Indo-Pacific Profiles on Climate Vulnerabilities and Action

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Australia

Commitments & Action to Reduce Emissions

Australia plans on achieving net-zero emissions by 2050, and has a comprehensive "technology-led" plan to do so.[1]

Their National Greenhouse and Energy reporting (NGER) scheme is a national framework to report info about companies' greenhouse gas emissions, and energy production and consumption, while their Safeguard Mechanism "requires Australia's largest greenhouse gas emitters to keep their net emissions below an emissions limit."[2] They also set Renewable Energy Targets, have an Emissions Reduction Fund to incentivize emitters to adopt carbon-reducing practices, and award a Climate Active Carbon Neutral Standard certification for businesses.[2] Although Australia implemented a carbon tax in 2012, leading to a "significant and immediate" reduction in carbon emissions, just two years later they became the first country in the world to abolish a "functioning carbon pricing scheme" the moment a conservative government was elected.[3] Their plan to decarbonize thus emphasizes "investing in [R&D that will] reduce the cost of new and emerging technologies [which they call their 'technology-led plan'], rather than tax our existing industries;" interestingly, Australia will also "continue to supply energy exports in the form our customers want it [referring to coal and natural gas]," reasoning that "other countries will fill the gap if Australia is forced out of global markets early."[2]

Priority Low-Emissions Technologies

Australia's priority low emissions technologies are clean hydrogen, ultra-low-cost solar, large-scale energy storage, low emissions steel and aluminum, carbon capture and storage (CCS), and soil carbon measurement and storage.[1] Some of this research is co-funded through international partnerships, including with the Republic of Korea, U.K., Germany, Japan, and Singapore.[2]

Risk to Climate Change

Climate change has made Australia experience "higher temperatures, more extreme droughts, fire seasons [recall the intense late 2019 to early 2020 wildfires], floods, and more extreme weather." Additionally, rising sea levels, marine heatwaves, and ocean acidification is devastating Australia's coastal communities and ecosystems, with much of the Great Barrier Reef likely not recovering from climate-induced coral bleaching.

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Bangladesh

Risks from Climate Change

With rising sea levels and coastal erosion possibly leading to a loss of 17% of land surface—possibly displacing 1/3 of the population in the process—and 30% of food production by 2050, Bangladesh is considered "especially vulnerable to climate change."[1] Likewise, climate change is expected to result in "increasingly frequent and severe tropical cyclones, heavier and more erratic rainfall [which results in higher river flows, river bank erosion, and increased sedimentation], melting of the Himalayan glaciers," increased drought of some parts of the country, and warmer and more humid weather, putting at stake any progress the country has had on "increasing incomes and reducing poverty."[2]

Mitigation and Adaptation Efforts

Bangladesh has a climate action plan, mostly emphasizing adaptation, which is built on six pillars:[2]

1. Food security, social protection, and health – ensure that society's most vulnerable are protected from climate change's effects on "food security, safe housing, employment, and access to basic services, including health"
2. Comprehensive disaster management – strengthen systems to deal with increasingly severe and frequent "calamities"
3. Infrastructure – ensure that "existing assets are well-maintained and fit-for purpose" and "urgently needed infrastructure is put in place"
4. Research and knowledge management – predict the scale and timing of climate change impacts on different economic sectors and socio-economic groups; "to underpin future investment strategies; and to ensure that Bangladesh is networked into the latest global thinking"
5. Mitigation and low carbon development – implement low carbon development options as the country's economy grows
6. Capacity building and institutional strengthening – "enhance the capacity of government ministries and agencies, civil society and the private sector"

Even though they account for less than 0.35% of global greenhouse gas emissions,[1] Bangladesh's mitigation strategy emphasizes energy efficiency and renewable energy development ("particularly solar homes and biogas plants"), the "transfer of state-of-the-art technologies from developed countries to ensure [...] a low-carbon growth path," and reducing greenhouse gas emissions from agriculture and urban waste management.[2]

