



**THE THIRTEENTH NATIONAL ECONOMIC
AND SOCIAL DEVELOPMENT PLAN
(2023-2027)**

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(Unofficial Translation)

Foreword

The 13th National Economic and Social Development Plan (2023-2027) is a second-level plan that acts as a key mechanism to translate the National Strategy into implementation and serves as a framework for the formulation of third-level plans so as to enable relevant development partners to function in support of achieving the targets of the National Strategy within the expected timeframe. The National Economic and Social Development Council Act B.E. 2561 (2018) stipulated that the 12th National Economic and Social Development Plan shall be in effect until 30 September 2022, which means that the five-year timeframe of the 13th National Economic and Social Development Plan comes into effect on 1 October 2022 and falls within the national budgetary fund for the 2023-2027 period — the second five-year implementation period of the National Strategy.

The 13th National Economic and Social Development Plan (NESDP) was formulated with the intent to focus on tangible development implementations and targets as well as to indicate a clear direction that Thailand should take during the following five-year period. These objectives were accomplished by processing well-rounded data, including the various dimensions of capitals lessons learned from the previous development plan, and changes in the factors and conditions that will influence various organs of the country. In addition, as per the orientation of the drafting of the plan, all sectors of the development partners were supported to participate in broad exchanges of ideas and opinions.

The 13th Plan was formulated when the world and Thailand were still facing various limitations due to the COVID-19 pandemic, which not only caused illness and death but also adversely affected economic conditions, impacting the livelihoods of all groups of the population. In addition, the 13th Plan period fall within a time of rapidly-evolving technological development, worsening climate change, an ageing society in Thailand and many countries around the world, as well as geo-political changes. In striving for national development amidst these current transformative trends, it is therefore important to bolster the internal strengths of the country to enable it to continue to prosper in the midst of wide-ranging changes and transitions while attending to the economic, social and ecological benefits of the country in a sustainable fashion.

In orientating the direction of the 13th Plan in order to empower the country to overcome challenges and reach the stage when **“Thailand becomes a developed country with security, prosperity and sustainability in accordance with the Sufficiency Economy Philosophy”** in the spirit of the National Strategy, the following four principles were adopted:

1. Sufficiency Economy Philosophy by perpetuating, maintaining, and furthering national development in accordance with the Sufficiency Economy Philosophy and through national development guided by **reasonableness, moderation and immunization, based on knowledge and integrity**. Consistency with national and international situations and conditions must be considered along with the potentials of economic, social, natural resources and ecological capitals of the nation. Importance is placed on multi-dimensional balances, namely the balance between the enhancement of national competitiveness and the ability to maintain self-sufficiency; fairness in opportunities to reduce disparities; and ecological equilibrium that enables people to co-exist sustainably with the environment. All organs of the country are administered to ensure the ability

to cope promptly with risks from both domestic and international challenges. The formulation of national plans therefore shall be carefully considered using multidisciplinary approaches and implementation shall also be propelled to achieve the development goals for the utmost benefits of the people.

2. Resiliency by focusing on three levels of development; namely, **1) ‘Survival level’ or ‘Readiness’** in resolving or eliminating existing limitations or weaknesses that cause hardships to people’s lives or make the country vulnerable to internal and external changes as well as building preparedness for all levels of the society to cope with crises that might arise so that normalization can be quickly restored; **2) ‘Sufficiency level’ or ‘Adjustment’** of factors necessary to foster economic, social and environmental security from family level up to community and national levels. The adjustment includes directions, forms, and approaches to development to correspond to the dynamic changes taking place in the modern world; and **3) ‘Sustainable level’ or ‘Transformation for sustainable growth’** by pushing for structural changes in various dimensions to enhance the ability of individuals and society for continual development and support the sustainable growth of the nation.

3. Sustainable Development Goals (SDGs) by basing the development direction on the concept of **“leaving no one behind”** and focusing on enhancing a good quality of life for all groups of people in terms of access to adequate basic necessities of life; a healthy environment; supportive factors for both physical and mental health; opportunities to capitalize on one’s own potentials to improve one’s livelihood; and commitment to pass on natural resources and a healthy environment to future generations.

4. Bio-Circular-Green Economy Model (BCG Model) by focusing on scientific, technological and innovative knowledge to create added economic value and strive for a balance between the conservation and use of the natural resources base and biodiversity. The model also aims to transform manufacturing, services and consumption formats in order to reduce impacts on the environment.

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Part 1

Role, Significance and Characteristics of the 13th National Economic and Social Development Plan (2023-2027)

Actions taken to drive the country’s socio-economic development prior to the 20-Year National Strategy (2018-2037) were primarily based on the National Economic and Social Development Plans, which served as a framework for the planning of all administrative actions and other operations, including the application of the annual budget, to ensure coherence and consistency. The National Economic and Social Development Plans in the past were designed to act as Comprehensive National Development Plans for government agencies at all levels to align their missions, action plans, and budget applications with the goals specified in those plans. Each national development strategy in the previous development plans focused primarily on fulfilling its specific aspects of development objectives with an aim to ultimately integrate the achievements of each development aspect and bring about integrated, collaborative overall outcomes that would lead to the accomplishment of the national development goals indicated in the plan.

Picture 1-1: Alignment of three levels of the plans



Source: NESDC (2019)

However, after Thailand embraced the Constitution of the Kingdom of Thailand B.E. 2560 (2017), the formulation of plans to lay Thailand’s development framework has undergone significant changes. Section 65 of the Directive Principles of State Policies stipulates that **the State should set out a national strategy as a goal for sustainable national development under the principle of good governance to be used as a framework for formulating consistent and integrated plans as well as annual budget frameworks** so as to create synergies that will advance the national development goals as defined in the National Strategy. To transform national strategies into harmonized, systematic and actionable plans, **the National Strategy**, which is **the country’s first-level plan**, functions as a comprehensive national development framework that balances national development in the dimensions of national stability, economy, health, society and environment through a public participatory process. **The second-level plans** serve as key mechanisms for translating the National Strategy into actions and comprise the following: 1) **Master Plans under the National Strategy** which define integrated and interconnected development goals and strategic issues for relevant national strategies at different levels to ensure consistency; 2) **The National Reform Plan**, which aims to solve urgent structural, mechanical or regulatory barriers and lay a firm foundation for development to be compatible with the focused national development context; 3) **The National Security Policy and Plan**, which acts as the

directive framework for operations to prevent, issue alerts about, solve or suppress any threats to national security; and 4) **The National Economic and Social Development Plan**, which *identifies important development direction and goals under the National Strategy*, taking into account development dynamics and conditions the country is facing so that relevant sectors can adapt their operations to those conditions. A well-defined development direction will result in coherence in national development from direction to structure, policy and practice – which lays the groundwork for the achievement of long-term goals. Key development issues other than those indicated in the National Economic and Social Development Plan still maintain their significance and will be advanced through other second-level plans. All of the four aforementioned second-level plans are key mechanisms for transforming national development directions in various dimensions under the National Strategy into action in **the third-level plans**, which is action plans to clearly identify the operations of government agencies’ projects in accordance with their missions to ascertain the success of the second-level plans and the National Strategy in achieving their goals with coherence and integration at every level.

Picture 1-2: Elements of the second-level plans



Source: NESDC (2019)

To ensure that **the 13th National Economic and Social Development Plan will be able to accurately identify the direction and development issues the country must act on in the second five-year phase of the National Strategy**, it is necessary to **adjust the paradigm in the drafting of the 13th Plan to make it as clear, practical and up-to-date as possible**. The 13th Plan must explicitly state the main goals to be achieved as well as the sub-goals in each relevant dimension that shall be expedited or adjusted. It should also steer the country towards resolving weaknesses, reducing constraints, and developing a capacity to respond to global dynamics and conditions so that Thailand can grow continuously and sustainably amidst the evolving trends, uncertainty, and ever-increasing complexities of the modern world.

The 13th Plan was therefore drafted with an intention to clearly identify the development direction and goals upon which the nation needs to place an emphasis. The drafting process began by synthesizing and analyzing global, regional and domestic trends and their potential impacts, and then assessing consequent challenges and opportunities for national development with regard to the contexts, conditions, and constraints that Thailand is facing. Various elements of national

development are considered in a holistic and comprehensive manner before the emphasized goals are set for the timeframe of the 13th Plan for the country to enjoy sustainable growth and development accomplishments according to the National Strategy.

Part 2

National Development Context

In reviewing approaches to national development during the 13th National Economic and Social Development Plan, it is necessary to understand the situational context of national development, which is a key condition in coping with highly dynamic and ever-changing external factors that can introduce beneficial opportunities or risk factors to Thailand's development in the future. When faced with crises that gravely affect global economic, social and environmental conditions, Thailand needs to expedite the implementation of its national development plan to quickly reach targets by administering and managing its limited resources with the greatest efficiency.

The synthesis of the development context and the status of multi-dimensional capitals of Thailand during the 13th Plan was completed by **collecting and processing data derived from the outcomes of the 12th National Economic and Social Development Plan**, many issues of which still need to be implemented continually; together with **assessing the impacts of the COVID-19 pandemic** that brought about dramatic changes to the global development scenario and affected Thailand in many dimensions; and by contemplating on **predictions of key global megatrends** that can potentially affect Thailand's future development. The synthesis is expected to facilitate **an assessment of the directions, situational conditions, and present status of capitals in Thailand's various dimensions**, which constitute key factors in driving the national development plan into an anticipated direction, and to build Thailand's preparedness for adaptation amidst increasingly complex changes in the modern world. These goals are to be achieved through strategic development approaches with clear emphases that are suitable for national and international contexts. The aim is to overcome previous limitations while utilizing existing potentials to create opportunities for sustainable growth amidst complex changes in a timely fashion so as to ensure the fair and substantial distribution of benefits to all sectors of the country.

2.1 Economic Dimension of the National Development Context

Thailand's current economic system is categorized as efficiency-driven. The country's economic competitiveness is enhanced through the improvements of the manufacturing sector efficiency and product quality. Major investments are concentrated on the development of supporting factors; for example, basic infrastructures, education, labor training, efficiency of the labor market, market size, financial market development, and technological readiness. Despite the continual development of these supporting factors, Thailand still faces challenges in improving resource utilization, product and labor market efficiency, and the efficiency of its public sector. The slow progress of efficiency improvements has caused Thailand to fall behind several other countries that have achieved high-income status. Thailand has therefore been *trapped among the ranks of upper middle-income countries for a long time*, despite its success in maintaining economic stability. Problems relating to *structural factors* — namely the excessive reliance on foreign countries for capital, technology, production and exports as well as its limited bargaining power in the global value chain — are ongoing issues for Thailand. This, combined with limited economic productivity, makes the Thai economy vulnerable to changes and also hinders its capability to upgrade its income level.

The industrial sector, a crucial part of Thailand's economic progress, lags behind other countries with similar levels of development. The Thai manufacturing industry primarily relies on Original Equipment Manufacturer (OEM) production or traditional modes of production with limited value addition. Thailand lacks sufficient labor productivity, technology application, investments in intellectual property and capital accumulation to develop its own technologies. Thai industries with potential for high technology or research and innovation are relatively small and

face constraints in technological transfer, with a low ratio of domestic value-added generation and minimal use of domestic materials due to the absence of technology and key materials. Thailand's average annual growth in *total factor productivity (TFP)* is a mere 2.1 per cent, which is lower than that of other upper-middle-income countries. Limitations in labor skill and quality developments impede TFP growth and expose Thailand to various challenges such as fast-paced technological advancement, changing demographics, shifting consumer behaviors, and global trade conflicts that aggravate competitions in the global market. Meanwhile, the Thai *service sector* primarily operates in the traditional modes, mainly depending on low-skilled workforce without efficient utilization of technology. It is therefore a workforce-reliant service sector that generates low value-added with limited growth, emphasizing quantity rather than quality. Modern, technology-driven businesses and highly-skilled service sector are still relatively small.

The COVID-19 pandemic has had a major impact on most business operations worldwide. The Thai economy has been found to be highly sensitive to international economic events. In 2020, the Thai economy contracted by 6.1 per cent — more severe than most other countries in the world which had the average economic contraction of only 3.5 per cent. The Thai service sector, excluding public services, suffered the worst impact with a 7.5 per cent decrease in annual growth. This is in particular among the tourism industry, which is highly important to the Thai economy. Tourism revenues from foreign tourists declined to 2.18 trillion baht in 2020, leading to a 70 per cent contraction of the national economy. The sectors that suffered with relatively lower impacts are the industrial sector with a 5.9 per cent contraction and the agricultural sector with a 3.6 per cent contraction. Widespread economic disaster inevitably affects the labor market, leading to higher unemployment, reduced working hours, and an increase in a household debt to GDP ratio. Thai household and business sectors have become more vulnerable to debt repayment. In particular, vulnerable groups with low incomes and higher levels of short-term debts for consumption — which do not generate income and incur monthly installments of loan repayment — are the most affected by decreased incomes. Higher household debt may further restrain private sector consumption and affect the Thai economy as a whole. *This reflects the vulnerability of the Thai economic structure that has limitations in coping with crises and increasingly intense competition.*

The vulnerable economic structure and limited domestic value creation are key factors hindering Thailand's industrial development and economic growth, which also impacts its competitiveness in the face of a changing technological and consumer landscape in the global arena. The International Institute for Management Development (IMD) ranked Thailand 28th out of 64 economies for its economic competitiveness in 2021, downgraded from 27th in 2017. This was partly due to a focus on capital and price competition over investment in quality or value development, and partly due to the impacts of the new normal lifestyle on the growth of Thai online businesses. The domestic online market is dominated by foreign platforms providing access to cheaper foreign products, leading to intense price competitions.

The increased use of automation and robotic technologies in various production lines to replace workforce (while most laborers still lack necessary skills and knowledge), the labor sector contraction due to an ageing society, and trade restrictions implemented by several countries to put a curb on imports — these might all become factors constraining Thailand's economic growth in the future.

Despite several structural limitations and challenges, Thailand still maintains a potentially healthy state of **economy** due to its rich natural resources, well-developed infrastructure and

logistic systems, and expertise in producing products and services that meet global market demands. These factors support the country's adaptation in order to embrace benefits from opportunities presented by global megatrends, leading to shifts in consumer behaviors and demands, changes in business operations, alterations in the supply chain, and the relocation of manufacturing bases. The advent of the digital age will create new jobs that require technological skills and increase demands for electronic products. A globally ageing population will drive demands for medical and healthcare products and services. A health-conscious trend will lead to increased demand for safe agricultural and healthy food products. The rising concern for the environment will boost demand for clean energy, electric vehicles, and eco-friendly products and services, while putting pressure on businesses to adopt circular economy principles and prioritize sustainability. These contexts open up an opportunity for Thailand to transform its economic structure by shifting resources from a traditional production base to a future-oriented economy that generates higher value added and contributes to sustainable development in line with the approaches and goals of the National Strategy.

In this regard, Thailand's economic development during the 13th Plan needs to expedite a **transformation of the manufacturing sector into an innovation-driven economy that aims for sustainable development**. This ambition can be accomplished by emphasizing product and service quality enhancement to create higher value and by ensuring the fair and practical distribution of economic benefits to all relevant domestic sectors. In order to revive the economy from the impacts of the COVID-19 pandemic, diverse approaches for national economic restructuring need to be cascaded into multilevel policies and plans that support the transformation of key potential sectors to become industries and services of the future as the forthcoming drivers for economic growth. To achieve this goal, Thailand needs to boost the growth of industries with potentials and advantages by integrating technology to rapidly improve their overall productivity for high-value products and services. This requires investment in research and development to advance existing knowledge and foster innovation that will lead to the creation of Thai intellectual property with an emphasis on value and sustainability. Thailand should also focus on developing new industries of the future that align with global market trends so as to offset the declining domestic purchasing power. Achieving this objective requires efforts to enhance the quality of production factors, building an enabling ecosystem for fair competition, upgrading links to the global value chain, and maximizing the utilization of the existing infrastructure, incorporating technology and fostering innovation to improve labor productivity to correspond to the target of **transforming into the future-oriented and high-value creation industry and service sectors**.

The next development period is geared towards increasing the potential of the manufacturing sector as well as elevating the quality of Thailand's main products and services to correspond to global market demands and changes in the global value chain. This next development period will also *focus on expediting the development of Thailand's targeted key manufacturing and service sectors* by: 1) Elevating the agriculture sector towards the **production of high-value agricultural produce and processed agricultural products** by utilizing technology to improve productivity, reduce dependency on natural resources, and add value to agricultural produce for the high-value food industry; 2) Transforming the tourism sector, Thailand's key service sector, into **quality-focused and sustainable tourism** by promoting quality, value, and sustainability over quantity, and creating added value for services that align with the modern market's directions and trends; 3) Transforming the **automobile industry into an electric vehicle industry throughout the supply chain** with the support of investments in research and development in order to boost the capacity of Thai manufacturers while preparing the

energy infrastructure as well as other supporting factors in a systematic manner; 4) Propelling Thailand to become a **high-value medical and wellness hub** by producing more medical and healthcare personnel, upgrading standards, and supporting the utilization of advancements from cutting-edge research and technology in treatment processes and healthcare services as a means to create added value and to upgrade the level of services based on innovative and advanced technology; 5) Implementing strategies to make Thailand **the region's key strategic gateway for trade, investment and logistics** by enhancing connectivity between areas both domestically and internationally along with developing digital and logistical infrastructure to facilitate trade and investment; and 6) Accelerating the development of Thai electronics industry to become **ASEAN's center for smart electronics and digital industries**, by transforming Thailand's semi-conductor and electronics industries from OEM (Original Equipment Manufacturer) to OBM (Owned Brands Manufacturer) and ODM (Owned Design Manufacturer).

2.2 Social and Human Resources Dimensions of the National Development Context

The efforts for national development in various dimensions under the previous national economic and social development plans have resulted in Thailand's overall success in mitigating poverty-related problems reflected in the continual decline in the number and proportion of people living in poverty in Thailand. During the period of the 12th Plan, it was found that the proportion of the poor decreased from 8.6 per cent of the total population in 2016 to 6.84 per cent in 2020. However, due to limitations in long-term national data, the assessment of poverty eradication results can only provide the average value of the overall picture, which cannot explain the dynamics of poverty and cannot determine whether the most vulnerable households will be able to escape from poverty. The lowest-income group has increased its average income per head by 4.6 per cent, which is lower than the targeted 15 per cent a year on average. The key factor is the unequal distribution of benefits from economic growth. Despite an increase in national income generated by economic development, it was not fairly allocated to all population groups, resulting in the persistent poverty of some individuals. Moreover, an economic downturn following the impacts of the COVID-19 pandemic has led to an increase in poverty, making it more difficult for some people to escape from the poverty trap and increasing the likelihood of *intergenerational poverty*. The situation recapitulated structural problems in Thai society including disparities in access to quality education and skill development, technology, infrastructure, and public services. There is also inadequate social security and welfare to maintain stability, which could affect the long-term development of the country.

Thailand's inequitable distribution of economic and social opportunities has brought about disparities in many dimensions, including a wide gap of *income disparity* between the rich and the poor, with the average income of the richest group being nearly 16 times higher than the poorest group. The high-income group enjoys faster income growth compared to the low-income group, who continuously accumulates debt. The high-income group has more opportunity to save and invest, leading to the top-earning 10 per cent of the population owning assets valued at almost one-third of total national assets. This indicates *wealth disparity*, which is partly due to the unequal distribution of economic benefits in the past.

There is also a *spatial disparity* resulting from the growth and concentration of economic activities in Bangkok and its surrounding areas, where the majority of income comes from the industrial and trade sector, while the Northeastern and Northern regions, which make up about one-third of the population and whose income mostly rely on agriculture, have an economic size lower than 10 per cent of the national gross domestic product (GDP). The per capita income in

these regions is also lower at less than half the national average and three to four times lower than that of Bangkok and its surrounding areas. This is not only due to the concentration of economic activities but also to disparities in infrastructure, resources allocation and human capital quality, which are important factors for development. Bangkok and the Central region have higher Human Achievement Index (HAI) than other regions in almost all aspects, reflecting *disparity in access to quality public services* such as healthcare, education, profession, income, transportation and telecommunications. Moreover, Thailand also has a wide gap in the *business enterprise disparity* between businesses of different sizes. Even large Thai business enterprises, which are the main driving force of the country's economic growth, still have lower production capabilities compared to multinational companies (MNCs), while the Small and Medium Enterprises (SMEs), which make up more than 99 per cent of all enterprises and employ more than 70 per cent of the workforce, contributed only 34.2 per cent to national GDP in 2020. This indicates that Thailand is still unable to elevate the role of SMEs in driving the country's economy, as targeted by the goal of 50 per cent. Obstacles preventing small enterprises from developing into medium-size enterprises include limitations in access to capital for business expansion, productivity improvement, management system development, technology utilization, and domestic and international market expansions. These reflect the problem of Thai SMEs' inability to adapt and take advantage of technological advancement in order to cope with crises and to respond to fast-changing market demands. Thailand's multi-dimensional disparity problems were brought to light and exacerbated by the COVID-19 pandemic crisis. The poor and the disadvantaged underwent more severe impacts than the general population due to their lack of savings, inability to access credit services, and high risk of being laid off. They also faced greater health risks due to reliance on public transport and cramped, unhealthy living conditions, as well as limited access to protective gears and disease control equipment. Meanwhile, technological advancement might also lead to *digital disparity*, for a lack of digital tools, skills, and capital to access the internet. All these shortages exacerbate the opportunity to participate and benefit from new economic activities, education, skill development training, and access to public assistance measures.

