

THAILAND ECONOMIC MONITOR

THAILAND'S PATHWAY TO CARBON NEUTRALITY: THE ROLE OF CARBON PRICING

December 2023



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Preface

The Thailand Economic Monitor (TEM) reports on key developments in Thailand's economy over the past six months, situates these changes in the context of global trends and Thailand's longer-term economic trajectory, and updates Thailand's economic and social welfare outlook. Each edition of the TEM also provides an in-depth examination of selected economic and policy issues and an analysis of Thailand's medium-term development challenges. The TEM is intended for a wide audience, including policymakers, business leaders, financial-market participants, and the community of analysts and professionals engaged in Thailand's evolving economy.

The TEM is produced by the staff of the World Bank's Bangkok office, consisting of Kiatipong Ariyapruhya, Hector Pollitt, Muthukumara S. Mani, Taisei Matsuki, Marco Forni (Task Team Leaders), Warunthorn Puthong, Thanapat Reungsri, Yus Medina Pakpahan, Nadia Belghith, Steven Pennings, Migle Petrauskaite, Daniel Mira-Salama, Ou Nie, Biying Zhu, Uzma Khalil, Georges Comair, Kwanpadh Suddhi-Dhamakit, Buntarika Sangarun and Parichart Atcharerk. Fabrizio Zarcone, Lars Christian Moller, Mona Sur and Gonzalo Varela provided overall guidance. The team is grateful to Ergys Islamaj, Yew Keat Chong, Gregor Semieniuk, Joseph Pryor, Marissa Santikarn, David Kaczan, Nate Vernon and Agustin Penaloza for their constructive peer review comments. Clarissa Crisostomo David, Kanitha Kongrukgreatiyos, and Piathida Poonprasit are responsible for external communications related to the TEM, as well as the production and design of this edition.

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ABBREVIATIONS

ADEME	French Environment and Energy Management Agency
AE	alternative energy
AMI	advanced metering infrastructure
ASEAN	Association of Southeast Asian Nations
BCA	Business Collateral Act
BMA	Bangkok Metropolitan Administration
BMCL	Bangkok Metro Company Limited
BMR	Bangkok Metropolitan Region
BMTA	Bangkok Mass Transit Authority
BTS	Bangkok Transit System
BOI	Board of Investment Thailand
CDM	Clean Development Mechanism
CE	circular economy
CHEEF	China Energy Efficiency Financing Project
CHUEE	China Utility-Based Energy Efficiency Program
CICC	Inter-secretarial Commission on Climate Change, Mexico
CGD	The Comptroller General's Department
CGE	Computable General Equilibrium
CLMV	Cambodia, Lao PDR, Myanmar, and Viet Nam
CMLT	Commission for the Management of Land Traffic
CO	carbon monoxide
CO ₂	carbon dioxide
CO ₂ e	carbon dioxide equivalent
CP	Charoen Pokphand
CPSD	Country Private Sector Diagnostic
CPTPP	Comprehensive and Progressive Agreement for Trans-Pacific Partnership
DAEDE	Department of Alternative Energy Development and Efficiency
DCCE	Department of Climate Change and Environment
DEPA	Digital Economy Promotion Agency (Thailand)
DLT	Department of Land Transport
DOE	Department of Energy, United States
DNA	Designated National Authorities
DPIM	Department of Primary Industries and Mines
DPT	Department of Public Works and Town and Country Planning
DSM	demand-side management
EAP	East Asia and Pacific
EE	energy efficiency
EEC	Eastern Economic Corridor
EEDP	Energy Efficiency Development Plan

EEI	Electrical and Electronics Institute
EEPS	energy efficiency portfolio standard
EEU	Energy Efficiency Utility
EGAT	Electricity Generating Authority of Thailand
EMS	energy management system
ENCON Act	Energy Conservation and Promotion Act
ENCON Fund	Energy Conservation Promotion Fund
ENSO	El Niño Southern Oscillation
EPA	Environmental Protection Agency, United States
EPPO	Energy Policy and Planning Office
ERIA	The Economic Research Institute for ASEAN and East Asia
ESCAP	Economic and Social Commission for Asia
ESCCM	National Strategy on Climate Change Management
ESCO	energy service company
ETS	Emissions trading systems
FACTS	Flexible Alternating Current Transmission Systems
GDP	gross domestic product
GEF	Global Environment Facility
GGs	Green Growth Strategy
GHG	greenhouse gas
GJ	gigajoule
GPP	green public procurement
GWh	High Energy Performance Standards
G2G	Government to government
IBRD	International Bank for Reconstruction and Development
IFC	International Finance Corporation
IMCSD	Inter-Ministerial Committee on Sustainable Development, Singapore
INFORM	Index for Risk Management
IPCC	Intergovernmental Panel on Climate Change
IoT	Internet of the Things
ITCZ	Inter-Tropical Convergence Zone
kgoe	kilogram of oil equivalent
km	kilometer
Km ²	square kilometers
KPI	Key performance indicator
ktoe	thousand ton of oil equivalent
kW	kilowatt
kWh	kilowatt-hour
L	liter
LAOs	Local Administrative Organizations
LEED	Leadership in Energy and Environmental Design
LDD	Land Development Department

LRT	light rapid transit
M ³	cubic meters
M&V	measurement and verification
MD	The Marine Department
MDES	Ministry of Digital Economy and Society
MEA	Metropolitan Electricity Authority
MEPS	Mandatory Energy Performance Standards
MHESI	Ministry of Higher Education, Science, Research, and Innovation
MJ	megajoules
MJ/m ²	megajoules per square meter
MLPD	million liters per day
MOA	Ministry of Agriculture and Cooperatives
MOEN	Ministry of Energy
MONRE	Ministry of Natural Resources and Environment
MOC	Ministry of Commerce
MOE	Ministry of Education
MOF	Ministry of Finance
MOI	Ministry of Interior
MOL	Ministry of Labor
MOT	Ministry of Transport
MOU	memorandum of understanding
MRT	mass rapid transit
MSDHS	Ministry of Social Development and Human Security
MSMEs	Micro-, small- and medium-Size enterprises
MW	megawatt
NbS	nature-based solutions
NBTC	Office of the National Broadcasting and Telecommunications Commission
NDCs	nationally determined contributions
NDRC	National Development and Reform Commission, China
NEPC	National Energy Policy Council
NESDC	National Economic and Social Development Board
NESDP	National Economic and Social Development Plan
NGO	non-governmental organization
NO _x	nitrogen oxide
NPL	non-performing loan
NSI	National Strategy Institute, Republic of Korea
NSO	National Statistical Office
NXPO	The Office of National Higher Education Science Research and Innovation Policy Council
OAA	Old Age Allowance
OECD	Organization for Economic Co-operation and Development
ONEP	Office of Natural Resources and Environmental Policy
ONWR	Office of the National Water Resources

OPM	Office of the Prime Minister
OTP	Office of Transport and Traffic Policy and Planning
PCGG	Presidential Committee on Green Growth, Republic of Korea
PDNA	Post-Disaster Needs Assessment
PEA	Provincial Electricity Authority
PECC	Special Program on Climate Change, Mexico
PM	Prime Minister
PM _{2.5}	particulate matter less than 2.5 micros in size
PPP	Polluter Pays Principle
PPP	purchasing power parity
PV	photovoltaic
R&D	research and development
RE	renewable energy
REDP	Renewable Energy Development Plan
RMB	Renminbi (China's currency)
ROA	return on assets
ROE	return on equity
SDG	Sustainable Development Goals
SEA	Southeast Asia
SEMARNAT	Climate Change office, Mexico
SMEs	small and medium enterprises
SO ₂	sulfur dioxide
SO _x	sulfur oxide
SPP	small power producer
SRI	Science Research and Innovation
SRT	State Railway of Thailand
TA	technical assistance
tce	tons of coal equivalent
tCO ₂	tons of carbon dioxide
Tco _{2e}	total carbon dioxide equivalent
TGO	Thailand Greenhouse Gas Management Organization
THB	Thai Baht
THB/L	Thai Baht per liter
toe	ton of oil equivalent
TSRI	Thailand Science Research and Innovation
ug/m ³	micrograms per cubic meter
UN	United Nations
UNDRR	United Nations Office for Disaster Risk Reduction
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
UN-HABITAT	United Nations Human Settlements Programme
URMAP	Urban Rail Transportation Master Plan

USD	United States Dollar
VAT	Value added tax
VSPP	very small power producer
WMO	World Meteorological Organization

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EXECUTIVE SUMMARY

Recent Developments

The economic recovery faltered due to global headwinds as growth fell to 1.5 percent year-on-year in 2023 Q3, well below expectations (Figure ES 1). Goods exports and manufacturing contracted by 3.1 percent and 4.0 percent¹, respectively, amid weak external demand. Expanded cost-of-living measures, private consumption and tourism supported the recovery. However, Thailand's tourism arrivals reached only 75 percent of pre-pandemic levels in September despite the ongoing recovery in global services trade. Chinese arrivals have slowed and remained significantly below pre-pandemic levels (36 percent). Due to its heavy reliance on tourism and trade, the Thai economy's lagging recovery diverged further from peers such as Malaysia and Philippines (Figure ES 2).

The current account turned positive at 2.6 percent of GDP in Q3 2023 but remained vulnerable as imports contracted more than exports. The goods trade surplus reflected underlying weakness: goods imports contracted further by 10.7 percent, in line with weak manufacturing and goods exports. The financial account balance registered a deficit for the first half of this year, amid exchange rate depreciation, net FDI outflow and net foreign portfolio outflow. Meanwhile, the Real Effective Exchange Rate (REER) depreciated by 1.5 percent, one of the largest in the region. This depreciation was linked to the US dollar appreciation, concerns within local markets about uncertainty surrounding new fiscal stimulus measures, and the persistent vulnerability of the current account balance.

Inflation has turned negative but underlying price pressures may persist. After remaining within the Bank of Thailand's target range of 1-3 percent for 3 months, headline inflation turned negative for the first time in two years at -0.3 percent primarily due to lowered electricity price as well as lower food prices, broad energy subsidies and the lagging recovery (Figure ES 3). The dip into negative territory is temporary and primarily due to government policy of lowered electricity prices. In Q2 and most of Q3 Thailand continued to be the lowest among ASEAN peers. Core inflation (excludes energy and raw food) continued to wane, reaching 0.7 percent, reaching its pre-pandemic average of 0.7 percent over 2016-2019. However, strengthening domestic consumption and a strong pick-up in producer prices starting in 2022 may exert more pressure on consumer prices if price subsidies are reduced and global energy prices surge. The central bank has pursued monetary normalization to contain risks of underlying price pressures, that may be obscured by price controls, while supporting the economic recovery.

Expanded fiscal responses to high energy prices have supported the recovery and contained cost-of-living pressures but slowed consolidation. In FY23 (October 2022 - September 2023), the central government's fiscal deficit fell to 3.2 percent of GDP, improving from the 5.2 percent in the previous year. The general government structural balance is estimated to be a smaller deficit due to the less expansionary policy in FY 23, similar to the trend seen among ASEAN peers. However, fiscal consolidation progressed slowly due to continued high recurrent spending and expanded energy subsidies, as well as slow recovery in tax revenue. Spending on subsidies remained significantly above pre-pandemic levels, primarily due to continued support for the State Oil Fund. Based on the recent WB *Thailand Public Revenue and Spending Assessment* (2023), subsidies and tax reductions on diesel, gasoline, and cooking gas may benefit households but were found to be costly, regressive, and relatively inefficient in reducing poverty. For example, targeted assistance to the poor of THB 1 provides as much poverty alleviation as THB 9 of blanket subsidies. Public debt reached 62.1 percent of GDP end-FY23.

The financial system remains stable amid improving profitability, although risks associated with high levels of household debt remain. Capital and liquidity buffers at commercial banks remain well above regulatory requirements, with profitability rising. Indicators of asset quality continued to improve. Non-performing loan (NPL) ratio remains low at 2.8 percent, and provisions are adequate with an NPL coverage ratio of 175.6 percent as of Q2. Profitability stands below pre-pandemic levels with return on assets at 1.3 percent and return on equity at 9.4 percent but continues to improve. Household debt stands at elevated level even compared with advanced economies (90.6 percent of GDP as of 2023 Q1) and the highest among ASEAN peers. The composition of household debt in Thailand warrants attention due to the large share of



uncollateralized lending (44 percent of GDP). Higher interest rates will further strain households' ability to service debt.

Poverty is estimated to have declined in 2022 due to the labor market recovery. Per capita household consumption showed an 8.1 percent growth between 2021 and 2022 as the unemployment rate declined and average wages rose. Certain stimulus programs, such as the half-half initiative, and social assistance programs like the state welfare card and old age allowance, provided support to low-income households. With the rise in household income and consumption, it is anticipated that the poverty rate at the \$6.85 line would have decreased to 11 percent in 2022 from 12.2 percent in 2021. The impact of the COVID-19 crisis on poverty was milder in Thailand than in peer countries with available data, as in Indonesia poverty increased from 9.4 percent in 2019 to 10.8 percent in 2021 and then declined to 9.5 percent in 2022. In the Philippines poverty increased from 16.7 percent in 2018 to 18.1 percent in 2021. On Sept 26, the cabinet approved a three-year debt moratorium for farmers (fiscal cost of THB 30 billion) which will support farmers' consumption, but obscures risks to banks' balance sheets, delays debt restructuring and may encourage further debt accumulation.

Outlook and Risks

The economy is projected to recover in 2024 supported by tourism and goods exports recovery as well as sustained private consumption. Growth is projected to accelerate from 2.5 percent in 2022 to 3.2 percent in 2024 (Table ES 1). Tourism and private consumption will be key drivers. Goods exports are expected to rebound due to favorable global trade despite the slowing Chinese economy (Figure ES 4). Tourism is projected to return to pre-pandemic levels in mid-2025, set back by the Chinese slowdown. The planned Digital Wallet² is not yet included in the baseline but could potentially boost near-term growth further if implemented. Potential growth for 2023-30 is estimated at 2.7 percent, 0.5 percentage points lower when compared to the previous decades due to aging and subdued productivity growth. This slowdown is also observed among regional peers, as the average potential growth in the East Asia and Pacific (EAP) region is projected to average 4.8 percent over the remainder of this decade, down from 6.2 percent in the decade to 2021³.

The current account balance will strengthen in 2024 and support external stability. The current account surplus is projected to rise from an estimated 0.5 percent of GDP in 2023 to 2.4 percent of GDP in 2024, driven by both goods and services trade as well as reduced oil import bills. As a result, foreign exchange reserves are expected to increase from the current level of 43 percent of GDP, which is approximately 10 months of imports.

Headline inflation is projected to slow to a regional low of 1.1 percent in 2024 due to continued energy subsidies and lower global energy prices. This decline is attributed to lowered energy prices and extension of energy subsidies, while food prices and core inflation are expected to increase. Core inflation is expected to increase marginally, supported by an anticipated increase in the minimum wage and the closing of the output gap, but remain within an acceptable range in 2024.

Public debt is projected to peak at 62.8 percent in FY24. Due to the new government's expanded cost-of-living support measures and tax expenditures, the general government deficit is projected to widen to 3.1 percent in FY24 and remain elevated in FY25. Public investment will be set back by delays in the budget approval for FY24. While public debt is projected to remain sustainable (Figure ES 5), Thailand faces higher pressure for social spending and public investments. Thailand currently still has the room to raise tax revenue and maintain fiscal sustainability while meeting both spending pressures and investment needs (WB Thailand [Public Spending and Revenue Assessment](#) 2023).

¹ Growth terms are in year-on-year terms, unless specified otherwise.

² The digital wallet scheme currently faces legal challenges; the Fiscal Responsibility Act stipulates that the borrowing must be justified on grounds of economic recession or crisis. The government is seeking approval from the Council of State. Once there is certainty about how the scheme will be implemented, the scheme would be included in World Bank baseline projections.

³ World Bank Global Economic Prospects, June 2023



Upside and downside risks to growth exist. If the Digital Wallet program (THB 500 billion, 2.7 percent of GDP), is rolled out in May 2024, growth is anticipated to surpass baseline projections by 0.5-1.0 percentage points over the two-year period and the fiscal deficit may increase to 4-5 percent of GDP, approaching the average level observed during the COVID-19 crisis in 2020-2022. Public debt may reach 65-66 percent to GDP. Heightened geopolitical conflict and high oil prices could lead to another inflationary surge in Thailand, due to its high dependency on energy imports. Moving to a low-carbon growth path can help build energy security, reduce environmental degradation and position Thailand as a regional leader in green and sustainable growth. Carbon pricing, in conjunction with other complimentary policies and the withdrawal of fossil fuel subsidies, can be used to lower greenhouse gas emissions (Figure ES 6; see Chapter 2 on Carbon Pricing).

Carbon Pricing: An Idea Whose Time has Come

In 2022, Thailand's Nationally Determined Contribution (NDC) was updated to increase the emission reduction target from 20% to 30% (compared to baseline) by 2030, setting a robust foundation for achieving net-zero emissions by 2065. However, this is somewhat less ambitious than the net-zero targets of most of its regional peers including Cambodia (2050), Indonesia (2060), Lao PDR (2050), Malaysia (2050), Singapore (2050) and Vietnam (2050). The National Energy Plan supports these targets and outlines pathways for decarbonizing the energy sector. Key plans instrumental in shaping Thailand's net-zero emissions goal include the Climate Change Master Plan, Power Development Plan, Alternative Energy Development Plan, and Energy Efficiency Plan. These plans set specific targets for renewable power generation, renewable energy consumption, and energy intensity reduction.

Carbon pricing is a critical policy instrument for achieving ambitious reductions in greenhouse gas emissions. Policymakers considering carbon pricing must navigate between carbon taxes and emissions trading systems (ETSs). Designing these policies is complex due to multiple considerations: sectoral and emissions coverage, price levels, relation to other mitigation instruments, ease or difficulty of administration, use of revenues to address efficiency and distributional objectives, competitiveness concerns, and political risks.

Thailand has implemented a range of policies to reduce greenhouse gas emissions and has taken the first steps to implementing comprehensive carbon pricing. Notable climate policies in Thailand include the Environmentally Sustainable Transport System Plan, a vehicle CO₂ emissions tax scheme, and initiatives like the Waste Management Roadmap and REDD+ Readiness for forest protection. Integration of these policies into existing development plans aims to establish a marketplace, particularly emphasizing energy efficiency. While not currently participating in international emissions trading or carbon-pricing markets, Thailand's NDC expresses openness to such mechanisms, showing a commitment to global collaboration in reducing emissions. Both domestic and international carbon pricing schemes in Thailand could build upon the current voluntary carbon market that has been operational since 2015.

The two main forms of carbon pricing, carbon taxes and Emission Trading Schemes (ETSs), each have their own advantages and disadvantages. The carbon tax is simple to implement and does not require much institutional development. However, ETSs are more politically feasible in some countries and Thailand could build upon the voluntary ETS that is already operational. A hybrid policy may also be possible. Which option is best for Thailand will likely depend on other factors, such as the sectoral coverage of the scheme and the potential uses of the revenues generated.

It is important to consider the choice of sectors covered by carbon pricing. Carbon pricing is effective in sectors where there are technological options to reduce emissions and market operators are aware of the costs imposed on their fossil fuel use by the carbon price. If technological options do not exist, they are blocked by regulatory or institutional factors, or market participants are unaware of them, carbon prices will be ineffective at reducing emissions. There may therefore be an important role for combining carbon pricing with other policies that stimulate low-carbon technology uptake.



The feasibility and effectiveness of carbon taxes and ETSS could be diminished by other macro and sectoral policies already in place. For example, if the current fossil fuel subsidies (i.e. diesel and cooking gas) remain, they will send confusing pricing signals to the market and reduce the effectiveness of carbon pricing. Removing the current price caps and subsidies would therefore need to be part of the introduction of carbon pricing in the same sectors.

How to use the revenues from carbon pricing is an important question. Carbon taxes generate revenues for public budgets. ETSS may also generate revenues if the traded allowances are initially auctioned by the government. The revenues from these instruments could be used to fund other climate policies. Alternatively, they could be used to offset some of the negative impacts of carbon pricing (for example on vulnerable households or trade-exposed industries), to reduce other taxes, to support public expenditure, or to reduce national debt levels. How the revenues are used is important for determining the socio-economic impacts of carbon pricing.

Our model simulations show that Thailand could make greater use of carbon pricing to prevent further increases in emissions, but additional policy would be needed for ambitious emission reductions. Carbon prices could restrict emissions growth. However, in the long term, the results from the modelling exercise suggest that modest carbon prices that increase rapidly after 2030 would not be sufficient for large-scale emission reductions. Additional measures, such as building EV infrastructure or providing training in solar panel installation, would thus be necessary to accelerate low-carbon technology take-up.