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China

Commitments & Action

China is the world's largest greenhouse gas (GHG) emitter, whose 11.1B tons of CO_2 emissions in 2021 accounted for 33% of the world's total, much of it from its heavy use of coal.[1] Worryingly, China continues to build significant numbers of coal-fired power plants each year (China's coal-fired power plants were responsible for roughly 10% of global CO_2 emissions in 2018), synthetic natural gas plants (which produce more CO_2 emissions than just burning the coal directly), and has financed roughly ¼ of the coal-fired power plants currently under development outside their country.[2] Interestingly, however, as the "Chinese economy grew roughly 42% in the past five years, Chinese CO_2 emissions grew 2%-5%," suggesting a "partial decoupling" of the country's economic growth with emission growth.[2]

Speaking publically about their desire to address climate change, China has committed to peak CO_2 emissions by 2030,[2] and net-zero by 2060, which is "largely consistent" with the Paris Agreement.[3]

To meet these goals, China has taken steps to address climate change:

(1) Cutting Coal Consumption – programs to shut down inefficient coal-burning facilities, coal power plant efficiency standards, etc.

(2) Deploying Low-Carbon Power – "generous feed-in tariffs for wind and solar power," minimum renewable power purchasing requirements for grid companies, etc.

(3) Putting a Price on Carbon Emissions – a nationwide CO_2 trading program launched, but is still in development; regional trading programs operate in cities and provinces

(4) Improving Energy Efficiency – energy efficiency standards for a wide-range of consumer and industrial sources of emissions

(5) Other policies – building mass transit, promoting green finance, conserve forests and grasslands and conduct massive reforesting projects, etc.

Many Chinese policies that address climate change officially have multiple objectives that are integrated with other "medium- and long-term [efforts for] economic and social development" (e.g. "Switching from coal to natural gas is central to cleaning the air in China's cities."), making them more durable and successful, although corruption and lack of sufficient resources sometimes undermines the enforcement of environmental regulations.[2]

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India

Background & Commitments

Producing 2.4B tons of CO_2 annually, India is the third-largest carbon emitter worldwide, accounting for 7% of global emissions in 2020.[1] It is important to note, though, that India's per-capita emissions are just 1.77 metric tons per person, which is considerably lower than many other countries.[1]

India has pledged net-zero greenhouse gas emissions by 2070 but has "resisted setting overall reduction targets, saying industrialized nations should bear a much greater share of the burden as they have contributed far more towards global warming over time," instead setting "emissions intensity" (emissions per unit of economic growth) targets—which does not necessarily mean emissions reductions.[2] India says it will reduce its economy's greenhouse gas emission intensity by 45% by 2030, in part by supplying 50% of its electricity production from non-fossil fuel sources; these goals are dubious, though, as India's official statistics claim 39% of its electricity is already carbon-free, contradicting the International Energy Agency's estimate of 20%.[2]

Forest Efforts

India has ambitions to cover 1/3 of its land area with forest cover, planning to "plant enough trees by 2030 to absorb an additional 2.5-3 billion tons of CO_2."[2] To achieve these goals, the government has "designated more than $6.2 billion for tree planting across the country," recently organizing a million people to plant 250 million saplings in just a single state; however, "long-term survival of trees planted in such mass campaigns" is concerning, with disease or lack of water usually killing off 40% of planted saplings.[3]

Impacts from Climate Change

March 2022 was the hottest month in India in 122 years— the heat wave coming far earlier than usual and reaching 120◦F— and rainfall was 60%-70% below the norm.[4] These kinds of extreme weather events are "30 times as likely now as before the industrial age," which will become more common from climate change.[4] Given India's central role in the world economy, these disastrous effects are not insolated: The yield of India's national wheat harvest was down at least 3.5% from not only the heat wave, but the unusually intense flooding that came before it—with some districts seeing as much as a 30% decline; this has contracted India's wheat exports, which was hoped would cushion the shortage caused by the war in Ukraine.[4]

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Indonesia

Commitments & Action

Indonesia plans to peak greenhouse gas (GHG) emissions by 2030—reducing GHG emissions "29% below business-as-usual [BAU] by 2030," or 41% "contingent on sufficient international financial support" —and reach net-zero by 2060 or sooner.[1] Indonesia, as an archipelago, is particularly vulnerable to climate change, seen by the country's decision to move its capital from Jakarta, much of which is projected to be fully submerged by mid-century partly from rising sea levels.[2] To meet its climate goals, Indonesia has recently passed the implementation of a carbon tax, which is scheduled to be gradually rolled out over time until full implementation by 2025.[2]

