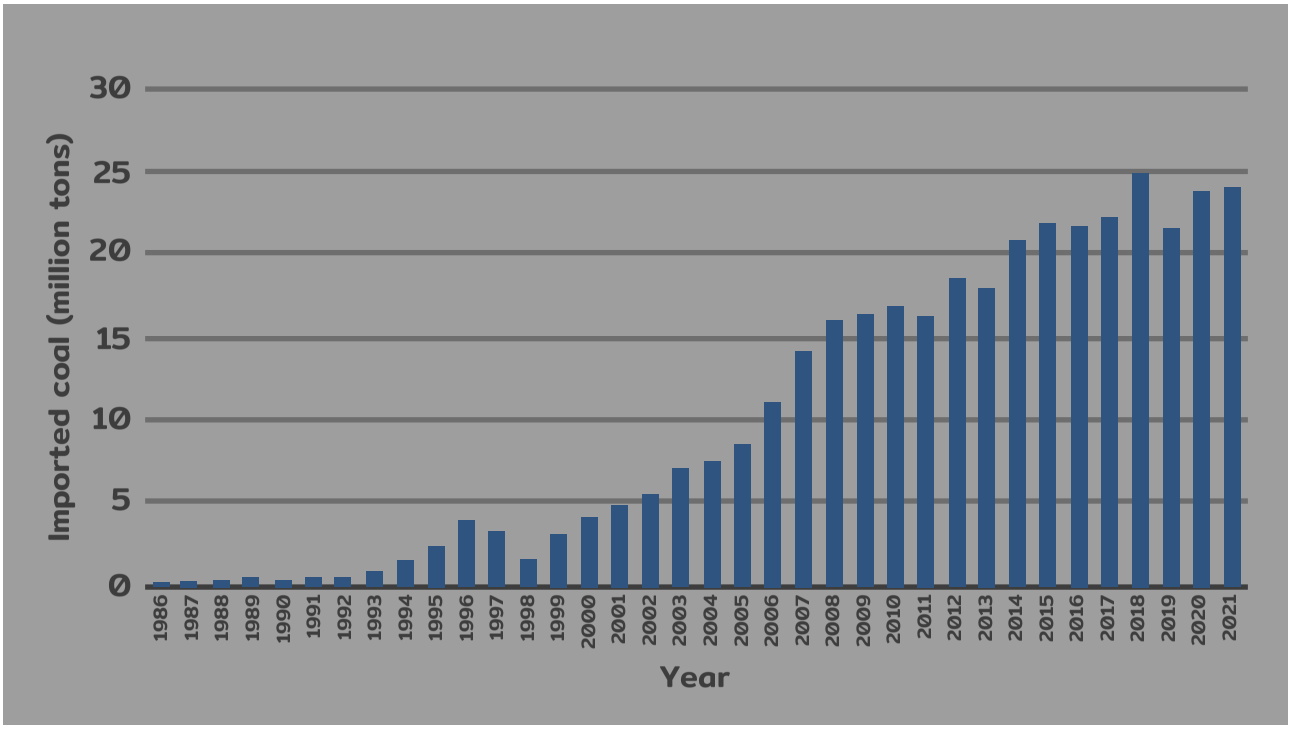
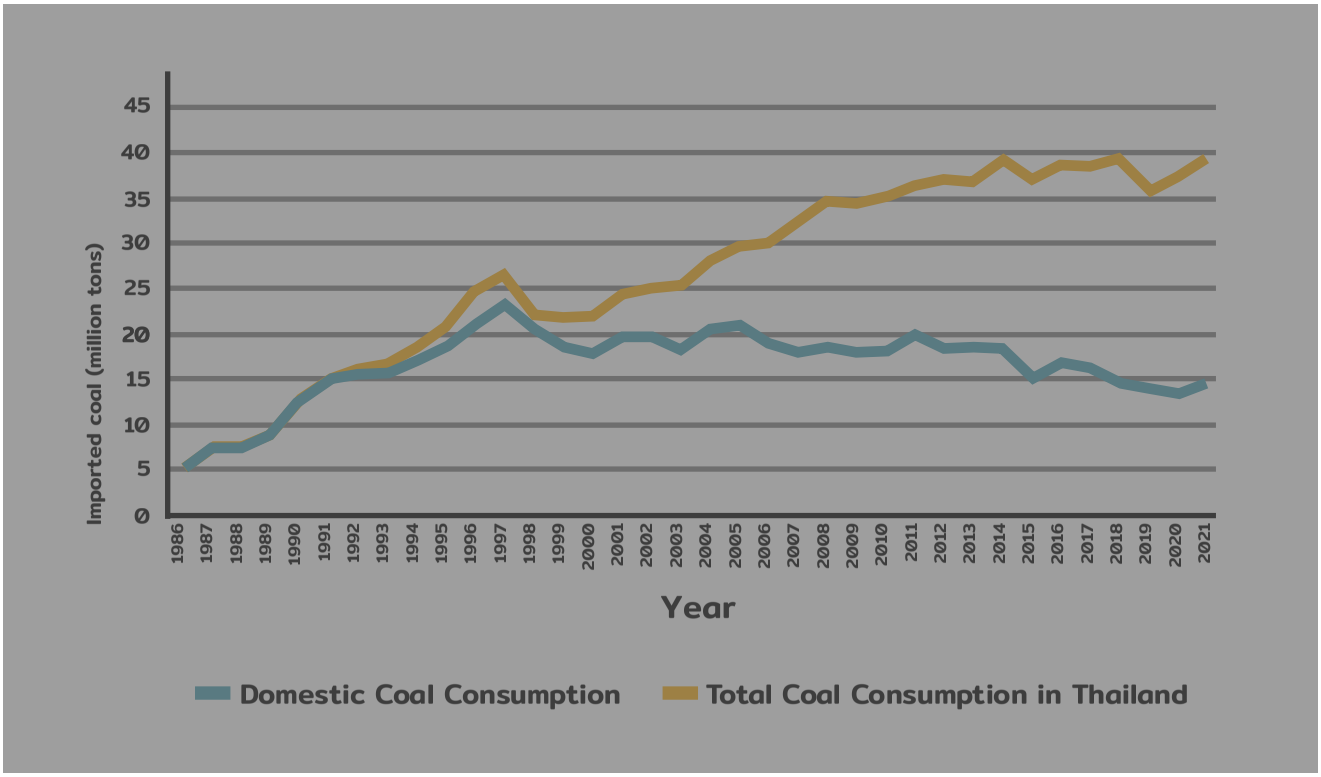
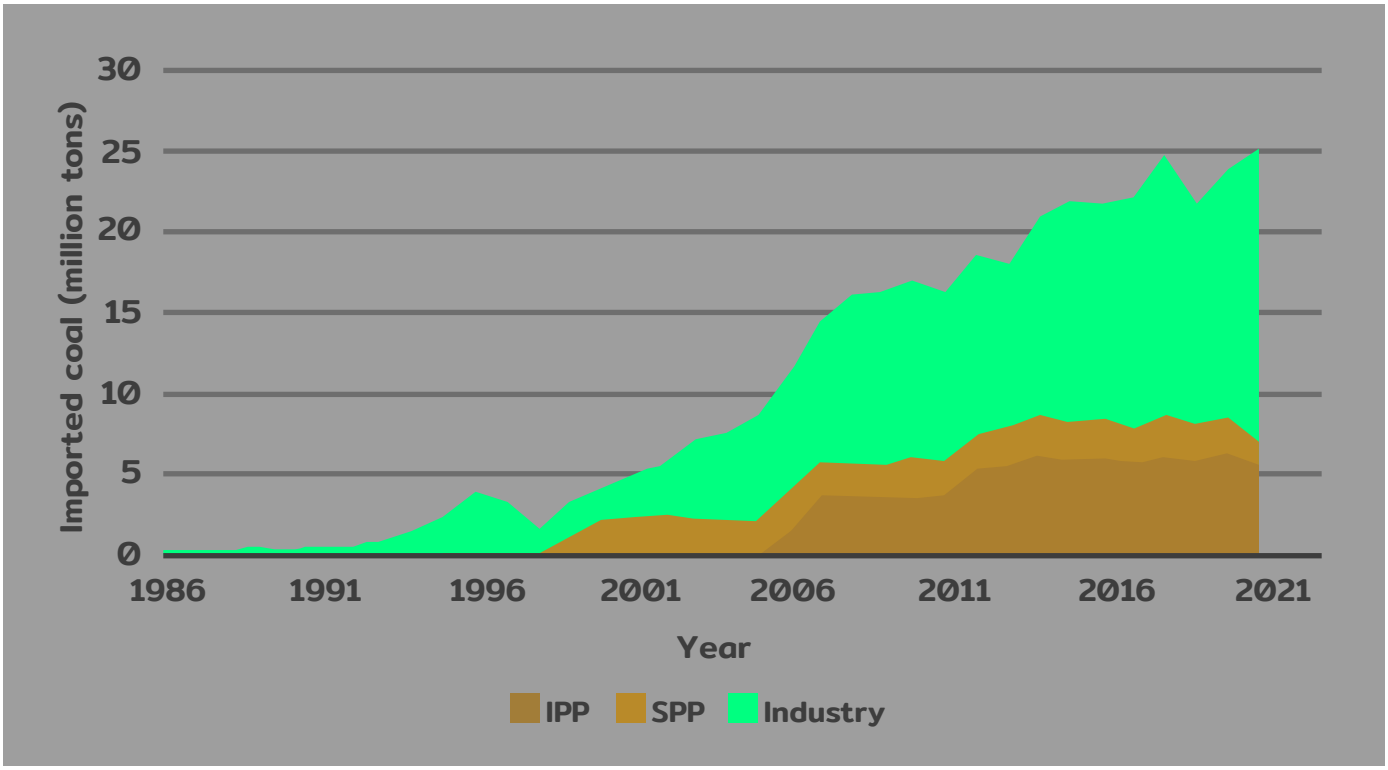