There need not be a high economic cost to stabilizing emission levels using carbon pricing instruments. The model simulations use the carbon pricing revenues to reduce a combination of employment taxes and personal income taxes, rather than fund climate measures. Under these conditions, GDP could increase slightly compared to the baseline scenario. Accelerating a shift to lower cost renewable electricity would help to minimize the policy costs, especially as solar power becomes cheaper than alternative generation technologies. A shift to renewables will also increase investment, providing a stimulus that boosts short-term economic growth. Finally, reductions in domestic fossil fuel consumption could improve Thailand's trade balance, providing further economic stimulus.

Project-level Emission Reduction Credits could be an important source of international finance for Thailand in the future. Although this report focuses on macro and sectoral level carbon pricing instruments, project-level Emission Reduction Credits (ERCs) could be used to connect Thailand to international carbon markets. The initial setup costs of establishing such a scheme need not be high and ERCs could generate an important source of international finance that allows project-level investments in Thailand, including in reforestation. It is therefore worth considering how ERCs might be used in Thailand in future.

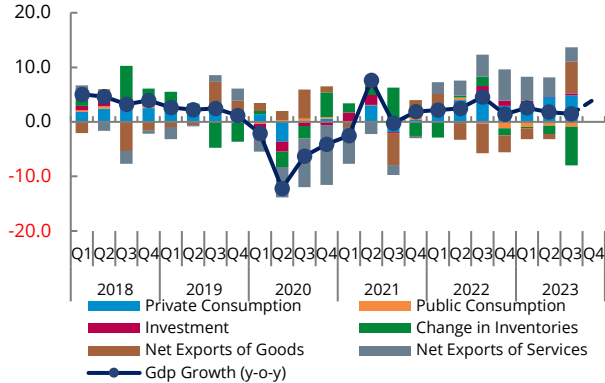
The time has come to consider the role for carbon pricing in meeting Thailand's emission reduction targets. This report explores some of the complexities involved in implementing carbon pricing. It finds that Thailand has already taken some of the most difficult steps in setting up a comprehensive carbon pricing policy instrument. Important questions remain to be addressed about what form carbon pricing should take in Thailand and which economic sectors should be included in a carbon pricing scheme. The potential benefits from carbon pricing may be substantial. Carbon pricing is likely to play an important role in meeting future emission reduction targets, reducing environmental degradation and air pollution while positioning Thailand as a regional leader in green and sustainable growth.



Recent Developments and Medium-Term Outlook

Figure ES 1: Thailand's recovery has faltered due to destocking linked to manufacturing and goods export contraction...

(Percentage-point contribution to real GDP growth, year-on-year)

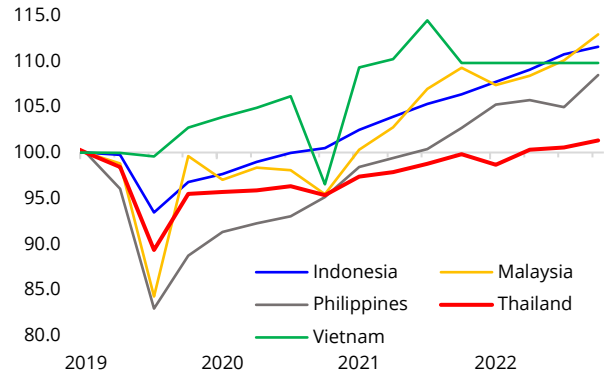


Source: NESDC.

Note: Change in inventories include statistical discrepancies; 2023 Q4 is estimated.

Figure ES 2: ... as a result, Thailand's lagging recovery diverged further ASEAN peers with gaps equivalent to 7-11 percent of GDP

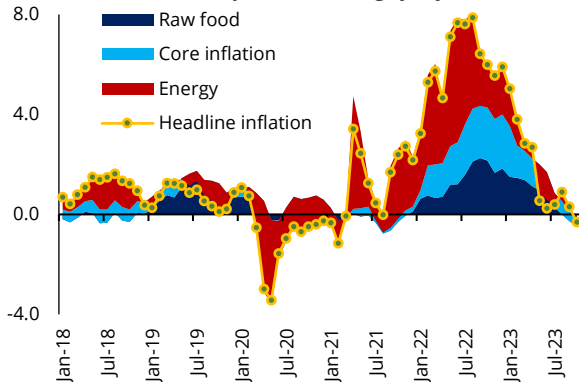
(GDP Index, seasonally adjusted, Q4 2019 = 100)



Source: CEIC; World Bank staff calculations.

Figure ES 3: Headline inflation turned negative due to cost-of-living measures and easing global prices

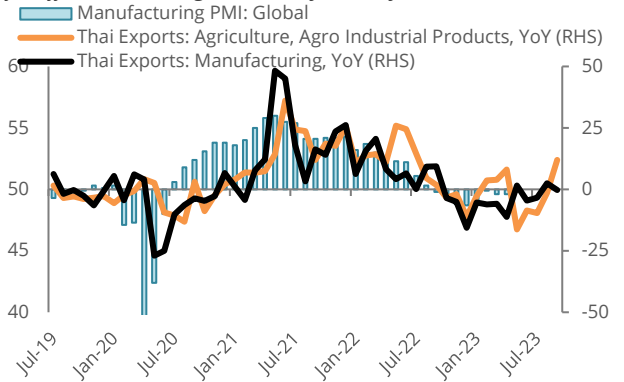
(Contribution to headline inflation, % change y-o-y)



Source: CEIC; World Bank staff calculations.

Figure ES 4: Indicators point to an ongoing recovery in goods exports

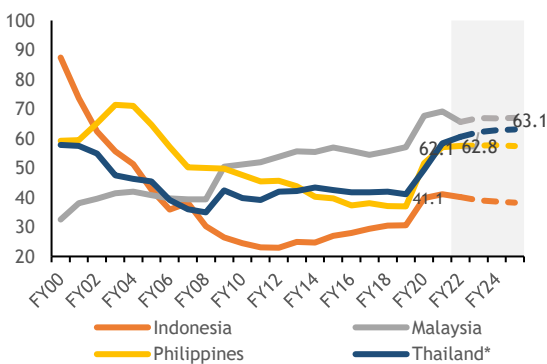
(left: diffusion index; right: Percent year-on-year)



Source: Haver Analytics; CEIC; World Bank staff calculations.

Figure ES 5: Public debt is projected to rise but remains sustainable

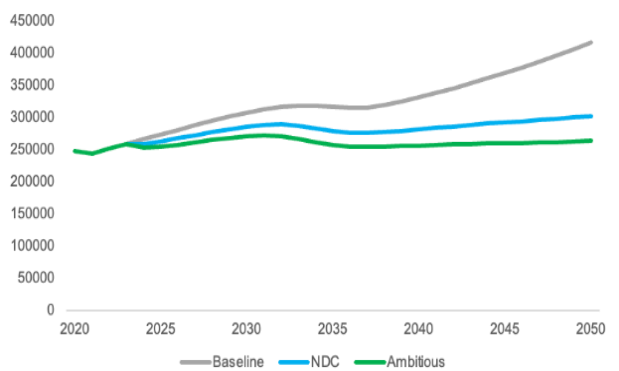
(Percent of GDP)



Source: CEIC; World Bank staff projections.

Figure ES 6: Thailand can use carbon pricing to pursue a low-carbon growth path

(CO₂ emissions (KtCO₂))



Source: World Bank staff projections.



Table ES 1: Macroeconomic Indicators

	2020	2021	2022	2023f	2024f	2025f
Real GDP Growth Rate (at constant market prices)	-6.1	1.5	2.6	2.5	3.2	3.1
Private Consumption	-0.8	0.6	6.3	6.2	3.9	3.4
Government Consumption	1.4	3.7	0.2	-4.5	2.5	2.7
Gross Fixed Capital Investment	-4.8	3.1	2.3	1.8	3.2	3.8
Exports of Goods and Services ¹	-19.7	11.1	6.8	2.2	5.8	4.1
Imports of Goods and Services	-13.9	17.8	4.1	-1.5	4.8	2.5
Real GDP Growth Rate (at constant factor prices)						
Agriculture	-2.9	2.6	0.5	2.7	2.1	2.2
Industry	-5.1	6.0	-1.0	-1.6	1.2	1.3
Services	-5.6	-0.5	4.9	4.7	4.4	4.0
Inflation (Consumer Price Index)	-0.8	1.2	6.1	1.4	1.1	1.5
Current Account Balance (% of GDP)	4.2	-2.1	-3.5	0.5	2.4	3.5
Fiscal Balance (General Government, % of GDP)	-4.7	-7.0	-4.5	-2.4	-3.1	-2.8
Debt (% of GDP)	50.2	57.8	59.7	62.1	62.8	63.1

Note: 1/ Exports of goods and services accounted for 69.4 percent of GDP in 2022. See more details in the outlook section.

Source: NESDC; World Bank staff calculations.



Part 1. Recent Economic Developments and Outlook: Navigating the Recovery



1. Recent Economic Developments: Maintaining Recovery amid Global Headwinds

i. The Global Economy

Global growth continues to soften.

After a sharp slowdown in 2023, global economic growth is set to edge down a touch further in 2024, marking the third consecutive year of deceleration, amid the lagged and ongoing effects of tight monetary policy, restrictive financial conditions, and weakening global trade. The recent conflict in the Middle East has heightened geopolitical risks and raised uncertainty in commodity markets, with potential implications for global growth, at a time when the world economy continues to cope with the lingering effects of a series of overlapping shocks in recent years. Near-term prospects are diverging. The advanced economies and China—comprising three-quarters of global output—are projected to slow in 2024. Meanwhile, aggregate growth in other EMDEs is set to firm somewhat



from a cyclical low, but the outlook remains precarious in many countries facing varying combinations of elevated financing costs and high debt.

Global trade growth has been anemic.

Goods trade has weakened, in line with the sharp slowdown in global industrial production. Services trade has continued to recover, but at a slower pace than previously expected. Following a period of exceptional weakness in 2023—the slowest expansion outside global recessions in the last 50 years—global trade growth is projected to rebound in 2024, partly reflecting a recovery of the global demand for goods.

Growth in the East Asia and Pacific region is projected to slow in 2024 and 2025, mostly owing to an anticipated deceleration in China.

In the rest of the region, growth is projected to edge up in 2024 and 2025, underpinned by solid domestic demand. Risks to the outlook are skewed to the downside and include a more severe downturn in China with adverse spillovers to the broader region and heightened geopolitical tensions—including from the conflict in the Middle East—which could spur higher commodity prices and inflation. Weaker than expected global demand and trade, and climate change-related extreme weather events pose down further downside risks.

ii. Growth and Real Sector Developments: The Recovery Faltered due to Global Headwinds

Economic recovery faltered in 2023 Q3 as goods exports and manufacturing contracted.

GDP grew by 1.5 percent, below expectations (consensus: 2.2 percent) slowing from a disappointing 1.8 percent in the previous quarter (Figure 1). Domestic demand, particularly private consumption (5.4 percent), as well as the continuing tourism recovery continued to be the key drivers (Figure 2). Though private investment continued to expand with support from the recovery of greenfield foreign direct investment (FDI), it slowed slightly as investment in equipment and exports weakened. Public consumption contracted due to the phasing out of COVID-related social transfers. Net goods exports contributed 5.8 pp to GDP growth in Q3 vs. -1.0 pp in Q2, thanks to a sharp contraction of goods imports and a smaller contraction of goods exports vs. Q1 and Q2. Stock depletion was due to rice, sugar, plastics and synthetic rubber and computers and peripheral equipment, in line with better-than-expected demand for agricultural and worse-than-expected external manufacturing goods demand. Net services exports added 2.6pp to GDP growth, slightly lower than 3.4pp in Q2 as the pace of tourism recovery moderated. High frequency indicators show that private consumption and services continued to diverge from manufacturing, which has fallen close to pre-pandemic levels (Figure 3).

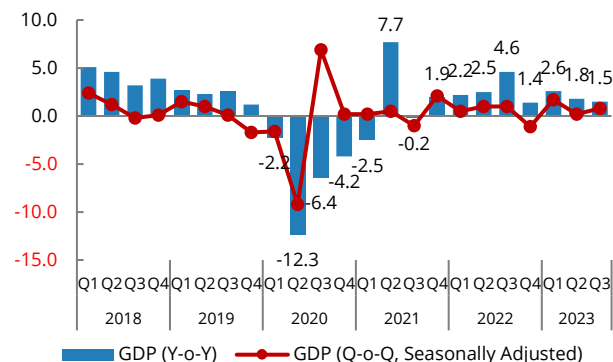
Thailand's recovery has been set back by the economy's exposure to tourism and goods trade.

The twin shocks of the pandemic and weak global trade has particularly impacted Thailand due to the country's position as a trade and tourism hub. Thailand's tourism arrivals reached only 75 percent of pre-pandemic levels in September despite the ongoing growth in global services trade. Visitor numbers increased across the board, except for China and Japan which are experiencing economic slowdown. Chinese arrivals remained significantly below pre-pandemic levels—at a subdued 36 percent of the 2019 level. Major ASEAN economies such as Indonesia, Malaysia and Philippines reached their pre-pandemic GDP levels around late 2021 to early 2022. Thailand reached its pre-pandemic GDP level in 2023 Q1 but is now diverging further from ASEAN peers (Figure 4); the widening gap is equivalent to accumulated GDP losses of 7-11 percent of GDP. ASEAN peers benefited from commodity windfalls (Indonesia and Malaysia),

shifting supply chains (Vietnam), and IT services demand (Philippines). Thailand however, faced headwinds due to slowing potential growth (see outlook section) as well as the region’s largest exposure to tourism and household debt burden (see financial sector section).

Figure 1: Growth faltered in 2023 Q3 but the tepid recovery remained intact

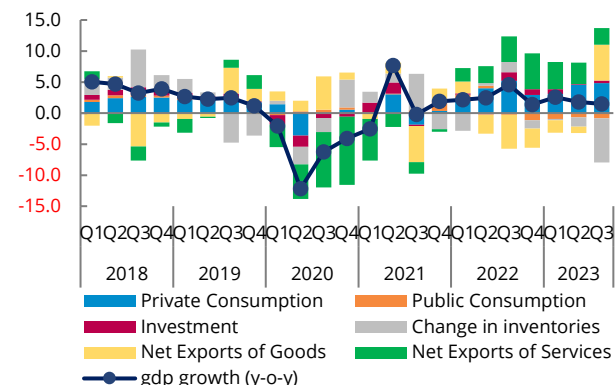
(Percentage change)



Source: NESDC.

Figure 2: Substantial destocking reflected contraction in manufacturing and goods exports

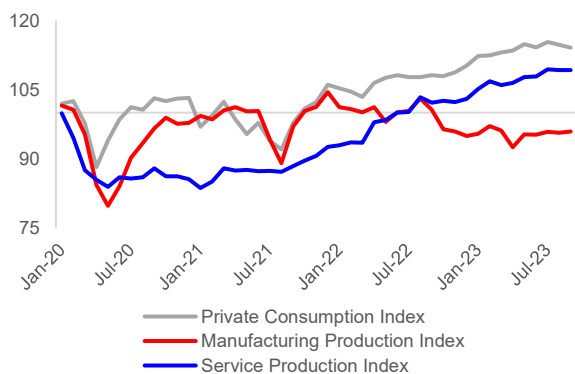
(Percentage-point contribution to real GDP growth, year-on-year)



Source: NESDC.

Figure 3: Manufacturing remained below pre-covid levels, diverging from private consumption and services

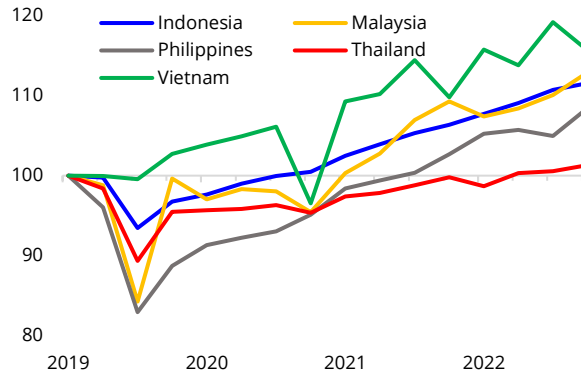
(Index, sa)



Source: CEIC; World Bank staff calculations.

Figure 4: Thailand’s lagging recovery diverged further from ASEAN peers with gaps equivalent to 7-11 percent of GDP

(Index Q4 2019 = 100, sa)



Source: NESDC; CEIC; World Bank staff calculations.

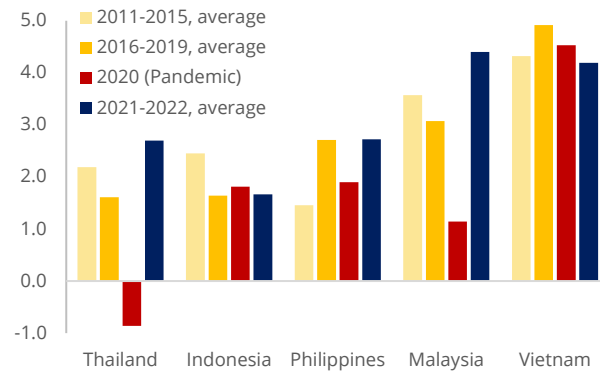
Recovery of foreign direct investment supported private investment, including in the Eastern Economic Corridor.

After contracting during the pandemic, net foreign direct investment inflows recovered to an average of 2.7 percent of GDP over 2021-2022 but remained behind Malaysia and Vietnam (Figure 5). In 2023, applications for investment promotion, especially in the targeted sectors of Electric Vehicles (EV) and Smart Electronics in the Eastern Economic Corridor (EEC), picked up in 2023 H1 but slowed amid political uncertainty associated with the delayed change in government in 2023 Q3 (Figure 6). EV and parts producers from China and Taiwan benefited from investment promotion as well as



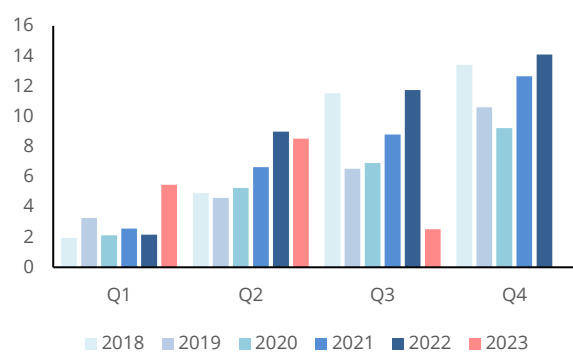
tax and subsidy measures to support EV usage and production.⁴ Targeted agro-industry and food processing sectors also saw rising applications. Notably, the non-targeted energy sector, including renewables, also saw considerable interest.

Figure 5: FDI inflows in 2021-2022 improved but remained behind Malaysia and Vietnam
(Percent of GDP)



Source: CEIC; World Bank staff calculations.

Figure 6: Applications for investment promotion surged in 2023H1 but fell during political transition
(Percent of GDP, quarterly)



Source: Board of Investment; World Bank staff calculations.

On the supply side, manufacturing dragged on growth.

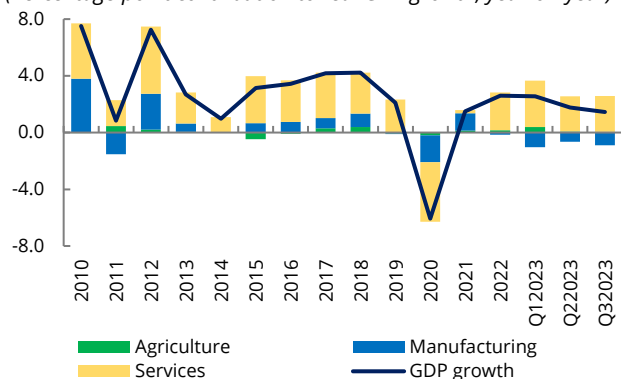
The manufacturing sector, particularly industries associated with exports, contracted by 3.0 percent on average for the first three quarters this year, in line with weak global demand. A broad-based expansion in the services sector, particularly accommodation and food services, continued to be the key driver of growth amid recovering tourism and employment (Figure 7). Agriculture expanded slowed by 0.9 percent as production of major crops (e.g., oil palm and paddy) plunged due to drought in certain areas. Rainfall fell below the 30-year precipitation average due to the El Niño Southern Oscillation (ENSO).⁵ After falling as of October 2022, agricultural prices showed signs of recovery in Q3 2023 (Figure 8).

⁴The new government (1) extended the subsidy for EV producers until 2027 but revised the amount down from THB 150,000 per unit to THB 100,000; (2) reduced import tariffs on EV cars ranging from zero to 40 percent, depending on engine size; and (3) exempted import duties for parts imported between 2022 and 2025, and treated the value of imported battery cells as a cost of local manufacturing (up to 15% of an EV's retail price) to promote local production.