Proposed Big-Idea Strategies

Most of Indonesia's GHG emissions come from land-use change and forestry (65.5%) and energy (22.6%).[3] Forest and grassland conversions are being primarily driven by "logging coupled with [...] agro-industrial production" (especially for palm-oil) and peat fires, many of which are intentionally caused to clear land; coal-fueled economic development has increased electricity and heat emissions.[3] Indonesia's strategy relies on making its forests a carbon sink again by halting deforestation and reducing coal emissions by increasing energy efficiency, significantly "raising the proportion of renewable energy"—possibly by further exploiting their massive geothermal energy reserves[5]— in their energy mix, and implementing carbon capture, utilization, and sequestration (CCS) on coal- or biomass-fired power plants.[4] To begin meeting these goals, Indonesia has implemented a "nationwide moratorium on the draining of [...] peatlands [that increases their risk of burning]," which likely contributed to the 60% decrease in forest loss from 2016 to 2017.[5] As an archipelago expecting high population growth, Indonesia remains conscientious of the fact that "demand for land use, either for housings, livestock, or crops will also increase," which may compete with efforts to prevent deforestation; however, they insist that "proper mapping and balance of land use," alongside "consideration of trajectory of changes in population," can mediate between the two competing interests.[4]

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Japan

Carbon Pricing Mechanisms

The Japanese government has officially pledged net-zero greenhouse gas emissions by 2050. In 2012, after years of considering carbon-pricing mechanisms, Japan ultimately became the first Asian country to implement a carbon tax. It is levied on fossil fuels, but many energy intensive industries are exempted due to concern about negative effects on economic growth and international competitiveness. The tax revenue is redirected to "supplement renewable energy projects and to enhance energy-saving measures;" however, their carbon tax rate of $2.65 / ton of CO_2 –one of the lowest among G20 countries—falls significantly short of meeting scientific recommendations (e.g. the IMF encourages between $35 and $70 / ton of CO_2), meaning that Japan will likely not meet its climate goals with current projections.[1]

Priority Green Sectors for Technological Growth

Japan views a hydrogen economy as central to meeting their climate pledges,[2,3] especially to reduce industrial emissions. They plan on expanding the use of nuclear power[2,4] in part to produce green hydrogen, which will then fuel key emission-heavy industries: Hydrogen or hydrogen-based fuel cells will be used for power generation, steel-making, carrier ships, passenger vehicles, construction machinery, and aircraft.[2] Japan currently relies almost entirely on fossil fuels, nearly all of which is imported due to lack of domestic reserves, and it does not anticipate renewable energy, despite growth, to dominate energy supply.[4] To establish energy security, Japan has sought heavily to exploit methane hydrates reserves— which can be processed into natural gas— along the ocean floor.[5] In the long run, Japan also plans to utilize its substantial coastline to generate offshore wind power.[2, 3] In addition, Japan foresees Carbon Recycling—using carbon emissions as an input for industrial processes— to play a role in its emission reduction strategy as well,[6] even establishing a Carbon Recycling Advancement Office within their Agency for Natural Resources and Energy.[3]

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Malaysia

Climate Vulnerability

Climate change will potentially impact Malaysia via "sea level rise, reduced crop yields, greater diseases among forest species and biodiversity loss, erosion of shorelines, increase flood intensities, coral reef bleaching, increased incidences of disease, tidal inundation of coastal areas, decreased water availability, loss of biodiversity, and more droughts," which can be unbearable for a country "considered [...] a free zone from climate related disaster."[1] By 2050, Malaysia's temperature may rise up to 1.5 degrees Celsius, and the sea level is expected to rise "anywhere from 15 to 95 centimeters over a hundred-year period, threatening the increasing urban population in [...] coastal areas."[1] Considering at least 1/3 of the population depends on the agricultural sector for their livelihood (with 14% working in farms and plantations), and about 39.2% of total land use are planted with crops, climate change significantly reducing agricultural as well as livestock yields could be devastating.[1] Most of Malaysia's thermal power plants are located near the ocean, making them vulnerable to coastal erosion and sea-level rise, and electricity transmission networks may be disrupted by more extreme weather patterns; this comes just as electricity use will likely sharply increase—primarily by air conditioners.[1]