As for its population structure, Thailand has become an ageing society from 2005, with a total number of over 11.6 million elderly people in 2020, or 17.57 per cent of the total population, and a trend that is set to increase. It is expected that within 2023 when the 13th Plan is in use, Thailand will become a *Complete Aged Society* with the number of people aged over 60 years old as high as 20.1 per cent of the total population. In contrast, the school-age and working-age population is on the decline, particularly those between three and twenty-one years old which will continually decline in proportion until they will account for merely 20.66 per cent of the total population in 2027, or a decline of over 715,000 people within the period of the 13th Plan.

Becoming a Complete Aged Society might aggravate domestic disparities due to higher income disparities among the elderly compared to the younger population. A continuous decline in the proportion of the working-age population might result in shortages in the workforce and increase the reliance on foreign laborers, leading to potentially negative economic and social impacts such as slowed growth, decreased competitiveness, and reduced labor productivity. Additionally, there will be a need for more budgetary requirements to cover the social welfare expenses of the retired population as well as higher healthcare costs, which would further increase the fiscal burden.

In terms of Thailand's *human resource development*, the overview seems to show continuous progress with improved well-being, better access to education, and higher income

levels. According to the Human Development Index (HDI) of the Organization for Economic Co-operation and Development (OECD), the Thai population of all age groups has gained more capability in general, but there is a declining trend in reading and educational attainment, with an increased number of the “Not in Education, Employment or Training” youth (NEETs) whose potentials have been undermined and underdeveloped. The **qualitative development of human capital** has always been a major challenge for Thailand, owing to the *system and quality of education* that generate low educational achievement.

A report by the Organization for Economic Co-operation and Development (OECD), which tested the knowledge and understanding of 15-year-old students worldwide in mathematics, science, and reading, found that 59.5 per cent of Thai students did not pass the standard criteria and only 0.18 per cent scored above the standard. Moreover, Thailand lacks synchronization between the education system and the labor market with absence of database on national human resources supply and demand to support workforce development planning. Such data would help identify necessary professional aptitudes and skills for each specific profession, which the business sector values more than educational certificates. These pose limitations in the production and upgrading of labor skills to correspond to the market’s demand and the national direction to transform its economic structure into an innovation-based economy that tends to have higher demand for skills related to science and technology, such as digital knowhow, data management, artificial intelligence, coding, as well as skills that technology cannot yet replace, particularly behavioral skills such as human skills, critical thinking, teamwork, and creativity. As the proportion of school-age population is expected to be declining, there will be less need for an expansion of educational institutions in terms of quantity, but this will provide an opportunity to upgrade educational quality, equality and efficiency. This can be achieved by utilizing technology in the management of educational resources and lifelong learning. The advancement of digital technology and more widespread access to the internet provides more opportunities for education and learning beyond the classroom, such as distance learning, lifelong learning and personalized learning. These types of learning will play an important role in responding to the demands of a fast-changing labor market.

An overall assessment of the context and status of Thailand’s social capital indicates that during period of the 13th Plan, Thailand must focus on resolving its structural problems in order to progress towards a **society of opportunities and fairness** through distributing opportunities, fostering equality, and reducing disparities in terms of income, wealth accumulation, geographical area, and business competition. These can be achieved by the **dissemination of economic and urban development** to distribute benefits from economic progress, provide equal opportunities to access basic infrastructure and quality public services, enhance physical, logistical and digital infrastructure to accommodate economic and urban development so that all groups of people can access and benefit from technology, including access to knowledge, finance, and social welfare. Particularly, this will enable vulnerable groups to have the opportunity to develop their full potentials in order **to remedy chronic poverty and prevent intergenerational poverty**. This can be achieved by promoting quality education and professional skill development to children and youth from the poor household group along with **developing comprehensive and inclusive social security and protection** that are systematically integrated to ensure stability in life and adequate social protection for all to be free from poverty in a sustainable manner.

To level the playing field for business competition, an emphasis should be placed on the **development of SMEs’ competitiveness potential** and sustainable growth by creating an

enabling environment that allows Thai entrepreneurs to compete fairly, such as providing technological support, accessible financial mechanism to cover all capital sources, upgrading product and service standards, as well as connecting Thai SMEs to the global value chain network.

2.3 Natural Resources and Environmental Dimension of the National Development Context

Thailand's **natural resources and environmental capital** serve as a fundamental pillar for sustainable economic development and quality of life for people. However, economic activities that excessively exploits natural resources for production and consumption can bring about waste and pollution beyond the carrying capacity of the local ecosystem and can lead to the deterioration of natural resources and environment. This may affect the long-term economic and social development of the country. Thailand's economic development over the past several decades could be regarded as focusing on the benefits of economic growth without sufficient consideration for sustainability in the use of natural resources and the carrying capacity of the ecosystem. The efficiency of natural resource usage in producing goods and services remain low with low added value creation. This has resulted in the rapid degradation of Thailand's natural resources and increasingly severe environmental problems from waste and pollution. This is a challenge for achieving sustainable development goals, which are among the key determining factors in attaining the development vision of the National Strategy.

An assessment of the country's key natural resources shows that Thailand's *forest resources* remain relatively stable, with the proportion of forest areas estimated to be around 31 to 33 per cent of the country's total landmass as a result of reforestation to replenish forest area loss each year. Nevertheless, these figures are still lower than the target laid out in the 12th Plan, which set an expansion of forest areas to cover 40 per cent of the country's total landmass. Considering long-term tendencies, it has been found that in the past forest encroachment and deforestation were the major causes of forest loss in the country. However, forest fires, both natural and human-caused, have recently become the most significant cause of Thailand's forest area loss. With wildfires becoming more common, coupled with the warming effects of climate change, forest land and biodiversity will be even more seriously threatened in the future.

As for *water resources*, Thailand has continuously been developing its water resources, both surface water and underground water sources. Nevertheless, the rapidly increasing economic activities in the agricultural, industrial, and tourism sectors, together with household consumption, have led to higher demands for water. This, combined with the degradation of natural water sources and fluctuating rainfall each year, has resulted in a decrease in the water level in reservoirs and more intense droughts each year. At the same time, Thailand is frequently prone to floods, and although the number of afflicted people has declined in the recent past, it is still rather high. The situation is made worse by the increasingly severe effects of climate change. However, advancement in technology can be useful for improving water management practices; for example, by using water-saving technologies in production processes, by adopting the internet of things (IoT) to manage water loss in the supply system, and by using technology to forecast the water situation with more precision and accuracy.

Marine and coastal resources play an important role in maintaining the balance of biodiversity — by serving as habitats for sea animals and plants — and in supporting various forms of economic activities such as transportation, tourism, and fisheries. Thailand has a total coastal area of 3,151 kilometers covering 23 provinces, which is at risk from natural factors and human actions; namely the encroachment of mangrove forests, release of toxic waste, pollutants, plastic

waste dumped into the sea and climate change. All of these are becoming a significant threat to marine and coastal resources as they can cause a loss of natural balance in coral reefs as well as increasingly serious coastal erosion in many areas.

Regarding Thailand's environmental capital, *waste management* is a significant challenge for the country's environmental management. The proliferation of economic activities and people's changing lifestyles generate continuously rising amounts of waste, increasing by 2 per cent a year on average during the period from 2010 to 2019 despite the usage of appropriate waste disposal and recycling systems. In 2020, only 69 per cent of waste was appropriately disposed of or recycled. This figure was lower than the target in the 12th Plan, which set it at no less than 75 per cent to be reached by 2022. Consequently, a large amount of waste remains, affecting water source quality, aquatic life, as well as both surface and underground water sources. Unmanaged waste is caused by the inadequate capacity of waste management systems, resulting in a failure to cope with the large amounts of waste generated by the country's economic and social activities. Besides, a lack of proper waste sorting and segregating leads to an inability to fully reuse waste products.

Air pollution is another problem in Thailand, particularly PM2.5 particles that mostly come from the burning of waste or agricultural materials in open air, vehicle emissions, diesel engine exhaust, industrial emissions, or natural disasters such as forest fires. This situation of toxic air pollution recurs every year, especially in industrial areas and large cities with dense populations and heavy traffic. The country's main industrial areas, especially Rayong province, continue to suffer toxic air pollution from benzene, which has constantly been higher than the standard level since 2012.

Regarding *Greenhouse Gas Emissions*, an environmental issue of global concern, Thailand has announced its goal to reduce its greenhouse gas (GHG) emissions and implement measures regarding climate change after 2020 when the GHG emissions were set to be reduced by 20 to 25 per cent in comparison with a business-as-usual level of GHG emissions in 2030, meaning that total GHG emissions are to be no more than 444 million tons of carbon dioxide equivalent. Although Thailand's GHG emissions have tended to increase consistently since 2013 from various activities, it is still lower than a business-as-usual level. In 2018, Thailand's GHG emissions were 16 per cent lower than a business-as-usual level, which was an unanticipated success based on the target set out in the 12th Plan, which targeted the GHG emissions to be lower than a business-as-usual level by 7 per cent. In reviewing the sources of GHGs, it was found that the highest proportion — 74 per cent of total GHG emissions — came from energy use while 42 per cent from electricity generation, 23 per cent from transportation and 20 per cent from industry and construction. The power and transport sectors will play a very important role in regulating Thailand's GHG emissions, in conjunction with plans to enhance the CO₂ absorption capacity of forests and land use, which currently has an annual capacity of 91.13 million tons of carbon dioxide equivalent.

Nevertheless, in order to achieve Thailand's carbon neutrality target by 2050 and realize Thailand's intention to reach net zero GHG emission by 2065 — according to a statement by the Thai Prime Minister to the 26th Conference of the Parties (COP 26) of the United Nations Framework Convention on Climate Change (UNFCCC) — Thailand will have to consider more challenging tactical targets and lay down long-term strategic targets in order to reduce GHG emissions by 40 per cent, or GHG emissions of 222 million tons of carbon dioxide equivalent by 2030. Presently, relevant agencies are reviewing targets as well as short-term and middle-term action plans in accordance with this stated intention. As current trends following advances in

technology and the awareness of climate change increase demand for clean energy, Thailand will see a significant opportunity to reduce GHGs in the upcoming period. The public sector must therefore progress to prepare the country's infrastructure to adequately and properly accommodate a low-carbon transition to renewable energy and electric vehicles.

Hence, a major approach to developing natural resources and environment capital in the next phase is the structural transition from short-term economic outcomes to sustainable growth. National development in the future will no longer be able to detach environmental issues from economic and social activities. Consequently, clear targets must be set towards becoming an environmentally friendly circular economy and a low-carbon society along with consumer behavior modifications in order to reduce the use of raw materials and production waste so as to resolve environmental problems.

The starting point of economic and social development in conjunction with the preservation of environmental balance in order to preserve the health of natural resources and environment and pass them on to the future generations in the long run can be achieved by promoting **the circular economy with efficient and sustainable use of resources in tune with the carrying capacity of the ecosystem** by: using scientific knowhow, technology and innovation to drive the Thai economy and society towards the most efficient use of resources by all sectors; providing measures to support investments in green technology and innovation; advocating the manufacturing sector to remodel its business operations to be in line with the circular economy approach in a low-carbon society; and encouraging local communities and farmers to participate in natural resources restoration while providing them with opportunities to enjoy tangible benefits from the circular economy so as to motivate them to change their economic behaviors and adopt sustainable modes of living.

Moreover, as most of the country's terrain lies in lowland areas and a large population relies heavily on agriculture in their livelihoods, Thailand faces high risks of being impacted by climate change. The country also has to tackle challenges from environmental imbalances from the repercussions of economic and physical development such as higher demands for water in urban areas and economic zones, climate change and more severe threats of natural disasters. These are management risks facing Thailand while the country still lacks the capability and efficiency in crisis management. Hence, it is necessary to rectify these issues by addressing the root causes in order **to mitigate the risks and impacts of natural disasters and climate change**. This can be achieved through the promotion of preventive measures against disasters in key areas, such as integrating relevant data for creating risk assessment maps in tandem with city planning; promoting the use of technology in risk management for natural disasters and climate change; educating the public and establishing participatory processes regarding disaster risk management; restoring and rehabilitating natural resources and ecosystems; and promoting international cooperation to collaboratively manage the risks of natural disasters and environmental challenges.

2.4 Public Administration Dimension of the National Development Context

During the 12th Plan period, Thailand saw progress in public administration, which is considered a significant development of the country's institutional capital. The public sector became more capable of responding to demands from various sectors through upgrading procedures and public service delivery into digital formats and developing information and data systems to support government agencies' operations. Moreover, the Thai government was outstanding in its development of *e-government and facilitation services for the business sector*.

In 2020, Thailand ranked 57th out of 193 countries in the United Nations' E-Government Development Index (EGDI), an improvement from its previous rank of 77th in 2016.

On the other hand, Thailand still faces some obstacles hampering *the efficient development of the public sector* from reaching its potentials. According to a report by the International Institute for Management Development (IMD), even though Thailand was able to lower the personnel budget ratio in the annual national expenditure to a certain extent with more local administrative organizations awarded for their improved performance, key limitations to the public sector's efficiency development still arise from structural problems. These are, for example, the immensity of the public administration body, outdated bureaucratic procedures and regulations that do not support the operations of the digital government, and a lack of systematic and integrated data system in digital format. This is because each agency primarily adheres to the legal framework of its duties and authority as well as the role of sole implementor rather than working cooperatively with other government agencies or sectors despite the fact that these agencies can deliver the same public services with higher quality and efficiency. There are redundancies in some agencies' roles and missions. Overlapping agencies are not working in an integrated manner and do not share or develop information systems together. It is also difficult and takes a long time to dissolve or merge government agencies that have become unnecessary, and this hinders the reformation of government agencies' missions to accommodate fast-changing contexts. Moreover, many outdated rules and regulations lead to operational delays, which forces people and the business sector to bear the high cost of capital investments — the real expenses and cost incurred by a loss of business opportunities could be as high as 133,816 million baht per year or 0.8 per cent of GDP.

Another key factor contributing to the successful enhancement of the public administration and institution capital is *fiscal sustainability*. Despite its good financial stability, Thailand's long-term fiscal management remains a cause for concern. The national expenditure budget structure during 2016-2020 exhibit a high level of fixed expenditure at an average of 74.8 per cent with a personnel expenditure ratio of 21.1 per cent on average, which is relatively high compared to other countries, while Thailand has a rather narrow tax base. This budget structure has an impact on the public sector's operations. As Thailand becomes an ageing society, there will be more challenges to its fiscal sustainability because more budget will have to be allocated to public welfare and public health, while the declining number of working-age population will have adverse impacts on economic growth. The limitations of these structures will unavoidably affect revenue collection and the budget administration of the public sector. Moreover, risks from crises that might erupt and cause severe impacts to the country might lead to less-than-estimated net revenue whereas it has to roll out many financial and fiscal policies and measures to relieve financial burdens on people and businesses. As a result, the government would have fewer fiscal resources for national development.

Thailand's *social safety* is another issue of concern. For security in life and property, the World Peace Index, rated by the Institute for Economics and Peace, ranked Thailand at 123th from a total of 163 countries, while the Global Cybersecurity Index (GCI) showed that Thailand degraded in rank, from 22th in 2017 to 44th in 2020, owing to limited potentials on both personnel and public agency levels that resulted in a failure to develop digital skills, knowledge and capacity to cope with cyber threats in a timely manner. It is therefore a challenge for the public sector to diminish present limitations and continue to improve public agencies' performances.

Regarding institutional capital on the civil society level, which is indicative of social stability and strength, Thailand has developed a rather strong civil society network with a high

level of volunteer operations and social assistance. This plays a very important role in coping with various crises and reflects a positive social force that is a good characteristic of Thai people. However, most agencies in the civil society sector still lack adequate support from the public sector and have limited connections to work together cooperatively. The current Thai social dynamism has a higher tendency for individualism with changes in social values from the widespread influences of online platforms and social media on people's lifestyles, which leads to frequent social movements that demand the public sector to operate with transparency and efficiency. Such movements might easily spark social unrest if there is a social trend of mistrust towards the public sector. The public sector is therefore compelled to acknowledge a need to transform its administration and management so that it can connect with, and provide opportunities for, all sectors in the society, by inviting them to become partners in the national development effort to ensure greater participation and efficiency and to consequently restore trust in the public sector.

Hence, public administration development to strengthen the institutional capital during the 13th Plan will focus on **enhancing public administration's quality and efficiency** in order to promptly and substantially respond to people's demands. The public sector then has to keep up with changes and provide quality services equally to every member of society. Connections between the central agency and local agencies shall be forged in an integrated system with good governance to maintain social stability and bolster the country's institutional capital.

Public sector reform is a perpetual challenge for Thailand, particularly in an era when most people are well-aware of their rights. The public sector therefore must expedite the development of institutional mechanisms to support a transformation into digital government by deploying technology in providing public services to ensure speed, convenience and efficiency. At the same time, it must resort to *information and participatory processes* in formulating public policies and in public administration and management to keep up with changes and to respond promptly to changing situations, with the ultimate goal of **enhancing the country's capability in dealing with changes and risks in a new global context**. Besides, the public sector must review its role and operational processes with an emphasis on developing its capacity for resilience, connectivity and openness, as well as committing to the digitization of information and services to give people and businesses convenient, speedy and economical access, while guaranteeing that the public sector's services are of good quality and responsive to the demands and expectations of people and all sectors in an efficient, equitable and timely manner. To achieve these goals, the public sector's human resources administration and management system needs to be modified to place a stress on equipping personnel with the necessary skills for digital public services. At the same time, outdated and unnecessary laws shall be revoked while laws and regulations supporting national development for future growth shall be formulated so that Thailand will have a **modern, efficient, and responsive public sector** that meets people's expectations and can truly contribute to Thailand's transformation.

Part 3

Objectives, Targets, and Development Milestones of the Thirteenth Economic and Social Development plan

3.1 Objectives and Targets

During the five-year period of the 13th National Economic and Social Development Plan (2023-2027) Thailand needs to overcome several challenges in order to cope with risks from domestic and international contextual changes while enhancing its ability to take advantage of arising opportunities in a proper and timely manner. Therefore, development directions in the 13th Plan are set with an aim to **transform the country into a “Progressive Society with Sustainable Value-Creating Economy”** through comprehensive transformation at the structural, policy, and mechanism levels so as to foster a society that keeps pace with the world’s dynamics to enhance Thai people’s opportunities to perform self-development to their fullest potentials. Manufacturing and service activities will also be enhanced to promote value add based on environmental sustainability.

To pursue the objectives, **the five main development targets** of the 13th plan are determined as follows:

3.1.1 Restructuring the manufacturing and service sectors towards an innovation-based economy: Enhancing competitiveness of key manufacturing and service sectors by stimulating value added enhancement through innovation, technology and creativity that corresponds to the development of a modern society and is environmental-friendly. Linking local economy and small entrepreneurs with the production value chain and target services. Developing and promoting enabling ecosystem that supports innovation, trade and investment.

3.1.2 Developing human capital for the new global era: Equipping Thai people with skills and traits that fit the modern world in terms of knowledge, behavioral skills and manners according to the norms of society. Expediting workforce enhancement to achieve quality that meets the needs of the labor market as well as to accommodate economic restructuring towards the higher-potential manufacturing and service sectors with higher productivity. Placing importance on developing social security and protection to enhance security in people’s life.

3.1.3 Creating a society of opportunities and fairness: Reducing economic and social disparity in terms of income, geography, wealth, and the business sector’s competition by supporting and enabling vulnerability groups and the underprivileged to have better opportunities towards socioeconomic mobility. Distributing economic opportunities. Providing equitable access to quality public services in every area. Promoting free and fair competition in the business sector.

3.1.4 Ensuring the transition of production and consumption towards sustainability: Reducing pollution together with improving natural resource utilization in line with ecosystem capacity. Pushing for a reduction of greenhouse gas emissions for Thailand to achieve carbon neutrality by 2050 and net zero greenhouse gas emissions by 2065.

3.1.5 Enhancing Thailand’s capability to cope with changes and risks in the new global context: Promoting preparedness for coping with and seizing opportunities arising from an ageing society, climate change, epidemics, and cyber threats. Developing basic infrastructure and institutional mechanisms conducive to digital transformation. Restructuring the public administrative system to be able to respond to changes in socioeconomic and technological contexts in a timely and efficient manner and with good governance.

