



Decarbonization: Opportunities in ASEAN

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INTRODUCTION

The Association of Southeast Asian Nations (ASEAN) continues its rapid pace of urbanization and industrialization, making it a bright spot in the global economy.¹ ASEAN's growth has come with continued robust increases in energy and electricity demand. Now, with plans for new coal-fired electricity plants at the center of the region's energy strategy, ASEAN is shaping up as one of the most important regions in the global fight to minimize the effects of climate change. This reflects abundant and easily mined coal reserves in ASEAN and the fact that coal-fired electricity plants are uniquely well-suited to producing inexpensive baseload power, reliably operating around-the-clock. Unlike renewables, coal doesn't need the sun to shine, the wind to blow, or rivers to flow. So it's understandable that the region is building and planning large numbers of new fossil fuel plants. However, at a time when renewable energy sources such as solar and wind, as well as smart grids and better energy storage technology are opening up new possibilities globally for carbon-free electricity, ASEAN governments have a chance to think more creatively about their future energy mix. Building a coal-fired electricity plant effectively locks in that generating source for 30 to 50 years.

Renewable energy is increasingly cost-effective. Solar and wind power is already cheaper than coal in some situations; estimates are that within a decade, wind and solar will be cheaper than coal in much of the world. The cost of solar panels falls by 26% each time the number of solar panels doubles; the drop in price for the doubling of wind turbines is 19%. The combination of efficiency improvements and larger-scale solar and wind power manufacturing has lowered costs dramatically.² In a February 2017 interview with CNN, Christiana Figueres, the former Executive Secretary of the United Nations Framework Convention on Climate Change, argued that the economics for renewables will ultimately make the strongest case for decarbonization.³

According to the International Renewable Energy Agency, if renewable energy's share of global energy doubles to 36% by 2030, global GDP would increase by up to 1.1% (US\$1.3 trillion) and around 15 million new jobs will be added, 10 million more than in a business-as-usual scenario.⁴ Renewables will "fuel economic growth, create new employment opportunities, enhance human welfare, and contribute to a climate-safe future," yielding positive ripple effects beyond the direct reduction of global greenhouse gas emissions upon the greater economy and society.⁵

Following the COP21 Paris climate agreement, countries around the world are increasingly moving toward decarbonization, or the reduction of carbon intensity in various industries. Much of the ASEAN region remains stuck in an old mindset, with inadequate adoption of new energy policies and sources, and a lack of demand side management. Moreover, projected trends show coal use for electricity generation capacity in ASEAN will grow to five times its size today in the next 20 years.⁶ Unless the course changes, many ASEAN countries will remain at odds with the COP21 pledge to effectively decarbonize by mid-century.

Developing ASEAN countries face a strategic dilemma between continuing to have access to cheap and easily available electricity for industries and households, and moving toward a cleaner and more

sustainable growth path and a healthier environment for their populations. Unless policymakers, utilities, and sectors driving energy demand commit to this transition through innovative energy policies, the transformation will be much slower than it need be.

THE CURRENT SITUATION

ASEAN faces a strategic dilemma. Over the last two decades, its greenhouse gas emissions have increased at roughly 5% annually; by contrast, Germany has decreased its emissions at a compound rate of 1% per year over a similar time period.⁷ If the current growth trajectory continues, and the ASEAN coal path is locked in for the next few decades, countries in the region will increasingly see the effects of global warming, pollution, and more tenuous financing, as the business case for alternative and renewable energy sources strengthens and that for coal use weakens. Moreover, if moves to impose carbon taxes ever become reality, coal would quickly become an expensive alternative and some coal-fired electricity plants could end up as stranded assets.

ASEAN is experiencing rapid growth of cities, new buildings, cars, and industrial activity. Already 22% of ASEAN's more than 600 million person population live in cities, with an expected 54 million more by 2025.⁸ Coal, being cheap, abundant, and accessible, is the energy source that largely fuels this growth, mostly through coal-fired electricity plants.⁹ The world's greatest relative future increase in coal demand will come from ASEAN, growing by an average of over 7% annually by 2021, as compared to India's annual average of 5% for the same time period, though India's absolute growth in coal demand will be greater. In contrast, China's demand growth is expected to remain flat over the same time period, while demand in the European Union, Japan, and the United States declines.¹⁰ ASEAN is a net coal exporter, with Indonesia being one of the world's largest coal producers, providing abundant supply on which to base economic growth in the region.¹¹