National Policy on Climate Change

Malaysia has set the goal of achieving carbon neutrality by 2050, announcing plans to implement a carbon tax and domestic emissions trading scheme, although the details have yet to be released.[2] They already have a Green Income Tax Exemption and Green Investment Tax Allowance to incentivize green technology projects, services, and the purchase of certified green technology assets, as well as tax incentives for "Sustainable and Responsible Investment sukuk and bonds."[2] Malaysia's carbon dioxide emission are primarily from electricity and heat production (39%), followed by road transportation (21%) and manufacturing industries (9%); their methane emissions are primarily from oil and gas fugitive emissions (44%), industrial waste water (24%), and solid waste disposal (20%).[3] Their focuses on emissions avoidance revolves around "renewable energy, energy efficiency, building, transportation, waste, and forestry [they plan to keep 50% of their land mass as forest]."[3] However, Malaysia's report to the U.N. seems to radically inflate how much carbon their forests are sequestering, and lie about their country's conversion to cropland to avoid reporting significant amounts of emissions,[4] challenging their credibility to accurately report emissions.

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Myanmar / Burma

Commitments & Action

According to Myanmar's Climate Change Strategy and Action Plan from 2016-2030, Myanmar's official goal is to achieve "climate resilience" and pursue a "low-carbon growth pathway to support inclusive and sustainable development" by 2030.[1] Note that the country has not "set forth an economy-wide mitigation target," nor is considering any carbon pricing mechanism, but its Intended Nationally Determined Contribution from 2015 does set targets—such as increasing the share of hydropower supply, saving 20% of electricity by energy efficiency improvements, and distributing efficient cook-stoves to reduce fuel wood used for cooking—that can lead to a reduction in greenhouse gas emissions.[2]

Most of Myanmar's emissions were from land use change and forestry (51%)—primarily rapid deforestation and degradation due to "shifting cultivation, excessive fuel wood cutting, agricultural land expansion, and infrastructure development" —with agriculture (32.1%) and energy (10.9%) following.[3] Although their GDP has grown faster than their emissions, their economy "emitted almost 5 times more GHGs relative to GDP than the world average."[3]

The sectors of focus revolve around, in their words:[1]

1. Climate-smart agriculture, fisheries, and livestock for food security
2. Sustainable management of natural resources for healthy eco-systems
3. Resilient and low-carbon energy, transport, and industrial systems for sustainable growth
4. Resilient, inclusive and sustainable cities and towns
5. Climate risk management for people's health and wellbeing
6. Education, science and technology for a resilient society

Myanmar plans to connect everyone in their country to electricity by 2030 (for context, about 70% of the rural population is not connected); they plan to fill the increasing demand with an energy mix that includes hydropower, natural gas, coal, and renewable energy. Currently, nearly all the country's electricity generation is from hydro (52%) and natural gas (45%), although the country has significant potential for solar and wind energy, as well as mini-grids; interestingly, "all contracts for coal-fired power plants signed by the former government with international and regional companies have stalled due to public opposition and concerns about pollution and other environmental impacts."[4]

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New Zealand

Commitments and Action

New Zealand has committed to net zero emissions of all greenhouse gases (except biogenic methane) to zero by 2050, and to reduce biogenic methane to 24-47% below 2017 levels by 2050.[1] Additionally, they pledged to reduce net emissions by 50% below gross 2005 levels by 2030.[2]

The Climate Change Commission provides emissions budgets, which are the total quantity of emissions that are allowed during an emissions budget period (which are blocks of 5 years).[2] To meet these emissions budgets, New Zealand makes Emissions Reduction Plans.[2] New Zealand has also implemented an Emissions Trading Scheme—including using forestry for carbon offsets— and has decided to tax agricultural emissions after 2025.[2]