**Figure 11: A comparison of total coal consumption and domestic coal consumption in Thailand, 1986–2021 (Source of data: Energy Policy and Planning Office)**



## Figure 12: Coal imports to Thailand by user 1986–2021 (data source: The Thai Customs Department, compiled by EPPO)




Nearly all coal imports are transported to Thailand by sea, and the three main exporters are Indonesia, Australia and Russia (Table 10). There are also significant imports of anthracite from Vietnam, subbituminous coal from the Philippines and Colombia, and lignite from Laos by land. The recent conflict in Ukraine may disturb Russian supplies of coal, not only to Thailand but throughout the region, and this could result in other countries, particularly Indonesia, filling the gap. This in itself might benefit the Thai companies operating coal mines and logistical operations out of Indonesia (see next section).

## Table 10: Imports of coal to Thailand in 2020, by country of origin and type of coal (data source: UN Comtrade)

| Exporter | Coal import quantity to Thailand (tons) | | | | | Total | |
|---|---|---|---|---|---|---|---|
| | Anthracite | Bituminous | Subbituminous | Lignite | Coking Coal | Quantity (tons) | Value (thousand USD) |
| Indonesia | 16,597 | 3,834,434 | 13,960,713 | 0 | 0 | 17,811,744 | 906,794 |
| Australia | 18 | 3,414,114 | 231,999 | 0 | 0 | 3,646,131 | 275,708 |
| Russia | 25,142 | 892,734 | 721,526 | 0 | 0 | 1,639,402 | 102,744 |
| Other | 112,087 (111,095: Vietnam) | 7,300 | 464,632 (232,534: the Philippines; 174,081: Colombia) | 147,805 (147,706: Laos) | 17,307 | 749,131 | 53,376 |
| **Total** | **153,844** | **8,148,582** | **15,378,870** | **147,806** | **17,307** | **23,863,005** | **1,338,622** |

There are several polluting impacts from the process of importing coal. These include fossil fuel use in sea transport, spillages when transporting loads to a barge, riverbank erosion in the transport upstream, and then noise, dust, and odour pollution around distribution centres in Nakhon Luang. Yet none of these costs, many of which contravene Thai law, are accounted for. There is 0% import tax and no excise tax placed on coal imports, and thereby little economic incentive for the private sector to switch to other clean energy sources. There is a clear regulatory gap that reveals Thailand is far from engaging in a true energy transition.


# Overseas production and distribution

Thai companies are involved in overseas coal mining, power generation and transportation. Their impact on the environment through mining, transportation and consumption transcends domestic activities, with much of the fuel never landing on Thai soil or crossing Thai waters. This section highlights the overseas operations of key companies, and how profits are made on the back of international coal. Such practices are not incorporated into domestic climate commitments or sustainable policy practices. Yet it is important that the domestic audience calls out continued involvement in international coal, does not accept any attempt at corporate greenwashing, and forces companies to confront their responsibilities.

A key country here is Indonesia, which is the world's biggest exporter of coal and has a reserve of 39 billion tons. Indonesia has brought forward its goal for net zero carbon emissions from 2070 to 2060, and plans to phase out coal for electricity by 2056 (Nangoy & Suroyo, 2021). However, under recent price hikes, the fuel remains an attractively profitable prospect. Beyond overseas trade, domestic consumption is projected to rise by 3.1% in 2022. Many Thai companies have bought mines in Indonesia and set up logistics firms to trade the commodity around the region.

Another country worth mentioning is Myanmar, where Thai companies have long attempted to set up coal plants and mines. The well-referenced Global Energy Monitor website highlights the following projects:

1. Dawei power station: In 2011 there was a proposal to develop a coal powered plant in an agreement between Italian-Thai Development, Thailand's largest construction firm, and Ratch Group (Mizzima, 2012). The project was later linked to natural gas (The Irrawaddy, 2014).
2. Hpa-an power station: A 1,280MW plant in Kayin State was proposed with financing from TTCL Public Company Limited, a joint venture between Italian-Thai Development (51%) and Japan's Toyo Engineering Corp (49%). In June 2018 the Kayin State government claimed the project will go ahead without Union approval, although with no subsequent activity the project appears abandoned (Villadiego & de Combate, 2018).
3. Kengtung power station: The proposed 660MW plant in eastern Shan State involved a 2015 agreement between Thai-based Lumpoondum Company with Myanmar Ministry of Electric Power (as it was then known) (Thai Biz Myanmar, 2015). The project subsequently appears to have been abandoned.
4. Mai Khot power station: Since the mid-2000s, a Thai-Burmese joint venture (including Italian-Thai Company and EGAT) has been trying to exploit coal reserves in Mai Khot, Shan State, for both a 405MW plant for electricity to export, and fuel transfer by truck to Thailand. Despite seeming to fall prey to lobbying by a cross-border network of civil-society and NGOs, a new joint venture between the Thai company Sahakol Equipment PLC, and Golden Lake Co., Ltd. from Myanmar has since 2019 been trying to re-establish the project under a 28-year concession. Despite delays over the COVID-19 outbreak in Myanmar, the power plant has been announced to begin construction in 2023 (Myat Moe Aung, 2019).
5. Myeik power station: In 2014 Ratch group signed an MoU with the Department of Hydropower Planning, Ministry of Electric Power in Myanmar to explore the possibility for a 2,600MW coal plant in Tanintharyi Region (NS Energy, 2014). However, there has been little action on the project since.
6. Maw Taung coal mine: This mine in Tanintharyi Region accesses a 3.6 million deposit of sub-bituminous coal and is operated by Saraburi Coal Company (a subsidiary of Italian-Thai Development) and the military-affiliated Myanmar Economic Corporation (PYO & KAN, 2011). The output is claimed to be exported to Thailand.
7. Mawlamyine Cement coal plant: See Siam Cement group case for further information.

That so many projects have failed in the country is notable. However, that Thai companies are heavily involved shows the thirst to reach beyond national borders and seek new ventures in fossil fuel operations, including coal, with which to maximise profits. Amidst the present tragic political turbulence in the country, there is cause for concern that such projects, potentially providing funds to the junta, might be covertly green-lighted. On the other hand, the growing restrictions around coal financing, combined with the unreliable investment environment in Myanmar, might just prove an insurmountable barrier to new ventures.