Targets and indicators of each main aim are determined as follows:

Main Target	Indicators	Current Condition	2027 Target values
Restructuring manufacturing and service sectors towards an innovation-based economy	Gross National Income per capita	US\$7,097 (THB227,000) in 2021	US\$9,300 (THB300,000)
Developing human capital for the new global era	Human Achievement Index (HAI) (Covering 8 dimensions: health, education, employment, income, housing and living, family and neighborhood life, transportation and communication and participation)	0.6501 (Medium human achievement level) in 2020	0.7209 (High human achievement level)
Creating a society of opportunities and fairness	Disparity in wellbeing (expenditure) between population groups in the highest echelon: 10% (Top 10) and the lowest echelon: 40% (Bottom 40)	5.68 times in 2020	Lower than 5 times
Ensuring the transition of production and consumption towards sustainability	Greenhouse Gas (GHG) emissions	Reduction of GHG emissions from energy & transport sectors in 2019 by 17% from business-as-usual (BAU) level	Reduction of overall GHG emissions (energy and transport/ industry/waste management) by no less than 20% from business-as-usual (BAU) level
Enhancing Thailand's capability to cope with changes and risks under the new global context	Composite index measuring resiliency which comprises of four sub-indicators reflecting ability to cope with changes:		
	1) International Health Regulations (IHR) capacity and health emergency preparedness	85% in 2020	90% With each core competency at no less than 80%
	2) Global Climate Risk Index (CRI)	5-year average rank (2015-2019): 36.8	5-year average rank (2023-2027): no less than 40 ¹
	3) Digital Competitiveness Rank	38 th in 2021	30 th
	4) Government Effectiveness Rank	20 th in 2021	15 th

¹ High rank indicates high level of climate risk

Indicators and target values of each main target are collective indicators achievable through collaborative implementations of various development milestones and will be applied in the evaluation of overall achievement.

3.2 Development Milestones

In order to translate the main targets into a clearer vision of development agendas that promote operation integration among agencies and sectors so as to achieve tangible outcomes, **13 development milestones** have been formulated in the 13th Plan to identify what Thailand wishes to “be” or to “have.” These milestones will emphasize development issues that are of the highest priorities in transforming the country into a “Progressive Society and Sustainable Value-creating Economy”.

The 13 development milestones are categorized in 4 development areas as follows:

3.2.1 Targeted manufacturing and service sectors

Milestone 1: Thailand is a leading country in high-value agricultural produce and processed agricultural products.

Milestone 2: Thailand is a sustainable quality-oriented tourist destination.

Milestone 3: Thailand is the world’s major electric vehicle manufacturing base.

Milestone 4: Thailand is a high-value medical and wellness hub.

Milestone 5: Thailand is the region’s key strategic trade, investment and logistics gateway.

Milestone 6: Thailand is ASEAN’s hub for digital and smart electronics industry.

3.2.2 Socioeconomic opportunity and equality

Milestone 7: Thailand has strong, high-potential and competitive SMEs.

Milestone 8: Thailand has smart cities as well as safe and livable regions with sustainable growth.

Milestone 9: Thailand has less intergenerational poverty and adequate, appropriate social protection.

3.2.3 Natural resources and environmental sustainability

Milestone 10: Thailand is a circular economy and low-carbon society.

Milestone 11: Thailand can mitigate the risks and impacts of natural disaster and climate change.

3.2.4 Key enablers for Thailand’s transformation

Milestone 12: Thailand has a high-capability workforce committed to lifelong learning and responsive to future development context.

Milestone 13: Thailand has a modern, efficient, and responsive public sector.

Picture 3. Alignment of Development Milestones and Main Targets



Part 4



Strategic Plan Per Development Milestone

Milestone 1: Thailand is a Leading Country in High-Value Agricultural Produce and Processed Agricultural Products

1. Past Development Situation

Recent development in the Thai agricultural sector has mainly focused on the production of raw materials for downstream industries and exports as a means to generate inbound revenues achieved through expanding agricultural areas, improving inputs as well as continuously developing and applying technology. These measures succeeded in increasing production efficiency to a certain level. In 2019, the agricultural sector and related process industries contributed 1,477,589 million baht to GDP, with economic activities related to agricultural production and the food and beverage industry accounting for 74.5 per cent of GDP from the agricultural sector and related process industries.

Although the Thai government has promoted agricultural production and development throughout the supply chain, some limitations remain in the enhancement of Thailand's agricultural development. These include: 1) Irrigation: 83 per cent of agricultural lands lie outside irrigated areas; 2) Farming in inappropriate areas: 30 per cent of farmland is inappropriate for farming and has inappropriate soil quality; 3) Decrease in farmer land holdings: farmers now own only 48 per cent of agricultural land; 4) Air pollution caused by the open burning of crop residues; 5) Lack of clustering along the value chain among agricultural institutions and networks to increase negotiating power and reduce operational costs; 6) Mismatches between product quantity and quality for both direct consumption and industrial processes; 7) Production and exports of raw materials are low-value processed products and non-value added products; and 8) Rising average age of the agricultural workforce.

Meanwhile, external factors holding back Thailand's agricultural development and growth include: 1) Intensifying natural disasters, whether droughts, floods or storms, as well as infectious diseases of animals and plants; 2) Price fluctuations in agricultural products due to seasonality and global economic conditions; and 3) Increasing use of non-tariff social measures, such as labor and environmental standards in international and bilateral trade.

However, rising demand for food, more diverse agricultural raw materials and residues, and more eco-friendly awareness among manufacturers and consumers are opportunities for Thailand's agricultural sector to shift from “low-value quantity-oriented” to “high-value quality-oriented” production and turn Thailand into a leading producer of high-value agricultural produce and processed agricultural products. While considering the preparedness of the Thai agricultural sector in achieving this transition, there are certain areas that need to be examined, addressed, and improved in order to reduce restrictions and facilitate the production processes of high-value agricultural produce and processed agricultural products. These areas are: **(Upstream)** 1) Low usage of specific modern agricultural technology and innovation; 2) Few linkages among vast agriculture databases and lack of application in agricultural management; 3) Limited knowledge and understanding on creating added value from eco-friendly farm produce such as commercial tree plantations, agrotourism etc.; 4) Crop insurance system does not sufficiently attract farmers to voluntarily purchase crop insurance. **(Midstream)** 5) Few patents in food technology and processing innovations despite the establishment of “Food Innopolis” and the high volume of research and development investment; 6) Low levels of preparedness and long delays in building food safety and quality assurance infrastructure in order to standardize and register new quality-focused food products; **(Downstream)** 7) The unclear classification between high-value

agricultural and processed agricultural markets such as medical food, healthy food, herbal extracts, bio-chemicals etc.; 8) Limited numbers of central markets for agricultural produce and processed agricultural products; **(Enabling factors)** 9) Inappropriate water demand and supply management in terms of sourcing, allocation, water resources development and rehabilitation as well as water management techniques, including wastewater treatment, coupled with an unmet water need of 70 billion cubic meters and low capability to manage the risks of flood and drought; 10) A variety of agricultural safety standards and accreditation systems have different requirements, resulting in high costs when exporting to destination markets with its own standards; 11) Insufficient and ineffective system to collect, transport, and distribute agricultural products, which needs improvement to ensure modern and prompt handling; and 12) Inefficient mechanisms to link relevant parties in the supply chain.

2. Development Goals

2.1 Connections between Milestone 1 and the main targets and goals of the 13th National Economic and Social Development Plan and the National Strategy

Milestone 1, whereby Thailand is a leading country in high-value agricultural produce and processed agricultural products, is aligned with all of the five targets in the 13th Plan, namely: 1) **Target 1: Restructuring the manufacturing and service sectors towards an innovation-based economy** by enhancing competitiveness and enabling local economies and small enterprises to connect to the value chain of the target manufacturing and services sectors; 2) **Target 2: Developing human capital for the new global era** by creating a quality workforce in line with the needs of the target manufacturing sector; 3) **Target 3: Creating a society of opportunities and fairness** by reducing inequalities in terms of both income and economic security as well as increasing opportunities for businesses, while enabling vulnerable and marginalized groups to have better opportunities in economic and social mobility; 4) **Target 4: Ensuring the transition of production and consumption towards sustainability** through efficient use of natural resources in manufacturing and consumption and within ecological limits; and 5) **Target 5: Enhancing Thailand's capability to cope with changes and risks under the new global context** by overcoming significant future threats, in particular climate change, epidemics/emerging diseases, and cyber threats.

Milestone 1 is also consistent with the following three areas of the National Strategy:

1) **Competitiveness enhancement** with the following goals: 1) Thailand becomes a developed country with stable and sustainable economic growth; and 2) Thailand's national competitiveness is increased as per the National Strategy's master plan on agriculture, which focuses on raising manufacturing safety standards, leveraging the outstanding and unique quality of Thailand's agricultural produce and biological diversity to add value to agricultural produce, and using modern technology and innovation in production and farm management.

2) **Social Cohesion and Equity** with the goal of creating fairness and reducing inequalities in all dimensions as per the National Strategy's master plan on local economies, which focuses on agricultural clusters with a structure to concretely distributes income to local economy and community, and local economy drivers to bring together all sectors, including the private sector, civil society and local communities to develop and strengthen communities.

3) **Eco-Friendly Development and Growth** with the goal of ensuring balanced utilization and economic growth of the natural resource and environmental base by balancing

development with ecosystem capacity as per the National Strategy's master plan on sustainable growth, which focuses on growth with an emphasis on sustainable utilization, conservation, maintenance, rehabilitation and regeneration of the natural resource and environmental base without excessive use and pollution beyond the self-healing capacity of the ecosystem, as well as eco-friendly manufacturing and consumption.

2.2 Goals, Indicators, and Targets

Target 1 To increase value added of agricultural produce and processed agricultural products.

Indicator 1.1 National GDP in agriculture grows by 4.5 per cent per annum.

Indicator 1.2 Total net farmer household income is not lower than 537,000 baht per household by the end of the plan.

Indicator 1.3 Organic agriculture areas increase to 2.0 million rai and Good Agricultural Practices (GAP)-certified agriculture areas increase to 2.5 million rai by the end of the plan.

Indicator 1.4 Inappropriate farming areas decrease by 10 per cent by the end of the plan.

Target 2 To develop infrastructure and management system to ensure quality, food security, and sustainability of the agricultural sector.

Indicator 2.1 The agricultural sector has an average total factor productivity (TFP) of 1.5 per cent by the end of the plan.

Indicator 2.2 There are at least two central markets for agricultural produce each in the Northern, Northeastern, Southern Regions, and one each in the Central and Eastern Regions by the end of the plan.

Indicator 2.3 There are at least 40 billion cubic meters per year of water flowing into reservoirs across the country by the end of the plan.

Indicator 2.4 Efficiency of the irrigation system is not lower than 75 per cent by the end of the plan.

Indicator 2.5 At least 20 per cent of non-agricultural irrigated areas reuse water by the end of the plan.

Indicator 2.6 There are at least 4,000 sub-districts with a capacity to reduce flood and drought risks and establish community water management systems by the end of the plan.

Target 3 To enhance the capacity and role of farmers as economic partners in the supply chain with a proper and fair share of benefits.

Indicator 3.1 The number of Level-1 agricultural cooperatives according to the cooperative strength criteria increases by at least 18 per cent by the end of the plan.

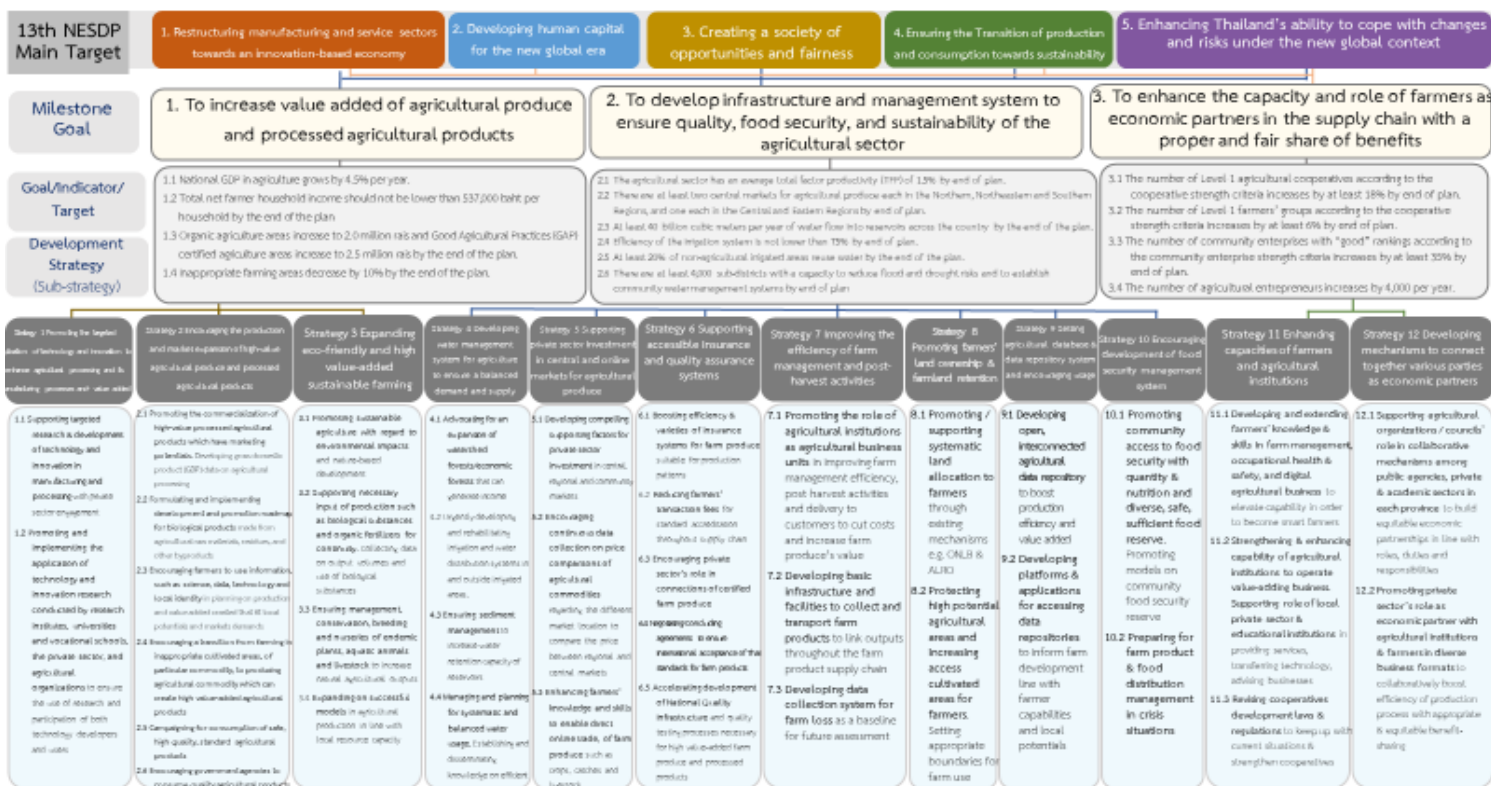
Indicators 3.2 The number of Level-1 farmers' groups according to the cooperative strength criteria increases by at least 6 per cent by the end of the plan.

Indicator 3.3 The number of community enterprises with "good" rankings according to the community enterprise strength criteria increases by at least 35 per cent by the end of the plan.

Indicator 3.4 The number of agricultural entrepreneurs increases by 4,000 per annum.

3. Strategy Map

Milestone 1: Thailand is a leading country in high-value agricultural produce and processed agricultural products



4. Development Strategies

Strategy 1 Promoting the targeted application of technology and innovation to enhance agricultural processing and its value add:

Sub-strategy 1.1 Supporting targeted research and development of technology and innovation in agricultural production in collaboration with private sector to apply in particular market appropriately.

Sub-strategy 1.2 Promoting and implementing the application of technology and innovation research, conducted by research institutes, universities and vocational schools, the private sector, and agricultural organizations, to ensure the beneficial use of research and participation of both technology developers and users.

Strategy 2 Encouraging the production and market expansion of high-value agricultural produce and processed agricultural products such as safety-guaranteed produce, herbal extracts, medical food, alternative foods, functional foods, bioenergy, biomaterials and biochemicals, and plant-based and insect-based proteins:

Sub-strategy 2.1 Promoting the development and commercialization of high-value processed agricultural products which have marketing potentials through a comprehensive roadmap for developing and promoting high-value processed agricultural products per product category. This support could bring about systematic, continuous and efficient development and promotion. Moreover, gross domestic product (GDP) data on agricultural processing product should be developed for formulating further support.

Sub-strategy 2.2 Formulating and implementing a development and promotion roadmap for the production and use of biological products. These products are made from agricultural raw materials, residues from the agricultural production process, and other byproducts. Examples of products include bioenergy, biomaterials and biochemicals, organic fertilizers, vaccines, biotics, carbon credits and carbon sinks.

Sub-strategy 2.3 Encouraging farmers to utilize diverse information, such as scientific knowledge, technology and innovation in the production process, agricultural database and local identity in analyzing, planning and improving products, productivity and agricultural processing. The local potentials and markets demand should be considered in order to apply an appropriate improving approach by farmers.

Sub-strategy 2.4 Encouraging a transition from farming in inappropriate cultivated areas, of particular commodities, to producing agricultural commodity which can create high value-added agricultural products.

Sub-strategy 2.5 Raising consumer awareness to promote the consumption of agricultural and processed produce with safety, high quality, and certified standards in order to stimulate market activities for extensive quality products.

Sub-strategy 2.6 Encouraging government agencies to consume quality agricultural produce and processed agricultural products such as agricultural produce for hospital, school and prison use, as well as medical food.

Strategy 3 Expanding eco-friendly and high value-added sustainable farming models based on domestic success cases, such as farming related BCG economy, good agricultural

practice, agroforestry, organic farming, agrotourism, artisanal fishery, legal fishing, and good labor practice:

Sub-strategy 3.1 Promoting sustainable agriculture with consideration to environmental impacts and nature-based development through the sustainable protection, management and rehabilitation of nature/ecosystems in order to improve the quality of people's lives and benefit biological diversity, particularly through sustainable agricultural practices such as reforestation, agroforestry, elimination of open burning, legal fisheries and good labor practices.

Sub-strategy 3.2 Supporting necessary inputs to ensure further adoption of eco-friendly, high value-added agricultural models. Examples of input include biological substances and organic fertilizers. The data on output volumes and use of biological substances should be continuously collected for further suitable measures.

Sub-strategy 3.3 Ensuring the management, conservation, breeding and nurseries of endemic plants, aquatic animals and livestock to naturally increase agricultural outputs.

Sub-strategy 3.4 Expanding on successful models to efficiently manage agricultural production in line with local resource capacity.

Strategy 4 Developing water management system for agriculture to ensure a balanced demand and supply as well as reuse:

Sub-strategy 4.1 Advocating for an expansion of watershed forests/economic forests to generate income in areas inappropriate for farming, as well as increasing natural water volume for adequate use by the entire system.

Sub-strategy 4.2 Urgently developing and rehabilitating irrigation and water distribution systems in irrigated areas, together with developing and managing water sources outside irrigated areas and community water sources, as well as proper sediment management to increase the water retention capability of reservoirs. These implementations require cooperation between local administrative organizations and relevant government agencies.

Sub-strategy 4.3 Ensuring appropriate sediment management to increase the water retention capability of reservoirs. The management include the sediment filtration, as well as the planted soil-covering or anti-erosion to reduce the soil erosion along the water area.

Sub-strategy 4.4 Managing and planning for systematic and balanced water utilization, as well as establishing and disseminating knowledge on efficient water utilization, such as a reuse of water.

Strategy 5 Supporting private sector investment in developing central and online markets for agricultural produce including livestock and fishery products:

Sub-strategy 5.1 Developing compelling supporting factors to encourage private sector investment in developing central, regional and community markets.

Sub-strategy 5.2 Encouraging continuous data collection on price of agricultural commodities regarding the different market location to compare the price between regional and central markets.

Sub-strategy 5.3 Enhancing farmers' knowledge and skills to enable direct online trade of their produce including crops, catches and livestock.

Strategy 6 Supporting insurance and quality assurance systems for agricultural and its processed products that are accessible and affordable to farmers:

Sub-strategy 6.1 Enhancing the efficiency and varieties of insurance systems suitable for diverse agricultural production patterns.

Sub-strategy 6.2 Facilitating a reduction of farmers' transaction fees regarding standard accreditation throughout the supply chain to increase access and to incentivize farmers to produce products with higher standards.

Sub-strategy 6.3 Encouraging the private sector's role in linking certified agricultural produce to the value-added agricultural product supply chain.

Sub-strategy 6.4 Negotiating/concluding agreements with relevant organizations to ensure that Thailand's standards for agricultural produce and products are internationally acknowledged.