New Zealand has investigated ways to encourage sustainable finance. The New Zealand Green Investment Finance, for example, invests in projects that reduce greenhouse gas emissions, and mandates some organizations to disclose climate-related information.[2]

Climate Risk and Adaptation

New Zealand released their first climate adaptation plan in August 2020, which revolves around reforming "institutions to be fit for a changing climate," collecting and distributing "data, information, and guidance to enable everyone to assess and reduce their own climate risks," and embedding "climate resilience across government strategies and polices," emphasizing, in particular, the natural environment; homes, buildings and places (e.g. building resilience); infrastructure (in energy, telecommunications, transport, water, and waste); communities (e.g. making sure info and advice on disaster resilience is accessible for all people); and the economy and financial systems (e.g. requiring climate-related financial disclosures and delivering fisheries system reform).[3]

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Philippines

Climate Vulnerability

The Philippines are one of the countries most vulnerable to climate change, expecting, among other effects, "changes in rainfall patterns and distribution [increase in the number of days with heavy rainfall, even though the total amount of annual rainfall decreases], droughts, threats to biodiversity and food security, sea level rise [60% of local governments, including 13.6 million Filipinos, are at risk are needing relocation; saltwater intrusion of coastal aquifers adds pressure to water scarcity], public health risks [particularly from dengue, malaria, cholera, and typhoid], and endangerment of vulnerable groups such as women and indigenous people."[1] By 2100, the Philippines is expected to lose 6% GDP annually; however, if the country invests just 0.5% of its GDP by 2020 in climate adaptation, it can "avert losses of up to 4% of its GDP by 2100."[1] This may also be in part because (1) "98% of coral reefs in Southeast Asia will die by 2050" and therefore "by years 2051 to 2060, the maximum fish catch potential of Philippine seas will decrease by as much as 50% compared to 2001-2010 levels" and (2) rice yields will likely dramatically decline "at least 10% for each 1 degree Celsius increase in growing-season minimum temperature in the dry season."[1] Additionally, as if it wasn't enough, "approximately 1 million hectares of grasslands in the Philippines are [...] prone to fires."[1] Drought, causing water scarcity, may also add pressure to hydropower, which accounts for 20% of the country's energy supply.[2]

Commitments & Action

The Philippines contribute about 140 million tons of carbon emissions per year, or about 0.4% of the world's total, with the majority of total greenhouse gas emissions coming from electricity and heat (~30%), agriculture (~25%), and transport (~15%).[3] Despite this, as a part of its commitment to the Paris Agreement, the country aims to reduce its greenhouse gas emissions by 75% by 2030, established the Climate Change Commission to make the policy to do so, and has required all local governments to craft climate adaptation plans.[2] Since much of the country's electricity is from gas-, oil-, and coal-fired plants, and increased energy use from transportation and buildings is expected, it appears that the Philippines will have to be much more aggressive on their mitigation efforts to reach their goals.[2] However, considering the country's poverty and severe climate vulnerability, much of their efforts are focused on climate adaptation over mitigation.

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Singapore

Climate Vulnerability

Singapore is known to be quite vulnerable to climate change, particularly at risk of rising sea levels "with 30% of [land] being less than 5 meters above [sea level]," although their sea level is projected to rise 1 meter by 2100.[1] Additionally, "rising temperatures and reduced rainfall can affect [the country's] water supply, biodiversity and greenery, increase the energy demand for cooling, and pose implications for public health [such as dengue]."[1] Singapore also imports over 90% of its food supply, making it vulnerable to climate-related pressures in other countries.[1]

Climate Adaptation Strategy

In addition to water conservation efforts, to diversify their water supply, Singapore has developed systems to catch and store, import, treat and recycle, and desalinate water.[1] The country has also taken measures to improve their drainage systems to cope with higher intensity storms.[1] They have sought to supply 30% of their nutritional needs locally by 2030 (compared to 10% currently) by (1) diversify import sources, (2) growing local, and (3) growing overseas.[1]