⁵ www.tmd.go.th/media/climate/climate-events/เดือนไทย_ตุลาคม2566.pdf

Figure 7: Manufacturing continued to contract and set back the services-led recovery

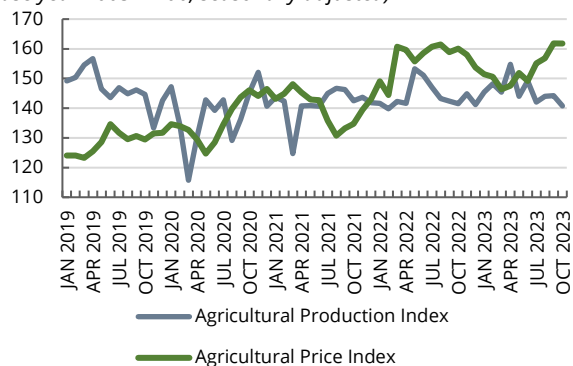
(Percentage-point contribution to real GDP growth, year-on-year)



Source: NESDC.

Figure 8: Agricultural production suffered from drought

(Base year 2005 = 100, seasonally adjusted)



Source: Office of Agricultural Economics, Ministry of Agriculture and Cooperatives.

iii. The Current Account Returned to Surplus and Reserves Remained Ample

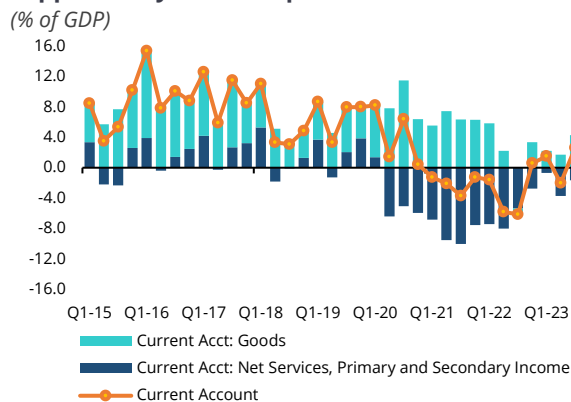
The current account turned positive in Q3 2023 as imports contracted more than exports.

The current account rebounded in Q3 2023, resulting in a surplus of 2.6 percent of GDP, driven by the goods trade surplus (Figure 9). The net services, primary and secondary income remained negative, but at a lower level. The goods trade balance has been positive for the past four quarters, but underlying weakness remained. Goods exports growth in Q3 2023 still contracted partly due to weak manufacturing such as agro-manufacturing products and electronics while imports contracted further. In the Q3 2023, Thailand's exports to several countries continued to contract compared to last year but to a lesser amount. This was partly due to lower exports to some main export destination countries such as Vietnam, Malaysia, Indonesia, and South Korea. Thailand's merchandise exports to Vietnam dropped by 18 percent yet contracted less compared to 22.6 percent in the previous quarter. As of September 2023, exports contracted by 4.1 percent, albeit the lowest contraction among major ASEAN exporters. The Purchasing Index (PMI) for the manufacturing sector in September indicates a slower-than-expected export recovery. Goods imports contracted further by 10.7 percent in Q3 2023, in line with weak manufacturing and goods exports as well as lower oil prices.

The financial account balance registered a deficit for the first half of this year, amid exchange rate depreciation.

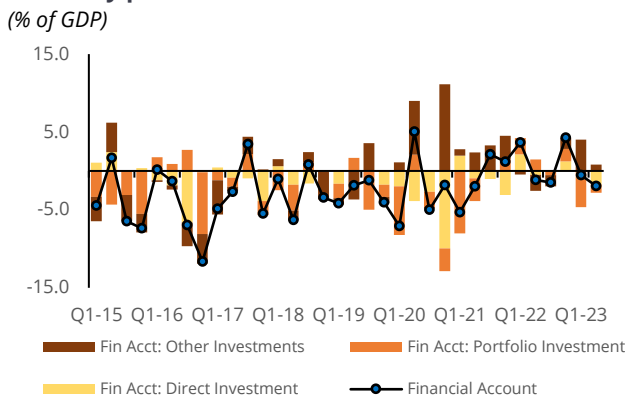
In Q2 2023, the financial account was in deficit due to net FDI outflow and net foreign portfolio outflow, wider than in the previous quarter (Figure 10). In October, the Nominal Effective Exchange Rate (NEER) depreciated by 1.1 percent. Meanwhile, the Real Effective Exchange Rate (REER) depreciated by 1.5 percent, one of the largest in the region, while Philippines peso strengthened (Figure 12). This depreciation was linked to the US dollar appreciation, concerns within local markets about uncertainty surrounding new fiscal stimulus measures, and the persistent vulnerability of the current account balance. Net foreign portfolio outflows declined in October, driven by inflows into the bond market, while substantial outflows from the equity market persisted. International reserves remained the highest among Emerging Asian economies at 44 percent of GDP, and equivalent to 10 months of imports (Figure 13).

Figure 9: The current account rebounded in Q3 supported by trade surplus



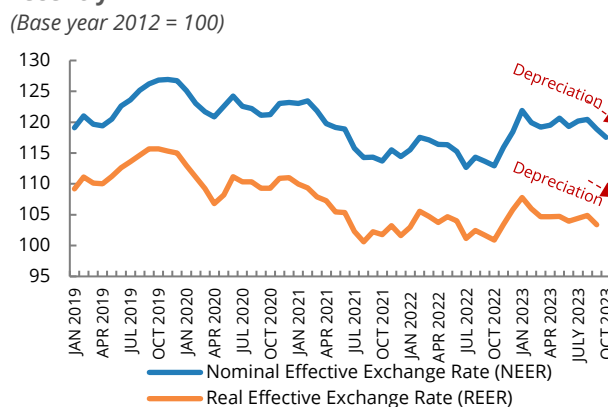
Source: Bank of Thailand; World Bank staff calculations.

Figure 10: The net financial account deficit was driven by portfolio investment



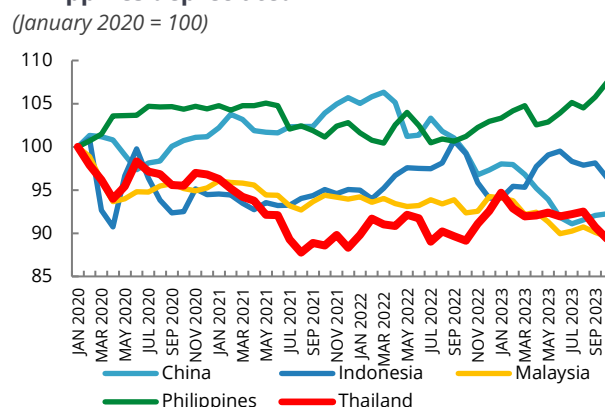
Source: Bank of Thailand; World Bank staff calculations.

Figure 11: The REER and NEER depreciated further recently



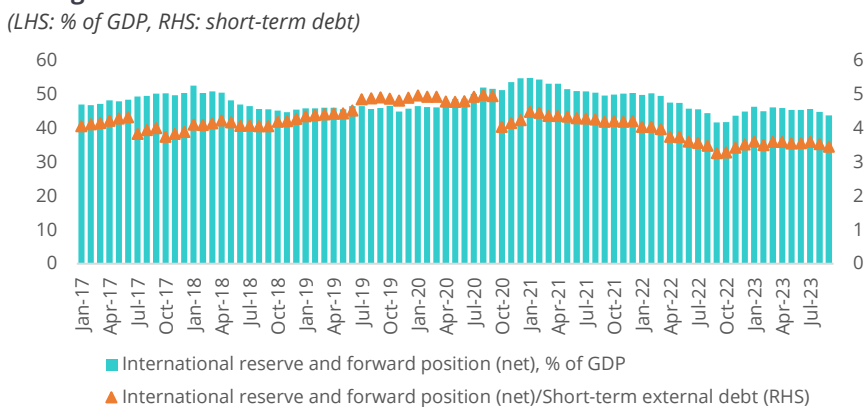
Source: Bank of Thailand; World Bank staff calculations.

Figure 12: The REER for Thailand, Indonesia, and Philippines depreciated



Source: Bank for International Settlements (BIS).

Figure 13: Thailand's international reserves and forward position remain strong at three times the level of external debt



Source: Bank of Thailand; World Bank staff calculations.

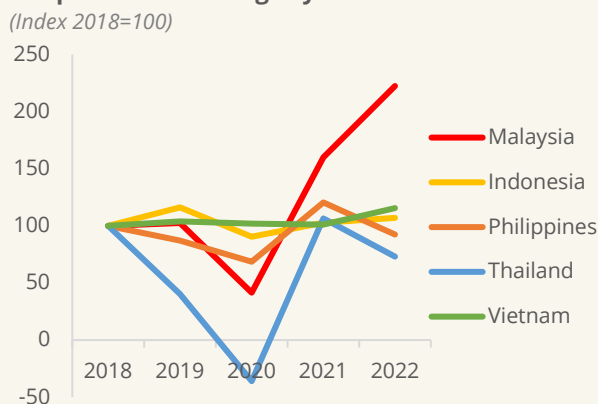


Box 1: Recent FDI Trends in Thailand

Promoting FDI in targeted innovative sectors, as identified in the 20-year National Strategy, remains a priority of the new government. FDI plays an important role for boosting Thailand’s innovation capacity as it is concentrated in skills-intensive sectors that spend more on R&D (WB *Thailand Manufacturing Productivity Report 2020*). FDI can serve as a channel for the international transfer of environmentally friendly technologies and practices and thus catalyze the process of decarbonization faster than domestic firms (See Javorcik et al. 2019 and Chapter 2 on Carbon Pricing).⁶

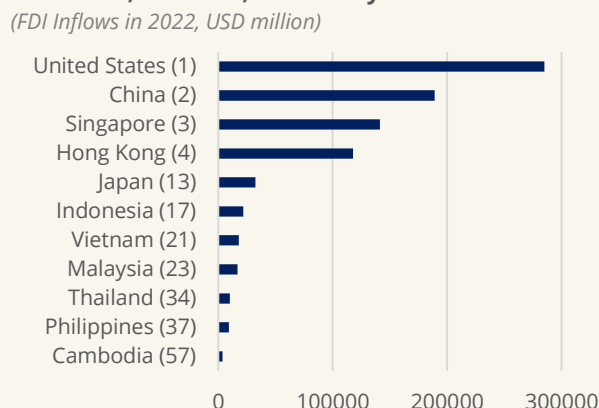
After turning negative during the pandemic, FDI inflows to Thailand have been positive for the last two years, surpassing the pre-pandemic level. According to UNCTAD *World Investment Report 2023*, FDI inflows amounted to USD 10 billion in 2022, a decrease of 31.5 percent compared to 2021, but still much higher than the USD -4.9 billion in 2020 during the Covid-19 pandemic (Figure 14). In part, this followed the significant downward pressures on global FDI due to the food, fuel and finance crises around the world, the Ukraine war, rising inflation and interest rates, and fears of a coming recession. Furthermore, Thailand was ranked 34th globally for the FDI inflows in 2022, ahead of the Philippines and Cambodia, but behind other regional peers like Indonesia, Malaysia and Vietnam, (Figure 15). Against this backdrop, the number of announced greenfield projects and international project finance deals in 2022 increased significantly compared to the previous year, by 15 and 70 percent, respectively.

Figure 14. FDI inflows to Thailand recovered after the pandemic but slightly decreased in 2022
(Index 2018=100)



Source: UNCTAD World Investment Report 2023.

Figure 15. Thailand’s FDI inflows lagged peers Indonesia, Vietnam, and Malaysia
(FDI Inflows in 2022, USD million)



Manufacturing is driving Thailand’s FDI inflows. According to Thailand’s Board of Investment (BOI), the value of approved foreign investment projects in 2022 increased by 14.2 percent compared the previous year. The total approved projects reached 320 billion baht (or USD 9.1 billion) (Figure 16). Foreign direct investments (FDI) in 2022 proved largest in metal products and machineries, followed by electric and electronic products as well as services, with a share of 26, 25 and 18 percent of total FDI, respectively. The big four investors included Japan, Taiwan, China, and USA. Lately, investment applications approved by the Board of Investment from January until September this year have shifted towards electrical appliances and electronics as well as electric vehicles (Figure 17).

⁶ cepr.org/voxeu/columns/good-environment-good-business-foreign-acquisitions-and-energy-intensity

Figure 16. The largest investors were from Japan, Taiwan, and China, and dominated in metal products and machinery as well as electric and electronic products

(Billion Baht, 2022)

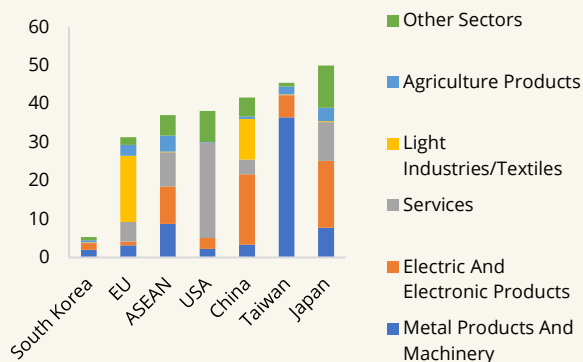
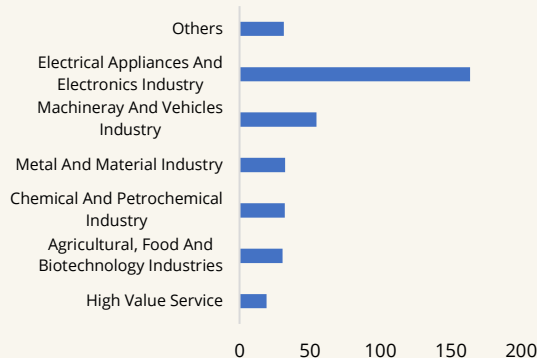


Figure 17. Investment in electrical appliances and electronics industry dominated approved FDI by BOI this year

(Billion Baht, Jan-Sept 2023)



Source: Thailand Board of Investment (BOI).

Note: 1) Foreign Investment projects refer to projects with foreign capital of at least 10%.

Thailand’s FDI inward stock as a share of GDP has consistently been the highest among ASEAN economies over the last decade but decreasing attractiveness in ASEAN. In 2022, the FDI inward stock stood at 62 percent of GDP, surpassing Malaysia, and Vietnam (Figure 18). However, as a share of total FDI in ASEAN, both FDI stocks and flows in Thailand have fallen steadily over the past fifteen years (Figure 19). This is partly explained by Cambodia, Lao PDR, Myanmar, and Viet Nam (CLMV) becoming more important destinations for FDI within ASEAN, due to their low-cost labor and increasingly open investment and trade regimes. Indonesia also recently enacted the Omnibus Law on Job Creation in 2020 to attract investment.⁷ Thailand ranks high among countries with the most reforms in business regulation over the past few years, which have streamlined the setting-up processes and reduced the time to start a business from 29 days to 6 days. The rights of borrowers and creditors have been strengthened as well as the system of land administration. The country has taken steps to clarify corporate governance, ownership and control structures by enacting legislation requiring companies to appoint independent members of the board of directors and to establish an audit committee.⁸ However, Thailand’s Services Trade Restrictions Index remained the highest in ASEAN (OECD 2022).

Figure 18. Thailand’s FDI inward stock remained the strongest in the region...

(FDI stock as percent of GDP)

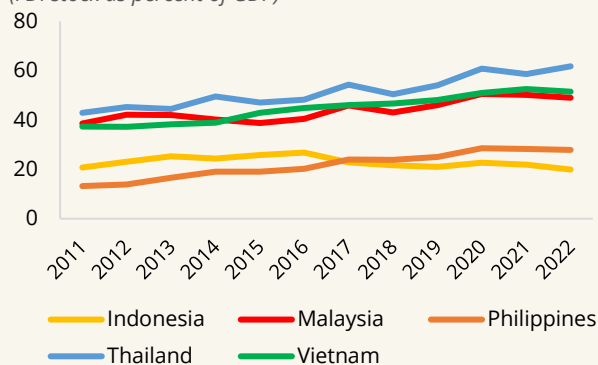
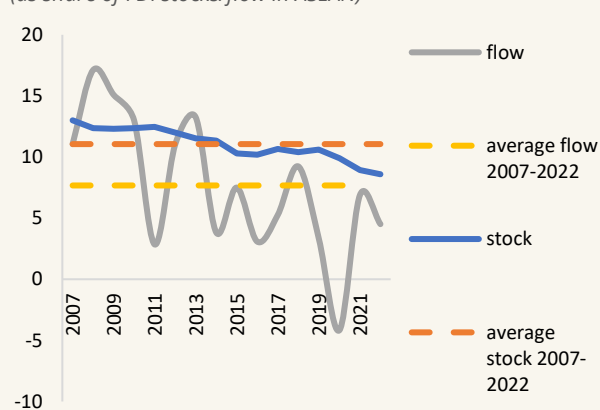


Figure 19. ...but Thailand’s shares of total FDI inflow and stock in ASEAN are declining.

(as share of FDI stocks/flow in ASEAN)



Source: 2023 UNCTAD World Investment Report and World Development Indicators.



iv. Inflation Fell but Underlying Pressures may Persist

Inflation turned negative due to energy subsidies, lagging recovery and lower food prices.

After remaining in the Bank of Thailand's target range of 1-3 percent for 3 months, headline inflation turned negative for the first time in two years at -0.3 percent, down from 0.3 percent in the previous month primarily due to the downward adjustment in electricity prices. Thailand's inflation rate continued to be the lowest among ASEAN peers and ranked behind only China among emerging markets due to the lagging recovery as well as energy subsidies and low food prices (Figure 18). Despite elevated global oil prices, domestic electricity and motor fuel prices decreased significantly due to energy price subsidies. These reduced electricity prices from THB 4.7 per unit to THB 3.99 and capped diesel prices at THB 30 per liter. Raw food price continued to decline, led by lower pork and vegetable prices, despite the rise in rice prices.

Core inflation has abated but underlying pressures may persist.

Core inflation (excluding energy and raw food) continued to wane, reaching 0.7 percent, reaching its pre-pandemic average of 0.7 percent over 2016-2019 (Figure 21). However, strengthening domestic consumption and a strong pick-up in producer prices since 2022 is expected to exert more pressure on core prices.

The Bank of Thailand maintained gradual monetary policy normalization as the economy recovery strengthened.

While price controls and subsidies can help temporarily contain supply-side shocks, it can also complicate monetary policy by devaluing the usefulness of the CPI as measure of inflation.⁹ An abrupt reduction in price subsidies in the context of still-high global energy prices and recovering demand could also exert price pressures. In light of the risk of remaining underlying inflationary pressure, the central bank raised the policy rate by 25 basis points to 2.50 percent while maintaining the SME soft loan facility until April 2024 to support economic recovery. Considering the improving macro-economic fundamentals, anchored inflation expectations (Figure 23) and rising demand driven-inflation pressures, the policy rate is expected to remain at its estimated neutral rate of 2.5 percent, as the output gap closes in 2024.¹⁰

⁷ WB Indonesia Economic Prospects June 2023

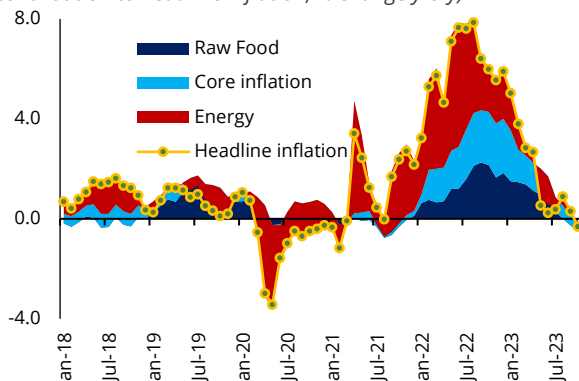
⁸ www.doingbusiness.org

⁹ Justin-Damien Guénette (2020). *Price Controls: Good Intentions, Bad Outcomes*. World Bank Policy Research Working Paper). Also see Box 2. The role of price controls in times of high volatility in EMDE and Thailand WB *Thailand Economic Monitor* June 2022.

¹⁰ The estimation is based on a standard Taylor rule that relates the central bank policy rate to inflation expectations, deviations from target, and output deviations from potential output. Potential output is derived from a Cobb-Douglas production function, with calibration of the function's parameters.

Figure 20: Headline inflation turned negative amid easing global energy prices and energy subsidies

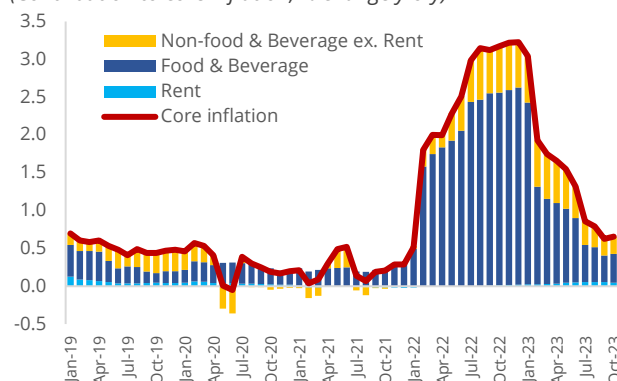
(Contribution to headline inflation, % change y-o-y)



Note: Headline inflation includes raw food and energy.
Source: CEIC; World Bank staff calculations.