Sub-strategy 6.5 Accelerating the development of National Quality Infrastructure including quality testing processes necessary for the development of high value-added agricultural produce and processed agricultural products.

Strategy 7 Improving the efficiency of farm management and post-harvest activities to reduce costs and increase the value of agricultural produce:

Sub-strategy 7.1 Promoting the role of agricultural institutions (cooperatives/farmers' collectives/social enterprises) as agricultural business units in improving farm management efficiency, post-harvest activities and delivery to customers so as to reduce costs and increase the values of farm produce.

Sub-strategy 7.2 Developing basic infrastructure and facilities to collect and transport agricultural produce in order to link outputs throughout the agricultural product supply chain.

Sub-strategy 7.3 Developing data collection system for farm loss as a baseline for future assessment.

Strategy 8 Promoting farmers' land ownership and conservation of appropriate agricultural areas as agricultural production bases:

Sub-strategy 8.1 Promoting and supporting systematic land allocation to farmers through existing mechanisms, such as land allocation to communities as per government policies and land allocation by the Agricultural Land Reform Office.

Sub-strategy 8.2 Protecting high-potential agricultural areas and increasing access to cultivated areas for farmers, as well as determining appropriate boundaries for agricultural use.

Strategy 9 Developing an agricultural database and data repository system and encouraging the effective use of data:

Sub-strategy 9.1 Developing a connected agricultural data repository with public access to be adopted as a basis for boosting the efficiency of agricultural production and value-add creation. The crucial data include 1) natural resources (e.g. water, soil, forests, the sea, etc.), 2) agriculture, such as the appropriateness of agricultural production in a given area, farmer

registration, etc., 3) marketing of agricultural produce and processed agricultural products (e.g. price trends, markets, etc.), and 4) technology and innovation.

Sub-strategy 9.2 Developing platforms and applications for accessing data repositories to allow the use of agriculture-related data in classifying farmers' production patterns and capability. The application could ensure that approaches and other measures established to develop the agricultural sector are aligned with different farmer capabilities and local potentials for cultivating agriculture produce.

Strategy 10 Encouraging the food security management system:

Sub-strategy 10.1 Promoting community access to food security in terms of quantity, nutrition, as well as diverse, safe, sufficient food security reserves. The food security reserve model for community should be encouraged to establish as a role model for further implementation.

Sub-strategy 10.2 Preparing for agricultural product and food distribution management in crisis situations.

Strategy 11 Enhancing the capacities of farmers and agricultural institutions:

Sub-strategy 11.1 Developing and extending farmers' knowledge and skills in farm management, occupational health and safety, and digital agricultural business to elevate farmers' capability in order to become smart farmers. Smart farming has high potentials capability in enhancing agricultural production systems and its value-added creation in line with local conditions and market demands.

Sub-strategy 11.2 Strengthening and enhancing capability of agricultural cooperatives, farmers' collectives and community enterprises to operate value-adding businesses. Supporting the role of local private sector and educational institutions, including vocational schools and higher education institutions as a service provider, technology transfers, and business consultants so as to enable effective adaptation and scaling up of agricultural businesses.

Sub-strategy 11.3 Reviewing and revising cooperative-related laws and regulations to keep up with current trends while strengthening cooperatives, such as revising accounting systems and financial auditing to improve speed, transparency and independence in order to prevent and address problems in a timely manner as well as to build public confidence in the cooperative system.

Strategy 12 Developing mechanisms to connect various parties, including the private sector, government agencies, farmers' group and local academics, to forge economic partnerships in agricultural development throughout the supply chain:

Sub-strategy 12.1 Supporting the role of agricultural organizations/councils in collaborative mechanisms among government agencies and the private and academic sectors in each province to ensure that the production and business operations of farmers in particular areas are in line with those areas' potentials, the private sector's needs, provincial government agencies' missions, and the expertise of local educational institutions. This collaboration is to establish economic partnerships based on the sharing of knowledge, data, skills and benefits in an equitable manner and commensurate with roles, duties and responsibilities.

Sub-strategy 12.2 Promoting the role of the private sector as an economic partner in agricultural businesses with agricultural institutions and individual farmers to foster

collaboration and enhance the efficiency of the production process in line with local potentials and market demands. This benefit-sharing should be appropriate and equitable among the partners.

Milestone 2: Thailand is a Sustainable Quality-Oriented Tourist Destination

1. Past Development Situation

As an important source of direct and indirect income, the tourism industry has played a vital role in Thailand's economy, accounting for 2.99 trillion baht (18 per cent of GDP) and employing 8.3 million workers in 2019. The industry continued to see steady growth with an annual revenue growth of 2.3 per cent between 2015 and 2019. However, such growth was mainly due to the average 5.6 per cent annual increase in tourist numbers, while the average spending per tourist grew at a decelerating speed and the average duration of stay also decreased. As a result, Thailand's tourism industry has faced challenges in sustainability due to quantitative rather than qualitative growth. In terms of income distribution, it has been found that 90 per cent of tourism-related revenues concentrate in the main tourist destinations with little distribution to secondary tourist destinations. In particular, approximately 98 per cent of revenues from international tourist spending is incurred at primary tourist destinations.

Since 2020, the COVID-19 pandemic has caused a severe contraction of the tourism industry as revenues declined by 71 per cent since 2019 to 0.79 trillion baht in 2020. Despite the government's domestic stimulation packages including "We Travel Together" and "Kamlangjai" programs, the tourism sector has yet to recover because the structure of the Thai tourism industry heavily relies on international tourists (63.9 per cent). In addition, the industry's contraction heavily impacted tourism-related businesses due to a decline in tourist numbers and a liquidity crisis. The government has therefore implemented urgent rehabilitation and remedy measures to increase liquidity, including low-interest loans and a debt moratorium, but most tourism-related businesses are in the informal sector and, as a result, cannot adequately access these measures. As the pandemic persists, the economic outlook of Thailand's tourism industry remains uncertain.

Thailand's tourism still holds advantages over rival countries due to the country's strategic location at the center of the region, its natural and cultural diversity, and the friendly nature of Thai people. According to the World Economic Forum, Thailand ranked 36th out of 117 countries in the Travel and Tourism Development Index 2021: Rebuilding for a Sustainable and Resilient Future, dropping one position from the 35th rank out of 117 countries in 2019. The 2021 report indicated that Thailand's significant strengths lied in air transport infrastructure (13th), natural resources (14th), and non-leisure resources (16th). However, certain challenges remain to be addressed. These are environmental sustainability (97th), safety and security (92th), and prioritization of travel and tourism (88th). These weaknesses are important issues for tourism over the coming period, which will be driven by the key trends of 1) health and hygiene-related concerns, 2) an ageing society, 3) advanced technology in tourism, and 4) environmental awareness and sustainability.

Sustainable development of the tourism industry must take into consideration internal and external risk factors. Based on the current tourism situations, trends and past problems, Thailand faces many challenges which need to be addressed in order to achieve the set goals, namely: 1) create added value to increase tourist spending by prioritizing quality over quantity 2) enhance tourism competitiveness, especially for secondary tourist destinations and small enterprises to attract more domestic travelers, and ensure efficient distribution of tourism revenues, 3) sustainable tourism management with regards to cleanliness and safety standards as well as social, natural and environmental aspects, and 4) develop enabling factors to ensure sustainable tourism, in particular preparedness of the workforce and businesses to adapt to changes, amendment of the

obsolete/obstructive laws and regulations as well as the use of technology and data to efficiently develop and promote tourism.

2. Development Goals

2.1 Connections between Milestone 2 and the main targets and goals of the 13th National Economic and Social Development Plan and the National Strategy

Milestone 2, whereby Thailand is a sustainable quality-oriented tourist destination, is aligned with the National Strategy in the area of **competitiveness enhancement** with a focus on diversifying the tourism products and experiences to maintain the country's status as a world-class tourist destination attracting all classes of visitors and increase the proportion of high-quality tourists. It is also connected with four targets in the 13th Plan, namely, 1) **Target 1: Restructuring the manufacturing and service sectors to become an innovation-based economy** by enhancing tourism competitiveness and enabling local economies and small enterprises to connect to the value chain; 2) **Target 2: Developing human capitals for the future**; 3) **Target 3: Creating a society of opportunities and fairness**; and 4) **Target 4: Transitioning production and consumption towards sustainability** through efficient and sustainable management of tourism resources.

2.2 Goals, Indicators and Targets

Target 1 To transform Thailand's tourism into high quality-oriented tourism with links to other high-potential industries and services.

Indicator 1.1 Spending per day of domestic and international tourists increases by 10 per cent per year on average.

Indicator 1.2 Thailand's overall Travel and Tourism Development Index (TTDI) ranking improves to the 25th rank or better; safety and security to the 50th rank or better; environmental sustainability to the 50th rank or better; health and hygiene to the 50th rank or better; and cultural resources and business travels to the 25th rank or better.

Indicator 1.3 Tourist satisfaction level improves by 0.05 points per year.

Indicator 1.4 The number of repeated visitors increases by 15 per cent per year on average.

Target 2 To restructure the country's tourism sector to lean towards domestic travelers, and to improve the distribution of economic opportunities.

Indicator 2.1 Tourism revenues of all secondary destinations (weighted average of all secondary destinations) increases by 10 per cent per year on average.

Indicator 2.2 Revenues from domestic tourists increase by 10 per cent per year.

Indicator 2.3 The number of Community-based Social Enterprises increases by 50 communities per year on average.

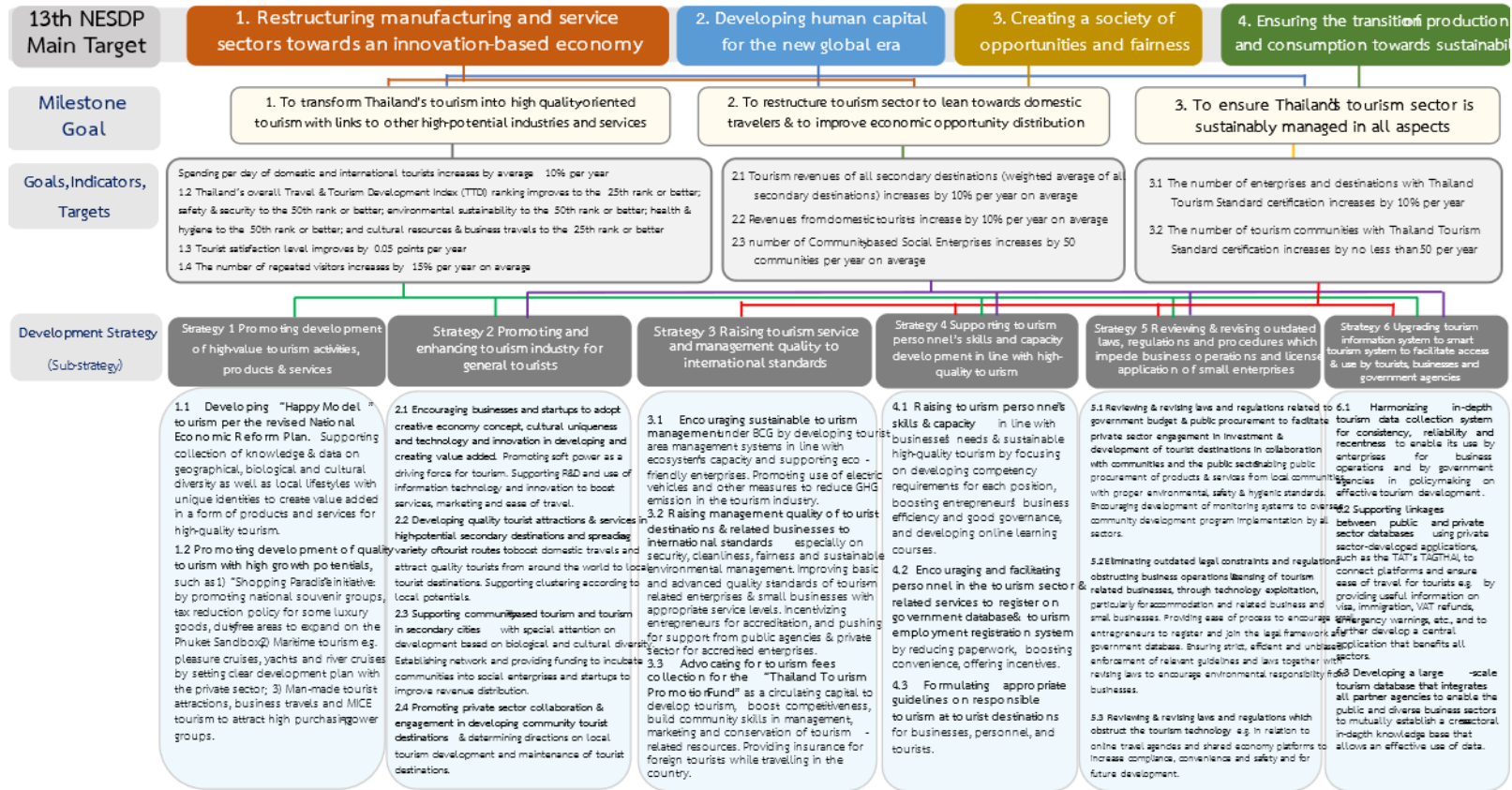
Target 3 To ensure that Thailand's tourism sector is sustainably managed in all aspects.

Indicator 3.1 The number of enterprises and destinations with Thailand Tourism Standard certification increases by 10 per cent per year.

Indicator 3.2 The number of tourism communities with Thailand Tourism Standard certification increases by no less than 50 communities per year.

3. Strategy Map

Milestone 2: Thailand is a sustainable quality-oriented tourist destination



4. Development Strategies

Strategy 1 Promoting the development of high-value tourism activities, products, and services:

Sub-strategy 1.1 Developing “Happy Model” tourism as per the revised National Economic Reform Plan. Supporting the collection of knowledge and data on geographical, biological and cultural diversity as well as local lifestyles with unique identities to create value add in the form of products and services for high-quality tourism, thus generating commercial benefits, increasing the capacity of businesses, and ensuring good experiences and quality of life for tourists as well as local populations at tourist destinations.

Sub-strategy 1.2 Promoting the development of quality tourism with high growth potentials including 1) “Shopping Paradise” initiative: by encouraging the launch of national souvenir groups as well as tax reduction policies for importing certain classes of luxury goods, establishing duty-free areas as an extension of the Phuket Sandbox to stimulate spending and revenue distribution to small entrepreneurs; 2) Maritime tourism including pleasure cruises, yachts and river cruises: by formulating a clear development plan in collaboration with the private sector to identify locations for marinas both as home ports and transit ports, for cruises in areas with potentials along the Gulf of Thailand and the Andaman Sea such as Pattaya and Phuket, together with creating tourist spots in connection with the marinas to substantially stimulate private investment and revenue distribution; 3) Promoting man-made tourist attractions, business travel and MICE (Meetings, Incentives, Conferences and Exhibitions) tourism to boost domestic and international investments, business travels as well as other travel styles for high purchasing-power groups such as senior citizens, retirees, long-term visitors, and digital nomads.

Strategy 2 Promoting and enhancing tourism industry for general tourists:

Sub-strategy 2.1 Encouraging businesses and startups to adopt creative economy concepts, cultural uniqueness and technology and innovation in developing and creating value add to tourism. Promoting soft power as a driving force for tourism. Supporting research and development as well as the use of information technology and innovation in enhancing services, marketing and ease of travel.

Sub-strategy 2.2 Developing quality tourist attractions and services at high-potential secondary destinations and spreading a variety of tourist routes thoroughly to boost domestic travel and attract quality tourists from around the world to local tourist destinations. Supporting clustering according to local potentials.

Sub-strategy 2.3 Supporting community-based tourism and tourism in secondary cities with special attention on development based on biological and cultural diversity. Encouraging the concept of generating income from natural and cultural conservation. Building ecotourism knowledge. Developing environmental management systems at tourist destinations to promote community and cultural protection. Establishing networks and providing funding to incubate communities into social enterprises and startups to improve revenue distribution.

Sub-strategy 2.4 Promoting private sector collaboration and engagement in developing community tourist destinations and in determining directions on local tourism development, security and safety, and maintenance of tourist destinations to ensure good conditions.

Strategy 3 Raising tourism service and management quality to international standards:

Sub-strategy 3.1 Encouraging sustainable tourism management under the BCG (Bio-Circular-Green) Economy concept by developing tourist area management systems in line with the ecosystem's capacity and supporting eco-friendly enterprises. Promoting the use of electric vehicles and other measures to reduce greenhouse gas (GHG) emission in the tourism industry.

Sub-strategy 3.2 Raising the management quality of tourist destinations and related businesses to international standards especially in relation to security, cleanliness, fairness and sustainable environmental management, such as hygiene measures based on emerging tourism approaches so as to steer towards high-quality tourism as well as "white tourism" standards. Improving basic and advanced quality standards of tourism-related enterprises and small businesses with appropriate service levels. Incentivizing entrepreneurs for accreditation, and pushing for support from government agencies and the private sector for accredited enterprises.

Sub-strategy 3.3 Advocating for the collection of tourism fees to contribute to the "Thailand's Tourism Promotion Fund" as a circulating capital to develop tourism, increase competitiveness, build community skills in management, marketing and conservation of tourism-related resources, as well as provide insurance for foreign tourists while travelling in the country.

Strategy 4 Supporting tourism personnel's skills and capacity development to achieve quality and sustainability for high-quality tourism such as heartfelt services, understanding and pride in local cultures, language skills, digital communications, storytelling, cleanliness and security, and environmental protection:

Sub-strategy 4.1 Enhancing the skills and capacity of tourism personnel in line with the needs of businesses and sustainable high-quality tourism by focusing on developing competency requirements for each job position, boosting entrepreneurs' business efficiency and good governance as well as developing online learning courses to strengthen their knowledge in financial management, marketing, tourism management, and digital technology including effective use of data for improvement.

Sub-strategy 4.2 Encouraging and facilitating personnel in the tourism sector and associated services to register on the government database and tourism employment registration system by easing the procedures, increasing convenience, and offering incentives.

Sub-strategy 4.3 Establishing appropriate guidelines on responsible tourism at tourist destinations for businesses, personnel, and tourists.

Strategy 5 Reviewing and revising outdated laws, regulations and procedures which impede business operations and license application of small enterprises to encourage a transition towards sustainable high-quality tourism:

Sub-strategy 5.1 Reviewing and revising laws and regulations related to government budget and public procurement to facilitate private sector engagement in the investment and development of tourist destinations in collaboration with communities and the public sector. Enabling public procurement of products and services from local communities with appropriate environmental, safety, and hygienic standards. Encouraging the development of monitoring systems to oversee the implementation of community development programs by all sectors, including the public, private, academic sectors and civil society, to eliminate redundancy and ensure development efficiency and continuity.

Sub-strategy 5.2 Eliminating outdated legal constraints and regulations obstructing business operations and licensing of tourism-related businesses through technology exploitation, in particular for accommodation and related businesses with an emphasis on covering small businesses. Providing ease of process to encourage small entrepreneurs to register and join the legal framework and government database to enable them to link with high-quality tourism. Ensuring strict, efficient and unbiased enforcement of relevant guidelines and laws together with revising laws to encourage environmental responsibility from tourism-related businesses.

Sub-strategy 5.3 Reviewing and revising laws and regulations which obstruct tourism technology, particularly in relation to online travel agencies and sharing economy platforms to increase compliance, convenience, and safety for tourists and surrounding communities as well as to facilitate future development.

Strategy 6 Upgrading tourism information systems to smart tourism systems to facilitate access and use by tourists, businesses, and government agencies:

Sub-strategy 6.1 Harmonizing the in-depth tourism data collection system for consistency, reliability and recentness to enable its use by enterprises for business operations and by government agencies in policymaking regarding effective tourism development.

Sub-strategy 6.2 Supporting linkages between government and private sector databases using private sector-developed applications, such as TAGTHAI, to connect platforms and ensure ease of travel for tourists especially by providing useful information on visa, immigration, VAT refunds, emergency warnings, etc., and to further develop a central application platform for Thailand's tourism industry with a large central database open to all sectors to facilitate tourist behavior analysis. Pressing for the development of a national tourism platform.

Sub-strategy 6.3 Developing a large-scale tourism database integrating all partner agencies, including the Tourism Authority of Thailand, Tourism Council of Thailand and Board of Trade of Thailand, which enables the public and diverse business sectors to mutually establish a cross-sectoral in-depth knowledge base which allows an effective use of data to search, study, analyze, understand, plan and conduct marketing activities to reach high-potential customers.