Climate Mitigation Strategy

Singapore contributes to around 0.11% of global emissions,[2] although they plan to reach net-zero by 2050.[3] As an import-heavy country, they emphasize that besides reducing consumption, improving operational efficiency, and reducing the carbon footprint of activities within their country, they have "no control over the production and transport of imports- and their embodied carbon emissions."[2] Most of Singapore's carbon emissions are produced by the burning of fossil fuels for the industry, building, household, and transport sectors.[2] To try to reduce these emissions, Singapore has implemented a carbon tax on large greenhouse gas emitters, covering 80% of their emissions; interestingly, Singapore is designing a framework to prevent companies from moving operations to countries without carbon taxes, and works to prevent anti-competitive behavior from electricity retailers exploiting the tax. Additionally, Singapore has passed laws to encourage energy efficiency in industry, even funding up to ½ the cost of some select energy efficiency projects; has committed to making 100% of public buses electric or hybrid, and likewise promoted the use of public transport and electric vehicles; and endorsed reducing food waste (in lieu of compulsory meat-free diets) and buying local produce.[2] Regarding clean energy, Singapore recognizes solar as the most promising alternative (although there are significant land constraints), and the country does not see nuclear as a viable option.[4]

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South Korea

Climate Commitments & Mitigation

As one of the world's top carbon emitters, South Korea annually emits around 600 million tons of carbon dioxide—about 1.7% of global carbon emissions.[1] They have committed to cutting greenhouse gas emissions to 40% below 2018 levels by 2030, and carbon neutral by 2050.[2] To help accomplish this goal, they aim to cut electricity generation and heating emissions "by 44.4% below 2018 levels in 2030 by reducing the country's reliance on coal-fired plants"[2] and expanding renewable energy's proportion to 20%.[3] They will "no longer finance the construction of coal power plants in other nations," although this pledge does not cancel existing ongoing projects,[2] and "suspend granting permits for new coal-fired power plants and phase out old ones."[3] They want to "provide more electric and hydrogen vehicles for the market, and offer more low-carbon options for public transportation such as intercity railroad networks."[3] The country also seeks to "expand zero-energy requirements for all new buildings and promote green remodeling to dramatically improve building energy efficiency," as well as practice a circular economy by "implementing action plans for each product phase from production to recycling."[3] More than 70% of national greenhouse gas emissions are subject to a nationwide emissions trading scheme,[3] and Korea also has taxes on fossil fuels and in particular gasoline.[4]

Climate Vulnerability

Korea anticipates both the maximum level of rainfall—as well as the average—to increase in the future, which is expected to elevate the frequency, intensity, and spontaneity of flooding; though, drought will likely impact some areas.[5] Parts of the ecosystem may be severely disrupted, such as the physiology of vegetation and the distribution and diversity of species (e.g. conifer forests will shrink, and oak may start to replace them), and related habitat reduction will increase extinction pressure on already-endangered species.[5] Korea has had some success with reforestation programs, but the probability of wildfires and major landslides is anticipated to increase.[5] According to their Climate Report, "the suitable areas for [most] crops [rice, soybean, maize, potato, pepper, and Chinese cabbage] will gradually move northward," decreasing their production; meanwhile, pest and weed outbreak patterns will alter dramatically.[5] The report also mentions concern about climate change's effect on industry, from things like deterioration of ocean health and destruction of infrastructure from massive disasters. The likelihood of health problems from heat waves, disease, and air-quality is expected to increase, and Korea will try to mitigate these effects by "smart cit[ies]" and "urban regeneration new deal project[s]."[5]

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Thailand

Climate Vulnerability

Thailand's changing climate is expected to cause "prolonged droughts, decreased agricultural and fishery yields, violent flooding, sea level rise, and health-related issues [e.g. from heat stress, water-borne diseases, and landslides]," which will, in the next few decades, likely "create or exacerbate" problems such as "water management challenges [e.g. saltwater intrusion of underground water resources], heightening of class-related tensions, a flood of new immigrants and refugees, damage to the tourism industry, and conflict with China over dam-building."[1] Regarding the last point, China's dam construction upstream of the Mekong River (vital to much of Thailand's agriculture and industry) will cause declines in fish stock and block nutrients from flowing downstream to Thai farmers.[1] Bangkok, the capital and most populous city, is extremely vulnerable to being permanently underwater in the coming decades because of rising sea levels and sinking water table.[1] As one of the world's largest rice exporters—and over 40% of the population relying on agriculture for their livelihoods—climate stress that decreases average rice yields perhaps as high as 45% will likely devastate not only Thailand, but much of the world too.[1]