Fossil fuels, including coal, oil, and natural gas, account for 80% of ASEAN's total primary energy supply (TPES), a measure of all the energy used in an economy (including electricity generation, mining, manufacturing, and transportation), today compared to just over half in 1990. Of the three fossil fuels, coal has shown the most rapid growth.¹² Most coal-generated electricity increases in Asia will come from Indonesia and Vietnam, this despite the fact that Vietnam became a net coal importer in 2015 for the first time in its history.¹³

By contrast, renewables make up a relatively small share of ASEAN's electricity generation, with hydropower accounting for the largest share and responsible for over half of the region's renewable energy capacity growth.¹⁴ Following the COP21 Paris climate agreement, Vietnam revised its Power Development Plan to include more than twice as much renewable energy capacity as a proportion of total installed energy capacity in 2030 than originally planned (from 9.4% to 21%) and revised down its coal capacity growth by 9%, from 52% to 43%.¹⁵ Vietnam leads ASEAN in hydropower, generating 45% of all hydropower energy in the region, though hydropower projects have serious ecological costs, including the loss of forests and biodiversity in the Mekong River Delta region.¹⁶

Indonesia both produces and consumes vast amounts of coal, with the coal economy experiencing a recent boost in prices, due in part to China cutting back its domestic coal production.¹⁷ The country is suffering from Asia's highest sulfur dioxide (SO₂) and nitrogen oxide (NO_x) emissions.¹⁸

ASEAN WILL FACE WORSENING IMPACT OF CLIMATE CHANGE

ASEAN is both "ground zero" for coal growth and on the front lines of climate change, thanks in part to massive urban populations living in coastal areas. It is more vulnerable than most parts of the world, as climate change will likely inflict large economic losses from its impact on the region's major sectors and assets, ranging from agriculture and tourism to labor productivity and ecosystems. According to

the Asian Development Bank (ADB), Southeast Asia's gross domestic product (GDP) may suffer an 11% reduction from today's GDP by 2100, after gradual economic losses in between now and 2100 due to climate change.¹⁹ The vulnerability of the region comes not only from its coastal cities but its unique conditions of high exposure to severe storms, high sensitivity to warmer temperatures and precipitation patterns, and the relatively low capacity of many institutions and communities to adapt to adverse effects from climate change.²⁰ In 2013, the Philippines experienced the catastrophic Typhoon Haiyan, whose impact was exacerbated by rising sea levels and which claimed over 6,000 lives and resulted in economic losses of billions of dollars.²¹ In January 2017, MIT and Conservation International announced a research collaboration in the Visayas region in the Philippines, which suffered serious damage from the typhoon, to explore nature-based solutions, specifically mangrove forests, to help mitigate climate change and help communities prepare for its adverse impact on coastal areas in the country. More coal plants will make their efforts more difficult.²²

Also at stake is the Mekong River Delta, which affects Vietnam, Thailand, Laos, and Cambodia. For Vietnam, the Delta is the food basket of the country, providing 50% of the nation's rice, 80% of its fruit, and 60% of its fish.²³ It also accounts for one-fifth of the world's rice exports. The region has already experienced negative effects stemming from climate change; mangrove trees are disappearing along the coast because the annual sea level rise is too great for them to grow, saltwater intrusion destroyed more than 6,000 hectares of rice fields in 2014, and unpredictable rainfall patterns have caused greater flooding during the wet season. The Mekong River Commission predicts that if sea levels rise, as projected, one meter by 2100, 40% of the Delta will be underwater.²⁴

POLLUTION AND PUBLIC UNREST

ASEAN citizens are increasingly aware of the impact of environmental pollution stemming from the burning of fossil fuels, with citizen activism rising in response—evidenced by the public protests that took place in Vietnam in response to Taiwanese-owned Formosa Plastic's dumping of chemicals into the ocean that resulted in mass fish deaths. Citizens are protesting the status quo in favor of more renewable energy, more stringent corporate environmental and social responsibility regulations, and more action against polluters.