Figure 21: Core inflation fell to pre-pandemic levels due to falling food prices

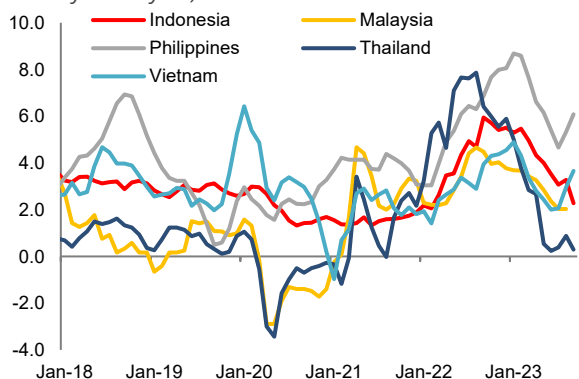
(Contribution to core inflation, % change y-o-y)



Note: Core inflation includes prepared food and excludes raw food and energy.
Source: Haver Analytics; World Bank staff calculations.

Figure 22: After peaking in 2022, inflation fell to a regional low

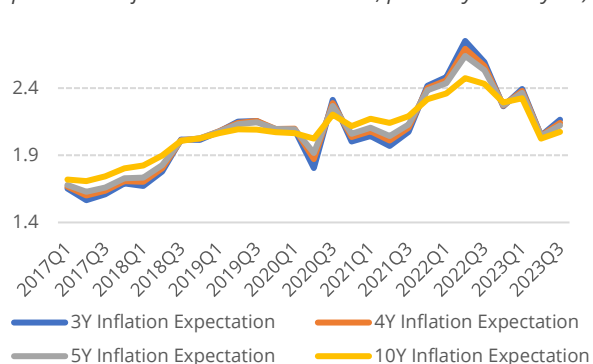
(Percent year-on-year)



Source: MOC; CEIC; World Bank staff calculations.

Figure 23: Long-term inflation expectations remain within the inflation target range

(Expectations inflation index-linked bonds, percent year-on-year)



Source: Puey Ungphakorn Institute for Economic Research, Bank of Thailand.

v. Thailand’s Financial System Remained Stable amid Improving Profitability

The Thai financial system remains resilient with adequate capital and liquidity, high asset quality and improved profit levels.

As of 2023 Q2, the tier-1 capital adequacy ratio for Thai banks stands at 16 percent, well above the Basel III minimum requirement of 10.5 percent. Important indicators of banking system funding liquidity remain stable: liquid assets to short-term liabilities is 33 percent in 2023 Q2 and the loan to deposit ratio is 108.4 percent. On market liquidity, Thailand’s deep and solid institutional investor base continues to absorb government debt, minimizing risks of a bank-sovereign nexus. System-wide non-performing loan (NPL) ratio remains low at 2.8 percent, and provisions are adequate with an NPL coverage ratio of 175.6 percent as of Q2. Profitability stands below pre-pandemic levels with return on assets (ROA) at 1.3 percent and return on equity (ROE) at 9.4 percent but continues to improve.

External financial conditions remain challenging amidst multiple global uncertainties.

Rising commodity prices and interest rate hikes in advanced economies continue to impose pressure on funding costs. Thailand's capital market has seen net portfolio equity outflows for most of the months this year, with year-to-date (ytd) equity outflow totaling USD 500 million, a tightening compared with the 2022 total inflow of USD 500 million. Concurrently, net portfolio debt flows have seen some fluctuations, dipping again into the negative territory in August and September 2023, bringing the ytd debt flow to a negative USD 31 million reading. Recent geopolitical uncertainties could further reflect on international investor sentiments and hence weigh on external funding conditions.

Relatively high household indebtedness remains a source of vulnerability for the financial sector.

Household debt in Thailand has historically been high (86.4 percent of GDP in 2019 Q4 according to the Institute of International Finance (IIF)) due to a variety of structural reasons related to lending practices, borrower financial literacy and discipline, and debt mediation and bankruptcy process. It has been exacerbated by the COVID-19 crisis due to pandemic-related policy measures and monetary easing, and now stands at elevated level even compared with advanced economies and the highest within ASEAN at 90.6 percent of GDP as of 2023 Q1, household debt in Thailand is higher than most periods (except for the several quarters during the pandemic) in terms of both amount and as a percent of GDP.¹¹ The composition of household debt in Thailand warrants attention due to the large share of uncollateralized lending (44 percent of GDP), notably higher than say China (28 percent of GDP). The difference is due to the prevalence of uncollateralized lending, including personal loans (19 percent), credit card loans (4 percent), agricultural loans (7 percent) among others. This lending was in part encouraged by COVID-related relief measures introduced in 2020 and extended in 2022. Expiration of these measures may reveal underlying bank asset quality issues, as households facing higher interest rates will have difficulty repaying these loans and banks do not hold collateral against these parts of their portfolio. The extent of such impacts will likely be contained since NPLs and special mention loans account for a small portion of housing loans and credit card loans (3.3 percent), although the fraction is higher for personal loans (7.5 percent).

The proposed debt moratorium program for the agricultural sector may serve as a relief for certain distressed households, but implications of the program should be carefully monitored.

While some agricultural households may suffer from low repayment capacity and may find debt relief helpful, the relief program should be time-bound and targeted at specific segment of the agricultural sector suffering from certain negative shocks (i.e., covid-related economic shocks or natural disaster). The blanket debt moratorium could increase moral hazard in the financial sector and increase excess accumulation of debt without necessarily achieving economic and social objectives. Further, moratorium could decrease the transparency of bank balance sheet conditions, as traditional indicators no longer capture the true conditions of bank asset quality. These concerns could be more relevant against the broader backdrop of elevated household debt levels in the economy. Over time, authorities could benefit from collecting and monitoring indicators of real-time bank balance-sheet health while gauging the portion of the total bank lending portfolio affected by the moratorium.

¹¹ Credit to households expanded rapidly over the last decade, rising from 59.3 percent of GDP in 2010 to over 80 percent in 2019, driven by not only personal loan but also auto and housing loans, incentivized by the government's one-off first-car and first-home tax rebates. The growth of credit to households slowed to approximately 3 percent per year during the pandemic and borrowing likely helped smooth consumption among liquidity-constrained households.



vi. Expanded Fiscal Responses to High Energy Price Slowed the Path to Consolidation

The fiscal deficit reached a post-pandemic low in FY23, but consolidation remained sluggish due to measures to mitigate high prices.

In FY23 (October 2022 - September 2023), the central government's fiscal deficit fell to 3.2 percent of GDP, a notable improvement from the 5.2 percent in the previous year (Figure 22). The general government structural balance is estimated to be a smaller deficit due to the less expansionary policy in FY 23, like the trends seen among ASEAN peers. However, fiscal consolidation progressed slowly due to continued high recurrent spending and subsidies (Figure 23), as well as slow recovery in tax revenue. Fiscal revenue improved slightly to 18 percent of GDP, its highest level since 2019 (Figure 25). Higher revenue from personal and corporate income taxes, due to the economic recovery, and other revenue more than offset the loss in excise revenue from diesel tax cuts. In FY23, the government incurred a revenue loss of 0.6 percent of GDP primarily due to the cut on the diesel excise tax. In contrast, capital expenditure fell to its lowest level since 2016 at 1.4 percent of GDP, down from 1.6 percent in the previous fiscal year. Spending on subsidies remained significantly above pre-pandemic levels, primarily due to additional support for the State Oil Fund. Public debt reached 62.1 percent of GDP at the end of FY23 (Fig. 6).

Energy subsidies have proven fiscally costly.

The implementation of energy subsidies, including caps on diesel oil, cooking gas, and electricity prices, helped alleviate living costs but also slowed the pace of consolidation. As of November 5, the State Oil Fund deficit widened to THB 75.6 billion (0.5 percent of GDP) (Figure 24). This marked the largest deficit in six months, attributed to the increased cost of the diesel price subsidy, driven by high global oil prices. The government has guaranteed THB 110 billion of the Oil Fund's borrowing (0.8 percent of GDP) to replenish the fund (Table 1). The excise tax reduction on diesel of THB 2.5 per liter and on gasoline of THB 1 per liter is estimated to incur a fiscal cost of 0.3 percent to GDP per year. Based on recent fiscal policy impact analysis on equity in Thailand, subsidies and tax reductions on diesel, gasoline, and cooking gas were found to be costly and relatively inefficient in reducing poverty¹².

Budget execution for FY2023, notably capital spending, outperformed historical rates.

The Comptroller General's Department (CGD) reported the (cash basis) budget disbursement result of FY2023 (Oct. 2022 - Sep. 2023) as well executed and exceeding the specified target. In total, THB 3.09 trillion or 96.97 percent of the FY2023 budget (THB 3.185 trillion) was disbursed. The current budget execution disbursed THB 2.61 trillion and accounted for 101.6¹³ percent of the current budget (THB 2.57 trillion) while the capital budget disbursed THB 478.19 billion accounted for 77.7 percent of the original capital budget (THB 615.78 billion) The capital budget execution of 77.7 percent was significantly outperformed execution rates of 60-70 percent over 2016 – 2021.

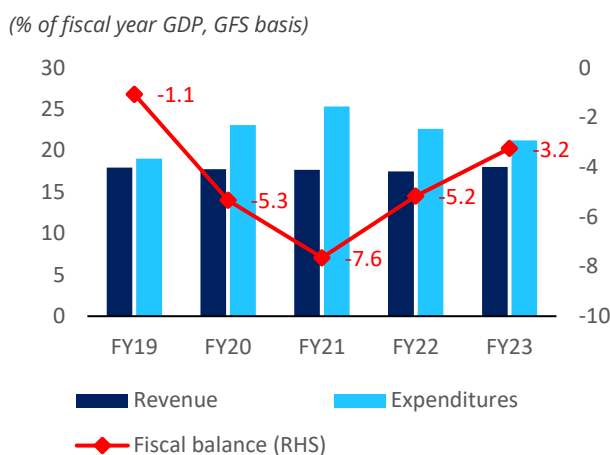
¹² The analysis suggests that raising welfare benefits through a well-targeted social assistance policy could reduce poverty approximately nine times more than the impact achieved by diesel price support policies implemented in 2022, at a similar cost (see WB *Thailand Public Revenue and Spending Assessment: Promoting an Inclusive and Sustainable Future, 2023*)

¹³ The actual execution can be more than the original budgeted amount due to the in-year amendment of transfers from capital budget to current budget expenditures.

The larger revised FY2024 budget will not kick in until March 2024, half way through the fiscal year, and faces execution challenges.

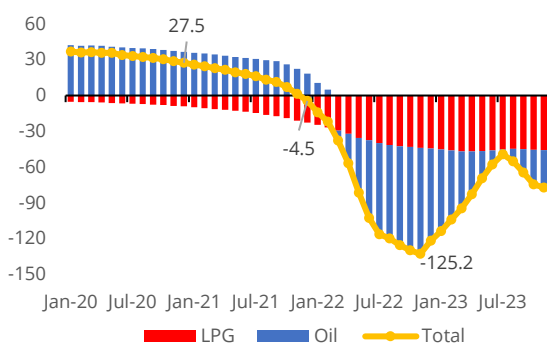
The new government under Prime Minister Srettha Thavisin took office on September 5, 2023, and approved a new budget of THB 3.48 trillion (USD 97.29 billion) for FY2024, exceeding the original budget approved by the previous government by THB 130 billion higher. As a result, the budget deficit will rise to THB 693 billion (3.6 percent of GDP). However, the new FY2024 budget bill still needs to undergo parliamentary scrutiny and is expected to be approved only by March 2024. Until then, the previous FY2023 budget bill remains in effect in FY2024 (Oct. 2023 – Sep. 2024). Timely execution of new large infrastructure projects in the FY2024 budget will prove challenging, given the limited remaining fiscal year. Budget execution typically falls below historical averages following a change in government.

Figure 24: The central government’s fiscal deficit in FY23 continued to fall...



Source: Fiscal Policy Office, Ministry of Finance.

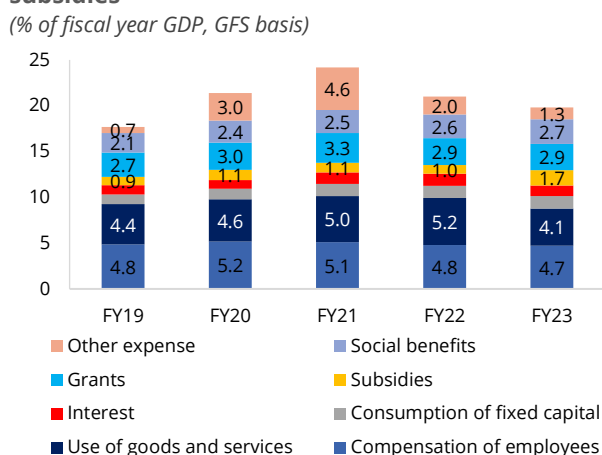
Figure 26: Caps on diesel price and cooking gas price have been subsidized by the State Oil Fund (State Oil Fund balance, THB billion)



Source: Oil Fuel Fund Office; World Bank staff calculations.

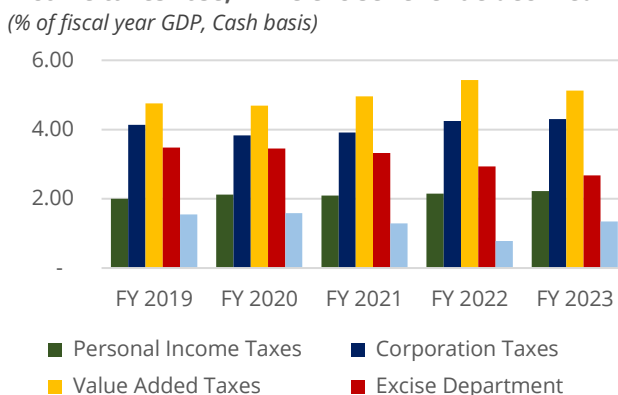
Figure 25: ...yet fiscal consolidation

slowed due to high recurrent spending and subsidies



Source: Fiscal Policy Office, Ministry of Finance, NESDC.

Figure 27: Revenue from personal and corporate income taxes rose, while excise revenue declined



Source: Fiscal Policy Office, Ministry of Finance, NESDC.

The new government expanded the energy and transportation subsidies.

The government maintained the diesel fuel price cap at THB 30 per liter from 20 September 2023 to 31 December 2023, using the excise tax cut and the State Oil Fund subsidy. In addition, the government extended the caps to gasoline prices from November 7th, 2023, to January 31st, 2024¹⁴ as well. In addition, the retail price of cooking gas (LPG) was fixed at THB 423 per 15-kilogram tank using the State Oil Fund. The electricity tariff was reduced from 4.45 baht per unit down to THB 3.99 per unit. The State Oil Fund as of September 10th, 2023, posted a negative net position of THB 59,085 billion, divided into a negative oil account of THB 14,311 billion, a negative LPG account of THB 44.8 billion, while the electricity bill remained a burden on the Electricity Generating Authority of Thailand (EGAT) at approximately THB 110 billion. Moreover, the Ministry of Transport also launched a flat 20-baht fare policy on Bangkok's Red and Purple electric train lines from October 16, 2023, onward. Before the flat rate, the Purple Line charged commuters THB 14-42 and the Red Line THB 12 - 42. The flat rate allows passengers to pay no more than THB 20 on both routes. The Department of Rail Transport estimated the economic benefits from using public transport as well as reducing road accidents and carbon emissions would be worth altogether THB 952.2 million per year¹⁵.

The government's centerpiece cash transfer stimulus, the Digital Wallet, THB 500 billion may start in May 2024.

The Government has presented specific plans for a one-time transfer of THB 10,000 (USD286) via digital wallets to Thai nationals aged 16 or above, with a monthly salary below THB 70,000 and bank deposits of less than THB 500,000. The amount must be spent within six months on purchases of consumer goods, food and beverages within the district, excluding spending on services, e-commerce, education, and utility bills, and cannot be exchanged into cash. The measure is estimated to benefit 50 million people (Figure 27) and incur a fiscal cost of THB 500 billion (2.7 percent of GDP), slightly lower than the original plan of THB 560 billion. The scheme will be funded through government debt issued in the domestic capital market. However, the scheme has been challenged on the basis of the Fiscal Responsibility Act which stipulates that the borrowing must be justified on the grounds of economic crisis or recession. The THB 500 billion loan bill must first be vetted by the Council of State before being presented to Parliament for approval by January 2024. The measure is expected to take effect in May 2024. Legal hurdles may delay or cause a revision in the digital wallet scheme. Once approved, implementation challenges include ensuring that enough vendors enroll in the scheme and are quickly reimbursed for sales so as to support the transfer multiplier effect of the stimulus. Other measures include additional personal income tax deductions and a THB 100 billion fund to enhance economic potential. The anticipated stimulus measures are expected to enhance short-term economic activity.

¹⁴ Gasohol 91 decreased by THB 2.50 per liter. Gasoline ULG 95 and gasohol 95 decreased by THB 1.00 per liter. Gasohol E20 and E85 decreased by THB 0.80 per liter.

¹⁵ www.drt.go.th/news-photo/กรมการขนส่งทางราง-เผย

Figure 28: Disbursement of capital budget peaked since FY 2018

(Public investment disbursement, % of total budget, cash basis)

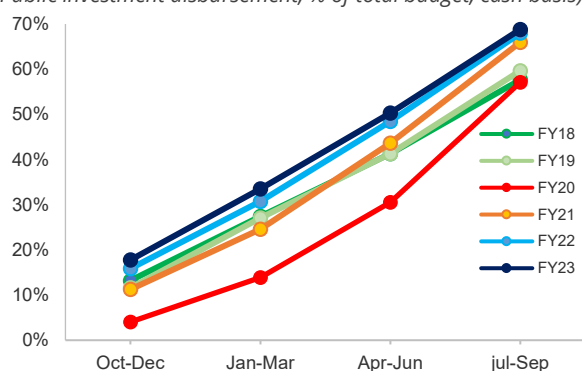
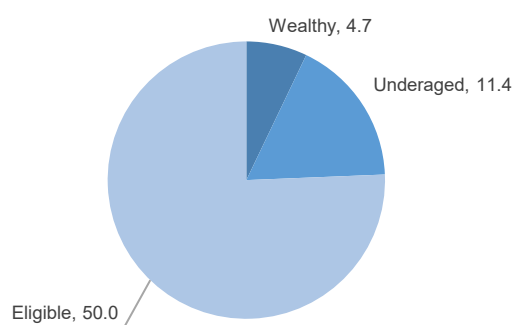


Figure 29: Estimated beneficiaries account for 76 Percent of the Population

(Million people)



Source: Fiscal Policy Office, Ministry of Finance, NESDC; World Bank staff calculations.

Public debt remains sustainable due to low external debt and prudent fiscal management.

Public debt rose to 62.14 percent of GDP at the end of September 2023, 21 percentage points higher than the pre-pandemic period (Figure 30). Despite the increase, public debt remains fiscally sustainable with low levels of foreign currency denominated debt at 1.6 percent of total debt and relatively low cost of funding. The impact of the potential implementation of the digital wallet program on sovereign bonds remains relatively muted. In the second half of 2023, the 10-year government bond yield increased in line with most ASEAN peers, rising by 4 basis points to 3.0 percent as of November 2023, similar to those of Indonesia and the Philippines (Figure 31).

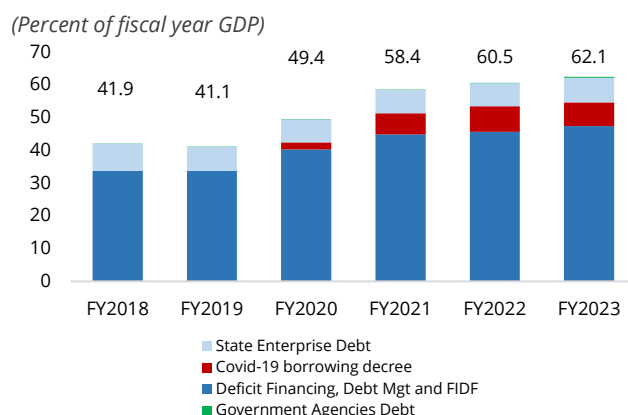
Table 1: Key fiscal-responsibility indicators remain well within their established parameters

Key fiscal responsibility, % or otherwise specified	Ceiling (%)	FY20	FY21	FY22	FY23
Public Debt / GDP	70	49.5	58.4	60.5	62.1
Government Debt Service / Revenue	35	6.5	8.6	8.1	8.2
External Debt / Public Debt	10	1.8	1.8	1.7	1.4
External Debt Service / Exports	5	0.07	0.08	0.15	0.17
Principal repayment / Annual budget expenditure	1.5-3.5	1.1	2.1	2.1	2.1
Average Time to Maturity		9 years 10 months	9 years 1 month	8 years 9 moths	8 years 9 moths
10-year government bond yields		1.4	1.7	3.0	3.0

Source: Public Debt Management Office, Ministry of Finance; World Bank staff calculations.