Following the Global Coal Exit List compiled by the German NGO Urgewald, Appendix 2 lists Thai parent companies and their subsidiaries, affiliates or joint ventures that operate in the coal sector. Many of these companies operate outside of Thailand. Following the two country-based examples of Thai corporate influence above, some of the companies themselves are now given attention. Major Thai players in international coal include Banpu, Lanna Resources (which is owned by Siam Cement Group), EGAT, and Asian Green Energy (AGE). Each of these companies will now be addressed in turn.

## BANPU

Founded in 1983 as a coal company, Banpu PCL has a history of mining in Thailand, linking into power production (the company has a 50% stake in BLCP power plant, Rayong province) and industrial uses (such as with limestone extraction and cement production). Overseas, they are one of the largest coal producers in Indonesia, as of 31st December 2020, with a reserve of 311 million tons covering five mines in East Kalimantan. They also own mines in Australia (270 million ton reserve) and China (132 million ton reserve). They have a 40% ownership stake in Hongsa power plant in Laos, run four plants in China, and have three pilot coal projects in Mongolia (Banpu, 2020).

In 2020, 82% of Banpu's revenue (which totalled US$2.3 billion that year) was from coal, and yet they have been pushing an image as a 'green' company. In an interview with the Bangkok Post in March 2021, chief executive Somruedee Chaimongkol promoted its Smart Energy for Sustainability campaign (Praiwan, 2021a). She highlighted how the company has diversified into rooftop solar panels, energy storage systems, and Electric Vehicles. There are renewable projects in Australia, China, Japan, and USA, with an aim for green energy to total 6.1GW by 2025 (Muramatsu, 2021a). In July 2021, the company announced that it would no longer start any new coal developments, aiming to adhere to the 3 D principles, namely decarbonisation, decentralisation, and digitalisation.

With coal revenue so high, the green credentials remain questionable. The 6.1GW of green energy includes gas-powered plants which demonstrates a problematic perception of what is green energy. In May 2018, PT Indominco Mandiri, an Indonesian subsidiary, was fined 145,000 USD for depositing 4,000 tons of hazardous coal waste on an open dump, an illegal act causing both water and air pollution (Ompusunggu, 2018). In 2019, the company was in discussion to fund Long Phu 3 power plant in Soc Trang province, Vietnam, a project which has since been shelved. The two-unit 1,320MW Shanxi Lu Guang coal-fired power plant, in Shanxi province of China, came online in 2021. They have also recently acquired shale gas assets in the USA. There is no clear sign of a retreat from fossil fuels. Indeed, with net profits soaring into the third quarter of 2021 by 763% due to the surge in coal and gas prices (Phoonphongphiphat, 2022), one wonders how much effort will honestly be put into a divestment from coal.

Publicly available financial records show how Banpu is integrated into a global coal trade system where the commodity comes nowhere near the Thai border. The 2020 annual Banpu report gives details on countries to which coal was traded from its Indonesian mines that year, with exports to Thailand a minor 6% (Banpu, 2020, p. 41):

- China 22%
- Japan 21%
- Indonesia (therefore domestic use from Indonesian-owned mines) 18%
- Philippines 10%
- Thailand 6%
- Bangladesh 6%
- South Korea 5%
- India 4%
- Malaysia 3%
- Taiwan 3%
- New Zealand 1%
- Vietnam 1%
- UAE 0.3%

# Lanna Resources & Siam Cement Group

Like its main competitor Banpu, Lanna Resources was formed as a coal producer and distributor (in Lanna's case established in 1985), although it has since branched into ethanol-for-fuel production and the renewable energy sector. In 2020, 74.3% of total revenue (total revenue being US$290 million) was through coal sales (Lanna Resources, 2020). Its overseas coal business is located in Indonesia, through the following subsidiaries:

- Lanna Harita Indonesia (LHI) – mining operation in Kutai Regency, East Kalimantan. Lanna has a 55% share, with a concession agreement running from 2001 to 2031. As of 2020, the remaining reserves are 23 million tons, with production capacity reaching 3.3 million tons per year.
- Singlurus Pratama (SGP) – mining operation in Kutai Regency, East Kalimantan. Lanna has a 65% share, with a concession agreement running from 2009 to 2039. As of 2020, the remaining reserves are 47 million tons, with production capacity reaching 3.5 million tons per year.
- Bulk Shipping Pte. Ltd. – registered in Singapore, the subsidiary was set up to operate and manage ocean freight transport and coal trading. Lanna has a 49% share.

In 2021, Lanna Resources increased its stake in PT. Pesona Khatulistiwa Nusantara (PKN), building on an initial investment in 2018. This mining company is based in North Kalimantan, accessing a coal reserve of 36 million tons, and has a concession agreement with the Government of Indonesia from 2009-2039.

Table 11 shows revenue for Lanna Resources as a whole. On the basis that its ethanol and renewable businesses are domestic, over half of its sales involve international trading of coal, under transport from its mines in Indonesia. It is interesting to see that outside of Thailand, India has become a major market. The 'others' category in Table 11 includes Taiwan, Japan and Bangladesh.

## Table 11: Sales for Lanna Resources by country, 2019 and 2020 (data source: Lanna Resources, 2020)

| Destination of coal | 2020 Sales | | 2019 Sales | |
|---|---|---|---|---|
| | Amount (million THB) | Proportion | Amount (million THB) | Proportion |
| Thailand | 4,055.90 | *42.6%* | 3,675.67 | *39.7%* |
| India | 3,630.63 | *38.2%* | 2,592.92 | *28.0%* |
| Singapore | 854.70 | *9.0%* | 1,040.30 | *11.2%* |
| UAE | 328.71 | *3.5%* | 447.70 | *4.8%* |
| China | 270.10 | *2.8%* | 110.81 | *1.2%* |
| South Korea | - | | 63.47 | *0.7%* |
| Others | 371.83 | *3.9%* | 1,322.95 | *14.3%* |
| **Total** | **9,511.87** | ***100%*** | **9,253.81** | ***100%*** |

The major shareholder of Lanna Resources with a 45.10% stake is Siam Cement Group (SCG). Established in 2013 by King Rama VI (to this day, the Crown Property Bureau owns a 30% share), SCG PCL focuses on three core businesses of cement-building materials, chemicals and packaging (SCG, 2019). Annual revenue from sales in 2021 was US$15.9 billion. SCG has six cement plants in Thailand, with four in Saraburi Province, one in Lampang, and one in Nakhon Si Thammarat. It also invests in cement production around the region, including Cambodia, Lao PDR, Myanmar, and Vietnam. In 2016, it was reported that the company uses approximately 2-3 million tons of coal per year in Thailand for its cement and paper business (ERC, 2019, p. 74). In 2017, the director of SCG Trading Co., Ltd. stated that they were importing around 6 million tons per year (Voice TV, 2017). However, the company now claims that it plans to cut down on coal usage at its plants in Thailand, Laos, Vietnam, Cambodia, and Indonesia (Global Cement Staff, 2021). It aims to reduce emissions by 20% before the end of the decade, achieving net zero by 2050, by increasing use of biomass and refuse-derived fuel.

In June 2016, it was reported that a cement factory in Kyaik Maraw Township, Mon State, was constructing an onsite 40MW coal power plant without first consulting with local people or authorities (Hintharnee, 2017). Mawlamyine Cement Limited, a joint venture between Siam Cement Group (Thailand) and Pacific Link Cement (Myanmar), claimed the plant was based on an agreement with the previous government.The plant went into service in April 2017.

## EGAT

Formed in 1967, EGAT (Electricity Generating Authority of Thailand) is a state enterprise responsible for power generation, transmission, and energy sales in Thailand. Until the 2000s, nearly all electricity production using coal involved EGAT-run power stations, principally Mae Moh in the north of the country. Private-run plants (IPPs and SPPs) that have since come into operation are set up under long-term power purchase agreements with EGAT (see Table 8 in Chapter 2 for a list of such plants). The recent scorecard on Thai energy policy by Greenpeace criticised EGAT for its continued focus on coal and gas, failing to put renewable energy as the forefront of policy (Greenpeace, 2020).