Milestone 3: Thailand is the World's Important Electric Vehicle Manufacturing Base

1. Past Development Situation

Thailand is one of the world's important automobile manufacturers, being ASEAN's number one and the world's 11th biggest automobile manufacturer/exporter in 2019 with a total export value of 1,300,561 million baht, while the world's top automobile manufacturers are China, the United States, Japan, Germany and India, in that order. Thailand's export markets for passenger cars include Australia, Vietnam, the Philippines, China and Mexico, respectively, and the markets for pickups, buses and trucks are Australia, the Philippines, New Zealand, Saudi Arabia and Vietnam, respectively. The automotive industry is one of the key drivers of Thailand's economy, with a manufacturing capacity of 2 million units per year and involving 13,920 operators and 345,000 employments. However, the world's automotive demands are shifting towards electric vehicles (EVs) partially due to advanced battery technologies, which lower prices and increase the efficiency of electric vehicles, in addition a global trend towards low-carbon societies.

The Thai government has promoted the next-generation automotive industry by emphasizing an expansion of the current industry onto more advanced technology and innovation together with determining key supportive measures for EVs, such as foreign and domestic market stimulation measures, supportive measures for demand stimulation and transition towards EV manufacturing, and systematic infrastructure preparedness measures. As a result, the number of applications for investment promotion in EVs and battery parts increases. In addition, the government has also supported the development of nationwide infrastructure, particularly charging stations. According to the Electric Vehicle Association of Thailand (EVAT), Thailand has 664 charging stations with 1,450 ordinary chargers and 774 fast chargers (2,224 in total) as of 11 June 2021. The domestic EV market in Thailand is also on a continuous upward trend based on the increased number of EV registrations.

Meanwhile, air pollution remains a serious problem with severe impacts, in particular from the PM2.5 particles from automobile combustion, open burning of agricultural materials, and industrial emissions. With measurements regularly exceeding acceptable levels every year, PM2.5 particulates have increasingly wide repercussions on the population, especially in industrial areas and large cities with dense populations and traffic congestions such as Saraburi, Bangkok and Chiang Mai. Besides, Thailand is continuing its efforts to reduce its GHG emissions in compliance with the Paris agreement. As a result, the Thai government has expedited the development of a comprehensive EV system and set a vision for Thailand to become one of the world's important production bases of EVs and their parts with an emphasis on the development of zero emission vehicles (ZEV), which include battery-powered electric vehicles (BEV) and fuel-cell electric vehicles (FCEV), setting targets by 2030 at 440,000 units in domestic use (50 per cent of all vehicles) and 725,000 units in production (30 per cent of all vehicles).

Based on the context and Thailand's automotive industry development policies, goals have been formulated for the next phase of Thailand's EV industry development acceleration in three areas with an aim to achieve the targets set by the National Electric Vehicle Policy Committee and to effectively mitigate environmental impacts. These include: **1) To increase domestic consumption and export demand for all types of EVs** by establishing consumption demand for the domestic market and export demand for EVs, especially hybrids and plug-in hybrids which play a significant role in familiarizing consumers over the transitional period; **2) To encourage existing operators to shift to EV production, and to support key technology investment in**

domestic EV production in order to enable the industry to meet global trends and emerging needs, to facilitate manufacturers of vehicle parts in shifting to EV industry or other appropriate businesses, and to mitigate the impacts affecting internal combustion vehicle manufacturers and other affected businesses; and **3) To build an ecosystem of supporting factors** focusing on human resources development, investment in large-scale battery factories and development of relevant standards. An urgent implementation of these measures will benefit the country's exports.

Transitioning towards EVs will impact the current production and workforce while shifting the supply chain towards sustainability. This is due to differences in engine aspects: while electric engines mainly rely on battery power, conventional engines are built from a wide range of parts which involve more businesses and a larger workforce. With this in mind, **Milestone 3 is set to cover a five-year transitional period with a focus on fully supporting the EV industry to become a new leading industry and helping the country to emerge as a production base of EVs** by manufacturing main parts simultaneously with shifting the production base of internal combustion vehicles towards EVs without abandoning high-potential export markets so as to maintain balance and the production capacity at more than 2 million units per year during the transition period, as well as supporting different tiers of manufacturers of conventional automotive parts to transition and become manufacturers in the EV industry.

2. Development Goals

2.1 Connections between Milestone 3 and the main targets and goals of the 13th National Economic and Social Development Plan and the National Strategy

Milestone 3, whereby Thailand is the world's important electric vehicle manufacturing base, is connected with three targets of the 13th Plan, namely, **1) Target 1: Restructuring the manufacturing and service sectors towards an innovation-based economy** by enhancing competitiveness of local economies and small entrepreneurs to enable them to connect to the value chain with an enabling ecosystem to support trade, investment and innovation; **2) Target 2: Developing human capital for the future** by equipping Thai people with necessary skills and qualifications according to social norms to meet the needs of targeted manufacturing sectors while promoting human security through social protection; and **3) Target 4: Transitioning production and consumption towards sustainability** through effective use of natural resources in manufacturing and consumption while addressing pollution in sustainable ways and reducing GHG emissions.

These three targets are also consistent with the National Strategy in the area of **competitiveness enhancement** by increasing the country's competitiveness of next-generation industries and services with a focus on transitioning the entire automotive industry into a smart automotive industry, supporting technology and the development of energy storage system, promoting investment in research and development and technology transfers, as well as encouraging the local automotive industry to achieve international standards.

Meanwhile, Milestone 3 is also consistent with the National Strategy on **developing and strengthening human capital** that, for the working-age population, emphasizes lifelong capacity building with continuous enhancement of capacity, skills, and competency of the workforce in line with the labor market's needs; and on **Eco-Friendly Development and Growth** that focuses on quality of life based on the Sustainable Consumption and Production (SCP) principle and sustainable growth in a climate-friendly, low-carbon society with reductions in GHG emissions.

2.2 Goals, Indicators and Targets

Target 1 To create domestic consumption and export demands for various types of EVs.

- Indicator 1.1** There are 282,240 EVs (zero-emission vehicles (ZEVs) with new registrations, which include battery-powered electric vehicles [BEVs] and fuel-cell electric vehicles [FCEVs]), accounting for 26 per cent of all vehicles, in use in Thailand by 2027.
- Indicator 1.2** Thailand manufactures 380,250 ZEVs, accounting for 17 per cent of all vehicles, by 2027.
- Indicator 1.3** No fewer than 40,000 vehicles are converted into modified EVs by 2027.
- Indicator 1.4** The export value of EVs or parts increases by 5 per cent per year, or Thailand's export value of EV parts increases by 5 per cent per year.

Target 2 To ensure that existing businesses can transition into EV production and there are investments in key EV technology in the country.

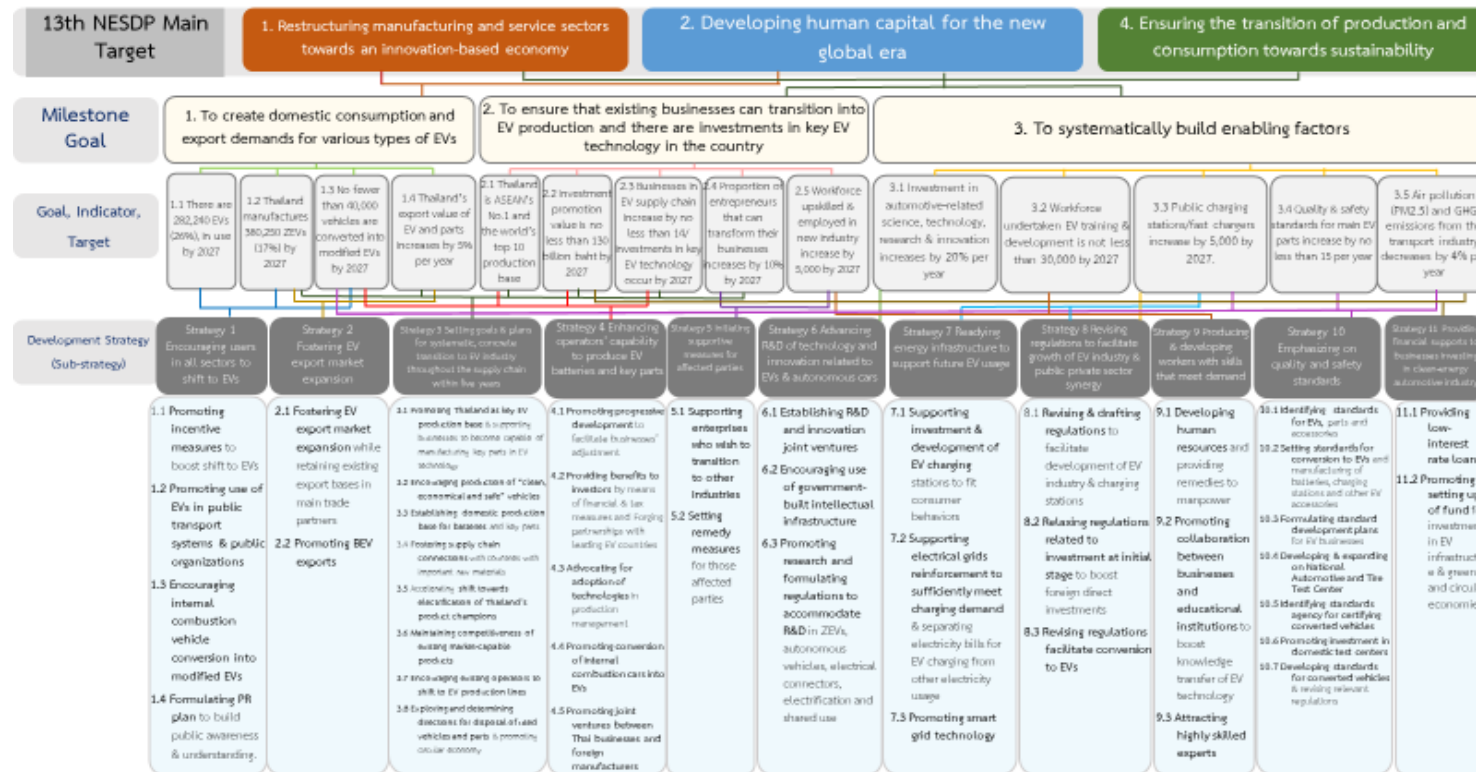
- Indicator 2.1** Thailand's automotive industry ranks as ASEAN's number one production base and is among the world's top 10.
- Indicator 2.2** The combined value of investment promotion for the EV and parts industry is no less than 130 billion baht by 2027.
- Indicator 2.3** The number of businesses in the EV supply chain increases by no less than 14, and there are investments in key EV technology in Thailand by 2027.
- Indicator 2.4** The proportion of entrepreneurs who can transform their businesses increases by 10 per cent by 2027.
- Indicator 2.5** The number of automotive workers upskilled to EVs and employed in the new industry increases by 5,000 by 2027.

Target 3 To systematically build enabling factors.

- Indicator 3.1** The value of investment in automotive-related science, technology, research and innovation increases by 20 per cent per year.
- Indicator 3.2** The number of workers undertaken EVs training development is not less than 30,000 by 2027.
- Indicator 3.3** The number of public charging stations/fast chargers increases by 5,000 by 2027.
- Indicator 3.4** The number of quality and safety standards for main EV parts increases by no less than 15 per year.
- Indicator 3.5** Air pollution (PM2.5) and GHG emissions from the transport industry decreases by 4 per cent per year.

3. Strategy Map

Milestone 3: Thailand is the world's major electric vehicle manufacturing base



4. Development Strategies

Strategy 1 Encouraging users in all sectors to shift to EVs:

Sub-strategy 1.1 Promoting incentives to encourage a shift to EVs, including 1) tax incentives such as an excise tax, waiver or reduction of annual vehicle registration fees, etc., 2) non-tax incentives such as discounts on household and condominium electricity bills, free parking, and hire-purchase loans for EV users, and 3) subsidies for EV purchases to lower operational costs to similar level as those of internal combustion vehicles.

Sub-strategy 1.2 Promoting the use of all types of EVs in public transport systems, government agencies, state enterprises and public organizations through a conditional procurement mechanism to promote domestic production and human resources development in the EV industry.

Sub-strategy 1.3 Encouraging people to convert existing internal combustion vehicles into modified EVs with safety standards certification and registration.

Sub-strategy 1.4 Formulating a public relations plan on ZEVs as well as supporting the development of a relevant piloted program to raise public awareness and understanding.

Strategy 2 Fostering EV export market expansion:

Sub-strategy 2.1 Fostering EV export market expansion while retaining existing export bases in Thailand's main trade partners for competitive products, particularly pickup trucks.

Sub-strategy 2.2 Promoting BEV exports, especially to countries with carbon-neutral policies to encourage the use of such vehicles.

Strategy 3 Formulating goals and plans for a systematic, concrete transition of the existing automotive industry throughout the supply chain to the EV industry within five years:

Sub-strategy 3.1 Promoting Thailand as a key EV production base to attract foreign investment in ZEV manufacturing, as well as supporting businesses within the supply chain to become capable of manufacturing key parts in EV technology, including connected and autonomous vehicles.

Sub-strategy 3.2 Encouraging the production of "clean, economical and safe" vehicles according to international standards (UN regulations) to improve the quality of vehicles for domestic use and meet the diverse needs of current and new export markets.

Sub-strategy 3.3 Enabling the establishment of a domestic production base for batteries and key parts such as motors, battery management systems and navigation systems.

Sub-strategy 3.4 Fostering supply chain connections with countries with important raw materials for ZEV production, including rare earth minerals and semiconductors.

Sub-strategy 3.5 Expediting a shift towards electrification of national product champions such as pickup trucks, eco-cars and motorcycles.

Sub-strategy 3.6 *Maintaining the competitiveness of market-capable products that are still unable to transition within a short period (five years), such as pick-up trucks, taking into consideration consumer preparedness and product readiness.*

Sub-strategy 3.7 *Encouraging existing operators with potentials to shift to EV production lines such as production with new materials of auto bodies and suspension systems, the production of power transmission systems, etc.*

Sub-strategy 3.8 *Exploring and determining directions for domestic disposal of used vehicles and parts in line with the global automobile trends, as well as promoting reuse in accordance with circular economy principles.*

Strategy 4 Enhancing Thai entrepreneurs' capability to invest in the production of EV, batteries and key parts:

Sub-strategy 4.1 *Promoting progressive development to facilitate businesses' transition and minimize economic impacts during the transitional period by supporting automotive technologies with potentials such as hybrids, plug-in hybrids, etc. in order to build momentum to become manufacturers in the BEV supply chain. Encouraging domestic manufacturers to use ICT to increase production management efficiency.*

Sub-strategy 4.2 *Providing benefits to boost investment by means of financial and tax measures. Forging partnerships with leading EV countries to seek appropriate measures to assist in the transition of Thai enterprises and boost competitiveness of Thai start-ups on the international market.*

Sub-strategy 4.3 *Advocating for the adoption of technologies such as autonomous systems, artificial intelligence, other 4.0 industries, as well as 5G wireless mobile technology in production management to cut costs and raise competitiveness.*

Sub-strategy 4.4 *Promoting the conversion of existing internal combustions cars into EVs to stimulate investment in the automotive industry's ecosystem and the transfer of EV technology.*

Sub-strategy 4.5 *Promoting joint ventures/business partnerships between Thai businesses in the existing supply chain and foreign manufacturers of EVs or parts to promote technology and resource transfer as well as to enhance Thai enterprises' development opportunities to become product and technology owners.*

Strategy 5 Initiating supportive measures for affected parties:

Sub-strategy 5.1 *Supporting enterprises in internal combustion engines and power transmission systems in their transition to other industries such as industrial robotics, rail or other industries with potentials.*

Sub-strategy 5.2 *Establishing remedy measures for those affected by the shift to an EV industry such as operators and workers in the petrochemical businesses and farmers of biofuel crops.*

Strategy 6 Advancing research and development of technology and innovation related to EVs and autonomous cars:

Sub-strategy 6.1 *Establishing research and innovation joint ventures. Accelerating the research and development of batteries, sensor system, electronic system and communication*

system for EVs. Developing CO2 capture technology, taking into consideration a product's entire lifecycle, and promoting technologies related to EV conversion as well as knowledge and technology transfer to local EV businesses.

Sub-strategy 6.2 Encouraging manufacturers of EVs and parts to use the government-built intellectual infrastructure for research and development, such as the National Automatic and Tire Testing, the Research and Innovation Center, and a battery-testing laboratory in Sanam Chai Khet District, Chachoengsao Province.

Sub-strategy 6.3 Promoting researches and formulating regulations to support research and development in ZEVs and autonomous vehicles as well as electrical connectors, electrification and shared use in order to extend results in the domestic industrial sector afterward.

Strategy 7 Readying energy infrastructure with appropriate and sufficient capacity to support future EV usage:

Sub-strategy 7.1 Supporting the investment and development of EV charging stations or chargers to fit consumer behaviors and daily routines at home, office, places of accommodation and public spaces.

Sub-strategy 7.2 Supporting the reinforcement of electrical grids to sufficiently meet the constant charging demand of increasing EV use, together with separating electricity bills for EV charging from other electricity usage.

Sub-strategy 7.3 Promoting the smart grid technology to fully integrate the connections and management of EV charging, including the development of smart meters as well as an integrated platform to link data from charging stations and EVs for the purpose of grid management.

Strategy 8 Reviewing and revising relevant regulations to facilitate the growth of the EV industry, with a focus on synergy between the public and private sectors:

Sub-strategy 8.1 Drafting and amending laws and regulations to facilitate the growth of the EV industry and charging stations together with regulations on communications and safety, installation and area development, and used batteries.

Sub-strategy 8.2 Relaxing regulations related to investment in supply chains of EVs parts that will be vital at the initial stage to boost foreign direct investments.

Sub-strategy 8.3 Reviewing and revising relevant regulations (particularly in relation to vehicle registration) to encourage and facilitate conversion to EVs.

Strategy 9 Producing and developing workers with skills that meet the EV industry's demand:

Sub-strategy 9.1 Developing human resources to support the EV industry and providing remedies during transition, as well as promoting lifelong learning.

Sub-strategy 9.2 Promoting collaboration between businesses and educational institutions to boost knowledge transfer of the EV technology, particularly in relation to battery technology, sensor system and EV electronics system.

Sub-strategy 9.3 *Setting measures to attract highly skilled Thai and foreign experts with benefits offered at the preliminary periods, such as tax benefits for high-skilled workforce in fields related to EV production, privileges in visa, residency and migration for foreign experts.*

Strategy 10 Putting an emphasis on quality and safety standards:

Sub-strategy 10.1 *Establishing and developing standards for EVs, parts and accessories in line with export markets' standards and requirements. Enhancing laboratory testing and accreditation standards in compliance with international standards.*

Sub-strategy 10.2 *Identifying key standards to promote conversion to EVs and the manufacturing of battery, charging stations and other EV accessories.*

Sub-strategy 10.3 *Formulating standard development plans for EV businesses.*

Sub-strategy 10.4 *Developing and enhancing the capacity of the National Automotive and Tire Test Center in testing EVs and parts in full compliance with international standards and requirements.*

Sub-strategy 10.5 *Identifying standards and designated agency responsible for certifying converted vehicles.*

Sub-strategy 10.6 *Encouraging investment in domestic test centers to achieve industrial standards and standards for EV manufacturers, product liabilities, and quality management through collaboration with international accreditation organizations.*

Sub-strategy 10.7 *Developing key standards — namely, installation standards and battery standards for converted vehicles — to build confidence in the safety of converted vehicles. Reviewing and revising relevant regulations, particularly in relation to vehicle registration to facilitate conversion into EVs.*

Strategy 11 Providing financial supports to businesses investing in the clean-energy automotive industry:

Sub-strategy 11.1 *Providing low-interest rate loans to EV-and-parts businesses.*

Sub-strategy 11.2 *Encouraging the establishment of a fund for investment in EV infrastructure and management related to the green and circular economies.*

Milestone 4: Thailand is a High-Value Medical and Wellness Hub

1. Past Development Situation

Thailand provides medical services to an increasing number of foreigners; however, the impacts on Thai people's access to healthcare must be taken into account. In 2019, 3.6 million foreigners visited Thailand for medical services, generating 41 billion baht in revenue. This is due to comparatively low costs and the good reputation of Thailand's medical personnel when compared with services at a similar level in other countries. On the other hand, the distribution of medical workers remains inequitable among different regions of the country: the ratio of physicians per 1,000 population is only 0.5 compared to 2.4 in South Korea and 1.9 in Singapore. Besides, Thailand's aim to become a healthcare hub and generate revenue by offering medical and healthcare services to foreigners may cause a brain drain of healthcare workers from the public to the private sector, thus impacting public access to healthcare, especially among those with low incomes or living in remote areas. Despite the fact that advanced technologies and innovations are applied to facilitate and lessen the burden of healthcare workers, potential negative impacts of technology must also be considered.

Thailand's medical and wellness tourism ranks 4th in the Asia-Pacific Region in terms of market share. However, confidence in the quality standards of facilities remains an issue. In 2019, Thailand saw 12.6 million persons/times of service uptakes in medical tourism services, contributing 409,200 million baht in revenues to the country. There were 530,000 employments and 4,352 registered wellness facilities, especially spas and Thai massage parlors, which are popular in foreign countries. Nevertheless, quality standards as well as image and pricing are in need of improvement in order to build customer confidence.