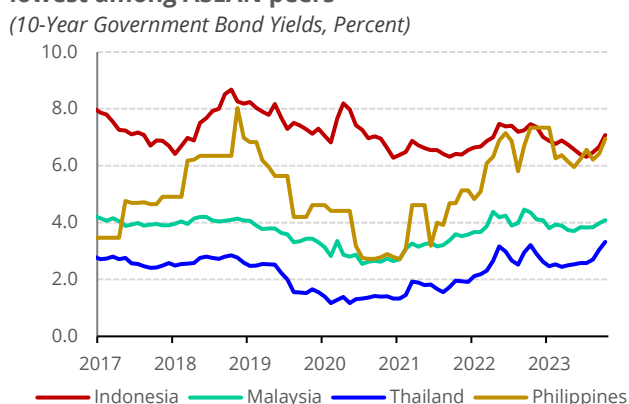


Figure 30: Public debt remains sustainable



Note: *includes SOEs, SFI guaranteed and agency debt.
Source: PDMO.

Figure 31: Government bond yield remains the lowest among ASEAN peers



Source: CEIC, World Bank staff calculation.

vii. Poverty Declined in 2022, Underpinned by Labor Market Recovery and Social Assistance

Poverty is expected to have declined in 2022, underpinned by the labor market recovery.

Per capita household consumption showed an 8.1 percent growth between 2021 and 2022, with the bottom quintile experiencing an even more rapid growth rate of 9.7 percent. This upswing in household consumption is likely attributed to the sustained recovery in the labor market and agricultural output, coupled with an increase in wages from private sector jobs as some COVID-19 relief measures and stimulus packages were phased out. The unemployment rate declined by 0.4 percentage points from 2022 to 2023 and was accompanied by a 1.9 percent increase in the average wage for private sector jobs. The most significant gains were recorded in the agricultural and service sectors. Certain stimulus programs, such as the half-half initiative, and social assistance programs like the state welfare card and old age allowance, were sustained to provide support to low-income households. In 2021, the poverty rate, measured against the upper-middle-income countries (UMIC) international line of \$6.85 a day (2017 PPP) poverty line, stood at 12.2 percent. With the rise in household income and consumption, it is anticipated that the poverty rate at the \$6.85 line would have decreased to 11 percent in 2022. Inequality is expected to have improved, with low-income households experiencing a greater increase in consumption per capita compared to their better-off counterparts.

Several challenges persist.

Household debt remained high at 90.6 percent of GDP in the first quarter of 2023, primarily driven by real estate and personal loans. In 2022, the average per capita consumption in the richest quintile's households was nearly six times higher than that in the poorest quintile. Low-income households, especially in rural areas, continue to concentrate in agriculture and self-employment, facing longstanding challenges, exposure to climate risks, and persistent vulnerability to poverty.



2. Outlook: Building the Momentum for Recovery



i. The Economy is Projected to Recover in 2024 amid Improving Internal and External Factors

In 2023, growth is projected to decelerate slightly due to declining public spending and stock rundown.

Growth is projected to decelerate slightly from 2.6 percent in 2022 to 2.5 percent in 2023, marking 0.9 percentage points lower than was expected in September 2023 (Figure 33). The downward revision is attributed to a weak outcome in Q3, driven by a substantial decline in stock accumulation and weaker-than-expected manufacturing production due to goods export contraction. Both public spending and investment are expected to contract. While tourism activity continues to support growth gradually, private consumption growth remains a solid contributor, supported by the ongoing recovery and an improved labor market. Consequently, private investment is projected to grow, albeit at a slower pace.

Growth is projected to accelerate in 2024 driven by the ongoing recovery in tourism and goods exports as well as private consumption.

In 2024 and 2025, growth is anticipated to accelerate from an estimated 2.5 percent in 2023 to 3.2 percent and 3.1 percent, respectively. The recovery of the tourism sector and sustained private consumption are expected to be the major drivers of growth, albeit at a slower pace (Table 2 and Figure 32). Goods exports growth is anticipated to rebound next year. Private investment is also projected to expand, supported by positive business sentiment driven by goods exports.

The revised fiscal budget proposal for FY 2024 is expected to also support the recovery, although with some delays due to the protracted budget process. The new government's primary policy focus leans towards pro-growth policies, including energy subsidies and broad-based transfers through Digital Wallet¹⁶. However, the latter is not included in the baseline projection due to uncertainty regarding legality. Over the long term, growth is forecasted to remain moderate at around 2.7 percent, reflecting structural challenges such as aging demographics and slowing productivity growth.

Table 2: Growth is projected to rebound in 2024

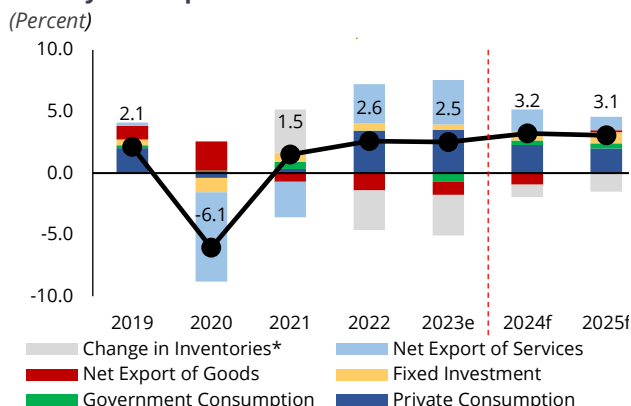
Percentage change	Share of GDP (2022)	Forecast				Contribution to GDP growth		
		2022	2023F	2024F	2025F	2023F	2024F	2025F
GDP	100%	2.6	2.5	3.2	3.1	2.5	3.2	3.1
Private Consumption	56%	6.3	6.2	3.9	3.4	3.5	2.3	2.0
Government Consumption	16%	0.2	-4.5	2.5	2.7	-0.7	0.4	0.4
Fixed Investment	24%	2.3	1.8	3.2	3.8	0.4	0.8	0.9
GFCF-Private	18%	5.1	2.8	3.6	3.5	0.5	0.7	0.6
GFCF-Public	6%	-4.9	-1.1	1.9	4.9	-0.1	0.1	0.3
Exports of Goods and Services	69%	6.8	2.2	5.8	4.1	1.5	4.0	2.9
Exports of Goods	61%	2.5	-3.9	3.0	2.3	-2.3	1.7	1.3
Exports of Services	9%	52.8	45.3	19.0	11.4	3.9	2.3	1.6
Imports of Goods and Services	69%	4.1	-1.5	4.8	2.5	-1.1	3.2	1.7
Import of Goods	59%	5.3	-2.3	4.9	2.2	-1.3	2.6	1.2
Imports of Services	10%	-1.2	1.9	4.4	3.9	0.2	0.6	0.5
Net Export of Goods and Services						2.6	0.8	1.2
Change in Inventories*						-1.1	-0.9	0.1
		2022	2023F	2024F	2025F			
Exports of Goods, USD term		5.5	-2.2	3.5	2.9			
Imports of Goods, USD term		15.3	-2.3	3.3	2.0			
Goods trade Balance, USD Billion		10.8	10.9	11.8	14.4			
Current Account Balance, USD Billion		-17.2	2.8	13.9	23.0			
Current Account Balance (% of GDP)		-3.5	0.5	2.4	3.5			
Headline CPI		6.1	1.4	1.1	1.5			

Note: *including statistical discrepancies.

Source: NESDC, Haver Analytics; World Bank staff calculations.

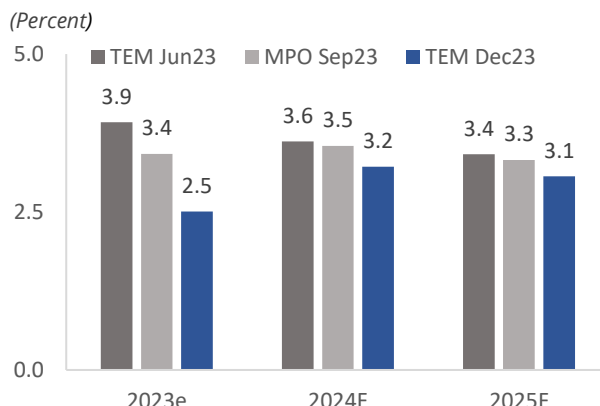
¹⁶ The one-time transfer of THB 10,000 (USD286) via digital wallets is planned to be funded through a THB 500 billion loan bill which must be first vetted by the Council of State and then presented to parliament for approval by January 2024. The measure is expected to take effect in May 2024 but uncertainty regarding legality under the Fiscal Responsibility Act remains.

Figure 32: Output will be supported by domestic activity and exports of services



Note: *including statistical discrepancy.
Source: World Bank staff projections.

Figure 33: Growth projections were revised downward over the forecast horizon

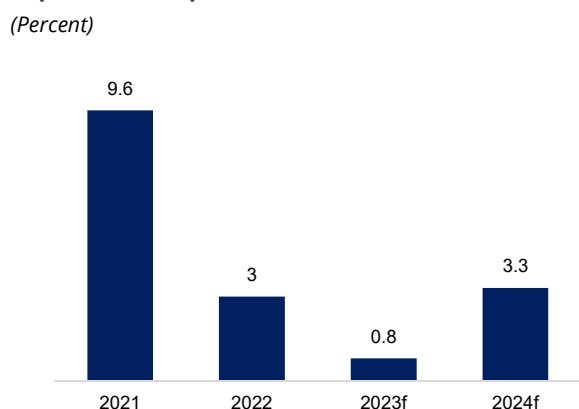


Source: World Bank staff projections.

Goods exports are anticipated to rebound in 2024, driven by the projected improvement in global growth and the expected easing of global financial conditions, even in the face of a slowing Chinese economy.

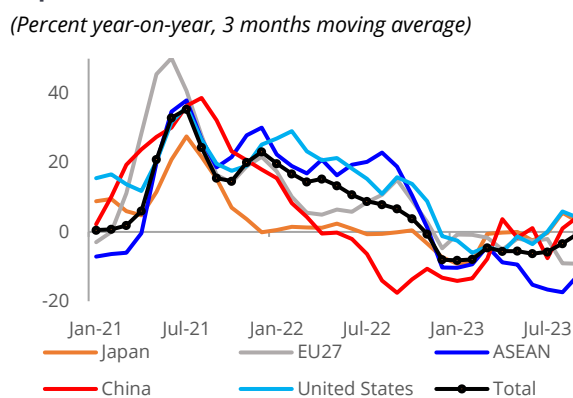
Exports of goods in 2024 are expected to rebound from a deep contraction in the previous year, reaching a growth rate of 3.5 percent in US dollar terms. This trajectory is consistent with the anticipated normalization of global goods trade volumes, which is projected to grow at 3.3 percent in 2024, after having contracted throughout most of 2023 (Figure 35). In contrast, global growth is projected to diverge from global trade, with growth forecasted to decline from 2.5 percent in 2023 to 2.1 percent in 2024 according to the consensus forecast. This reflects the effects of tight monetary policy, elevated inflation on real wages, and limited support from fiscal policy. Growth in China is projected to decelerate to 4.4 percent in 2024, as the economic rebound from the re-opening phase diminishes, compounded by ongoing challenges such as elevated debt levels and weakness in the property sector (East Asia and Pacific update, September 2023). Goods exports to major destinations have started to expand since August (Figure 34).

Figure 34: World merchandise trade volume is expected to improve in 2024



Source: WTO (October 2023).

Figure 35: Exports to major destinations have expanded



Source: Haver Analytics; World Bank staff calculation.

The return of tourists, especially from China, has bolstered the tourism outlook, although the recovery is proceeding at a slower pace than initially projected.

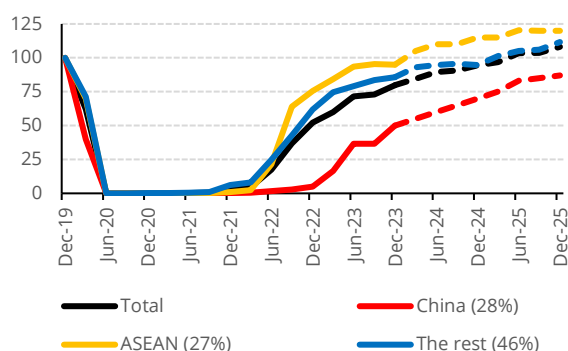
In 2024, tourist arrivals are anticipated to increase to 35.8 million, reaching 90 percent of the pre-pandemic 2019 level, up from an estimated 28.3 million in 2023. However, the recovery has been slower than previously projected, due to the gradual return of Chinese tourists, influenced in part by their ongoing economic slowdown. Additionally, the impact on growth was smaller than expected, attributed to a decrease in spending per capita by tourists, declining from an average of THB 1,480 per tourist per trip to USD 1,106 per tourist per trip. The potential extension of the visa-free policy and gradually increased airline capacity, with also improved airport capacity¹⁷ are anticipated to contribute to supporting the ongoing tourism recovery. The recovery is expected to continue into 2025, with the number of arrivals projected to reach pre-pandemic levels by mid-2025, marking a slower pace compared to the previous projection of achieving this by the end of 2024 (Figure 36).

As a result, the current account balance is expected to improve in 2024 and support external stability.

The current account balance is expected to continue improving, up from an estimated 0.5 percent of GDP in 2023 to 2.4 percent of GDP in 2024, driven by both goods and services trade (Figure 37). The projected increase in goods exports and reduced oil import bills will contribute to a rise in the goods trade surplus. Additionally, the recovery in the tourism sector and the normalization of shipping costs are expected to further widen the current account surplus.

Figure 36: Number of arrivals is forecasted to reach pre-pandemic levels by mid-2025

(Percent of pre-pandemic level in 2019)

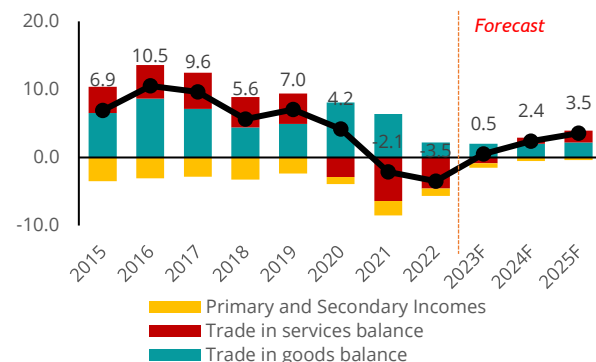


Note: Share of total as of 2019 in parenthesis.

Source: World Bank staff projections.

Figure 37: The current account balance is projected to improve further

(Percent of GDP)



Source: CEIC; World Bank staff projection.

Inflation is expected to remain among the lowest in emerging markets due to energy subsidies and

Headline inflation is projected to decrease from an estimated 1.4 percent in 2023 to 1.1 percent in 2024. This decline is attributed to lowered energy prices, while food prices and core inflation are expected to increase. Energy prices inflation is anticipated to contract sharply at 6.0 percent in 2024, following a mild contraction of 0.7 percent in the previous year (Figure 38). This projection is based on the expectation of a decline in global energy prices¹⁸, and the

¹⁷ New terminal, SAT-1, at Suvarnabhumi airport is expected to be fully operational by the end of 2023. The new terminal will increase airport capacity from 45 million to 60 million annually.

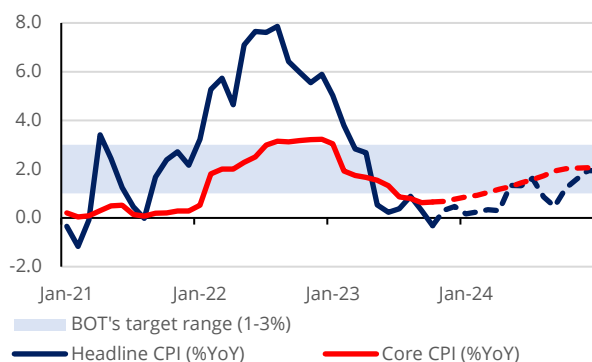
¹⁸ Energy prices, after dropping by an estimated 29 percent in 2023, are expected to fall 5 percent in 2024 as subdued global growth reduces demand pressure ([World Bank Commodity Markets Outlook, October 2023](#)).

easing global energy prices.

continuation of additional cuts to energy prices introduced in September 2023. Core inflation is expected to increase due to the anticipated increase in the minimum wage¹⁹ and the closing of the output gap but remain within an acceptable range in 2024. The projection assumes no significant shock in domestic food and energy prices, despite challenges from the impact of El Niño, the ongoing conflict in the Middle East, and other geopolitical risks, as these prices are subject to price control. Inflation is expected to reach the lowest levels among emerging markets (Figure 39). Consequently, the need for aggressive monetary policy has diminished, and the current policy rate is viewed as supportive of long-term sustainable growth, according to the BOT.

Figure 38: Headline inflation is projected decline due to falling energy prices

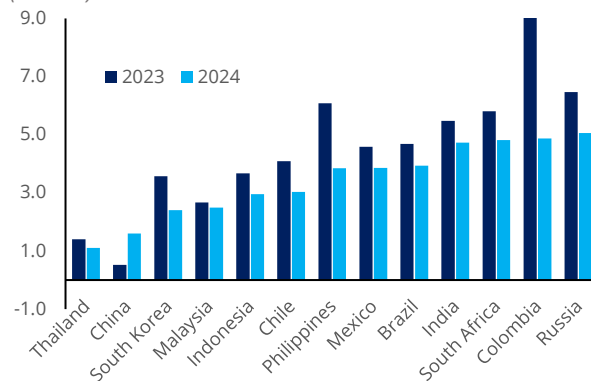
(Percent year-on-year)



Source: CEIC; World Bank staff projections.

Figure 39: Markets expect inflation to remain among the lowest in emerging markets

(Percent)



Source: Consensus forecast (May 2023); World Bank forecast for Thailand.

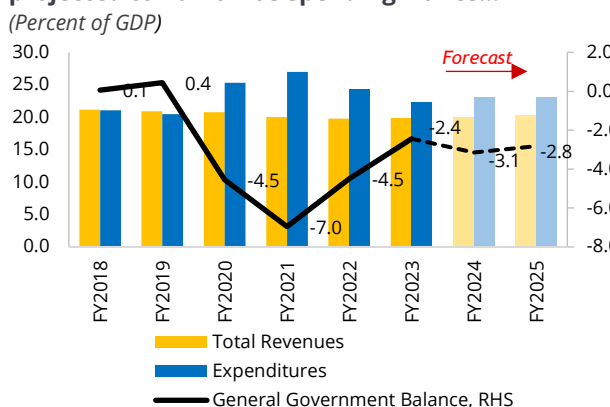
The planned fiscal budget for FY 24 and stimulus measures will offer a short-term boost to growth but are expected to delay ongoing fiscal consolidation.

The general government deficit is projected to widen from an estimated 2.4 percent of GDP in FY23 to 3.1 percent in FY24 and remain elevated in FY25. This is largely due to the government's revised expanded FY24 budget (which does not include the digital wallet scheme), while fiscal revenue recovery continues to be subdued (Figure 40). The recently announced cost-of-living support measures, including energy subsidies and tax expenditures. The off-budget stimulus measure, Digital Wallet program, is not incorporated into the baseline, but if implemented, it has the potential to boost growth while slowing the path of consolidation and causing higher public debt level. (see section ii. below). In contrast, the recovery of public spending is expected to be protracted due to delays in the budget approval process for FY24, extending from the normal September deadline to at least until April 2024²⁰. The public debt is projected to remain elevated at 62.8 percent in FY24. (Figure 41).

¹⁹ The Ministry of Labour has confirmed that it will raise the minimum wage for 2024. The new minimum wage is expected to be set at above the rate of inflation but is unlikely to be raised to 400 baht (USD11.12) per day as originally proposed. Thailand last raised its minimum wage in October 2022. The current daily minimum wage ranges from 328 baht (USD9.12) to 354 baht (USD9.84). The rates are determined by a tripartite committee, consisting of employers, employees, and government representatives. <https://www.aseanbriefing.com/news/thailand-to-set-2024-minimum-wage-rate-by-year-end/>

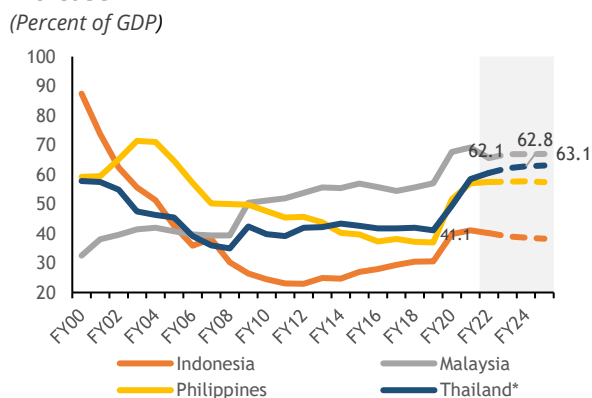
²⁰ In September, Thailand's new cabinet approved budget spending of 3.48 trillion baht (\$97.64 billion) for fiscal year 2024. However, the budget plan will go to parliament for a first reading in early January, and faces two more readings in early April before it is submitted for senate and royal approval.