EGAT also has business interests around the region, including coal mines and power plants through the following subsidiary companies:

- The RATCH Group is a subsidiary of EGAT, founded in 2000. It is focused on power generation, primarily through natural gas, but has also branched into coal mining and infrastructure. They own a stake in the following foreign coal power plants and mine:
    - Hongsa thermal power plant, Laos (40% stake) and Hongsa coal mine (37.5% stake), together with Banpu and Lao partners.
    - Thang Long Coal-Fired Power Plant, Vietnam.
- EGAT International Company Limited (EGATi) has 11.5% shares (next to Adaro Energy with 88.5% shares) in PT Adaro Indonesia with a coal mine in South Kalimantan. EGATi also has shares in hydropower in Laos.

- EGCO (Electricity Generating Public Company Limited) is an associate company, not a subsidiary, with EGAT owning a 25.4% stake. EGCO has a stake in:
    - BLCP power plant in Map Tha Phut together with Banpu (both have 50% stakes)
    - Quezon thermal power plant, the Philippines (100% ownership)
    - San Buenaventura (SBPL) thermal power plant, the Philippines (49% stake)
    - Subsidiary PT Manambang Muara Enim (MME) runs an open coal mine pit in South Sumatra under a 28-year concession until 2038 (40% stake)

Far from divesting from coal, EGAT and its affiliates have remained active in the sector. In a 2021 report on fossil fuel financing, EGAT is listed as one of fifteen key coal power expansion companies (Kirsch et al., 2021). The list also contains Vietnam Electricity Corporation (EVN) and Vietnam Oil and Gas Group (Petrovietnam). Ratch Group is a key promoter of the Hongsa power plant phase III expansion in Laos that has already caused the displacement of local communities despite concerns over financing (for further information, see Box 3 in the Lao section of Chapter 2). In Vietnam, Ratch's 2020 acquisition of a 49% stake in An Binh Energy and Infrastructure Fund (ABEIF) has brought into its portfolio Thang Long power plant, an unnamed 650MW plant under construction in the north, and an unnamed 1,200MW plant in early development, also in the north (Huong, 2020). The subsidiary has also been connected to the stalled Hai Phong 3 and Quang Tri plants, the former potentially having switched to gas and the latter looking unlikely to achieve financial closure.

At the opening to this chapter, it was noted how EGAT and Ratch Group have been involved in several attempts to set up coal projects in Myanmar. These include Dawei, Mai Khot, and Myeik power stations, albeit with little success. In 2021, Ratch Group was also aiming to purchase two coal-fired plants in Java, Indonesia, from PT Paiton Energy (PE) with combined capacity of 2,045MW (Praiwan, 2021b). The company has subsequently stated that these will be its last coal-based acquisitions, although the statement rings hollow knowing that the Indonesian purchases are held under 21-year purchase agreements.

# Asia Green Energy

Asia Green Energy (AGE) is a key logistics company in the coal sector, providing services for overseas shipping, inland transportation by river and road, and storage of the fuel (AGE, 2020). It was founded in 2004. The company exports coal out of Indonesia, Australia and Russia (Figure 13). In the case of Indonesia, exports are transported to Thailand, India, Myanmar, Cambodia, Vietnam, China, Taiwan, and the Philippines. Since 2017, AGE has set up its subsidiary VINN AGE to develop its business in Vietnam. Rather than displaying any signal of divestment from coal, which provides 90% of its total revenue, AGE is looking to access the fuel from new sources, including the USA, South Africa, Chile, Iran, Kazakhstan, and Malaysia (AGE, 2021). In 2022, its coal trade volume is expected to increase to 6.5 million tons in 2022, up from 5 million tons in 2021 (Praiwan, 2022). This already returns the company to pre-pandemic levels of growth. In 2020, overseas sales provided 11.3% of annual revenue (total annual revenue for that year reaching around US$340 million), an increasing proportion.

# Map shows Oversea Sale and Marketing

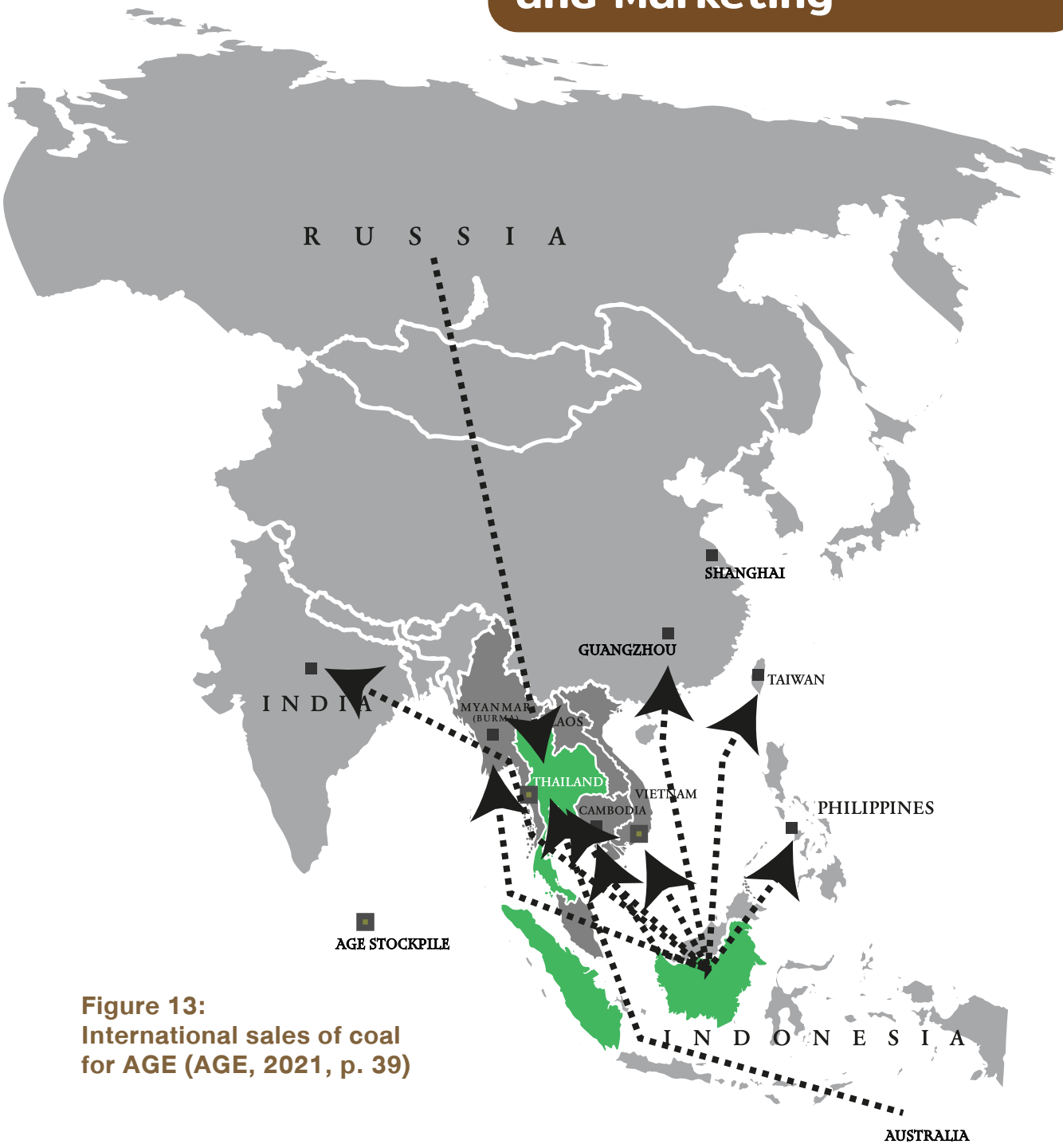



**Figure 13:**
**International sales of coal for AGE (AGE, 2021, p. 39)**

The 2020 Annual Report from AGE, which is publicly available, offers a telling snapshot into how such companies view the status and impacts of fossil fuels. Within the report, the following risks are highlighted, which are very much geared to concerns over the company's profits rather than any wider social and environmental impacts of their business.