Thailand exports low-value medical tools and equipment while importing high-value medical products. It is found that 88 per cent of exported products are medical consumables, while 42 per cent of imports are medical hardware, including ultrasound, x-ray, and MRI machines, and 40 per cent are medical consumables such as ophthalmological products. Support for the private sector and SMEs in product research and development and the promotion of domestic utilization remains limited, resulting in the import of medical tools and equipment due to lower costs.

Most of the domestic production of drugs and vaccines are downstream production using imported raw materials in manufacturing finished drugs and vaccines. In 2019, the value of Thailand's drug market was 184 billion baht. Domestic consumption accounted for 90 per cent of production, most of which, however, were finished drugs made from imported raw materials. Although the exports of drugs grew at 8 per cent per year from 2014 to 2018, they accounted only for 0.2 per cent of total exports because most exported drugs are cheap generics. There is currently downstream production of several types of vaccines, performed by mixing or aliquoting imported components. Due to a lack of advanced research and technology, the only vaccines locally produced from upstream are BCG and acellular pertussis vaccines. Meanwhile, the COVID-19 pandemic has spurred research and development in high-value vaccines. It is anticipated that the worth of the global vaccine market will reach US\$83.5 billion by 2027.

Thailand has a potential regarding medicinal plants. However, herb exports are mostly low-value raw materials whereas imports are expensive herbal extracts. Limitations remain in terms of sub-standard quality and lack of scientific research to verify their benefits, as observed from the low number of currently registered Thai herbal products. In addition, the customs tariff

for alcohol used in the herbal active ingredient extraction process is still inappropriate, resulting in a considerably higher tariff for alcohol, which therefore affects herbal product production costs. However, the COVID-19 pandemic helps accelerate research in this regard and several Thai herbs such as *Andrographis paniculata* (“Fah Thalai Chone”) and *Boesenbergia rotunda* (L.) Mansf. (“Krachai Khao”) are found to help prevent/treat COVID-19, presenting great opportunities for the further development of Thai herbal products.

Thailand's medical academic and research potentials are insufficient for self-reliance. Although four Thai universities were among the 2021 QS World University Ranking in Life Sciences and Medicine, and one of them ranked among the world's top 150 (Thailand and Singapore were the only ASEAN countries included in the world's top 150 group), according to the H-Index, Thailand ranks 42nd in terms of quantitative and qualitative research, lower than Malaysia. In addition to a gap in research development, the application and commercialization of research remains an issue due to a lack of supporting ecosystem and infrastructure such as test centers and laboratories of international standards and personnel with specific expertise. As a result, Thailand's medical industry still necessarily relies on imports.

The aim to become a medical and wellness hub as well as globalization threatens Thailand's ability to address emerging and re-emerging diseases. Over the past 20 years, Thailand has experienced several waves of imported emerging diseases such as SARS, Avian influenza, Zika, 2009 influenza and MERS. An ongoing widespread outbreak of COVID-19, the latest emerging disease, has critically impacted the country's tourism and export sectors. The Thai economy severely contracted in 2020, and the number of foreign tourists in the first quarter dropped by 38.01 per cent from the same period of the previous year. Moreover, the pandemic has also affected people's livelihoods and put the healthcare system in crisis. Therefore, Thailand needs to restructure its healthcare system, equipment, and workforce to ensure effective control and handling of pandemics and avoid threats to the country's healthcare system and economy.

2. Development Goals

2.1 Connections between Milestone 4 and the main targets and goals of the 13th National Economic and Social Development Plan and the National Strategy

Milestone 4, whereby Thailand is a high-value medical and wellness hub, is aligned with four main targets of the 13th Plan, namely **1) Target 1: Restructuring the manufacturing and service sectors towards an innovation-based economy** by adopting innovation in medical and wellness product production and services to create economic value add; **2) Target 2: Developing human capital for the new global era** with high medical and healthcare capabilities to mitigate obstacles to enhancing the capacity of medical services; **3) Target 3: Creating a society of opportunities and fairness** to mitigate impacts on public access to healthcare; and **4) Target 5: Enhancing Thailand's ability to cope with changes and risks under the new global context** by setting a direction for the development of emergency health and healthcare services management system.

Milestone No. 4 is also consistent with the National Strategy in the area of **Competitiveness Enhancement** under the goal “Thailand's national competitiveness is increased” through the designation of the comprehensive healthcare industry as a service industry of the future; leveraging Thailand's medical expertise to build associated industries related to the development of medical industry and services; using new technologies to raise the quality of medical services to international standards; and linking the industry with medical tourism. It is

also in line with the National Strategy on **Social Cohesion and Equity** under the goal of “Creating fairness and reduce inequalities in all dimensions,” particularly in the form of fair and equitable access to healthcare.

2.2 Goals, Indicators and Targets

Target 1 Thailand has the potential to create economic values from healthcare products and services.

Indicator 1.1 The proportion of value added in healthcare products and services to GDP is 1.7 per cent.

Target 2 Thailand's medical and healthcare knowledge has good potential and is conducive to creating value added to healthcare goods and services.

Indicator 2.1 Import values of medical hardware decreases by no less than 20 per cent (20 billion baht) at the end of the plan.

Target 3 Thai people enjoy equitable access to healthcare services.

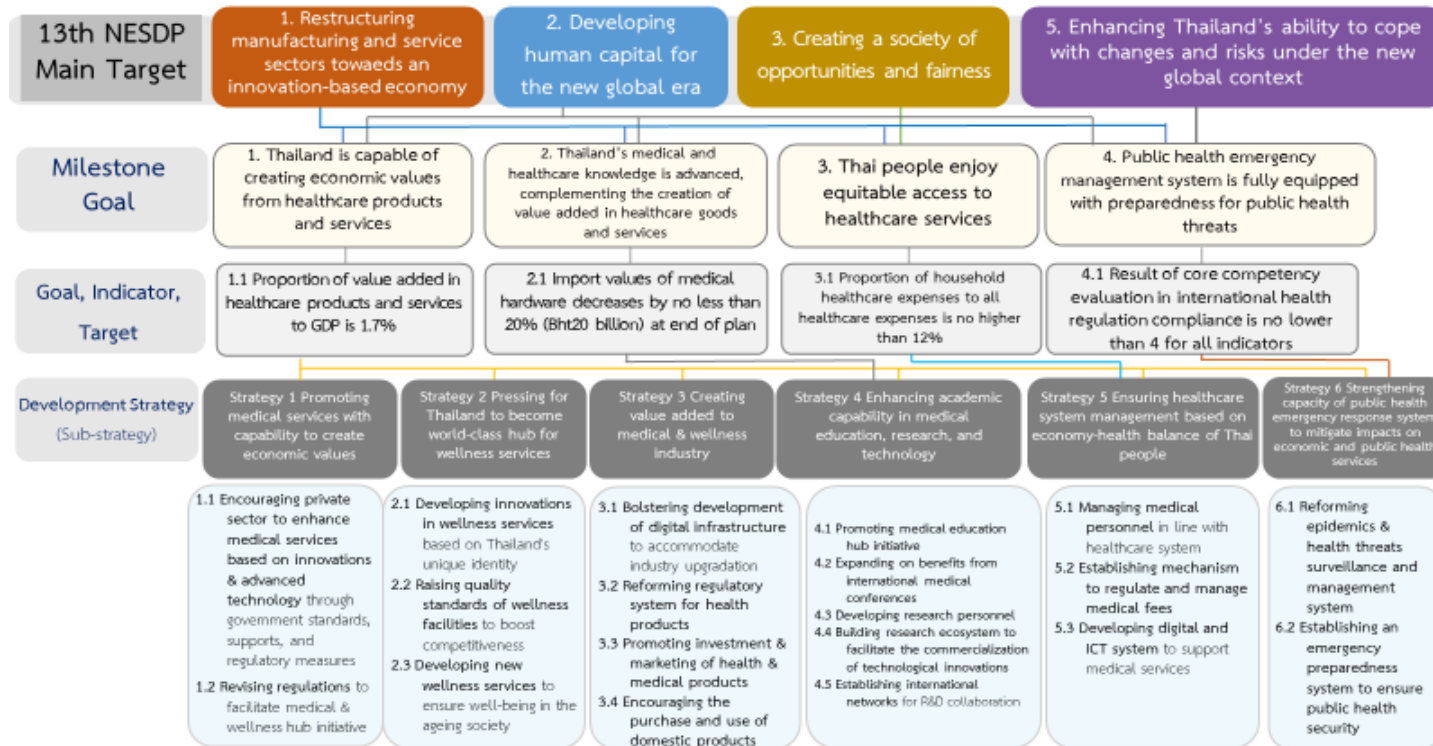
Indicator 3.1 The proportion of household healthcare expenses to all healthcare expenses is no higher than 12 per cent.

Target 4 The public health emergency management system is fully equipped with preparedness for public health threats.

Indicator 4.1 The result of core competency evaluation in international health regulation compliance is no lower than 4 for all indicators.

3. Strategy Map

Milestone 4: Thailand is a high-value medical and wellness hub



4. Development Strategies

Strategy 1 Promoting medical services with the capability to create economic values:

Sub-strategy 1.1 Encouraging the private sector to enhance medical services based on innovations and advanced technologies through government standards, supports, and regulatory measures.

1) Enhancing medical services with a focus on precision medicine, predictive medicine and personalized healthcare. Developing target group databases to enable individualized treatment and care as well as gene and stem cell therapies. Utilizing healthcare services to support evidence-based medical services, including anti-ageing medicine. Encouraging connections with business partners organizing medical services in Thailand for foreign patients, especially those from countries where the health security system covers medical expenses incurred in Thailand.

2) Developing a quality control system to regulate quality standards in advanced medical services, taking into consideration all aspects of impacts. For example, providing quality services at reasonable prices, regulating issues of ethical concerns in advanced medical technology and innovations such as surrogacy and stem cells, etc.

Sub-strategy 1.2 Reviewing/revising relevant laws and regulations to facilitate the medical and wellness hub initiative.

1) Exploring the feasibility of a specific law supporting the medical and wellness hub initiative that addresses operational constraints, such as a law related to digital medicine, use of foreign healthcare coverage and social welfare system, and immigration. Designating responsible agencies for implementation.

2) Revising relevant laws to combine licenses for wellness and medical services into a single license that covers all activities related to wellness facilities, hospitals and hotels, together with revising relevant laws to facilitate professionals in wellness-related fields that are not yet being taught in Thailand, such as nature therapy, to provide medical supports under their professional licenses.

Strategy 2 Pressing for Thailand to become a world-class hub for wellness services:

Sub-strategy 2.1 Developing innovations in wellness services based on Thailand's unique identity.

1) Incorporating Thailand's distinguished identity into wellness services by encouraging all local sectors to collaboratively create a comprehensive wellness city, leveraging local knowledge in traditional Thai medicine, alternative medicine and health tourism in local communities to develop Thai brands of wellness services and products with international competitiveness.

2) Pressing for the development of world-class managers in wellness services to build the reputation of advanced wellness services for foreigners as well as making a joint investment to expand services abroad, which might result in an increase in uptakes at low- and mid-level.

Sub-strategy 2.2 Raising the quality standards of wellness facilities to boost competitiveness. Developing professional standards of wellness-related businesses through quality management processes. Offering incentives for SMEs to register under the Health Business

Establishments Act B.E. 2559 (2016) and enhance service standards in order to compete on the international market.

Sub-strategy 2.3 *Developing new wellness services to ensure well-being in an ageing society.* Accommodating spaces for digital communities for well-being based on service and product innovations appropriate for new normal lifestyles, such as telemedicine and appropriate changes in behaviors and lifestyles through food therapy and mental therapy in the form of meditation. Studying consumer behaviors in each age and ethnicity group to identify incentives for service uptakes. Developing infrastructure with universal architecture to support long-term healthcare services. Establishing residential areas for the elderly as well as areas for sports and exercises to encourage longer stays among the active elderly and work-and-travel visitors.

Strategy 3 Creating value add to the medical and wellness industry:

Sub-strategy 3.1 *Bolstering the development of digital infrastructure to accommodate upgradation of the medical and wellness industry.*

1) *Developing a system for the evaluation of medical technology and medical product testing standards so as to meet international standards*, such as scholarly articles on safety standards for product registrations in Asian, US, and European markets, to ensure convenience and universal standard in product testing, as well as to create opportunities for Thailand to undertake research, analysis and accreditation of foreign products.

2) *Upgrading the production capacity of testing centers.* Collaborating with the private sector to develop and upgrade comprehensive testing centers to achieve international standards for medical products, including prototyping centers, laboratory animal centers, and centers for clinical trials in humans. Increasing the number of level-3 biosafety laboratories with a capacity to test products against hazardous organism in order to support domestic research and development and upstream manufacturing.

3) *Developing production bases and supporting the setting up of pilot plants for biopharmaceuticals, drugs, herbal products and vaccines with international standards*, particularly vaccines against emerging and re-emerging diseases, so as to meet domestic needs, minimize imports, and ensure the long-term security of the public health system.

Sub-strategy 3.2 *Reforming the regulatory system for health products.* Restructuring responsible agencies to increase independence and agility in terms of budget acquisition, personnel and network development to elevate capability and regulate health products at the same standards as those in developed countries, together with streamlining the registration process to allow businesses to market products promptly without losing opportunities and competitiveness.

Sub-strategy 3.3 *Promoting investment and marketing of health and medical products.* Revising relevant laws, regulations and measures on joint investment between the government and SMEs to facilitate domestic production. Utilizing tax mechanisms to promote investment. Supporting the manufacturing of products with international standards and market demands with a focus on traceability of raw materials. Building confidence through scientific evidences in products throughout the supply chain. Establishing a digital platform to connect demand and supply while marketing products domestically and internationally.

Sub-strategy 3.4 *Encouraging the purchase and use of domestic products.*

1) *Improving the List of Thai Innovations for ease of use and facilitate the development of the healthcare industry* with strict and serious enforcement in the public sector. Revising commodity codes for hardware and materials in alignment with the List of Thai Innovations. Formulating and including a list of Thai-manufactured medical equipment with international standards in the public procurement system.

2) *Forging attitudes and encouraging private healthcare facilities and medical schools to use domestically produced medical equipment which are of high quality, safe, efficient, and cost-effective* by offering tax benefits for the procurement of Thailand-produced medical equipment. Enforcing the inclusion of a list of Thailand-produced medical equipment with international standards in medical school curricula and service systems.

Strategy 4 Enhancing academic capability in medical education, research, and technology:

Sub-strategy 4.1 *Promoting the “medical education hub” initiative by developing international medical courses as well as trainings for medical personnel in South Asia and ASEAN with internship opportunities, both online and in Thai hospitals, through scholarships from international organizations, third countries or the Thai government. Equipping teaching faculties with skills in foreign languages, communications, teaching and evaluation that correspond to the teaching and training of foreign medical personnel.*

Sub-strategy 4.2 *Exploiting benefits and opportunities from international medical conferences.* Developing incentives and benefits for leading international organizations and foreign experts to take part in the improvement of Thailand’s medical research and innovation standards through, for example, research agreements, further expansion of presented works in Thailand, internship/exchange programs at leading institutions, inviting international experts to teach/speak in Thailand, and international presentation of works by Thai researchers.

Sub-strategy 4.3 *Developing research personnel* with interdisciplinary knowledge and skills in conducting research in science, technology, innovation and digital medicine, and technological innovation and evaluation. Facilitating knowledge exchanges and skills building among researchers within the professional community. Continuously incubating medical innovators. Encouraging educational institutions to engage in research. Attracting more international experts to work in Thailand and transfer knowledge as well as developing mechanisms to retain healthcare personnel, especially by means of appropriate remuneration for research personnel to motivate them to maintain their research profession.

Sub-strategy 4.4 *Building a research ecosystem to facilitate the commercialization of technological innovations.* Advocating for collaboration among developers, manufacturers, healthcare facilities and technological assessors to create research spaces to test products before adoption or commercialization so as to build confidence in innovations. Providing initial funding and developing a mechanism that enables the concrete use of research; for example, SMEs’ accessibility to research data, business matching between investors and researchers, post-research intellectual property protection and patent management. Assigning a quality control regulatory body to assist in expediting the product approval process to shorten time-to-market of healthcare products.

Sub-strategy 4.5 *Establishing international networks for collaboration in research and development.* Supporting a collaboration between research Institutions, private sector, domestic education institutions with international research Institutions/companies with capabilities

and international recognition in scientific research to promote medical technology transfer through, for example, joint research, commissioned research, etc. Elevating academic support to countries with tendencies to join the value chain network of research and development through scholarships and international training in line with Thailand's development directions for the medical and wellness industry.

Strategy 5 Ensuring healthcare system management based on the economy-health balance of Thai people:

Sub-strategy 5.1 *Managing medical personnel in line with the healthcare system.*

1) *Promoting private sector engagement in producing and developing medical personnel* with a role in identifying fields with needs, curriculum development, the production as well as upskilling of specialized and interdisciplinary personnel to accommodate high-value medical services, and necessary competency enhancement training.

2) *Encouraging importation of medical personnel.* Developing examinations for professional licenses to facilitate the recruitment of foreign personnel. Promoting shared use of personnel between the public and private sectors, especially personnel in fields with advanced expertise, to reduce shortages and ensure effective use of resources.

3) *Enabling the distribution of healthcare workforce* by developing a mechanism to rotate healthcare workforce in terms of geography, workload and areas of shortage. Offering incentives to healthcare workers to remain in the public health system, such as career paths, job promotions and capacity development opportunities for personnel in remote areas, reductions of workload, and improvement of basic welfare system to ensure good quality of life.

Sub-strategy 5.2 *Establishing a mechanism to regulate and manage medical fees.* Developing mechanisms and guidelines to regulate medical fees, which might be affected by the medical hub policy, to ensure appropriate costs. Improving the health security payment system to become more comprehensive so as to allow people to access necessary medical services in an inclusive and fair manner.

Sub-strategy 5.3 *Developing a digital and ICT system to support medical services.*

1) *Encouraging the use of digital technology to increase efficiency, reduce workloads, and address personnel shortages,* such as artificial intelligence for basic screening and telemedicine. Expanding the coverage of digital infrastructure. Revising relevant rules and regulations together with formulating mechanisms and guidelines to evaluate the use of medical technology and to avoid possible negative impacts.

2) *Initiating a national health database* by forging collaboration among relevant agencies through mutual agreement to link together basic data from public agencies on a common interoperable digital platform while taking into account personal data protection, such as data on morbidity and mortality, incapacitation, health security, research and innovation, number of healthcare workers and experts produced and currently in service for analyzing and expanding on the acquired data for service management and the planning of future workforce. Allowing open access to data to benefit the development of medical products and services so as to meet market demands and the needs of all population groups.

Strategy 6 Strengthening the capacity of public health emergency response system to mitigate impacts on economic and public health services:

Sub-strategy 6.1 Reforming the system of epidemics and health threats surveillance and management.

1) Restructuring and unifying the epidemics surveillance and management system. Designating a central agency to set national public health directions for an integration of surveillance, prevention, preparedness, emergency response, and rapid recovery operations. Establishing an emergency response center and command control system as a key public health management mechanism to ensure effective coordination and resource allocation.

2) Developing integrated health and environmental surveillance mechanisms and data systems. Setting up mechanisms that integrate public health and environmental management from policy to implementation levels. Building a system to link together data on public health under the One Health concept, including data on population health, zoonotic diseases, environment and key public health resources, based on the application of digital technology in data processing, to ensure effective and timely responses to public health threats.

Sub-strategy 6.2 Establishing an emergency preparedness system to ensure public health security. Formulating an appropriate workforce plan for the surveillance, prevention and control of diseases and public health threats including expert clinical and field epidemiologists, data scientists, researchers, mathematical modelers, lab technicians and disease investigators, with an appropriate ratio to the country's population, while providing adequate remuneration, welfare benefits and career advancement to the workforce. Encouraging people's collaboration in surveillance and prevention, as well as setting up a preparedness plan for essential drugs, medical supplies, vaccines, medical equipment and materials for effective emergency responses.