Coal emissions' direct impact on public health is felt tangibly in the region. A joint study by Harvard University, University of Colorado Boulder, and Greenpeace International estimated that Southeast Asia, Japan, South Korea, and Taiwan together experience roughly 20,000 premature deaths per year from coal emissions due to their contribution to cardiovascular and respiratory diseases, including almost 3,200 deaths in China due to transboundary pollution from Southeast Asian coal-fired power plants. If all the coal plants in the region that are currently under construction or planned for construction come to fruition, that number will increase to almost 70,000 in 2030, including 9,000 deaths in China due to transboundary pollution, with the highest rates of mortality occurring in Indonesia and Vietnam.²⁵ While China's coal emissions are on a declining trend due to its rapid adoption of renewable power, ASEAN's emissions will only increase if its continued economic growth relies on coal energy.²⁶ Worsening air pollution has caused protests in many cities in nearby China in recent years, with discontented citizens forced to breathe toxic air in their own homes and cities tracing the pollution source, organizing petitions, and speaking up to hold local enterprises and governments accountable.²⁷ Likewise, as pollution from coal-based electricity generation grows in ASEAN, governments may face similar public pushback.

Almost half of the Mekong River Delta population does not have access to fresh water due to industry and climate change-driven saltwater intrusion, while those that do are increasingly at risk of losing it. The Delta is in peril from industries that build dams and mine the river's sand, while climate change is causing sea-level rise that increases the river's salinity.²⁸ A high-profile example of environment-related public unrest against corporate activity occurred when the Formosa Ha Tinh Steel Plant in Vietnam

apparently spilled chemical waste directly into the ocean, causing more than 100 tons worth of fish deaths along 125 miles of coastline.²⁹ A Formosa external relations manager told state-run TV that Vietnam must choose between industrial steel growth and fish. A social media backlash ensued, with people using the hashtag #Ichoosefish to express their unhappiness over the government's slow and weak response to the incident.³⁰ The hashtag developed into a full-fledged "We Choose Fish" movement, with over 1,300 unique public posts on Instagram, Facebook, and Twitter using the hashtag and thousands of Vietnamese protesters rallying over a three-week period in Hanoi, Ho Chi Minh City, Nha Trang, Vung Tau, and Danang.³¹ Formosa agreed to compensate local fishermen and those affected by the disaster to the sum of US\$500 million—a move that may not have occurred without the widespread public outcry. In the face of reluctant government enforcement of regulations surrounding environmental protection in Vietnam and elsewhere in ASEAN, incidents such as this serve as a cautionary tale for firms to step up their efforts to ensure better environmental protection practices, or else face increased reputational risk and public resistance.

The Philippines has seen various citizen-led movements directed at companies that pollute and the banks that finance them. For instance, the Export-Import Bank of Korea experienced environmental activist-led protests in Manila in October 2016 over its continued funding of coal plants in the country.³² The same month, another protest of more than a hundred people, mostly supporters of the environmental group Philippine Movement for Climate Justice-Cebu, assembled in Cebu City, calling for the Duterte administration to move the country's energy policy away from its reliance on coal towards more renewables.³³ In January 2017, the Philippine Movement for Climate Justice held a "No to Coal" protest in response to the health effects including lung disease and other respiratory issues, a contaminated water supply, and persistent coughing in the local children caused by coal ash from two power plants in Limay where two more coal plants are under construction.³⁴

CARBON FINANCING: A MORE TENUOUS FUTURE

Banks and asset owners globally are starting to assess the environment-related risks of their holdings in Asia. Banks are rethinking lending commitments to carbon-intensive industries, and financing projects that focus on sustainability. The International Energy Agency reported that worldwide, "coal mining investment is drying up."³⁵ In the 15 months leading up to December 2016, the value of assets represented by organizations, countries, and individuals that have divested from fossil fuel companies has doubled, though the absolute number is small.³⁶ A recent study by Boston Common Asset Management of more than 25 major banks in the U.S., Europe, and developed Asia, found that the vast majority now disclose their financing or investment in renewable energy, though most are not yet integrating the results of environmental stress testing into their business decisions or setting renewable energy or energy efficiency financing targets.³⁷

The pressure on the financial sector to move away from carbon-heavy lending is likely to grow. Mark Carney, Governor of the Bank of England, and Michael Bloomberg, founder of Bloomberg LP and former Mayor of New York City, pointedly stated that "financial disclosure is essential to a market-based solution to climate change," in an editorial highlighting their work on the Task Force on Climate-Related Financial Disclosures (TCFD). The TCFD was established by the G20's Financial Stability Board, to create a set of voluntary climate change risk disclosure standards for investors, lenders, and insurance underwriters.³⁸ Financial disclosure incentivizes banks to more accurately reflect risks such as that of stranded assets and create transparency around their accounting for climate risk.