## Table 12: Corporate risks at stated by AGE (AGE, 2021)

| Stated risk | Company concern | Lack of concern (not mentioned in the report) |
|---|---|---|
| **Overseas freight transportation** | • Enough container ships available with which to transport coal.<br>• Taking out an insurance policy to mitigate against any losses during transport, such as during adverse weather in the monsoon season from October to December. | • Carbon emissions from sea transportation<br>• Sea pollution from fugitive dust and escaped coal falling into the sea, particularly during loading and unloading |
| **Emphasis on non-coal alternative energy** | • Use of other fuels that impact upon production costs and competitiveness<br>• Importance of coal remaining a low-cost fuel | • Lack of carbon emissions from renewable sources<br>• Contribution of renewable power to energy sovereignty |
| **Environmental complaints** | • The implications are that complaints are bad for business, although this at least breeds an acknowledgement that clean transportation and storage facilities are needed | • Coal remains a dirty fuel, causing the release of dust, sea and river pollution<br>• At least in Thailand, the environmental conditions around Nakon Luang district, the main distribution centre of the country, remain poor, affecting the health of humans and biodiversity in the vicinity |
| **Climate change** | • Can impact on the company's ability to deliver coal<br>• Can cause property damage | • Both the transportation and use of coal are causes of climate change, coal being the dirtiest of fossil fuels, representing the highest single source of greenhouse gas emissions |

# Financial investments into coal

A final alternative view of Thailand and its contribution to the coal industry involves financial investments. Although the major funders of coal have been China, South Korea and Japan, there are several means by which banks and financial companies from around the world invest in the fuel. More specifically, Thai banks and other financial institutions actively support the coal industry through their investments. The German NGO Urgewald has carried out important work in this respect, collating global investment into its list of around 2,800 coal parent companies and subsidiaries (see Appendix 2 for a description of their methodology next to an inventory of Thai coal companies present on the Global Coal Exit List). Urgewald further compiles data on the different forms of investment into coal companies and who is making these investments. Using this data, it is possible to extract a list of Thai private bodies with three means of investment:

1. Institutional investors hold bonds or shares in the list of companies
2. Commercial banks provide loans to these companies
3. Commercial banks provide underwriting services to these companies

Appendices 3 and 4 give detailed information on these institutions and banks, the specific companies that they are supporting, and the value of shares, loans, and underwriting. Table 13 below sums up the information on shareholdings, with greater detail available in Appendix 3. The table shows how 12 Thai institutions have invested US$6.9 billion into coal companies on the Global Coal Exit List. These include Thai coal companies (total investment over US$6.5 billion) and foreign coal companies in China, the Philippines, Singapore, South Korea, and Vietnam (total investment US$367 million). The two highest investors by a significant margin are Krung Thai Bank and investment company MFC Asset Management. These both invest over US$2 billion, primarily in PTT PCL. The third highest investor is the state welfare organisation Social Security Office at nearly US$1 billion. Taken together with significant investment by The Federation of Savings and Credit Cooperatives of Thailand, one wonders at the wisdom of investing the welfare finances of Thai citizens and farmers in coal companies, and wider into fossil fuels. Although prices are higher in the present moment, such is the volatility of this part of the energy sector that questions must be asked of gambling with vital funds that could end up losing value or trapped in stranded assets. Furthermore, the fact that state welfare agencies are invested in dirty energy that the government claims to be phasing out, the sincerity of the government's energy transition commitments also becomes even more questionable.

## Table 13: Thai private entities with shareholdings in domestic and foreign coal companies, as of November 2021 (data source: Urgewald)

| Organisations with shares in coal companies | Coal Companies | Total shareholdings (million US$) |
|---|---|---|
| **Banks**:<br>• Krung Thai Bank<br>• Bangkok Bank<br>• Kasikornbank<br>• Siam Commercial Bank<br>• Kiatnakin Bank<br>• TISCO Financial Group<br>• LH Financial Group<br>**Investment companies:**<br>• MFC Asset Management,<br>• Asia Plus Group<br>**Life Insurance:**<br>• Thanachart Capital<br>**State welfare organisations:**<br>• Social Security Office<br>• The Federation of Savings and Credit Cooperatives of Thailand | **Domestic:**<br>• PTT Public Co. Ltd.,<br>• Banpu Public Co Ltd,<br>• RATCH Group Public Co Ltd,<br>• Electricity Generating Public Co Ltd (EGCO Group),<br>• Lanna Resources Public Co Ltd | 6,517.20 |
| | **Foreign:**<br>• Guangdong Investment Ltd (China),<br>• Wanhua Chemical Group Co Ltd (China),<br>• Ayala Corp (Philippines),<br>• Jardine Cycle & Carriage Ltd (Singapore),<br>• Magna Resources Corp Pte Ltd (Singapore),<br>• Posco (South Korea)<br>• Vietnam Oil and Gas Group (PetroVietnam) (Vietnam), | 366.56 |
| | **TOTAL** | **6,883.76** |

Table 14 highlights the data on Thai financial institutions who are either underwriting or supporting coal companies through loans (further details can be found in Appendix 4). Loans can support day-to-day running of a company or link to a specific project, allowing for its expansion. For the period in which data was compiled (January 2019 to November 2021), only two banks provided loans to coal companies, namely Bangkok Bank and TMBThanchart Bank. The loans were to foreign coal companies from Indonesia and Vietnam, totalling US$1.17 billion.

Underwriting shares or bonds involves guaranteeing the financing, the obligation being realised once the shares or bonds have been issued to other investors. As of November 2021, 18 banks have supported six coal companies in this way, all companies being domestic. The key underwriters are Bangkok Bank (US$889 million for three coal companies), Krung Thai Bank (US$308 million for five coal companies), Siam Commercial Bank (US$293 million for one coal company), and Kasikornbank (also US$293 million for one coal company). Total underwriting by Thai banks comes to US$2.49 billion, together with loans making US$3.66 billion. These are highly significant numbers, and indicate a financial sector that is far from being aligned with a movement to phase out the coal industry. One absent bank from the lists is the Bank of Ayudhya (also known as Krungsri Bank), which plans to stop funding coal power plants completely by the end of the decade (Bangkok Post Business, 2021). It has also committed itself to carbon neutrality by 2030 for its own operations and 2050 for its financial services. It can only be hoped that this represents the beginning of a wider trend within Thailand's financial sector. However, it may take a push by consumers and government to result in further action by other banks.

## Table 14: Thai banks supporting companies on the Global Coal Exit List through underwriting and loans, covering the period January 2019 to November 2021 (data source: Urgewald)

<table>
<tr><th>Bank</th><th>Coal companies being underwritten</th><th>Coal companies provided with a loan</th></tr>
<tr><td rowspan="2">• Bangkok Bank<br>• TMBThanachart Bank<br>• Krung Thai Bank<br>• Siam Commercial Bank<br>• Bank of Thailand<br>• Kasikornbank<br>• Kiatnakin Bank<br>• Asia Plus Group<br>• Merchant Partners<br>• Finansia Syrus Securities<br>• ASL Securities<br>• Thanachart Capital<br>• Trinity Watthana<br>• Globlex Holding Management<br>• Globlex Securities<br>• IV Global Securities<br>• TMB Bank<br>• Aira Capital</td><td>• Banpu Public Co Ltd,<br>• Italian-Thai Development Public Co Ltd<br>• PTT Public Co. Ltd.,<br>• National Power Supply Public Co Ltd<br>• Sahakol Equipment Co Ltd<br>• Electricity Generating Authority of Thailand (EGAT)<br><br>Total amount underwritten:<br>US$2,493.73 million</td><td>• PT Adaro Energy Tbk (Indonesia)<br>• PT PLN (Persero) (Perusahaan Listrik Negara) (Indonesia)<br>• Vietnam Oil and Gas Group (PetroVietnam) (Vietnam)<br><br>Total amount provided in loans:<br>US$1,166.14 million</td></tr>
<tr><td colspan="2">TOTAL US$3,659.87 million</td></tr>
</table>


# Final messages

Globally, there is definite progress in the exit from coal through global pledges at COP26, and movements by China, South Korea, and Japan to stop overseas financing of new plants. Coal is on borrowed time and any new ventures run the risk of ending up as stranded assets. Further, coal plants are unwanted by the public wherever they are proposed, and deemed a cause of population displacement, local pollution, significant carbon emissions, and destruction of biodiversity. As we start to feel the effects of human-induced climate change, coal becomes emblematic of the dirtiest practices that cause these effects. Nobody wants coal except those who directly profit from the construction and operation of mines and plants.