Figure 40: The general government deficit is projected to narrow as spending wanes...



Source: FPO; World Bank staff projections.

Figure 41: ... and public debt is projected to increase



Source: IMF WEO; World Bank staff projections.

In the medium term, as the economy recovers, Thailand will need to consolidate fiscal spending and initiate tax reforms.

To enhance fiscal resilience, while also addressing challenges posed by an aging, Thailand can start by, first, the policies should focus on a more targeted social assistance and transfers, especially the Old Age Allowance²¹ to effectively address welfare and poverty alleviation. Second, Thailand can also implement reforms to improve efficiency of public spending, particularly in healthcare and education. Third, Thailand has the room to raise tax revenue and maintain fiscal sustainability while meeting spending pressures and investment needs. Given Thailand's income level, revenue collection is low. At current levels, revenues will be inadequate to meet future spending needs while maintaining fiscal sustainability. To raise revenue and promote equity, Thailand can implement reforms by: (a) adjusting the VAT rate and exemptions; (b) broadening the personal income tax base and streamline allowances, (c) expanding property tax collection; (d) improving tax compliance to increase efficiency and avoid base erosion and (d) introducing a carbon tax or emissions trading scheme with auctioned emission permits (World Bank *Thailand Public Spending and Revenue Assessment 2023*).

ii. Upside and Downside Risks to Growth Exists, Influenced by the Potential Rollout Fiscal Stimulus, Prolonged Weak Global Growth, and Geopolitical and Climate-Related Events

The digital wallet program, if approved, will provide substantial short-term upside risk to growth in 2024 and 2025.

Growth in 2024 and 2025 is anticipated to surpass baseline projections by 0.5 – 1.0 percentage points over the two-year period, if the funding for the Digital Wallet program, amounting to THB 500 billion (2.7 percent of GDP), is rolled out by May 2024. The fiscal deficit may increase to 4–5 percent of GDP, approaching the average level observed during the COVID-19 crisis between 2020 and 2022. Public debt may reach 65–66 percent of GDP. The estimation assumes the spread out of disbursement over two fiscal years and a fiscal multiplier of 0.3–0.6 times, associated with the characteristics of the program that may reduce impact on growth. These characteristics include broad-based coverage rather than targeted transfers, potential leakages to purchases of "big-

²¹ Currently the OAA ranges between THB 600 and THB 1,000 per month (increasing by beneficiary age) and has not been adjusted for over a decade.



ticket" items with high import content, and limited supply capacity in regional economies, which may result in rising inflation and interest rates (Box 2: *The Impact of Social Transfers on Economic Growth*). There are also implementation challenges in ensuring that enough vendors enroll in the scheme and are quickly reimbursed for sales so as to support the multiplier effect of the stimulus.

In contrast, weaker-than-expected global growth and geopolitical uncertainty pose key downside risks to near-term outlook.

Downside risk to the growth forecast include the global economic slowdown, especially in China and a resurgence of inflation in advanced economies, which would lead to a tighter-than-expected global financial conditions. An intensification of the recent conflict in the Middle East may present a further indirect impact to the Thai economy as any disruptions or escalations in the conflict may lead to increased volatility in energy markets. Thailand, due to its high dependency on energy imports, is particularly vulnerable to rising energy prices as evidenced by the region's large spike in inflation last year. Phasing out energy subsidies and moving to a low-carbon growth path can help build energy security, reduce environmental degradation while becoming a regional leader in green, sustainable growth (See Chapter 2 on Carbon Pricing).

Returning to pre-COVID tourism levels may prove challenging unless tourism competitiveness is improved, and underlying infrastructure needs met.

Thailand ranks 36th among 136 countries in terms of its competitiveness for travel and tourism in 2021. According to the Travel and Tourism Competitiveness Index, Thailand's competitive advantage as a tourism destination stems principally from its natural resources, price competitiveness, tourist service and air transport infrastructure. Nonetheless, Thailand's ranks among the bottom half of countries on several dimensions, including environmental sustainability (e.g., on air pollution see Box 5: *Easing Thailand's Air Pollution Burden*), ground and port infrastructure, health and hygiene and safety and security. Tourism is concentrated in a few major destinations: Bangkok, Chiang Mai and Phuket. The WB Thailand *Urban Infrastructure Finance Assessment: Challenges and Opportunities (2023)* identified that financing infrastructure in secondary cities can support regional climate-resilient growth.

El Niño's influence on drought and agricultural production will pose a challenge for farmers' income and food price inflation.

This scarcity of water, due to El Niño effect may critically impacts crop cultivation, as many Thai farmers depend on rainfed agriculture. Insufficient water availability can lead to decreased yields and crop failures, affecting staple crops like rice and impacting the overall agricultural output. The interconnected impacts on agricultural production and farmer's income underscore the importance of adaptive strategies and sustainable water management practices to enhance resilience in the face of El Niño-related climatic disruptions in Thailand.

**Box 2: The Impact of Social Transfers on Economic Growth**

International evidence suggests that Thailand’s planned digital wallet may influence short-run economic growth, particularly in those regions with a greater concentration of beneficiaries. The short-run increase in GDP for each 1 Baht increase in transfers is known as the “transfer multiplier”. This box reviews the factors that determine the size of the transfer multiplier and the empirical evidence on its size in other countries.

The most important factor determining the size of the transfer multiplier is whether the payments are consumed or saved—known as the Marginal Propensity to Consume (MPC). In theory, households receiving a temporary payment would save almost all of it, in order to smooth their consumption over time. But in practice, a sizable fraction of households face liquidity constraints—for example, a lack of cash or money in their bank account—and so are likely to spend cash received in a hand-to-mouth fashion. In high income countries in normal times, around $\frac{1}{4}$ - $\frac{1}{3}$ of households are hand-to-mouth (Kaplan, Violante and Weidner 2014), with Baker et al (2020) estimating a similar MPC out of the 2020 US stimulus payments. But in middle income countries the hand-to-mouth share is likely much higher. Bracco et al (2021) estimates that around half of households are hand-to-mouth in Thailand. Other groups—without lost income or without liquidity constraints—are likely to have a lower MPC, which may be one reason why they were targeted by co-payment schemes rather than direct transfers.

The second factor is how higher consumption affects national or regional output and employment. For higher consumption to stimulate the economy, the spending must be on goods with local content (Pennings 2021). While international evidence suggests that larger payments could be spent on “big ticket” items that may have less local content, in Thailand’s case the transfers likely offset reduction in other incomes of informal workers. Moreover, many farmers may live in remote areas, and are likely to spend mainly on locally produced goods and services, reducing leakages out of the local economy. Another concern is that an increase in consumption demand would lead to higher prices rather than an expansion of output and employment. Internationally, monetary authorities have often raised interest rates in response to the inflationary effect of transfers, reducing multipliers. In Thailand, interest rates have been rising due to increased demand pressures and high commodity prices.

International empirical evidence suggests transfer payments can boost national or regional GDP in the short term. For the US, Pennings (2021) estimates that one-off stimulus payments had a regional multiplier of around $\frac{1}{3}$. This means that if the residents of a region received an extra one-off payment of \$1, regional GDP would grow by \$0.33 in the short run. The multiplier was larger (0.4 to 0.6) for transfer payments targeted at low-income residents. While regional GDP fell when the transfers were withdrawn, there was some mixed evidence of a more persistent response in GDP. Although the Thai digital wallet covers 76 percent of the population, going well beyond the poor, the policy’s time limit (spent in 6 months) and location restrictions (<4km from home) are designed to make sure the transfer is spent on locally produced goods—more persistent and targeted than the one-off payments studied in Pennings (2021) — suggesting a higher regional multiplier, if well implemented (other things equal). Challenges include enrolling geographically disperse vendors in the program, reimbursing vendors for digital sales, and beneficiaries that live far away from their registered residences. Regional economies may not have the supply capacity to meet such a large increase in demand.



Using a sample of Latin American countries, Bracco et al (2021) find that a \$1 increase in transfers to individuals leads to a \$0.90 increase in GDP over the next few quarters, mostly operating through higher consumption. They also estimate a much lower transfer multiplier of 0.3 in developed countries. Using the model from Giambattista and Pennings (2017) they argue that the difference between multipliers can be explained by the higher share of illiquid/hand-to-mouth households in developing countries.

Aggregate economic effects across the whole economy may prove smaller. Large transfers such as the digital wallet (2.7 percent of GDP) may prove inflationary; in response, the central bank may raise interest rates and offset some of the effects of the transfer. Romer and Romer (2016) found that US monetary policy responded strongly to US social security benefit increases, which may have reduced their impact, though Conley et al (2023) argues they can still be large.

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Part 2. Carbon Pricing: An Idea Whose Time has Come



i. Introduction and Motivation

Carbon pricing could become a core part of Thailand's contribution to combating climate change.

There has recently been much discussion about what policies would be needed for Thailand to meet its international commitments in reducing greenhouse gas (GHG) emissions. Carbon pricing is one possible policy option that is increasingly gaining attention across the country. Five other ASEAN Member States either already have carbon pricing instruments or are currently preparing them²². In Thailand's 2023 national election, the climate change agenda gained prominence. The Climate Change Act that is currently under discussion in Thailand may include measures that allow the implementation of carbon pricing. Thailand already has a voluntary carbon price in place for some sectors, which could form the basis of a formal carbon price in future. It is thus worthwhile exploring how carbon pricing could contribute to Thailand's emission reductions, and how it could impact on the wider economy.

Gradually raising prices on fossil fuels through carbon

Carbon pricing is a policy mechanism that assigns a monetary cost to GHG emissions, aiming to incentivize businesses and individuals to reduce their emissions. It includes approaches like carbon taxes, cap-and-trade systems, and

²² Singapore and Indonesia already have carbon prices. Malaysia, the Philippines, and Vietnam are considering new carbon pricing instruments.

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pricing is critical to reducing GHG emissions.

offsetting, creating economic incentives for environmentally responsible behavior and helping to combat climate change. The policy has several important benefits:

- **Emissions Reductions:** Carbon pricing encourages behaviors that reduce energy use and shift to cleaner fuels, supporting efforts to combat climate change.
- **Clean Energy Investment:** Anticipated higher fossil fuel prices drive innovation and adoption of new, low-carbon technologies. This is especially effective when a clear and credible trajectory for rising prices is outlined.
- **Fiscal Benefits:** Carbon pricing can generate substantial revenues, providing governments with a valuable source of funds. This revenue may be used to support other climate policies or other public expenditure goals, as well as to compensate vulnerable groups who may be adversely affected by price increases.

By reducing fossil fuel consumption, carbon pricing may also improve urban air quality, leading to reduced incidence of illness and disease (See Box 5: *Easing Thailand's Air Pollution Burden*).

The main disadvantage of carbon pricing is the economic impact of higher fossil fuel prices. Although the macro-level effects are usually too small to impact overall inflation rates by much, households will lose purchasing power and energy-intensive companies could suffer a loss of competitiveness. As described below, revenues generated from carbon pricing could be used to offset some of these effects.

Carbon pricing comes in two main forms: carbon taxes and Emissions Trading Schemes.

At the macro or sectoral level, the two main forms of carbon pricing are carbon taxes and Emission Trading Schemes (ETSs). As described below, the two policy options have their own advantages and disadvantages, and specific national circumstances usually determine which option is more appropriate. The basic underlying idea is the same in both cases, however; by putting a cost on GHG emissions, companies (and households) are discouraged from using fossil fuels. If a company finds that the cost of switching production to less carbon-intensive methods is less than the cost of paying the carbon price, it will seek cleaner production methods and overall GHG emissions will fall. According to the World Bank's *State and Trends of Carbon Pricing* report²³, almost a quarter of global GHG emissions (23 percent) are now covered by either carbon taxes or ETSs.

Governments enact carbon taxes by assigning a specific price to GHG emissions.

Under a carbon tax, the government sets an explicit price for emitting carbon. This price usually results in increased costs for fossil fuels. Companies that can reduce emissions at a cost less than that of paying the carbon tax will do so. Other companies may pass on the cost of the carbon tax in the form of higher prices for other goods. For example, electricity prices are likely to increase if the fossil fuel costs for electricity generation are higher. The overall result should be reduced fossil fuel consumption and reduced levels of GHG emissions. The carbon tax will generate revenues for the government equal to remaining emissions multiplied by the carbon tax rate.

²³ <https://openknowledge.worldbank.org/entities/publication/58f2a409-9bb7-4ee6-899d-be47835c838f>

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Governments enact ETS by assigning a maximum volume of GHG emissions.

Under an ETS, the government fixes the maximum quantity of emissions across all the companies covered by the scheme (usually defined by economic sector). This maximum is called the emission cap. The government issues a quantity of allowances to match the emission cap. Unlike under a carbon tax, the government does not set the price of emitting carbon explicitly, but the companies covered by the ETS determine the price through their trading of the allowances on the open market. In general, companies will buy allowances, only if it is cheaper for them to do so than it is to avoid emitting carbon. An ETS will generate public revenues if the government sells the initial allowances. Alternatively, the allowances may be allocated for free to companies covered by the ETS, offsetting competitiveness effects and increasing political acceptability in industry (although resulting windfall profits can reduce public acceptability, especially if polluters are seeing as being rewarded). The trading of allowances means that firms with the best (lowest cost) opportunities to reduce emissions will do so and sell the resulting credits to those firms without good opportunities. Across the economy, emissions reductions thus happen in the places where they are most cost-effective.

The revenue generated from carbon pricing can be strategically employed to benefit the overall economy.

The revenues generated by carbon pricing could help to offset potential economic challenges resulting from policies to reduce GHG emissions in Thailand. For example, the effects of higher energy prices could be compensated by payments to low-income households. The revenues could also support retraining for workers who lose their jobs in negatively affected sectors, such as fossil-fuel based power plants. Aside from improvements to social welfare, the revenues from carbon pricing could be used for general budget support or directed investments towards cleaner technologies, aligning with broader goals of sustainable development. A combination of all these options is possible, given the scale of revenues available. However, as described below, freely allocating allowances in an ETS (as is often done initially) would limit the revenues available.

Carbon taxes are straightforward to administer.

Carbon taxes are usually managed by finance ministries. A key advantage of carbon taxes is that they can be seamlessly incorporated into existing procedures for collecting fuel taxes. A carbon tax could therefore leverage the already-established legal and administrative infrastructure in Thailand. This simplicity enhances the feasibility and effectiveness of implementation. For example, adjustments to rates or coverage can often be incorporated more swiftly as part of a budget and related finance bill. This simplicity is one of the reasons that a carbon tax is preferred in countries such as Argentina, South Africa, and Uruguay²⁴.

Introducing carbon taxes may create political tensions unless done appropriately.

Despite the macro-level benefits laid out above, in some countries a carbon tax may face strong political opposition from companies that would face higher costs and a potential loss of international competitiveness. One option is instead to implement an ETS (see below). Where carbon taxes have been introduced, countries have often started with a lower tax rate and introduced a carbon tax by restructuring existing taxes (e.g. excise tax on gasoline), or introduced a carbon tax in the context of broader tax reform. A more gradual implementation may improve the feasibility of the policy instrument.

²⁴ See https://carbonpricingdashboard.worldbank.org/map_data

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ETSs involve more complex administration.

ETSs are usually overseen by environment ministries. They are typically applied to large fossil fuel users in the power and industrial sectors, who have the necessary capacity to trade in emissions allowances²⁵. Small-scale emitters in ETS-covered sectors are therefore often excluded, although their contribution to emissions is typically modest. For an ETS to be successful, it must be possible to monitor emissions at plant level, oversee allowance registries, and manage market trading. Although Thailand has already built much of this capacity, overhead costs will still be much greater than those for a carbon tax. Alterations to ETS rules often necessitate changes to regulations and legislation, involving a prolonged process of notice and consultation.

However, ETS allowances offer some flexibility to address competitiveness concerns.

The focus on large companies and plants in an ETS aligns with existing regulations targeting local pollutants. In the industry sector, companies producing carbon-intensive, highly traded, commoditized goods (e.g. steel or cement) could suffer a loss of competitiveness if their energy prices increase. However, if some of the allowances in the ETS are freely provided to companies, the competitiveness effects could be offset. The ETS may thus be more politically feasible to implement than a carbon tax, although the free provision of allowances comes at a cost of reduced generation of revenues.

The interaction of carbon pricing with other policies needs to be assessed carefully.

The feasibility and effectiveness of carbon taxes and ETSs also depends on other macro and sectoral policies already in place. Some policies have countervailing and redundant effects in terms of GHG emission reductions. For example, if the current fossil fuel subsidies remain (see Chapter 1: Recent macroeconomic developments), they will send confusing pricing signals to the market, reducing the effectiveness of carbon pricing. Removing the current price caps and subsidies would therefore need to be part of any policy reform that introduces carbon pricing in the same sectors.

The use of carbon offsets may provide additional flexibility to carbon pricing.

Some countries, including South Africa and Korea, allow the companies covered by carbon pricing to a limited extent to use carbon offsets to reduce overall compliance costs. Offsets allow firms to pay for emission reductions elsewhere, if cheaper than reducing their own emissions. They may come in the form of Emission Reduction Credits (see Box 3. *Emission Reduction Credits*). Countries may allow the use of carbon offsets to reduce competitiveness effects for companies that produce carbon-intensive and highly traded goods. In Singapore, companies can offset up to five per cent of their taxable emissions and in Korea's ETS up to 10 percent. Offsets could also be used to reduce adverse price impacts on consumers. In Thailand, the government could consider extending the Thailand Voluntary Emission Reduction Program (T-VER) credit as an offset for this purpose.

²⁵ Alternatively, if the fossil fuel suppliers are covered by the ETS higher costs are passed on to final fossil fuel consumers in all sectors.

Box 3: Emission Reduction Credits

The carbon taxes and ETSs described in this chapter apply compliance-based approaches to reduce emissions at macro or sectoral level. In contrast, carbon credits, also called Emission Reduction Credits (ERCs), may be generated at project level. They therefore could be a complementary tool.

ERCs are an incentive-based approach where organizations or projects that reduce carbon emissions (or remove carbon from the atmosphere) receive credits. These credits can be sold to other entities, creating a financial incentive for emissions reduction efforts. The projects that receive credits can encompass activities such as afforestation, reforestation, renewable energy installations, methane capture at landfills, and energy efficiency improvements. The volume of credits received is based on the level of emissions prevented or removed.

ERCs complement compliance systems and can improve economic efficiency. They introduce economic flexibility and allow entities to invest in emission reduction projects where it is most cost-effective. They thus help to achieve greater emission reductions per dollar spent and may stimulate innovation at project level.

ERC markets have a global scope, allowing emission reductions achieved in one country to be recognized and financially rewarded by entities in other countries. Credits generated in Thailand could thus be sold abroad, providing a valuable source of international finance. The international ERC systems may also promote collaboration and technology transfer between countries, further reducing decarbonization costs in Thailand.

Implementing and sustaining a crediting program requires institutional capacity to e.g. monitor emissions, assess projects, issue ERCs, ensure compliance, and facilitate the use of credits in emissions reduction efforts. It would likely take several years to build capacity at national level. However, it is also possible to rely on international registries that are already operating globally and have established credibility. The registries can handle the issuance, tracking, and trading of ERCs. They adhere to standardized protocols and methodologies for ERC generation and issuance, ensuring the necessary consistency and transparency for market acceptance.

Nevertheless, to realize the full benefits of ERCs, Thailand would need to ensure that a system is in place to adjust macro-level emission targets for project-level activities. An 'adjusted credit' includes a reduction in a host country's emissions target to account for the emissions reductions claimed by the sale of ERCs generated within that country. The mechanism ensures that the sale of ERCs does not result in a net increase in global emissions and involves defining the rules, eligibility criteria, and procedures for credit adjustment. Initial agreements suggest that Thailand is already well advanced in establishing such a mechanism.

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ii. The State of Carbon Pricing and Other Climate Policy in Thailand

Thailand has set a clear goal of achieving net-zero emissions by 2065, which is supported by central plans covering the key sectors.

Thailand's Nationally Determined Contribution (NDC) and Long-Term Strategy for reducing GHG emissions contribute to the target of achieving net-zero GHG emissions by 2065. However, this is somewhat less ambitious than the net-zero targets of most of its regional peers including Cambodia (2050), Indonesia (2060), Lao PDR (2050), Malaysia (2050), Singapore (2050) and Vietnam (2050). In 2022, the NDC target was raised from a 20 percent reduction in emissions to 30 percent by 2030 (compared to a baseline scenario), although it is still regarded as insufficient to meet global targets.²⁶ Thailand's National Energy Plan has also been developed to support the net-zero pathways and decarbonization of the energy sector. The country's Climate Change Act is being drafted and is expected to launch in 2024. Other key plans in shaping the net-zero emission goal include the Climate Change Master Plan (CCMP), Power Development Plan (PDP), Alternative Energy Development Plan (AEDP), and Energy Efficiency Plan (EEP). The PDP aims for a 20 percent share of renewable power generation by 2036, while the AEDP targets a 30 percent share of renewable energy in total final energy consumption. The EEP plans to decrease energy intensity by 30 percent below 2010 levels by 2036 and could include an Energy Performance Certificate program that targets some of the largest emitters of carbon.