Green finance is a small but promising growth area for lenders and borrowers who wish to build sustainable development projects and investments. Though the term can be used loosely, it focuses on funneling capital to low carbon-intensity sustainable infrastructure or renewable energy investments. As capital markets in emerging ASEAN economies are generally less innovative than those in the U.S.,

Europe, and Australia, green lending vehicles such as yieldcos, securitizations, and the like are still uncommon.³⁹ Investor-owned banks operating in ASEAN are generally not yet incorporating green financing considerations on a large scale. Multilateral banks like the ADB, International Finance Corporation (IFC), and the new Asian Infrastructure Investment Bank (AIIB) have stepped in to help catalyze green financing and encourage private-sector lending, and have financed solar projects in Thailand and India. Indonesia's financial regulator is set to introduce rules in 2018 to restrict lending to polluting projects, with the largest banks working with the WWF to integrate sustainability criteria into bank lending and direct more financing to sustainable projects.⁴⁰ The Association of Banks in Singapore rolled out a set of guidelines for responsible lending in late 2015; these are designed to help banks integrate sustainability criteria into their risk assessment and lending processes, particularly in carbon-intensive sectors. In August 2016, the Singapore Exchange listed the world's first corporate green Masala bond (offshore rupee-denominated debt) from NTPC, India's largest energy conglomerate, the proceeds of which will be invested in solar and wind projects.⁴¹ The Malaysian government has implemented the Green Technology Financing Scheme, which offers soft loans to projects in sectors such as infrastructure and energy that focuses on emissions reduction and minimizes environmental degradation.⁴² Moreover, institutional investors from Europe, the Gulf, and China looking for longer-term investments are eyeing opportunities in new energy in the region and may supply needed capital.⁴³

Australia and New Zealand Banking Group (ANZ) has incorporated company-wide procedures and stress testing in its day-to-day investment and financing decisions to fund the transition to a low-carbon economy. So far, ANZ has funded and facilitated AUD\$2.5 billion in low-carbon and sustainable solutions and plans to increase that amount to AUD\$10 billion by 2020. Its lending supports energy efficiency, clean power generation, new technologies, and other climate adaptation measures. (ANZ is present in all the ASEAN member countries except for Brunei.) The bank sets annual sustainability targets that measure outcomes relative to goals, exemplifying an important aspect of corporate responsibility to sustainability—transparency and accountability. Its public sustainability targets are based on the United Nations Sustainable Development Goals. For environmental disclosures, ANZ uses an external Climate Disclosure Standards Board Climate Change Reporting Framework, and uses the accounting firm KPMG to independently evaluate its Corporate Sustainability Review, which is an annual review of the company's sustainability goals and achievements.⁴⁴

Standard Chartered, which operates in all 10 ASEAN countries, has pledged to lend US\$4 billion to renewable energy projects by 2020 and has set up environmental and social risk management procedures that aim to create long-term value for shareholders.⁴⁵ The bank is also creating climate risk and energy-sector assessment criteria to aid its energy-sector clients in making investments that help achieve the Paris climate agreement's secondary, more ambitious goal of limiting warming to 1.5°C above pre-industrial levels in this century.⁴⁶ The bank itself no longer invests in thermal coal mines that sell their coal and sets limits to emissions of coal-fired power plants it does invest in.⁴⁷ In its financing of An Giang Plant Protection Joint Stock Company's (AGPPS, now Loc Troi Group) integrated rice production chain in Vietnam, Standard Chartered incentivized sustainable agriculture by following the "big paddy field model", where AGPPS provided guidance from agricultural engineers who helped raise the productivity and efficiency of the farms.⁴⁸

CONCLUSION

The longer it takes to move to a lower-carbon future, the more expensive the bill for governments and businesses. If the implementation of emission reduction policies is delayed by even a decade, policy implementation costs could increase by as much as 60% over a 2020 implementation date.⁴⁹ Businesses that choose not to implement environmental mitigation strategies in the near-term will face increasingly stringent regulations that will make it costlier in the long-run to become compliant. ASEAN

SINGAPORE GREEN BUILDINGS CURBING CARBON EMISSIONS BY CUTTING ELECTRICITY DEMAND

The energy focus in ASEAN generally focuses on increasing supply—especially more electricity plants. Singapore is a lesson in the benefits of looking at the demand side of the equation. Singapore is betting that smarter, more efficient energy use will break the link between economic growth and increasing energy demand. The United States and the EU have been working on demand-side management for decades; Singapore is ASEAN's leader.