Yet, in a response to the title of this report, there are concerns as to the prospects for an exit from coal in the Mekong region, driven by a few irresponsible and self-interested actors who wish to wring out dollars from the extended presence of coal in a global energy system. Mekong countries have been lax in setting out ambitious plans to mitigate against climate change, for example through weak updates to their NDCs around the time of COP26. Indeed, they are threatening to embrace coal at precisely the moment where an exit is critical in order to fulfil climate obligations, and Greenpeace urges governments to reconsider such a move. There have been some positive recent words indicating a potential climbdown from such projects, but these need to be enshrined in national policy. In the case of Thailand, we have seen how Thai coal companies, banks and investors continue to support the fuel, whether at home or in overseas ventures. The case of Vietnam shows how there are conflicting voices in government and achieving political consensus that leads to action is not easy. But it is time that medium-term common sense prevails over short-term economic opportunism. As a site of acute risks to the impacts of climate change, the Mekong region will only afflict considerable self-harm by avoiding a clean energy transition.

The news is not all doom and gloom. Vietnam does act as a marker for a speedy transition to renewables, and there is much we can learn from its experience, including the need for grid infrastructure development to keep pace with renewable growth. Should Vietnam continue this trend (whether with solar or wind), a country like Thailand will get left behind in an ability to attract a broad range of investors such as for manufacturing. Developments like a European proposal to put an emissions tax on imported goods could marginalise countries with a production system based on fossil fuels. The fact is that we have the knowledge and have done the modelling to achieve the transition to a carbon-free energy system. It is a transition that will be beneficial both in terms of the resulting economic return and job creation, as well as reduced costs from pollution and climate-induced catastrophes.
Taking these thoughts on board, a few key messages are proposed to drive forward a campaign for a clean energy transition:

## To national governments of the Mekong region

1. There is need for an immediate long-term moratorium on new coal-fired power stations and coal mines. Such an action would acknowledge the inevitable exit from coal, avoid new stranded assets, and facilitate the push for a clean energy transition.

2. The polluting cost of coal needs to be properly accounted for. For example, in Thailand there must be an appropriate taxation of coal imports.

3. Favourable domestic policies should unlock the potential to attract both domestic and foreign capital into renewables in each Mekong country. This will produce vital revenue and jobs.

4. We welcome invitations and the encouragement of support from higher income countries to help lower income countries transition away from coal. But Mekong countries should not be reliant on this support and should not be using any delay as an excuse for inaction, especially as they are among the most vulnerable to climate change.

5. COP27 in November 2022 expects a significant update on Nationally Determined Contributions (NDCs) to realistically limit global temperature increases to 1.5°C. Mekong governments need to up their game and make substantially more ambitious NDCs and emissions commitments.

## To the private sector

1. Put simply, stop with the greenwashing. A movement to renewable energy needs to be backed up by a rapid divestment from fossil fuels, both domestically and abroad, not just acting to take attention away from polluting activities or outsource them to other countries.

2. Don't believe that renewables are less profitable. An early embracing of clean energy will give companies and investors a head start once the rush inevitably comes.

3. It is time for financial institutions and investors to immediately cut ties with coal companies, make this permanent in internal policy, and avoid losing the value of their client's funds in stranded assets.

## To consumers

1. Stay aware. Where does your electricity come from? What options do you have to utilise renewable power? If possible, write to your provider asking for a commitment to provide renewable power.

2. It is also necessary to stay aware of the practices of your bank and any other financial institutions with which you may be associated. Do they support coal? Again, write and ask them for a clear statement. Consumer pressure does lead to change. Inaction solves nothing.

3. Look at your own consumption. Energy efficiency is a vital means to combat climate change. Although this can be more effective in sectors using large amounts of electricity, such as in industry, it remains important to have good practices at home.

4. Sign up for campaign updates with Greenpeace Southeast Asia, to stay informed about the latest energy developments.

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# Appendix 1 : Coal plants in Vietnam

Table 15: Existing large-scale coal plants in Vietnam (data sources: GEM, 2022a; Stimson, 2022)

| Plant Name | Location (province) | Year of operation | Capacity | Operating company |
|---|---|---|---|---|
| **An Khanh 1** | Thai Nguyen | 2015 | 100MW (2 units) | An Khanh Electricity JSC |
| **Cam Pha Phase I-II** | Quang Ninh | 2011 | 680MW (2 units) | Vietnam National Coal and Mineral Industries Group |
| **Cao Ngan** | Thai Nguyen | 2006 | 115MW (2 units) | Vietnam National Coal and Mineral Industries Group |
| **Duyen Hai** | Tra Vinh | 2015-2019 | 3,150MW (5 units) | Electricity of Vietnam |
| **Duyen Hai 2** | Tra Vinh | 2021 | 1,200MW (2 units) | Teknik Janakuasa |
| **Ha Tinh Formosa** | Ha Tinh | 2015-2016 | 450MW (3 units) | Hung Nghiep Formosa Ha Tinh |
| **Hai Duong** | Hai Duong | 2020-2021 | 1,200MW (2 units) | JAKS Resources, China Energy Engineering Corporation |
| **Hai Phong** | Hai Phong | 2011-2014 | 1,200MW (4 units) | EVN Genco No 2 |
| **Lee & Man** | Hau Giang | 2018 | 125MW (2 units) | Lee & Man Vietnam Paper Limited Company |
| **Mao Khe** | Quang Ninh | 2013 | 440MW (2 units) | Vietnam National Coal and Mineral Industries Group |
| **Mong Duong** | Quang Ninh | 2015 | 1,080MW (2 units) | Electricity of Vietnam |
| **Mong Duong 2** | Quang Ninh | 2015 | 1,240MW (2 units) | AES-VCM Mong Duong Power Company |
| **Na Duong** | Lang Son | 2005 | 100MW (2 units) | Vietnam National Coal and Mineral Industries Group |
| **Nghi Son 1** | Thanh Hoa | 2013-14 | 600MW (2 units) | EVN Genco No 1 |
| **Nhon Trach Formosa** | Dong Nai | 2004-2016 | 450MW (3 units) | Hung Nghiep Formosa |
| **Ninh Binh** | Ninh Binh | 1974 | 100MW (4 units) | Ninh Binh Thermal Power JSC |
| **Nong Son** | Quang Nam | 2014 | 30MW (1 unit) | Vietnam National Coal and Mineral Industries Group |
| **Pha Lai** | Hai Duong | 1986 & 2001 | 1,040MW (6 units) | Pha Lai Thermal Power JSC |
| **Quang Ninh** | Quang Ninh | 2009 & 2014 | 1,200MW (4 units) | Quang Ninh Thermal Power JSC |
| **Son Dong** | Bac Giang | 2009 | 220MW (2 units) | Vietnam National Coal and Mineral Industries Group |
| **Song Hau 1** | Hau Giang | 2021-2 | 1,200MW (2 units) | PetroVietnam |
| **Thai Binh 1** | Thai Binh | 2017 | 600MW (2 units) | Electricity of Vietnam |
| **Than Bauxit** | Lam Dong | 2012 | 30MW (1 unit) | Lam Dong Aluminum |
| **Thang Long** | Quang Ninh | 2018 | 600MW (2 units) | Hanoi Export-Import Company |
| **Uong Bi** | Quang Ninh | 1975-2014 | 735MW (4 units) | EVN Genco No 1 |
| **Vedan Vietnam Cogeneration** | Dong Nai | 2015 | 60MW (1 unit) | Vedan Vietnam JSC |
| **Vinh Tan 1** | Binh Thuan | 2018-2019 | 1,200MW (2 units) | China Southern Power Grid, Vinacomin |
| **Vinh Tan 2** | Binh Thuan | 2014 | 1,244MW (2 units) | EVN Genco No 3 |
| **Vinh Tan 4** | Binh Thuan | 2017-2018 | 1,200MW (2 units) | Electricity of Vietnam |
| **Vung Ang 1** | Ha Tinh | 2014-2015 | 1,200MW (2 units) | PetroVietnam Power Corp |
| **TOTAL – 30 PLANTS WITH 74 UNITS AT 22,789 MW** | | | | |