Thailand is also implementing a range of emission reduction policies across specific sectors of its economy.

Other emission-reduction policies in Thailand include the Environmentally Sustainable Transport System Plan, a low emission development plan for increased transportation capacity, a vehicle CO₂ emissions tax scheme, a Waste Management Roadmap, feed-in tariffs, tax incentives for renewable energy investments, and measures to protect forests (called REDD+ Readiness). The country's approach is to integrate new policies with existing development plans, by combining regulations and voluntary measures to establish a marketplace, particularly in energy efficiency. While Thailand is not currently part of any international emissions trading or carbon-pricing market scheme, its NDC expresses openness to participating in such mechanisms.

The newly established Department of Climate Change and Environment is to focus on country's climate change efforts.

Demonstrating Thailand's commitment to deal with climate change and reduce greenhouse gas emissions in the country, the government has set up the Department of Climate Change and Environment (DCCE) under MONRE in July 2023 to supervise Thailand's missions and operations related to climate change, while also coordinating with public and private agencies on climate change issues. Specific roles and responsibilities between DCCE and Thailand Greenhouse Gas Management Organization (TGO), who has been the Designated National Authority of Clean Development Mechanism (NDA-CDM), are to be stipulated in the Climate Change Act. TGO currently oversees the T-VER voluntary system of emissions trading in Thailand and recently submitted the draft Greenhouse Gas Reporting Law to the Office of Natural Resources and Environmental Policy and Planning. It will now be considered as part of the Climate Change Act.

The TGO also has an advanced domestic

The TGO has established a comprehensive and effective infrastructure for monitoring, verifying, and issuing Emission Reduction Credits (ERCs) within Thailand. It has already built a national crediting program, issuing T-VER

²⁶ See <https://climateactiontracker.org/countries/thailand/>

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carbon crediting system.

credits into the domestic voluntary market, and it has received positive indications from the Carbon Offsetting and Reduction Scheme for International Aviation (CORSI) about receiving certification for T-VER credits that can be sold in international markets. In addition, the TGO played a key role in the governmental agreement between Thailand and Switzerland, in which Switzerland will purchase credits generated by the upgrade of over 1,900 buses in Bangkok to e-buses. The agreement would not have been possible if the government had not already developed an advanced authorization process and has already gone through the process to issue adjusted credits with a corresponding adjustment to national emission targets (see Box 3. *Emission Reduction Credits*).

iii. How can Thailand Achieve These Aspirations?

Carbon pricing must be considered in the context of Thailand's net-zero target.

To reach its net-zero emissions goal by 2065, Thailand must reduce its level of GHG emissions to nearly zero, with a small number of offsets to compensate remaining emissions. The aim of carbon pricing is not to identify where emissions can be reduced but to encourage the most cost-effective reductions within the scope of the carbon pricing instrument. This context is important. For example, whereas in the past economists have recommended a single carbon price across all sectors to maximize efficiency, the goal now is to stimulate the use of low-carbon technologies in each sector. Given the varying technology options available in each sector, it may be appropriate to have different carbon prices in different sectors or use sectoral policies to reinforce the carbon price signal where further incentive is required. The interaction between carbon prices and other macro and sectoral climate policies also becomes critical.

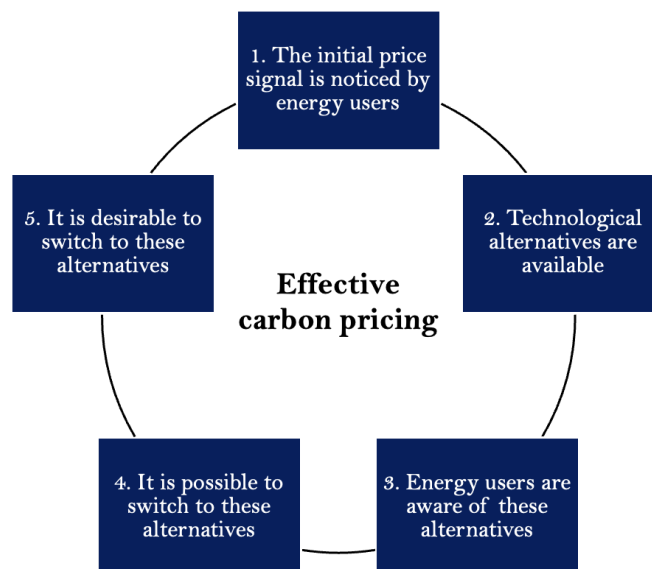
Carbon pricing helps to 'get the prices right', but this may not be sufficient to enact behavioral change.

Figure A shows the criteria needed for a carbon price to change behavior. First, the price of energy must increase enough for energy consumers to take notice. If the tax rate is set too low, the increase in fossil fuel prices may not register with consumers. Second, it is essential that consumers have low-carbon alternatives to switch to; if there are no alternative options, a carbon price risks becoming merely a revenue-raising instrument that reduces the purchasing power of consumers. Third, affected entities must be informed about these low-carbon alternatives to ensure adoption; for example, a utility company will not transition from coal if it does not understand how to install solar panels. Fourth, the transition to these alternative technologies must be feasible; regulatory hurdles and a lack of skilled capacity can limit low-carbon technology uptake. Finally, the switch to low-carbon technologies must make financial sense to energy users.

For carbon pricing to make more than a marginal contribution to reducing emissions, it may need to be combined with other climate policies.

Carbon pricing has a crucial role to play in the final criterion of providing incentives for change. It may also help to meet the other criteria, for example by increasing awareness of low-carbon technologies. However, other policies may more effectively meet these other criteria. For example, support for specific technologies (e.g. through subsidies or public procurement) could help these technologies become established and train workers for installation. Public information campaigns could directly address the criteria associated with awareness effects, particularly with respect to households moving away from carbon-intensive products. Rapid change will only happen if all five criteria are met, meaning that policy interaction is important and carbon pricing will be most effective if combined with other policies.

Figure A: Conditions for effective carbon pricing



Source: World Bank staff.

Innovative climate finance plays a crucial role in complementing carbon pricing instruments in the broader context of addressing climate change.

Carbon pricing provides a market-based mechanism to internalize the external costs of carbon emissions, while climate finance supports the transition to a low-carbon economy. Thus, innovative climate financing mechanisms can help fill financial gaps by attracting additional funds beyond what carbon pricing instruments generate. Climate finance also contributes to de-risking climate-related investments, making them more attractive to a broader range of investors. By integrating carbon pricing mechanisms with climate finance, policymakers aim to create a financial environment that encourages businesses to reduce their carbon footprint and accelerates the transition toward a low-carbon future. Furthermore, integrating climate finance with comprehensive support to access carbon markets will also be critical in providing firms — small and medium sized companies in particular — with an accessible end-to-end service starting from measuring their carbon footprint to generating returns from high-integrity carbon credits (See [Box 4](#)).

Box 4: A One-stop-shop to Provide Brazilian Firms Options to Reduce their Carbon Footprint

In December 2022, the World Bank Board of Directors approved a USD500 million project to expand sustainability-linked finance and strengthen the private sector's capacity to access carbon credit markets. In collaboration with Banco do Brasil, one of the largest financial institutions in Latin America, the project will adopt, for the first time, a sustainability-linked lending approach to help Brazil meet its climate goals.

The project aims to deliver robust mitigation benefits. Up to 90 million tCO₂e in emission reductions are expected by 2030, the equivalent to about 4.5% of what Brazil needs to stay on track with its net-zero commitments. The project is also expected to mobilize up to USD1.4 billion in private capital through the scale-up of financing by Banco do Brasil and private investors. As a leader in the Brazilian

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agribusiness sector, with around 60% of all rural credit in financial markets, Banco do Brasil is committed to supporting customers, partners and society in the transition to a low-carbon economy, with methodologies, lines of credit and sustainable solutions.

The Brazil Climate Finance Project adopts an innovative, outcome-based financing approach that incentivizes firms to adopt and implement credible GHG emission reduction plans to reduce their company-wide carbon footprint. The initiative also links these firms to high quality carbon markets.

With the new initiative, Banco do Brasil will be able to offer its clients packages that integrate financing with support to access carbon markets through a “one-stop-shop”. This will provide Brazilian firms with an accessible end-to-end service starting from measuring their carbon footprint to generating returns from high-integrity carbon credits.

The project will provide a USD400 million credit line, and Banco do Brasil will use these resources to originate sustainability linked loans to companies committed to reducing their carbon footprint. The initiative also includes a USD98 million pilot Climate Debt Fund, which is expected to leverage private capital to expand sustainability-linked finance in the broader economy.

These financing instruments are complemented by USD2 million in resources for increasing the capacity of Banco do Brasil to support firms in adopting credible mitigation plans and in accessing high quality carbon markets, through technical assistance.

Globally and in Brazil, financial institutions are channeling more resources to green and climate-related activities through a range of financial products. By mainstreaming mitigation-based financing within a large financial institution, the project pilots an innovative approach with strong potential for replicability at scale in Brazil and around the world.

Power sector reform could make the sector appropriate for carbon pricing.

Figure B explores how the main emitting sectors in Thailand match up against the five criteria described above, with green showing good compatibility and red showing major impediments. The power sector stands out as being both price sensitive and with alternative technology options available. Furthermore, a modest carbon price could make low-carbon technologies cheaper than fossil-fuel-based alternatives. However, the feasibility of switching to low-carbon options may be constrained by the current structure of Thailand's power market, which is dominated by EGAT and other state-owned utilities. Any regulations that prevent markets from working will reduce the effectiveness of a pricing mechanism. The regulated power setup has contributed to a lock-in of fossil fuel technologies and the overall inflexibility of the power system, hindering renewable energy uptake. There may also be a broader lack of engineering expertise or installation know-how to make low-carbon options viable.

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Figure B: How the main sectors meet the criteria for effective carbon pricing

	Power	Industry	Transport	Buildings	Agriculture
Price signal noticed	Green	Yellow	Green	Yellow	Green
Tech options available	Green	Yellow	Green	Yellow	Red
Alternative options known	Yellow	Yellow	Green	Red	Red
Possible to switch	Red	Yellow	Yellow	Yellow	Yellow
Desirable to switch	Green	Red	Yellow	Red	Yellow

Note: Green cells indicate good compatibility and red cells potential impediments. Orange cells indicate either sectoral heterogeneity or partial compatibility.

Source: World Bank staff.

In other sectors, additional policies complementing the carbon price could compel greater emission reductions.

Within carbon-intensive industry, technological options for reducing emissions may be limited (e.g., cement), or so expensive (e.g., hydrogen technologies) that a much bigger carbon price would be needed to encourage uptake. Although carbon pricing may encourage efficiency improvements, other policies will be needed for transformational change. In contrast, electrification of transport is already ongoing, and a carbon price could encourage uptake of electric vehicles (EVs). Here the limiting factor is available charging infrastructure and the importance of vehicle purchase costs (which would not be affected much by carbon pricing) in determining behavior. The situation is more complicated in buildings, where there are some technological options, but a lack of knowledge and price awareness inhibit uptake; supporting policies would be critical here. In agriculture, with scarce technological alternatives, carbon pricing is unlikely to be effective and there are issues relating to emissions monitoring and verification.

Current economic sensitivities must be accounted for to maintain support for carbon pricing.

Any increases in fossil fuel prices resulting from the carbon price will compound the effects of high global energy prices. The impacts will come at the same time as other commodity price increases and interest rate increases on high levels of household debt. With considerable pressure on household finances, the sensitivity of increasing basic commodity prices cannot be ignored (especially given the subsidies still in place, see Chapter 1). The effects could be particularly pronounced if carbon pricing is applied in sectors where emission reductions are not possible. Aside from careful selection of sectoral coverage, the best way to address these issues is to use the available revenues to target support to vulnerable groups as tightly as possible. The provision of this support could be a key factor in ensuring political feasibility.

iv. What Would Happen if Thailand had a Carbon Price?

This section assesses two scenarios with

The analysis in this section is based on results from two scenarios that were assessed with a macroeconomic model²⁷. With the scope of the Climate Change

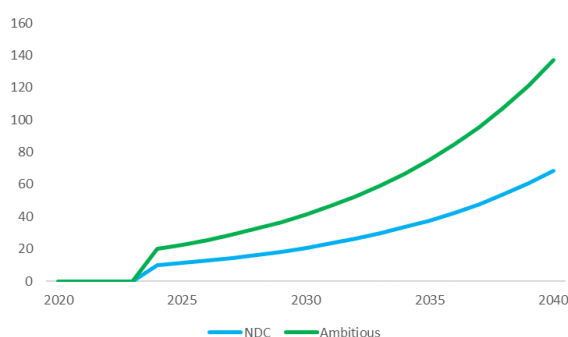
²⁷ The analysis presented in this chapter uses a macro-econometric empirical model, E3-Thailand, which breaks the economy into 20 energy users and 44 economic sectors. It is a non-equilibrium model designed specifically for policy makers and researchers to assess the macroeconomic impacts of carbon pricing instruments in Thailand. The model links together the Thai economy, energy consumption and emissions in one single framework. See annex and: <https://www.e3me.com/what/e3-thailand/>

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carbon prices in Thailand.

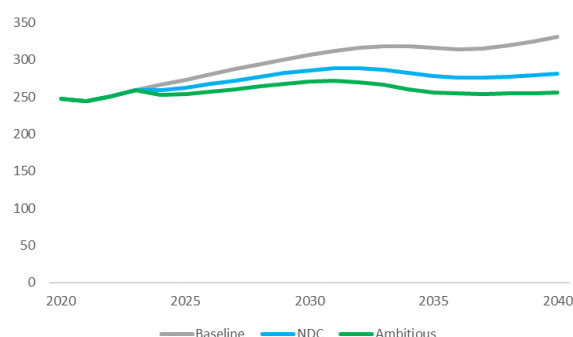
Act not yet clear, the scenarios focus solely on carbon pricing, even though a lack of other policies may limit effectiveness in reducing emissions.²⁸ In the scenarios, a carbon tax is applied to all sectors at the rates shown in Figure C. The NDC scenario sets a carbon price sufficient to meet the Nationally Determined Contribution (NDC) target for 2030 (USD21/tCO₂). The Ambitious scenario sets a higher carbon price to encourage further emission reductions (USD41/tCO₂ in 2030, rising to USD137/tCO₂ by 2040). The 2030 carbon price of USD21/tCO₂ in the NDC scenario is comparable to Korea's current carbon price and much lower than the EU's carbon price (around USD90/tCO₂). However, it would be higher than most other current carbon prices in place around the world.

Figure C: Carbon price (USD/tCO₂, 2023 price)



Source: E3-Thailand model.

Figure D: CO₂ emissions (MtCO₂)



Source: E3-Thailand model.

A carbon price could stabilize emission levels but additional measures, or very high carbon prices, would be required to reduce emissions.

The model results in Figure D show that the carbon prices could prevent emission levels from growing further in Thailand. However, in the long term, the model results suggest that even the carbon price in the Ambitious scenario may be insufficient to drive down emission levels towards carbon neutrality²⁹. Additional measures, such as building EV infrastructure or providing training for solar installation, would be needed to accelerate low-carbon technology take-up. These additional policies can have important interaction effects with carbon pricing. For example, if they raise public awareness or facilitate installation of low-carbon equipment, they can both directly reduce emissions and make carbon pricing more effective. Alternatively, carbon prices higher than those in Figure C could be set. Even in the Ambitious scenario, the carbon price is less than half of that in the EU ETS so there may be some scope to increase prices further. However, without addressing the other criteria in Figure B, the effects of higher carbon prices could be marginal and face more public opposition.

A critical issue is how to use the

Both carbon taxes and the auctioning of ETS allowances would generate revenues for Thailand's government. How these revenues are 'recycled' back into the economy is a key question in determining overall economic impacts.

²⁸ An exception is personal transport, where there are already ambitious EV targets in Thailand. Results from a separate modelling exercise on personal transport are summarized later in this section.

²⁹ The baseline case in the modelling assumes continued incremental technology increases. Future technology outcomes are uncertain.

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revenues generated by carbon pricing.

One option would be to use the revenues to fund other climate policies in the Climate Change Act that would complement the carbon prices. This approach has been used in other countries to improve political acceptability, by showing a clear focus on climate action rather than using carbon pricing for revenue raising purposes. However, the revenues could also be used to offset negative impacts on groups affected by carbon pricing (e.g. low-income households), increase other expenditure, reduce other tax rates, or reduce public debt levels.

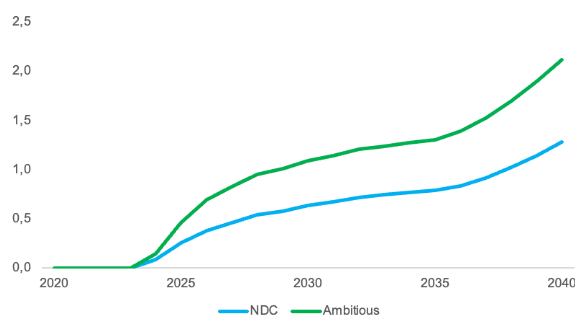
There need not be a high economic cost to stabilize emission levels.

In the scenarios modelled, revenues from the carbon price are used to reduce a combination of employment taxes and personal income taxes. The net economic cost of the carbon prices shows the combined effects of the carbon tax costs and the stimulus from the other tax reductions. The results in Figure E suggest that there need not be a major cost from the carbon tax, and GDP could increase slightly compared to the baseline scenario. The GDP increase is caused by two types of demand stimulus. The first stimulus comes from additional investment in low-carbon equipment, particularly in the power sector as it becomes more capital-intensive and less energy-intensive. This effect is more pronounced in the short term because it is funded by higher debts that must be repaid over the lifetime of the equipment. The second stimulus comes through a shift in Thailand's trade balance. Consumption of imported fossil fuel falls, while domestic fossil fuel production may instead be sold on global markets, boosting exports. Thailand's other exports are generally not carbon-intensive and so any loss of competitiveness from higher energy costs is limited.

Alongside economic gains, employment could increase.

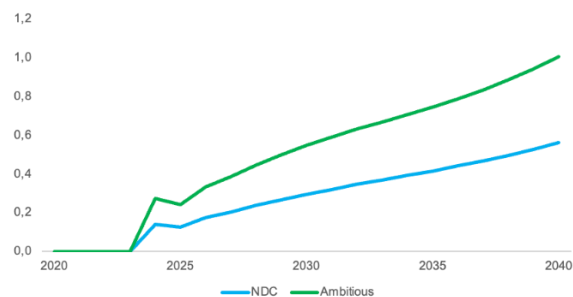
Figure F shows a similar trend for employment. In both the NDC and Ambitious carbon price scenarios, there is a small increase from the baseline employment figures, suggesting job growth taking place. In 2030 total employment is 0.3 percent higher than baseline in the NDC scenario, and 0.5 percent higher in the Ambitious scenario. The increase in employment can partly be explained by faster GDP growth. Additionally, a shift from a more energy-intensive economy to a more labor-intensive economy, and the use of carbon pricing revenues to reduce employment taxes, stimulates potential job creation. Additional jobs would be created in the sectors that produce or install low-carbon equipment (e.g. construction) and sectors that are sensitive to reductions in labor costs (e.g. hospitality). Some of the employment increases are offset by small reductions in employment in energy-intensive manufacturing sectors (e.g. cement).

Figure E: GDP impact, % from baseline



Source: E3-Thailand model.

Figure F: Employment impact, % from baseline



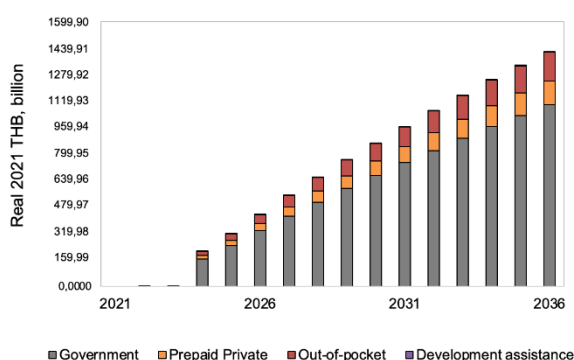
Source: E3-Thailand model.

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Carbon pricing (and other climate policies) could have other positive impacts beyond those captured in standard models.