Milestone 5: Thailand is the Region's Key Strategic Trade, Investment and Logistics Gateway

1. Past Development Situation

An **increasingly extensive trade rivalry between the United States and China** has inevitably affected Thailand and Southeast Asia. Strategically located in a demarcation zone, the country and its region need to maintain good relationships with both superpowers, especially in relation to changing trends in investment and trade in global supply chains as well as political and economic alignments. In this regard, Thailand's future direction should be focused on playing a leading role in forging business partnerships with other ASEAN countries, particularly the Greater Mekong Subregion (GMS) countries with an emphasis on collaboration rather than competition, while making Thailand a strategic gateway and nexus to promote constructive balance in international relations and the economy between the region and the two superpowers so that the region's progress and security are well maintained. In particular, Thailand needs to carefully balance its relations with China, the United States and other Western nations by clearly indicating the country's long-term needs in economic, social and environmental dimensions, as well as in terms of quality of life and advanced technologies, to elucidate to friendly countries Thailand's willingness to collaborate on these issues. Besides, due to geographical proximity to China, Thailand needs a clear economic development strategy to connect the country, Laos and China together and benefit from transport routes from Nongkhai and Chiangrai provinces into Laos and China, which would stimulate investment in building an agile trilateral economic network and trade system, specifically in Thailand's Northeastern and Northern regions, Laos, and China's southern provinces.

In addition, the COVID-19 pandemic has sparked a **tendency of production base relocation**. To prevent risks, many countries seek a guarantee against supply chain disruptions by moving production bases to friendly countries or to locations near export markets with efficient transportation, resulting in significant changes in the geography of supply chains around the world. Thailand, therefore, should promptly encourage local businesses in target industries to join the regional and global supply chains by receiving or making investments within international cooperation frameworks to pursue opportunities for economic growth, trade and investment expansion, and the enhancement of Thailand's technological level. These cooperation frameworks include China, Taiwan, India, Japan, South Korea, and the GMS countries, for example. Thailand should also develop proactive strategies to exploit the relocation of production bases in target industries to expand trade and investment with China, the United States, Europe, and Japan based on mutual interests that also meet Thailand's needs by attracting investment from every prospective country to relocate its production base to the Eastern Economic Corridor and other economic zones for linkage to key manufacturing locations in the GMS countries, southern China and Asia at large.

Trade and investment with other Asian countries with large markets and highly advanced technologies should be initiated, giving prominence to India following its massive market growth potential and Taiwan following its globally recognized high-standard advanced technology. Due to **new global standards in trade and investment requirements**, it is likely that many countries, especially Western countries, will increasingly place an importance on social and environmental standards, such as well-being, quality of life, elimination of inequalities, transparency, good governance, intellectual property protection, human rights etc., and use them as conditions in drawing cooperation frameworks in international trade and investment. As a result, Thailand needs

to formulate rules, regulations and practices to meet these international requirements, which will not only help the country develop immunity to trade sanctions and build confidence among investors but will also act as a key foundation for Thailand's progress into a developed country in future.

Due to the current situation, Thailand needs to **invest more in offsetting the impacts of the COVID-19 pandemic**, which has cost the country more than 3 trillion baht in a loss of revenues, delayed the country's transition into a high-income country, and increased the number of impoverished people by 10 million. In this regard, Thailand needs to increase investment by no less than 600 billion baht to escape from the middle-income trap, as well as urgently use the surplus from its economic expansion to reduce inequalities through investments in transport infrastructure to connect with neighboring countries, economic decentralization from Bangkok to regions throughout the country, and an increased private sector role in services to ensure maximum benefits and efficiency from investments in transport projects.

In addition to the aforementioned investment in infrastructure, **free trade agreements** will also contribute to an increase in trade and investment. So far, Thailand has concluded 13 trade agreements with 18 countries, accounting for approximately 63 per cent of the country's international trade. Nevertheless, the country should urgently negotiate more economic, trade and investment agreements with key partners — for example, the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP) as well as agreements with the European Union and the United Kingdom — for optimal benefits in line with the country's needs while retaining the advantages of the local manufacturing and service sectors. A fund should be set up to prevent and mitigate impacts from trade agreements, while economic collaboration should be expanded with countries that can become sources of knowledge in science, technology and innovation in fields required for upgrading Thailand's target industries.

However, Thailand faces limitations in terms of **trade and investment facilitation**, such as regulations on cross-border transports and slow technology adoption in the transport sector, which are obstacles to logistics, trade and investment facilitation. Together with investing in infrastructure and concluding free trade agreements, Thailand therefore needs to review and revise obstructive regulations, including regulations on cross-border transport, logistics and trade, as well as encouraging local logistics service providers of all scales to embrace digital technologies to facilitate and promote domestic and international trade and investment.

Following the country's **geographical advantage and infrastructure development**, Thailand has the potential to become the transport nexus between the Indian Ocean and the Pacific Ocean, benefit from China's One Belt One Road and the US-supported "Build Back Better World" initiatives, and connect with countries in the Greater Mekong Subregion (GMS) to facilitate trade connections with China. Hence, Thailand should integrate existing development plans for land, water and air transport infrastructure to leverage the country's geographical advantages and infrastructure linkages between the GMS countries and southern China while including the Eastern Economic Corridor and other Special Economic Zones in infrastructure linkages to globalize the local manufacturing and service sectors.

To promote transport and logistics in the GMS, a strategy should be formulated to drive international collaboration and agreements. In this context, a team should be set up to mobilize investment projects to expedite transportation linkages with GMS countries and China. There should also be an agency under the supervision of the Deputy Prime Minister responsible for high-

level strategic decision-making during negotiations; coordination among all relevant agencies to ensure integrated, collaborative operations; for example, by having the Ministry of Transport oversee the transports of goods and the Customs Department responsible for Thailand National Single Window system-and a consideration of import tariff reductions for construction materials.

2. Development Goals

2.1 Connections between Milestone 5 and the main targets and goals of the 13th National Economic and Social Development Plan and the National Strategy

Milestone 5, whereby Thailand is the region's key strategic trade, investment and logistics gateway, is connected with four targets in the 13th Plan, namely, 1) **Target 1: Restructuring the manufacturing and service sectors towards an innovation-based economy**; 2) **Target 2: Developing human capital for the new global era**; 3) **Target 3: Creating a society of opportunities and fairness**; and 4) **Target 4: Ensuring the transition of production and consumption towards sustainability**. These targets are achievable by creating an enabling ecosystem that supports trade and investment for Thailand to become the region's key trade and investment base; enhancing the productivity and opportunities of Thai entrepreneurs to enable linkages to regional and global value chains; and enhancing the competitiveness of Thailand's manufacturing and key service sectors.

Milestone 5 is consistent with the National Strategy under the Constitution of the Kingdom of Thailand B.E. 2560 (2017) based on the strategies of 1) **Security** in developing collaborations with neighboring countries and at the regional and international levels as well as with governmental and non-government organizations; 2) **Competitiveness enhancement** in developing the next-generation manufacturing and service sectors and infrastructure to connect Thailand with the world, putting an emphasis on seamless transportation networks and logistics services, while maintaining and enhancing Thailand's macro-economic stability, which focuses on connecting the country's trade and investment infrastructure with other countries as well as expanding trade and investment co-operations; and 3) **Eco-friendly development and growth** to ensure sustainable growth in a climate-friendly, low-carbon society with reduction in GHG emissions.

It is also linked with key areas in the master plan under the National Strategy, namely: 1) **Foreign affairs** in expanding bilateral and multilateral collaboration in economy, trade, transport and human resources, especially in the sub-region and in Asia; 2) **Next-generation industry and service sectors** focusing on developing and transitioning Thailand's target industries into next-generation industries as a pillar of the country's economy, as well as building an enabling ecosystem for the development of industries and services; 3) **Infrastructure, logistics and digital systems** focusing on enhancing the capability, quality and efficiency of the transport infrastructure and logistics system to increase productivity in the manufacturing and service sectors, reduce production and service costs so as to raise competitiveness in the international market, and promote systematic connections within the region and sub-region; 4) **Sustainable growth** focusing on reducing GHG emissions, creating sustainable growth on the basis of natural resources and the environment, and making climate-friendly investments in the development of public and private infrastructure.

2.2 Goals, Indicators and Targets

Target 1 Thailand is the regional trade and investment gateway.

Indicator 1.1 Thailand's economic competitiveness ranking (by the International Institute for Management Development) increases.

Target 2 Thailand is the regional supply chain.

Indicator 2.1 1) The total value of domestic investment increases by no less than 6 per cent per year on average, or 2) The proportion of total investment to GDP is no less than 27 per cent per year on average.

Indicator 2.2 1) Thailand's total export value expands by no less than 7 per cent per year on average, or 2) The proportion of Thailand's export growth to the global export growth is no less than 1.5 per cent per year on average.

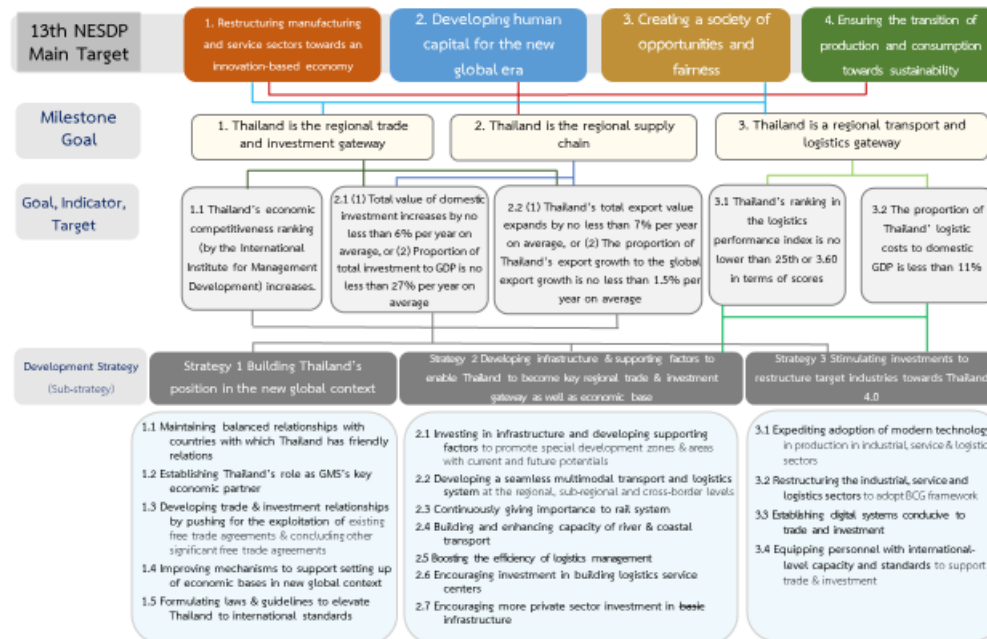
Target 3 Thailand is a regional transport and logistics gateway.

Indicator 3.1 Thailand's ranking in the logistics performance index is no lower than 25th or 3.60 in terms of scores.

Indicator 3.2 The proportion of Thailand's logistics costs to GDP is less than 11 per cent.

3. Strategy Map

Milestone 5: Thailand is the region's key strategic trade, investment and logistics gateway



4. Development Strategies

Strategy 1 Building Thailand's position in the new global context:

Sub-strategy 1.1 *Maintaining balanced relationships with countries with which Thailand has friendly relations* through policies that clearly meet the country's needs. Extending collaboration with countries with which Thailand has friendly relations to ensure equitable cooperation.

Sub-strategy 1.2 *Establishing Thailand's role as the Greater Mekong Sub-region's key economic partner* by means of close collaboration and mutual support rather than competition. Forging balanced and collective regional development through a national committee to integrate approaches to fostering international relations at all levels.

Sub-strategy 1.3 *Developing trade and investment relationships* by pushing for the exploitation of existing free trade agreements as well as concluding other significant free trade agreements. Negotiating various agreements supporting trade and investment, such as transport, immigration, and management at border crossing areas. Building and strengthening collaboration in the special development zones between Thailand, Laos and China to generate economic and social benefits from logistic nexuses at Nongkhai and Chiangrai provinces.

Sub-strategy 1.4 *Improving mechanisms to support the setting up of economic bases in the new global context.* Establishing a mechanism or national committee for integrated approaches to reviewing and revising investment promotion as well as investing in new economic fields to accommodate an ongoing shift of production bases and supply chain realignment across Asia in the form of, for example, tariff and non-tariff privileges.

Sub-strategy 1.5 *Formulating laws and guidelines to elevate the country to international standards.* Promptly enhancing standards in social and environmental aspects as well as in health, well-being, quality of life, inequality mitigation, labor mobility, transparency and good governance in the business sector to meet international standards in order to overcome trade barriers and the middle-income trap.

Strategy 2 Developing infrastructure and supporting factors to enable Thailand to become a key regional trade and investment gateway as well as economic base:

Sub-strategy 2.1 *Investing in infrastructure and developing supporting factors to promote special development zones and areas with current and future potentials,* including transport infrastructure, logistics services and networks along key routes and links with neighboring countries, cross-border investment and trade facilities, ports and land bridges in the Southern Economic Corridor to turn Thailand into a strategic gateway. Investing in, and developing, infrastructure to enhance and accommodate tourism and services in provinces with potentials, such as connecting tourism in the Andaman Sea, which include Phuket, Krabi, Phangnga, Trang and Satun provinces, so as to become one of the world's top five cruise destinations.

Sub-strategy 2.2 *Developing a seamless multimodal transportation and logistics system at the regional, sub-regional and cross-border levels.* Integrating infrastructure development plans for land, water and air transport to exploit the geographical and infrastructural linkages from regional, sub-regional and cross-border links, especially links with GMS countries and southern China. Including the Eastern Economic Corridor and other Special Economic Zones in the regional infrastructure linkages to globalize Thailand's manufacturing and service sectors.

Sub-strategy 2.3 *Continuously giving importance to the rail system and turning it into Thailand's main transport network with linkages to regional and sub-regional logistics networks in order to minimize logistics costs. Supporting rail connections between Thailand, Laos and China at Nongkhai and Chiangrai provinces as well as facilitating rail connections between local economic zones in the Northern, Northeastern, Central and Eastern regions and China and GMS countries.*

Sub-strategy 2.4 *Building and enhancing the capacity of river and coastal transport, focusing on convenient, modern and safe transport along key rivers, including the Chao Phraya, Nan and Pasak rivers, and particularly along the Chao Phraya to Laem Chabang Port. Developing waterways for economic purposes to boost the effectiveness of domestic and international transport.*

Sub-strategy 2.5 *Boosting the efficiency of logistics management to facilitate and mitigate obstacles in trade and investment as well as correspond to future trade patterns. Improving basic infrastructure management systems by, for example, adopting modern technologies, enhancing service systems, developing software, and relaxing relevant rules and regulations.*

Sub-strategy 2.6 *Encouraging investment in building logistics service centers, which includes container yards or inland container depots, dry ports, and loading-unloading docks, with an emphasis on integrating investment plans into key strategic transport routes to enable connections with GMS countries, China and ASEAN. Setting compelling service rates to motivate a shift in transport modes to rail system.*

Sub-strategy 2.7 *Encouraging more private sector investment in infrastructure with transparency, accountability and clear evaluation of efficiency and success. Allowing operators in the trade, investment and service sectors to have more roles in service provision.*

Strategy 3 Stimulating investments to restructure target industries towards Thailand 4.0:

Sub-strategy 3.1 *Expediting the adoption of modern technologies in production in the industrial, service, and logistics sectors, particularly in terms of a shift to automate production and prompt exploitation of technological advancement.*

Sub-strategy 3.2 *Restructuring the industrial, service and logistics sectors to adopt BCG (Bio-Circular-Green Economy Model) framework, as well as supporting clean energy usage, reusing and recycling of factors of production, and CO₂ emission reductions.*

Sub-strategy 3.3 *Establishing digital systems conducive to trade and investment. Developing a national trade platform to support B2B trade. Digitalizing Thailand's financial services to facilitate investments. Reviewing, revising and developing laws and regulations related to fair trade and trade and investment facilitation. Developing effective laws on electronic transactions and personal data protection.*

Sub-strategy 3.4 *Equipping personnel with international-level capacity and standards to support trade and investment.* Revising personnel development systems and curricula to meet the needs of the labor market and businesses by allowing the private sector to participate in curriculum development and share expenses incurred. Digitalizing pedagogical methodologies to facilitate self-learning and knowledge usage in income generation and business building. Raising labor skills and teaching levels at Thai educational institutions to international standards or the same level as those of leading global institutions to ensure the usefulness of skills in professional life.

Milestone 6: Thailand is ASEAN's Hub for Digital and Smart Electronics Industry

1. Past Development Situation

The electrical and electronics industry has been Thailand's significant industry for more than 50 years, playing an instrumental role in the country's economy. At present, Thailand is the world's No. 13 and ASEAN's No. 4 exporter of electronic and electrical appliances with an export value of 1.9 trillion baht (or 24.3 per cent of total exports) and involving more than 750,000 employments. On the other hand, Thailand's electrical and electronics industry still heavily relies on foreign direct investments, and Thai businesses are mainly assemblers with no native technology or research-to-commercialization links. The industry is also labor-intensive with low capital. As a result, Thailand's electrical and electronics industry lags behind regional leaders and fails to create sufficient value added to the economy.

Meanwhile, technological advances have rapidly changed and constantly impacted consumer behaviors, business models, and innovations. The COVID-19 pandemic in early 2020, a shift in the Thai population structure towards an aging society within 2023, the availability of digital infrastructure with high quality and nationwide coverage, and declining prices of smartphones and computers which increase people's accessibility, have accelerated the adoption of digital technology in the government sector, the private sector and the people, especially for data and online transactions, as well as the rapid growth of Thailand's digital industry despite the contraction of the Thai and global economies.

Most of Thailand's digital industry relies on imports particularly for the hardware industry, software and digital content, including smart gadgets, games, applications and online platforms (e.g. Facebook, LINE, Google, Twitter, Shopee, Lazada, and Grab) whereas Thai companies can only produce a small part such as accounting software, which has a small market share because most users are small and medium-sized local enterprises with low purchasing power. Apart from that, there is an export of digital products, namely games to Cambodia, Laos, Myanmar, and Vietnam. A delay in overall digital development is a result of a low level of technological and innovation readiness and a lack of advanced digital skills among the Thai population, together with outdated laws and regulations which are un conducive for foreign investment from global tech leaders as well as for startups. As a result, Thailand has lost an opportunity to generate economic value added from advanced digital technology, specifically big data from digital transactions, to develop products and services to respond to the needs and behaviors of users.

For these reasons, there is a need to accelerate the digital industry's competitiveness and elevate the electrical and electronics industry in order to turn Thailand into a key global production base for smart electronics. In addition, Thailand needs the digital transformation of economic and social development with complete digital immunity and an enabling ecosystem conducive to the development of smart electronics and a digital industry so that the country can make full use of rapidly changing technological advancement in effectively creating economic value add.

2. Development Goals

2.1 Connections between Milestone 6 and the main targets and goals of the 13th National Economic and Social Development Plan and the National Strategy

Milestone 6, whereby Thailand is ASEAN's hub for digital and smart electronics industry, is consistent with three goals of the 13th Plan, namely, 1) **Target 1: Restructuring the manufacturing and service sectors towards an innovation-based economy** by expanding the

current electronics industry and shifting towards the smart electronics industry with a focus on manufacturing key parts in the ASEAN supply chain, which will be of high value and high demand on future markets, together with boosting the digital industry's competitiveness; 2) **Target 2: Developing human capital for the new global era** by creating a capable workforce in line with the needs of future industries and services, including the country's smart electronics and digital service industries; and 3) **Target 5: Enhancing Thailand's capability to cope with changes and risks under the new global context** by encouraging the use of digital technology in diverse sectors and dimensions.

Moreover, Milestone 6 corresponds to the National Strategy in the areas of 1) **Security** with the goal of preparing and developing human capital, related tools and technology as well as Big Data technology to be ready to address all forms of threats, together with preventing and addressing existing and future national security problems; 2) **Competitiveness enhancement** through next-generation industrial and service development with a focus on advancing Thailand's target industries into the industries of the future that will become the pillars of the Thai economy, creating an enabling environment conducive to industrial and service development and developing sufficient, high quality, comprehensive and affordable technological infrastructure; and 3) **Eco-friendly development and growth** by developing sustainable growth in an eco-friendly society through the use of technological advancement in business operations and daily life as well as in reducing GHG emissions and creating a low-carbon society.

2.2 Goals, Indicators and Targets

Target 1 The domestic digital economy has expanded.

Indicator 1.1 The proportion of value added from the digital technology industry to GDP increases to 30 per cent by 2027.

Indicator 1.2 There is a public digital dashboard to track the digital transactions of government services by 2023, and all government services are digitized by 2027.

Indicator 1.3 The value of expenditure on research and development and innovation increases by at least 5 per cent per year by 2027.

Indicator 1.4 High-speed internet services are accessible and available to people in every village, community and tourist destination.

Target 2 The export of Thailand's smart electronics industry has increased.

Indicator 2.1 The export share of the country's smart electronics accounts for 60 per cent of total electrical and electronics industry exports by 2027.

Indicator 2.2 There are 400,000 workers with "smart electronics system integrator" skills to accommodate an expansion of the smart electronics industry by 2027.

Target 3 Thailand's digital and smart electronics industries have become stronger.

Indicator 3.1 At least three of the world's biggest tech companies invest in Thailand by 2027.