Table 16: Coal plants under construction in Vietnam (data sources: GEM, 2022a; Stimson, 2022; Vy, 2021)

| Plant Name | Location (province) | Year of operation | Capacity | Operating company |
|---|---|---|---|---|
| **Thai Binh 2** | Thai Binh | 2022 | 1,200MW (2 units) | PetroVietnam |
| **Nghi Son 2** | Thanh Hoa | 2022 | 1,920MW (2 units) | Marubeni Corporation & Korea Electric Power Company |
| **Quang Trach 1** | Quang Binh | 2025 | 1,200MW (2 units) | Electricity of Vietnam |
| **Long Phu 1** | Soc Trang | 2023? (no progress since 2018) | 1,200MW (2 units) | PetroVietnam Power Corp |
| **Van Phong** | Khanh Hoa | 2023-4 | 1,320MW (2 units) | Sumitomo Corporation |
| **Vung Ang 2** | Ha Tinh | 2024-5 | 1,200MW (2 units) | Diamond Generating Asia (Japan) |
| **TOTAL – 6 PLANTS WITH 12 UNITS AT 8,040 MW** | | | | |

Table 17: Coal Plants under pre-permit/ with permission struggling for funding
(data sources: Chánh, 2021; GEM, 2022a; Stimson, 2022; Vy, 2021)

| Plant name | Location (province) | Capacity | Extra notes |
|---|---|---|---|
| **An Khanh – Bac Giang** | Bac Giang | 650MW (2 units) | |
| **Bao Dai** | Bac Giang | 600MW (unspecified no. of units) | |
| **Cong Thanh** | Thanh Hoa | 600MW (2 units) | |
| **Duc Giang – Lao Cai** | Lao Cai | 100MW (1 unit) | |
| **Ha Tinh Formosa** | Ha Tinh | 450MW (3 units) | |
| **Hai Ha CHP** | Quang Ninh | 2,100MW (12 units) | |
| **Hai Phong 3** | Hai Phong | 1,200MW (2 units) | Potential conversion away from coal to LNG |
| **Long Phu 2** | Soc Trang | 1,320MW (2 units) | |
| **Long Phu 3** | Soc Trang | 1,800MW (3 units) | |
| **Na Duong 2** | Lang Son | 110MW (1 unit) | |
| **Nam Dinh** | Nam Dinh | 1,200MW (2 units) | Potential conversion away from coal via PDP8 |
| **Pha Lai 3** | Hai Duong | 660MW (1 unit) | |
| **Quang Trach 2** | Quang Binh | 1,200MW (2 units) | New PDP8 proposes conversion to LNG |
| **Quynh Lap 1 & 2** | Thanh Hoa | 2,400MW (4 units) | |
| **Quang Tri 1** | Quang Tri | 1,200MW (4 units) | Potential conversion away from coal via PDP8 |
| **Song Hau 2** | Hau Giang | 2,000MW (2 units) | Potential conversion away from coal via PDP8 |
| **Thai Binh 3** | | 440MW (1 unit) | |
| **Vinh Tan 3** | Binh Thuan | 1980MW (3 units) | Potential conversion away from coal via PDP8 |
| **Vung Ang 3** | Ha Tinh | 1,200MW (2 units) | |
| **TOTAL – 21 PLANTS WITH MINIMUM 50 UNITS AT 21,210MW (21.2GW)** | | | |

# Appendix 2: Thai companies on the Global Coal Exit List

The Global Coal Exit List is produced by the German NGO Urgewald (Urgewald, 2022). The list represents an attempt to capture the entire global coal industry, presently accounting for over 1,000 parent companies and around 1,800 subsidiaries, affiliates and joint ventures. The following criteria is used to select a company:

1. At least 20% of a company's power production or revenue is coal-related.
2. Companies whose annual thermal coal production exceeds or equals 10 million tons, and companies whose installed coal-fired power capacity generation exceeds or equals 5 GW.
3. Companies with coal power, coal mining or coal infrastructure expansion plans.

The table below extracts Thai parent companies and their subsidiaries that are on this list. Not all subsidiaries may be on this list, but those that meet one of more of the criteria given above. The list is dated 7 October 2021.

| Company | Subsidiaries (with country of headquarters) | Operations | Coal share of revenue |
|---|---|---|---|
| **Asia Green Energy PLC** | AGE Terminal Co. Ltd. (Thailand)<br>AGE Transport Co. Ltd. (Thailand)<br>AGE Global Trade Co. Ltd. (Thailand) | Services | >96% |
| **Banpu Public Co. Ltd.** | Hunnu Coal Pty Ltd (Australia)<br>Banpu (Shanghai) Trading Co Ltd (China)<br>Banpu Power Public Co Ltd (Thailand)<br>Centennial Coal Co Pty Ltd (Australia)<br>Hebi Zhong Tai Mining Co Ltd (China)<br>PT Indo Tambangraya Megah (Indonesia)<br>Tbk Shanxi Gaohe Energy Co Ltd (China)<br>Banpu Investment (China) Ltd (China)<br>BLCP Power Ltd (Thailand)<br>Hongsa Power Co Ltd (Laos)<br>Phu Fai Mining Co Ltd (Laos)<br>PT Bharinto Ekatama (Indonesia)<br>PT Indominco Mandiri (Indonesia)<br>PT Jorong Barutama Greston (Indonesia)<br>PT Kitadin (Indonesia)<br>PT Trubaindo Coal Mining (Indonesia) | Power, mining, services | >85% |
| **Eastern Pearl Co Ltd** | - | Services | >90% |
| **Electricity Generating Authority of Thailand (EGAT)** | Electricity Generating Public Co Ltd (EGCO Group) (Thailand)<br>EGAT International Co Ltd (Thailand)<br>RATCH Group Public Co Ltd (Thailand)<br>Hongsa Power Co Ltd (Laos)<br>Phu Fai Mining Co Ltd (Laos) | Power, services, mining | >18% (NB EGAT International has coal revenue >89%) |
| **Electricity Generating Public Co Ltd (EGCO Group)** | BLCP Power Ltd (Thailand)<br>PT Manambang Muara Enim Co Ltd (Indonesia)<br>Quezon Power (Philippines) Ltd Co (Philippines)<br>San Buenaventura Power Ltd Co (Philippines)<br>Quezon Management Services Inc (Philippines) | Power, mining, services | >24% |
| **Glow Energy Public Co Ltd** | - | Power | >20% |

| | | | |
|---|---|---|---|
| **Italian-Thai Development Public Co Ltd** | PT Thailindo Bara Pratama Co Ltd (Indonesia)<br>Thai Mozambique Logistica SA (Mozambique)<br>ITD Mozambique Limitada (Mozambique)<br>Italian-Thai Hongsa Co Ltd (Thailand)<br>ITD-SQ Joint Venture (Thailand) | Services | <20% |
| **Lanna Resources Public Co Ltd** | PT Lanna Harita Indonesia (Indonesia)<br>PT Singlurus Pratama (Indonesia) | Mining, services | 74% |
| **National Power Supply Public Co Ltd** | PT Utami Jaya Mulia (Indonesia) | Mining | >20% |
| **Premthai Energy Ltd** | - | Services | >90% |
| **PTT Public Co Ltd** | PTT Global Management Co Ltd (Thailand)<br>Sakari Resources Ltd (Singapore)<br>PT Bahari Cakrawala Sebuku (Indonesia)<br>PT Jembayan Muara Bara (Indonesia)<br>Tiger Energy Trading Pte Ltd | Mining, power | >1%<br>(NB PTT Global and Sakari have coal revenue >90%) |
| **Rapier-Behr Co Ltd** | - | Services | >50% |
| **Sahakol Equipment Co Ltd** | ITD-SQ Joint Venture (Thailand)<br>Mai Khot Energy Ltd (Myanmar) | Services, mining | 100% |
| **Thai Capital Corp Public Co Ltd** | TCC Energy Co Ltd (Thailand) | Services | 100% |
| **Thailand Anthracite Co Ltd** | - | Services | >20% |
| **Unique Mining Services Public Co Ltd** | - | Services | 100% |