Climate Mitigation

Thailand aims to peak its greenhouse gas emissions in 2030 (at approximately 370 Megatons of $CO_{2\ eq}$), and achieve carbon neutrality by 2065.[2] In the energy space, they plan to improve energy efficiency and adopt renewable energy and carbon capture and storage, as well as modernizing and expanding their electric grid; regarding transport, they point to switching transportation modes and fuels, energy efficiency, and reduction of traveling where possible.[2] Energy production composition in 2020 was 63.61% commercial energy (fossil fuels), 24.34% renewable energy (solar, wind, hydro, geothermal, biogas), and 7.87% traditional renewable energy (fuel wood, charcoal, agricultural waste).[2] Their industrial emissions are dominated by the chemical (37.96%) and mineral industry (60.16%).[2]

Thinking About State and Social Consequences of Climate Change

Climate change may further split Thai society along rural-urban and class lines, as each demographic will be affected differently, challenging the government's ability to cope with so many demands.[1] As crops fail and fishing stock dwindle, mass migration from rural to urban areas is expected; meanwhile, climate change could exacerbate already-existing tensions between Thailand and its neighbors (e.g. Myanmar from immigrants; China for the Mekong River) and the international community.[1] Thailand's "low level of institutional capacity" to follow through with commitments (e.g. due to rampant corruption and monopolies), has prevented the country from addressing complicated problems, and will likely continue to do so.[1]

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Vietnam

Climate Risk

The World Bank lists Vietnam as one of the five countries that will be worst-affected by climate change.[1] Temperatures in Vietnam are projected to increase on average between 1 and 3.4 degrees Celsius, with rises the minimum and maximum temperatures to be even stronger, "likely amplifying the impacts on human health [especially heat stress for poorer communities and outdoor laborers], livelihoods, and ecosystems."[1] However, there is "considerable uncertainty around future precipitation trends and the intensity of extreme events," particularly regarding El Niño weather events.[1] Without effective adaptation, between 3 and 9 million people may be affected by river flooding by around mid-century, and around 6 to 12 million people will potentially be affected by rising-sea-level-induced coastal flooding by the end of the century.[1] Additionally, "saline intrusion and shifts in viable geographical range of plant species" will cause losses of agricultural productivity for key crops [e.g. rice, maize].[1] For these factors, "without effective adaptation and disaster risk reduction efforts, multidimensional poverty and inequality are likely to increase," while Vietnam's average annual losses to disaster is estimated to be 1.5% of their GDP.[1]

Climate Commitments, Action, and Adaptation

Vietnam will "strive to reduce greenhouse gas emissions per GDP by at least 15% by 2030 and at least 30% by 2050 compared to 2014," and expects to "raise the rate of renewable energy in total primary energy supply [to] 15-20% and the forest coverage rate to 42% over the next decade."[2] Additionally, they committed to decreasing greenhouse gas emissions by 9% by 2030, although "this could be further brought to 27% with international support."[2] Vietnam seeks to reduce coal-fired thermal power from 34% of its power source in 2020 to 27% in 2030, and will not develop new coal-fired thermal power during this period outside of the ongoing projects,[3] as well as converting existing plants to natural gas "where possible."[2] Renewable energy is "currently limited and fluctuates due to an underdeveloped grid capacity and a prevalence of baseload thermal sources," and the hydropower that already exists is threatened by record low water levels.[3] The country postponed its nuclear power program in 2016.[3] Transmission and distribution networks are not being built quickly enough to match demand, which may bottleneck future growth in the electricity sector, whose demand is expected to grow 10-12% annually through 2030.[3] Looking forward, Vietnam appears to be expecting to grow liquefied natural gas imports, offshore wind capacity, and solar power.[3]

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