Sustainability issues are at the heart of Singapore's national identity, summed up with the slogan "city in a garden." Singapore has, since its independence from Malaysia in 1965, built upon founding Prime Minister Lee Kuan Yew's conviction that the tiny city-state, with one of the highest population densities in the world (7,540 people per km²), had no choice but to think long-term about its environment. Initially this effort focused on managing water resources better, planting trees, and cleaning up polluted waterways.

In 2009, Singapore set a goal of improving its energy intensity by 35% from 2005 levels by 2030. In 2015, at the Paris climate summit, Singapore pledged to reduce its emissions intensity by 36% from 2005 levels by 2030 and to see its carbon emissions peak concurrently.⁵⁰

According to Singapore's Sustainable Singapore Blueprint, "greening buildings is one of the most effective and positive-sum ways for a city to reduce its overall carbon footprint."⁵¹ Globally, buildings account for one-third of greenhouse gas emissions, 40%

of energy consumption, and 25% of water consumption. Energy consumption in buildings can be reduced between 30% and 80% percent using proven and commercially available technologies.⁵²

The Green Building Masterplan, first published in 2006 by the Ministerial Committee for Sustainable Development and which maps out Singapore's national sustainability strategies, is updated periodically and aims to accelerate sustainability in the building sector. In the Second Green Buildings Masterplan, the Building and Construction Authority (BCA) set a target for 80% of Singapore buildings to achieve Green Mark standards by 2030. The Third Green Building Masterplan, published in 2014, uses market-based incentives for retrofits of existing buildings and for new builds to conform to Platinum Green Mark standards, the most stringent level. Incentives such as gross-floor-area bonuses and financing are designed to encourage both owner and tenant participation.⁵³

Singapore's pioneering Green Mark standard is now more widely used in ASEAN than the U.S. Green Buildings Council's LEED standard. Unlike LEED, Green Mark was developed by a government, not an industry association, to achieve specific policy aims of reducing energy and water consumption. It is particularly well suited to tropical and subtropical environments. Green Mark has evolved over time to include more emphasis on passive design and sustainable construction materials and places a greater focus on the well-being and comfort of building occupants.⁵⁴

A study by the National University of Singapore found that green buildings in Singapore "save approximately 10% in operating expenses, and green commercial buildings increase in market value by about two percent. The average savings from 23 buildings (comprising office, retail, hotel, and mixed-used developments) sampled after retrofitting was about 17% of the total building's energy consumption, compared to before retrofitting." The cost premium for a new green building ranges from less than one percent for Green Mark Certified to up to 8% for Platinum levels. The average payback period is between two and eight years.⁵⁵

Efforts to bring building costs down are enhanced by government research and development. The BCA has launched the S\$52 million Green Buildings Innovation Cluster, meant to spur the development and testing of green building solutions among research institutions, property developers, architects, and engineers. In 2016, in collaboration with Lawrence Berkeley Laboratories, BCA's opened its SkyLab, the world's first high-rise, rotating rooftop laboratory in the tropics.⁵⁶

As of 2015, according to the Sustainable Singapore Blueprint, "there are more than 2,600 green building projects in Singapore. This amounts to more than 76 million square meters, or more than 30% of buildings' total gross floor areas." In 2015, Singapore's overall energy intensity improvement was 24% compared with 2005 levels. The city in a garden is well on its way to meet its target of a 35% improvement in energy intensity over 2005 levels by 2030.⁵⁷

stands to benefit financially from climate stabilization despite the initial costs incurred. It is prudent for ASEAN member states to act now.

ASEAN faces a challenging choice between more sustainable economic development or continuing to peg growth on apparently cheap coal. Utilities, industries driving energy demand, and banks operating in ASEAN face a dilemma as they weigh the cost of continuing with the immediate economies of coal-based growth, compared to charting a path of increased investments in renewable electricity-generation capacity and managing energy demand, including tougher energy efficiency standards. With political imagination and leadership, ASEAN countries could put a framework in place now that can help chart a decarbonization path that leads to more sustainable future growth. The region's prosperity in the 21st century may depend on it.

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