A separate analysis, using the World Bank's *Climate Policy Assessment Tool*, was carried out to estimate the non-economic impacts of the carbon prices described above. It found that the carbon prices could ease the financial pressure on Thailand's healthcare system, much of which is publicly funded (see Figure G). Health problems arising from poor air quality contribute substantially to this pressure (see Box 5: *Easing Thailand's Air Pollution Burden*). For example, in 2019, health damages linked to exposure to fine particle pollution, PM_{2.5},³⁰ represented about 6 percent of Thailand's GDP. The morbidity from this exposure amounted to an estimated 235,993 disability-adjusted life years (DALY) (World Bank, 2022). The potential advantages of cutting pollution are thus highly pronounced in major urban areas like Bangkok, where vehicle emissions regularly push PM_{2.5} levels to exceed safe thresholds. By driving down emissions, the implementation of a carbon price could decrease related illness and death rates, which in turn could avoid over 3 billion baht in lost annual wages (equivalent to 0.01% GDP) from sick days, as well as improve worker productivity (Figure H).

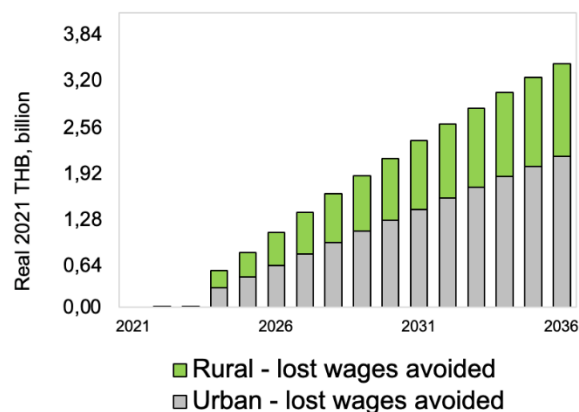
Figure G: Savings in health expenditure (THB million/year)



Source: Staff calculations using CPAT.

Note: Both graphs use the Ambitious scenario.

Figure H: Avoided lost wages due to a reduction in working days lost in Thailand



Source: Staff calculations using CPAT.

Box 5: Easing Thailand's Air Pollution Burden

Air pollution is a major economic and public health issue in Thailand. In 2019 alone, exposure to PM_{2.5} particles led to 32,211 premature deaths from ambient air pollution and an additional 7,449 deaths from household air pollution. These deaths, in economic terms, cost Thailand about USD 32.8 billion—roughly 6 percent of its GDP (World Bank, 2022). Beyond mortality, air pollution disproportionately affects the poor and vulnerable, hindering the country's economic growth by curtailing work hours,

³⁰ PM_{2.5} represents particles of an aerodynamic diameter of 2.5 microns and below, considered especially harmful since they can penetrate deep inside the lungs when breathed.

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decreasing agricultural yields, and reducing tourism in polluted areas. The projected cost of inaction on air pollution is expected to reach USD13 billion, or between 1.6 and 2.1 percent of Thailand's GDP, by 2030 (IIASA, 2023).

Local and regional agricultural burning and forest fires are the largest sources of air pollution in Thailand—and both are beyond the potential reach of carbon pricing. While carbon pricing can influence domestic polluters, Thailand's air pollution issue extends beyond its borders, with large contributions from agricultural burning, increasing wildfires, and widespread open waste burning in the greater Mekong region, particularly originating from neighboring Myanmar and Laos. To tackle this transboundary challenge, ASEAN nations have launched initiatives like the ASEAN Agreement on Transboundary Haze Pollution. Although progress has been made in reducing pollution hotspots in Southern ASEAN, the Mekong sub-region continues to face difficulties. In response, the Second Roadmap (2023-2030) aims to meet national PM_{2.5} air quality targets in line with WHO guidelines, focusing on reducing haze through strategies adapted to the specific conditions of each sub-region.

The challenge of air pollution calls for a mix of policies and priorities. While Thailand has implemented certain regulatory measures to tackle the issue, the persistent haze and high levels of PM_{2.5} in urban and rural areas indicate a need for more decisive commitment to policy action. The ongoing challenges, especially in regions like the greater Mekong, underscore the urgency for Thailand to update its targets and indicators in line with ASEAN's more ambitious Second Roadmap on tackling domestic sources of pollution. While carbon pricing could nudge polluters towards low-carbon alternatives where feasible, additional measures would thus be required to curb the local and regional release of various pollutants into the air:

- **Enact a Clean Air Act** to fill legislative gaps, integrate sectoral policies, and apply targeted controls or market-based solutions to polluters.
- **Prioritize regional and international cooperation** to tackle transboundary pollution and share best practices.
- **Perform a comprehensive, model-based cost-effectiveness assessment** to guide policy and investment decisions in air quality management.
- **Focus policy measures on major PM_{2.5} sources**, including:
 - **Transport:** Implement policies for better fuel quality, stringent emission standards, traffic management, and promotion of low-emission and low-carbon transport.
 - **Industry:** Advance cleaner energy use, introduce stricter environmental permits, set specific emission standards, and enhance monitoring and enforcement.
 - **Biomass open burning:** Introduce measures to reduce agricultural residue burning, prevent forest fires, and implement anti-burning and smog prevention campaigns.
 - **Forest fires:** Adjust policies and promote alternative agricultural practices to decrease the frequency and intensity of wildfires.
- **Manage and update emission inventories**, using models and tools for comprehensive pollutant analysis, and integrate air quality with climate change mitigation efforts for maximized co-benefits.

Carbon pricing could be beneficial to Thailand if other

The EU's Carbon Border Adjustment Mechanism (CBAM) places a tariff on imports to the EU that is equivalent in value to the costs imposed by the EU's own carbon price. The CBAM targets six emission-intensive sectors, including cement and steel, that currently account for 1.5 percent of Thailand's exports to

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countries implement CBAMs.

the EU. These exports could be put at risk by the CBAM. Although an expansion of CBAM to encompass other products or the adoption of CBAM by other countries could increase coverage, the impacts on Thailand are still likely to be limited outside specific sectors.³¹ Nevertheless, a domestic carbon price would be better for Thailand; the industries involved would still pay a carbon price, but the revenues would accrue to Thailand's government rather than to the EU.

Carbon pricing could become important in securing Thailand's position in global value chains.

There is a more substantial risk to Thailand that multinational corporations (MNCs), in pursuit of their own climate goals, start avoiding countries with carbon-intensive supply chains (and especially carbon-intensive electricity generation).³² The potential impacts of such a shift could dramatically outweigh the likely impacts of CBAM. Here, domestic carbon pricing could also shield Thailand's economy from negative trade impacts because MNCs would factor carbon pricing and subsequent emissions reductions that impact on supply chains when making their investment decisions. MNCs also benefit from international experience in reducing emissions³³, so could help with decarbonization in Thailand, if engaged with appropriate price-based incentives.

If carbon pricing is combined with other policies, ambitious targets like net-zero become more feasible.

Although much of Thailand's climate policy depends on the forthcoming Climate Change Act, ambitious targets have already been set for electrifying private vehicles. Thailand's recent *Public Revenue and Spending Assessment*³⁴ assesses ways to boost the uptake of electric vehicles (EVs). Despite current plans to electrify the public vehicle fleet by 2025, model simulations indicate that existing policies will not be sufficient to achieve current goals (Baseline in Figures I and J). However, a carbon price combined with support to build charging infrastructure and regulations on commercial vehicle use (e.g., taxis) could accelerate EV deployment and ensure consistency with the carbon neutrality target, provided that the power sector also decarbonizes.

³¹ One exception is Thailand's carbon-intensive plastics sector, which could lose output worth 0.2 percent of GDP in an expanded CBAM scenario. See New Climate Institute (2023) 'Trading-off: Exploring the Potential Implications of the EU's New Carbon Border Adjustment Mechanism for Southeast Asian Economies.' See: <https://newclimate.org/news/trading-off-exploring-the-potential-implications-of-the-eus-new-carbon-border-adjustment>

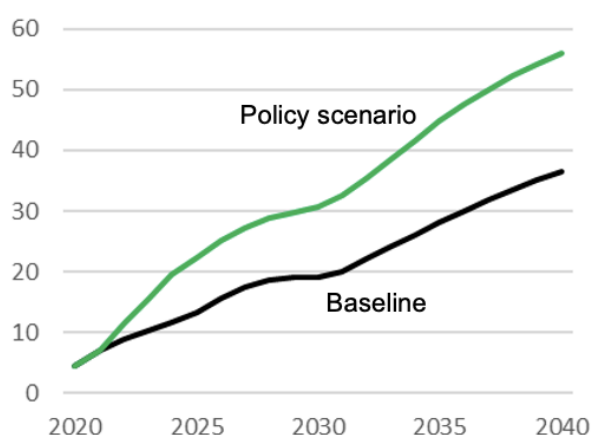
³² Standard Chartered (2021) 'Carbon Dated: The Net-Zero Supply Chain Revolution' See: <https://www.sc.com/en/insights/carbon-dated/>

³³ Brucal and others (2019). See <https://www.sciencedirect.com/science/article/pii/S0022199619300650>

³⁴ <https://www.worldbank.org/en/country/thailand/publication/th-prsa>

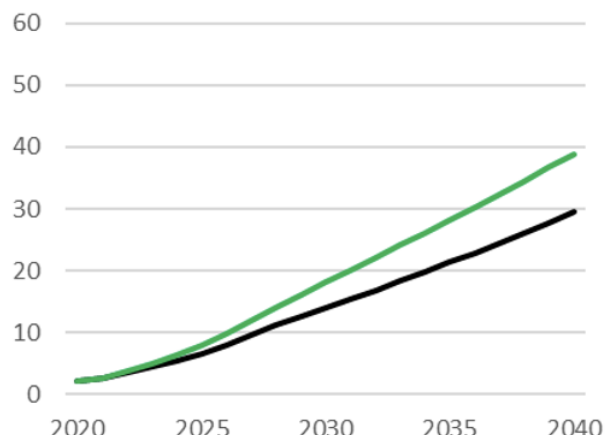
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Figure I: EV share in sales, %



Source: FTT:Transport modelling results.

Figure J: EV share in fleet, %



Source: FTT:Transport modelling results.

v. Key Messages Going Forward

Climate Policy at Crossroads: Crafting a Comprehensive Strategy

Thailand stands at a critical juncture in its climate policy journey. In the process of formulating the Climate Change Act, the country is actively seeking a robust policy mix to align with international commitments and achieve long-term net-zero emissions goals. To enhance the effectiveness of existing sectoral plans, a cohesive overarching strategy is essential to meet ambitious targets. ***Immediate action is needed to elevate policy ambition and ensure a clear roadmap towards a sustainable future.***

Carbon Pricing Integration: A Game-Changer for Thailand's Climate Agenda k.

Positioning carbon pricing as a pivotal element within the new policy framework is imperative. Recognizing its advantages, such as market-driven efficiency and revenue generation, is crucial. Implementation of carbon pricing can stimulate innovation, finance climate policies, and contribute to broader social objectives. ***It is time for Thailand to leverage carbon pricing as a catalyst for transformative change and sustainable economic growth.***

Holistic Approach: Augmenting Carbon Pricing with Complementary Policies

For carbon pricing to wield its full potential, it must work together with complementary climate policies. Conditions facilitating technological alternatives, awareness, and regulatory support are essential for effective emission reduction. Beyond carbon pricing, concerted efforts in awareness campaigns and regulatory reforms are necessary to create an environment conducive to behavioral change. ***The synergy between policies is the linchpin for success in reducing emissions and steering Thailand towards its climate goals.***

Designing Carbon Pricing: Addressing Key Questions for Optimal Impact

Strategic decision-making is vital in designing a carbon pricing instrument. Whether opting for an Emissions Trading System (ETS) or a carbon tax, determining sectoral coverage, and evaluating the role of offsets are key considerations. Balancing administrative efficiency with political feasibility is crucial. ***Thorough exploration of the design questions is imperative to ensure the effectiveness and acceptance of the carbon pricing mechanism.***

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Economic Viability: Carbon Pricing as a Driver for Sustainable Growth I	Contrary to concerns, implementing carbon pricing need not come at a high economic cost. Model simulations suggest a potential increase in GDP, with short-term stimulus from decarbonization investments. Transitioning to low-cost renewables and improved trade balance further bolsters economic production and job creation. <i>By strategically implementing carbon pricing, Thailand can position itself for sustainable economic growth and environmental stewardship.</i>
International Finance Opportunity: Project-Level Carbon Pricing P	Exploring Project-Level Carbon Pricing, through Emission Reduction Credits (ERCs), can connect Thailand to international carbon markets. The existing verification systems provide a foundation for seamless integration. This international linkage not only reduces operational costs but also positions Thailand to attract financial flows, supporting its own decarbonization efforts. Taking bold action to incorporate ERCs could serve as a pivotal stride in harnessing international finance for Thailand's sustainable future. <i>Project-level Emission Reduction Credits (ERCs) have the potential to play a transformative role in this pursuit of enhanced environmental sustainability and economic resilience.</i>
Carbon pricing: an idea whose time has come.	In conclusion, carbon pricing, when intricately woven into a comprehensive set of emission reduction policies, emerges as a transformative force shaping Thailand's sustainable development. Despite challenges in design and implementation, the potential rewards are significant. A well-crafted suite of policies centered around carbon pricing can turn Thailand's net-zero aspirations into a feasible reality. <i>The time has come for in-depth consideration of carbon pricing policy options to pave the way for a sustainable future</i>

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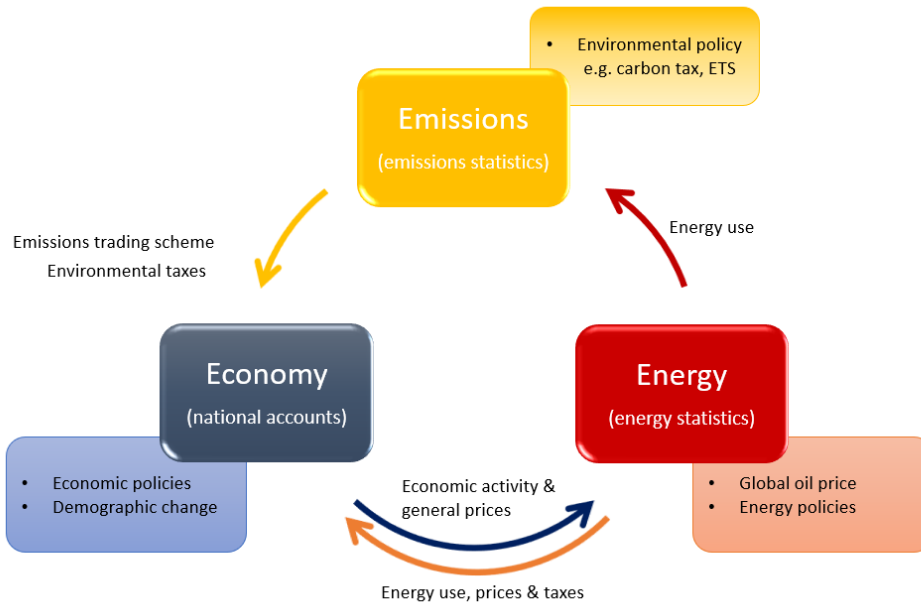
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Annex 1: The E3-Thailand model

E3-Thailand is a macro-econometric model of the Thai economy. It was originally built in 2017 with the specific purpose to assess the macroeconomic impacts of carbon pricing instruments in Thailand. The model links together the Thai economy, energy consumption and emissions in one single framework.

Figure C1: E3-Thailand Energy-emissions-economy linkages



E3-Thailand is based on an empirical approach that is different from the more common Computable General Equilibrium (CGE) neoclassical model. It relaxes assumptions about perfect knowledge, fully rational optimizing behaviour, fully flexible markets, and a fixed money supply.

E3-Thailand provides a system that is intended to reflect behaviour as it is observed, using an econometric approach, rather than applying principles of optimizing behaviour. Prices do not necessarily move to market-clearing rates and there are resources (e.g. labour) that are unused. The level of production is determined by the level of aggregate demand, unless supply constraints (e.g. full employment) are breached. There is an output gap between what the economy could produce (potential output) and what the economy is actually producing.

These features of E3-Thailand mean that the impact of a policy depends on both its efficiency of the allocation of scarce resources and how the policy impacts on aggregate demand (i.e. stimulus or austerity effects). In contrast, a standard CGE model will only consider the efficiency of resource allocation.

As CGE models typically start from an optimised position and add policies as constraints, the impacts of climate policy are usually negative. In contrast, E3-Thailand may find positive impacts if there is a stimulus effect, for example from the uptake of 'no-regrets' policy options.

Annex

The E3-Thailand model has a high level of disaggregation. It contains 42 economic sectors, 28 consumer spending categories, 24 users of 5 different energy carriers, CO₂ emissions from 24 sources and annual projections out to 2050.

E3-Thailand provides a wide range of socio-economic outputs at national and sectoral level, for example, employment, labour force and unemployment, wage rates, GDP, sectoral output, industry and consumer prices, investment, international trade, household income distribution (by social group), household consumption, and public balances: spending, taxes and subsidies.

The E3-Thailand technical model manual is available to download from the model webpage: <https://www.e3me.com/what/e3-thailand/>

Annex 2: China - Hebei Air Pollution Prevention and Control Program

China remains one of the most polluted countries in East and Southeast Asia. It is also, however, a recognized leader in air quality management, and a source of successful experiences and lessons.

The World Bank has been working on air quality management with the Chinese government for the last decade. The initial stages focused on institutional assessments, and characterization of the air pollution challenge (sources, sectors, health and economic impacts). In a second stage, the Bank mobilized cutting edge knowledge on cost-benefit modeling, and applied it to the Chinese context. Working closely with Chinese academics, the GAINS model³⁵ was applied to the JingJinJi area (formed by Beijing and the provinces of Tianjin and Hebei, the most polluted airshed in the country). The application of the model helped improve the existing air quality action plan for JingJinJi. Parts of the plan were then implemented in the Hebei province through a Program-for-Results (PforR) approach, with a USD500 million World Bank loan. The PforR links loan disbursements to tangible results, and has been proven its effectiveness in increasing expenditure efficiency for complex, multi-sectoral programs such as in air quality management. Disbursements by the Bank were made against progress made by the Hebei province in curbing emissions in key sectors: **in transport**, by substituting a polluting public bus fleet with a low-emissions fleet; **in households**, switching unhealthy coal-based domestic stoves to gas or electric stoves for cleaner cooking; **in agriculture**, by applying increased Nitrogen Use Efficiency fertilizers to agricultural fields; and **in industry**, by implementing a Continuous Emissions Monitoring and Enforcement system for Air Pollutants, which effectively caused industries to abide to emission standards and comply with regulations.

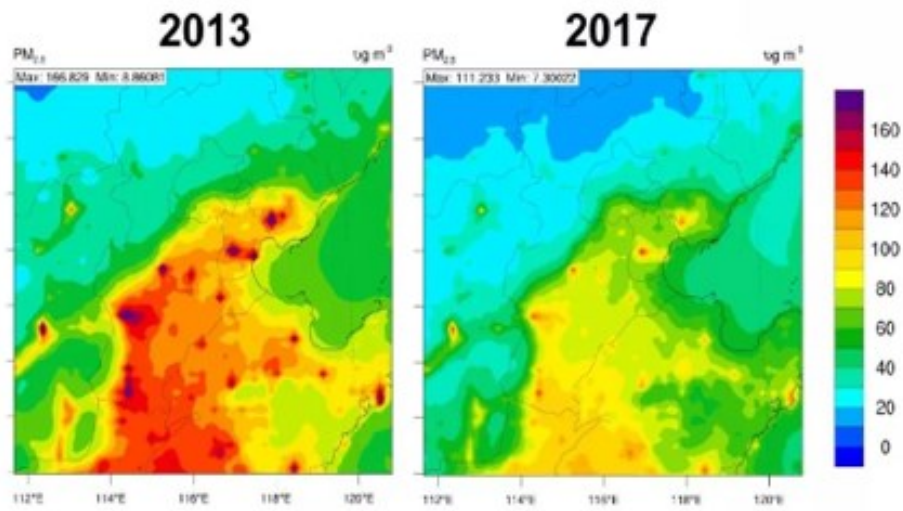
The program was extremely successful, managing to over-achieve its targets and reduce a staggering annual average PM_{2.5} concentration of 44% (from to 77 µg/m³ in 2013 to 43 µg/m³ in 2017), avoiding around 370,000 premature deaths, and delivering 4 to 6 million tons of CO₂-eq emission reductions.

One clear lesson learned from this Program is that cost effectiveness analysis is a key element for cities/regions and countries adopting measures that can achieve air quality at lowest costs. Original air quality plans for China were highly expensive. This high-cost approach would not be sustainable for the long term and identification of costs effective measures is crucial. China experience is being replicated to other China regions and countries under World Bank's technical assistance initiatives.


³⁵ The GAINS model, developed by IIASA is an internationally recognized model that explores cost-effective emission control strategies that simultaneously tackle local air quality and greenhouse gases so as to maximize benefits at all scales.

Annex

Figure 1. PM_{2.5} concentrations before (2013) and after (2017) Program implementation in the Jing-Jin-Ji region





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