# Appendix 3: Thai shareholders of companies on the Global Coal Exit List

The data given below represents the filing date of November 2021, as compiled by Urgewald (Urgewald, 2022).

| Company | Coal company invested in | Shares (million US$) | Total (million US$) |
|---|---|---|---|
| **Krung Thai Bank** | PTT Public Co. Ltd.<br>Electricity Generating Public Co Ltd (EGCO Group)<br>RATCH Group Public Co Ltd<br>Banpu Public Co Ltd<br>Vietnam Oil and Gas Group (PetroVietnam) (Vietnam) | 2,011.85<br>19.01<br>9.50<br>5.89<br>0.19 | **2,046.44** |
| **MFC Asset Management** | PTT Public Co. Ltd.<br>Electricity Generating Public Co Ltd (EGCO Group)<br>RATCH Group Public Co Ltd<br>Banpu Public Co Ltd<br>Posco (South Korea)<br>Guangdong Investment Ltd (China) | 2,011.85<br>19.01<br>9.50<br>4.41<br>0.26<br>0.20 | **2,045.23** |
| **Social Security Office** | PTT Public Co. Ltd.<br>Electricity Generating Public Co Ltd (EGCO Group)<br>RATCH Group Public Co Ltd<br>Banpu Public Co Ltd | 707.61<br>125.30<br>91.27<br>59.67 | **983.85** |
| **Bangkok Bank** | Magna Resources Corp Pte Ltd (Singapore)<br>PTT Public Co. Ltd.<br>Banpu Public Co Ltd<br>Electricity Generating Public Co Ltd (EGCO Group)<br>RATCH Group Public Co Ltd<br>Jardine Cycle & Carriage Ltd (Singapore) | 364.95<br>318.66<br>84.87<br>20.46<br>2.23<br>0.14 | **791.31** |
| **The Federation of Savings and Credit Cooperatives of Thailand** | PTT Public Co. Ltd. | 509.02 | **509.02** |
| **Kasikornbank** | PTT Public Co. Ltd.<br>Electricity Generating Public Co Ltd (EGCO Group)<br>Banpu Public Co Ltd<br>RATCH Group Public Co Ltd<br>Vietnam Oil and Gas Group (PetroVietnam) (Vietnam)<br>Jardine Cycle & Carriage Ltd (Singapore)<br>Ayala Corp (Philippines)<br>Lanna Resources Public Co Ltd | 201.30<br>2.37<br>1.95<br>1.88<br>0.55<br>0.08<br>0.04<br>0.01 | **208.18** |
| **Siam Commercial Bank** | PTT Public Co. Ltd.<br>Banpu Public Co Ltd<br>Electricity Generating Public Co Ltd (EGCO Group)<br>RATCH Group Public Co Ltd<br>Wanhua Chemical Group Co Ltd (China) | 145.05<br>21.19<br>7.19<br>5.75<br>0.15 | **179.33** |
| **Thanachart Capital** | PTT Public Co. Ltd.<br>RATCH Group Public Co Ltd<br>Electricity Generating Public Co Ltd (EGCO Group)<br>Banpu Public Co Ltd | 69.67<br>14.68<br>1.36<br>1.18 | **86.89** |
| **Kiatnakin Bank** | RATCH Group Public Co Ltd<br>PTT Public Co. Ltd.<br>Electricity Generating Public Co Ltd (EGCO Group)<br>Banpu Public Co Ltd | 8.52<br>8.01<br>1.28<br>0.04 | **17.85** |
| **TISCO Financial Group** | PTT Public Co. Ltd.<br>RATCH Group Public Co Ltd<br>Banpu Public Co Ltd | 9.83<br>0.12<br>0.03 | **9.98** |
| **LH Financial Group** | PTT Public Co. Ltd.<br>Banpu Public Co Ltd<br>RATCH Group Public Co Ltd | 2.27<br>1.39<br>0.54 | **4.20** |
| **Asia Plus Group** | Banpu Public Co Ltd<br>PTT Public Co. Ltd. | 1.08<br>0.40 | **1.48** |
| | | **TOTAL** | **6,883.76** |

# Appendix 4: Thai banks supporting companies on the Global Coal Exit List

The data given below covers the period January 2019 to November 2021, as compiled by Urgewald (Urgewald, 2022).

| Company | 1Underwriting | | Loans | | Total (Million US$) |
|---|---|---|---|---|---|
| | Company | Million US$ | Company | Million US$ | |
| **Bangkok Bank** | Banpu Public Co Ltd.<br>Italian-Thai Development Public Co Ltd<br>PTT Public Co. Ltd | 660.28<br>68.28<br>160.76 | PT Adaro Energy Tbk (Indonesia)<br>PT PLN (Persero) (Perusahaan Listrik Negara) (Indonesia) | 8.00<br>458.14 | **1,355.85** |
| **TMBThanachart Bank** | | | Vietnam Oil and Gas Group (PetroVietnam) (Vietnam) | 700.00 | **700.00** |
| **Krung Thai Bank** | Banpu Public Co Ltd.<br>Italian-Thai Development Public Co Ltd<br>National Power Supply Public Co Ltd<br>PTT Public Co. Ltd<br>Sahakol Equipment Co Ltd | 121.77<br>20.66<br>24.65<br>131.82<br>9.60 | | | **308.49** |
| **Siam Commercial Bank** | PTT Public Co. Ltd. | 292.57 | | | **292.57** |
| **Kasikornbank** | PTT Public Co. Ltd. | 292.57 | | | **292.57** |
| **Bank of Thailand** | Electricity Generating Authority of Thailand (EGAT) | 219.93 | | | **219.93** |
| **Kiatnakin Bank** | Banpu Public Co Ltd. | 153.53 | | | **153.53** |
| **Asia Plus Group** | Banpu Public Co Ltd.<br>Italian-Thai Development Public Co Ltd<br>National Power Supply Public Co Ltd | 31.77<br>68.68<br>44.05 | | | **144.50** |
| **Merchant Partners** | Italian-Thai Development Public Co Ltd<br>National Power Supply Public Co Ltd | 36.63<br>24.65 | | | **61.28** |
| **Finansia Syrus Securities** | Italian-Thai Development Public Co Ltd<br>National Power Supply Public Co | 18.26<br>24.65 | | | **42.91** |
| **Trinity Watthana** | National Power Supply Public Co Ltd | 24.65 | | | **24.65** |
| **Globlex Holding Management** | National Power Supply Public Co Ltd | 24.65 | | | **24.65** |
| **Globlex Securities** | National Power Supply Public Co Ltd | 19.40 | | | **19.40** |
| **IV Global Securities** | Sahakol Equipment Co Ltd | 15.98 | | | **15.98** |
| **TMB Bank** | Sahakol Equipment Co Ltd | 8.87 | | | **8.87** |
| **Aira Capital** | National Power Supply Public Co Ltd | 8.60 | | | **8.60** |
| | **TOTAL** | **2,493.73** | | **1,166.14** | **3,659.87** |

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