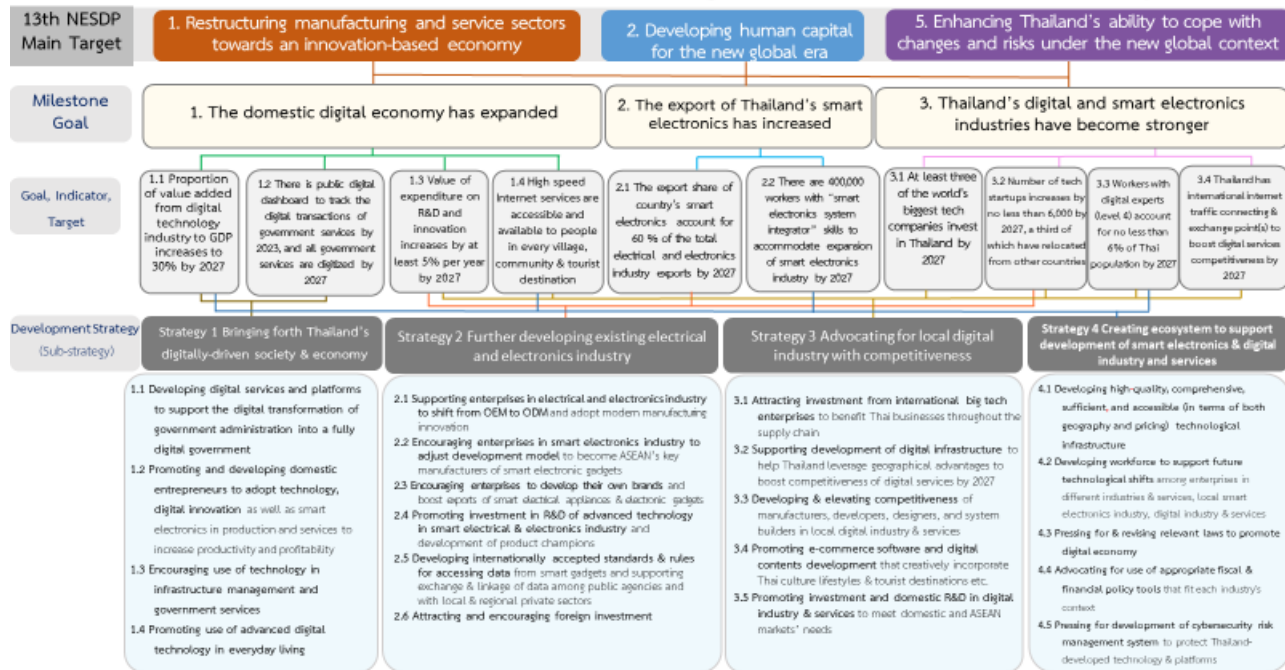
Indicator 3.2 The number of tech startups increases by no less than 6,000 by 2027, a third of which have relocated from other countries.

Indicator 3.3 Workers who are digital experts (level 4) account for no less than 6 per cent of the Thai population by 2027.

Indicator 3.4 Thailand has international internet traffic connecting and exchange point(s), which enhances the competitiveness of digital services by 2027.

3. Strategy Map

Milestone 6: Thailand is ASEAN's hub for digital and smart electronics industry



4. Development Strategies

Strategy 1 Bringing forth Thailand's digitally driven society and economy:

Sub-strategy 1.1 Developing digital services and platforms to support the digital transformation of government administration into e-government, a fully digital government, by encouraging government agencies to use technology and digital devices to perform duties, including online systems for clerical works, e-payments, cloud storage, electronic services, and transactions for clients as well as full data integration and connection across all government agencies.

Sub-strategy 1.2 Promoting and developing domestic entrepreneurs to adopt technology, digital innovation as well as smart electronics in production and services to increase productivity and profitability. Providing funds to support the adoption of smart electronic and digital tools, particularly by SMEs. Attaching importance to the development of digital platforms to assist agricultural markets and Thai agricultural operators in utilizing digital technology to comprehensively support the agricultural industry as well as in building preparedness for disasters and seasonal changes. Promoting an extension of the agricultural sector to include production, such as smart factories and smart medicine, as well as boosting service transactions on Thai digital platforms by different sectors, such as agricultural markets, tourism, medicine and wellness, and finance.

Sub-strategy 1.3 Encouraging the use of technology in infrastructure management and government services by designing digital platforms to support all dimensions of development, such as platforms for energy trade, carbon market, smart city, telemedicine and online education.

Sub-strategy 1.4 Promoting the use of advanced digital technologies in everyday living, including e-learning, smart gadgets and electronic transactions. Raising awareness on social media threats as well as basic skills to build immunity to fake news.

Strategy 2 Further developing the existing electrical and electronics industry:

Sub-strategy 2.1 Supporting enterprises in the electrical and electronics industry to shift from original equipment manufacturers (OEM) to original design manufacturers (ODM), as well as adopting modern manufacturing innovations to transition into Industry 4.0 and a green electronics industry through fiscal and financial tools as well as other innovation promotion policies.

Sub-strategy 2.2 Encouraging enterprises in the smart electronics industry to adjust their development model in order to become ASEAN's key manufacturers of smart electronic gadgets and parts, focusing on the production of sought-after and high-value key parts in the global supply chain and a shift to advanced electronics industry, such as the manufacturing of supercapacitors, optoelectronics, and microelectronics. Encouraging the industrial sector to use materials from domestic manufacturers.

Sub-strategy 2.3 Encouraging enterprises to develop their own brands and boost exports of smart electrical appliances and electronic gadgets, focusing on foreign markets where Thailand has potentials, such as ASEAN, Europe, and the United States.

Sub-strategy 2.4 Promoting investment in research and development of advanced technologies in the smart electrical and electronics industry as well as the development of product

champions, including EV sensor and electronic systems. Providing incentives for starting new businesses to manufacture smart electronic products and parts.

Sub-strategy 2.5 *Developing internationally accepted standards and rules for accessing data from smart gadgets. Supporting the exchange and linkage of data among government agencies and with local and regional private sectors to build big data for research and development of relevant products and services.*

Sub-strategy 2.6 *Attracting and encouraging foreign investment by collaborating with Thai businesses or joint ventures, together with giving privileges for investors that encourage or press for specialist partners to transfer knowledge and expertise to Thai enterprises with a focus on upstream industries with advanced manufacturing technology, which are the basis for the smart electronics industry.*

Strategy 3 Advocating for the local digital industry with competitiveness:

Sub-strategy 3.1 *Attracting investment from international big tech enterprises for the benefit of all Thai businesses throughout the supply chain, such as investment in diverse cloud data centers for ASEAN populations. Attracting big tech investment in Thailand's digital infrastructure, (e.g. data centers, e-government, cloud, and virtual platforms). Establishing investment formats and privileges that generate domestic economic value add, such as partnerships with Thai businesses and employing a Thai workforce.*

Sub-strategy 3.2 *Supporting the development of digital infrastructure to help Thailand leverage its geographical advantages to enhance the competitiveness of Thailand's digital services by 2027 by, for example, expanding international internet bandwidth, linking international networks to cut costs and times for building data centers, and developing domestic public cloud services.*

Sub-strategy 3.3 *Developing and elevating the competitiveness of manufacturers, developers, designers, and system builders in the local digital industry and services to become providers of user-friendly digital solutions that meet the needs of local or ASEAN markets by piloting in the fields of agriculture, medicine and wellness, tourism, and local administrative management.*

Sub-strategy 3.4 *Promoting the development of e-commerce software and the creation of digital content that creatively incorporate Thai culture, lifestyles and tourist destinations etc. to generate economic value add in all aspects, such as virtual museums, virtual cultural performance stages, virtual concerts and virtual movie characters.*

Sub-strategy 3.5 *Promoting investment and domestic research and development in the digital industry and services to meet the needs of domestic and ASEAN markets. Attracting and developing tech companies of all sizes, ranging from startups to global corporations, and building a digital ecosystem to increase opportunities for Thai tech businesses. Attracting and developing talent to enable a great leap forward in the development of the Thai workforce and industries. Offering appropriate privileges, such as tax measures, to boost investment in digital startups.*

Strategy 4 Creating an ecosystem to support the development of smart electronics and digital industry and services:

Sub-strategy 4.1 *Developing high-quality, comprehensive, sufficient and accessible (in terms of both geography and pricing) technological infrastructure to ensure that the*

population has sufficient social protection and is able to access education, healthcare, government services and other economic and social opportunities, as well as support future digital needs both quantitatively and qualitatively.

Sub-strategy 4.2 *Developing the workforce to support future technological shifts among enterprises in different industries and services, including the local smart electronics industry and digital industry and services.* Equipping workers with skills in line with the needs of future industries and services. Improving educational curricula through collaborations between the public, private and academic sectors (domestic and international). Accelerating labor skills enhancement while developing professional standards for workers in technology-related industries. Attracting foreign personnel in areas with shortages such as software development and disruptive technology.

Sub-strategy 4.3 *Pressing for and revising relevant laws to promote a digital economy and consumer protection. Strictly enforcing copyright laws as well as pressing for e-waste management laws and regulations. Developing and revising government regulations which hinder investments, recruitment of highly skilled labor, adoption of technology and digital innovation, and overall growth of the digital industry and services.* For example, mandating technology transfers as a condition for large-scale public procurements to boost the domestic production of infrastructure components. *Promoting sandboxes to encourage a revision of laws and regulations.* Establishing a system to monitor and regulate digital services, particularly transactions on foreign platforms, for the purpose of taxation.

Sub-strategy 4.4 *Advocating for the use of appropriate fiscal and financial policy tools that correspond to each industry's context* in order to stimulate investment in research and development and innovation as well as boost competitiveness of the smart electronics and digital industries and services, such as tax reduction for importation of digital technology and a verification, monitoring and protection system for consumers in the digital industry.

Sub-strategy 4.5 *Pressing for the development of cybersecurity risk management systems in accordance with international principles together with data sovereignty policies* to protect Thailand-developed technologies and platforms by formulating rules and conditions related to data sovereignty.

Milestone 7: Thailand Has Strong, High-Potential and Competitive SMEs

1. Past Development Situation

Small and Medium-sized Enterprises (SMEs) are Thailand's key enterprises. SMEs constitute 99 per cent of businesses in the country as well as generating 71.86 per cent of all employments, which contributes 5.6 trillion baht in gross value add to the 2021 economy (calculated by the volume of SME GDP) or 34.6 per cent of Thailand's 2021 GDP, with an average annual growth of 3.4 per cent during the five-year period of the 12th NESDP (2017-2021). However, the COVID-19 pandemic in late 2019 has caused massive declines in revenues to a large number of businesses. Consequently, it triggered a severe liquidity crisis, suspension of workers and operations or even permanent closures among many SMEs.

The government and relevant agencies have continuously promoted and supported SME development; for example, building capacity for business operations through trainings on entrepreneurial attitudes and skills, financial literacy, manufacturing and services, product and packaging development, and marketing. Nevertheless, most of them are general and basic trainings that are not tailored to the diverse demands and forms of SMEs. Therefore, operators cannot apply much in their business operations. Gaps remain in referrals and systematic monitoring and evaluation, whereas the government has focused on building an enabling ecosystem for businesses through integrated budgeting for SME promotion; for instance, appropriate funding, market promotion, standards, research and development and innovation by relevant agencies. Moreover, a considerable number of SMEs are informal and not listed in a proper system, resulting in the public sector's lack of clear and sufficient data on them and therefore limiting the ability to develop appropriate policies and measures to support, assist, remedy and meet the specific needs of SMEs, which are highly diverse in terms of size, type, and growth level.

Fast-changing and intense global and social contexts underlie challenges from internal and external factors on SMEs, while the need to keep up with the pace of changed and enhance competitiveness, particularly amidst limitless technological growth, forces SMEs to transition their business operations to technology-dependent businesses. Besides, Thailand's demographic shift into an ageing society impacts the number of workers as well as consumer behaviors, including a shift to consume more health-related products and services. Sudden climate change impacts also affect the reliability of natural products, while consumers become increasingly aware and choose more sustainable and eco-friendly products and services. In addition, the severe impacts of the COVID-19 pandemic forced SMEs to become more flexible in business operations and adopt digital transformation, automation and machinery as well as research and development and innovation to boost productivity and efficiency, connect with the global value chain, and decrease overreliance on specific markets, which are principles for creating business opportunities and diversifying risks.

In the meantime, the public sector needs to promptly improve and enhance the efficiency of the SME promotion and development system to become more relevant to the needs of entrepreneurs and based on an understanding of diverse businesses, as well as incentivizing SMEs to join the system and undertake development in an inclusive and equal manner in order for their businesses to thrive and expand.

2. Development Goals

2.1 Connections between Milestone 7 and the main targets and goals of the 13th National Economic and Social Development Plan and the National Strategy

Milestone 7, whereby Thailand has strong, high-potential and competitive SMEs, is consistent with the National Strategy in the areas of: **1) Competitiveness enhancement** particularly with two following goals: 1) Thailand becomes a developed country with stable and sustainable economic growth; and 2) Thailand's national competitiveness is increased and under the guideline on "developing modern, entrepreneur-based economy," which emphasizes the development of modern entrepreneurs with entrepreneurial skills, spirit, competitiveness and clear identities who can adapt and adopt digital tools and innovation in business operations and are supported in securing conventional and alternative funding sources through the use of financial and non-financial data, as well as being able to access online/offline domestic and international markets that fit their capacities, while being provided with information, facilitation and support to access the government's central data and knowledge repository in an equal and comprehensive manner; **2) Developing and strengthening human capital** with the goal: Thailand has adequate social surroundings suitable for life-cycle development and under the guideline on "promoting positive values and culture of business sectors" by encouraging businesses to practice good governance, embedding a business mindset of which social costs are taken into account, and promoting corporate social responsibility and social enterprises; and **3) Social cohesion and equity** with the goals of 3.1) distributing economic and social hubs and providing opportunities for every sector to take part in national development at all levels; and 3.2) enhancing the capability of local communities in the areas of development, self-reliance and self-management to build a quality society, particularly under the guideline on "adjusting local economic structures" to elevate farmers to become entrepreneurs in agricultural SMEs.

Milestone 7 also corresponds to three targets in the 13th Plan, namely: 1) **Target 1: Restructuring the manufacturing and service sectors towards an innovation-based economy** by developing and enhancing competitiveness of SMEs in every sector as well as enabling SMEs to connect to the global value chain with an enabling ecosystem appropriate for each type and sector of business; 2) **Target 2: Developing human capital for the new global era** by equipping Thai people with skills and traits that fit the modern world in terms of knowledge, behavioral skills, and manners according to the norms of society; and 3) **Target 3: Creating a society of opportunities and fairness** by reducing disparities in income, wealth and business competitiveness and by promoting fair and open competition among SMEs to compete sustainably.

2.2 Goals, Indicators and Targets

Target 1 There is an enabling environment conducive to the growth and competitiveness of SMEs.

Indicator 1.1 The proportion of SMEs registrations with the Social Security Office (in accordance with Section 33) to the total number of SMEs increases to 20 per cent; the proportion of SMEs with juristic person registrations to the total number of SMEs increases to 40 per cent; the proportion of SMEs with VAT registrations to the total number of SMEs increases to 5 per cent; and the proportion of SMEs with commercial registrations to the total number of SMEs increases to 20 per cent by 2027.

Indicator 1.2 The value of capital raising through capital markets increases by no less than 12 per cent per year; the proportion of SME's access to loan to total loans increases to no less than 60 per cent by 2027.

Indicator 1.3 Competitiveness in terms of trade regulations ranks no lower than 40th in 2027; there are at least two subordinate legislations under the Trade Competition Act B.E. 2560 (2017) per year on average; and the proportion of resolved complaints to the total number of complaints increases to 80-90 per cent per year.

Indicator 1.4 There is a current, comprehensive SME database system accessible to both the government and SMEs.

Target 2 SMEs have high business capability, improvability, and adaptability to new competitions.

Indicator 2.1 The proportion of SME GDP to overall GDP increases to 40 per cent, while the proportion of SME exports to overall exports increases to 20 per cent by 2027.

Indicator 2.2 The proportion of value of SME e-Commerce to the value of overall e-Commerce increases by no less than 10 per cent from the baseline year (2021).

Indicator 2.3 The number of new SME exporters rises by no less than 2,000 per year.

Indicator 2.4 SMEs' domestic market share increases to 25 per cent by 2027.

Indicator 2.5 The value of public procurement participated by SMEs increases by no less than 5 per cent per year on average.

Indicator 2.6 The value of VAT collection from SMEs increases by no less than 10 per cent per year on average.

Target 3 SMEs can effectively access and receive government supports.

Indicator 3.1 The number of Series C startups rises to 20 in 2027.

Indicator 3.2 The number of social enterprise registrations increases by no less than 25 per cent per year.

3. Strategy Map



4. Development Strategies

Strategy 1 Developing an enabling ecosystem conducive to SMEs' business operations and competitiveness enhancement:

Sub-strategy 1.1 *Expediting a revision of regulations obstructing business operations to ensure equitable competition between SMEs and large businesses* by developing competitive behavior monitoring tools to be used in formulating corrective and control measures against market domination. Articulating, and strictly enforcing, business operation guidelines to ensure appropriate and equitable competition among entrepreneurs. Reviewing and revising unnecessary laws and regulations.

Sub-strategy 1.2 *Facilitating every step of SME business operations;* for example, reducing steps and timeframes in new business registrations and approvals. Developing an e-government platform for all procedures regarding public services. Raising the efficiency of the Business Support Centers to assist entrepreneurs in starting and conducting businesses as well as developing and disseminating business operation manuals that include every business category and are accessible to entrepreneurs.

Sub-strategy 1.3 *Developing digital infrastructure and standard systems accessible to SMEs at low costs* by providing partial subsidies for the use of technology and basic software in boosting business efficiency and standards, especially in analysis, testing and certification. These aim to help SMEs lower developing and testing costs as well as acquire certifications for products and services, national and international standards. Expanding services of incubation centers specializing in specific businesses to cover the development and enhancement of SMEs' products and services to achieve quality, innovativeness, and international competitiveness.

Strategy 2 Developing a platform to link SME databases and encouraging SMEs to participate in the system:

Sub-Strategy 2.1 *Establishing one ID system for SMEs and encouraging SMEs to adopt the system in digital transactions.* Reducing steps and paperwork required in government transactions.

Sub-Strategy 2.2 *Developing a central portal to link SME data with the e-government platform.* Promoting data sharing between agencies and allowing relevant persons to access real-time big data by offering incentives and useful services to encourage SMEs to join database systems. Meanwhile, developing a procedure for requesting SMEs' consent in data sharing between agencies for the purpose of developing targeted policies and supportive measures.

Sub-strategy 2.3 *Transforming data and knowledge repository for SMEs into an online system as well as comprehensive e-services.* Building a digital platform for data and knowledge repository accessible to SMEs. This platform will enable them to perform market analysis and to develop or enhance the efficiency of products, services, and manufacturing processes by themselves.

Strategy 3 Building financial mechanisms compatible with the unique characteristics of SMEs to ensure all SME groups have comprehensive access to funding:

Sub-strategy 3.1 *Encouraging financial institutions, banks, and non-financial institutions to use business data and digital footprints in approving loans to SMEs* by using digital

transactions or key trade data in digital form to verify business status and act as collaterals in place of conventional collaterals.

Sub-strategy 3.2 *Determining the role of Specialized Financial Institutions (SFIs) to include clear measures on loans and guarantees for each SME segment, particularly for small and micro enterprises. Identifying guidelines and criteria for developing special loan schemes different from those of conventional financial institutions to increase SMEs' accessibility to loans.*

Sub-strategy 3.3 *Encouraging SMEs to raise funds through capital markets or diverse sources in line with their business models in addition to conventional loans. For instance, fundraising through the Market for Alternative Investment (MAI), crowdfunding, person-to-person loans, and venture capital. Granting SMEs and startups in the financial field opportunities to expand their businesses by providing alternative funding in line with business potentials and business models of other SMEs.*

Strategy 4 Encouraging and developing SMEs to become digital entrepreneurs:

Sub-strategy 4.1 *Fostering basic business knowledge especially knowledge and skills of the youth and entrepreneurs regarding digital, finance, new marketing, export market acquisition, business models, creative economy, exploitation of cultural capital, as well as other in-depth knowledge and skills as needed for specific sectors and types of business. Building SMEs' preparedness for coping with intense and fast-changing competition in the modern market, as well as for sustainable business operations, taking into consideration the environment, society and good governance, in order to achieve international competitiveness.*

Sub-strategy 4.2 *Offering benefits and incentives to encourage SMEs to invest in and utilize digital technology, machinery and automation in management, and to enhance manufacturing and service efficiency. Offering tax benefits and low-interest loans for investment in technology or machinery together with partially supporting consultancy fees and training expenses.*

Sub-strategy 4.3 *Developing international trade platforms accessible to SMEs and allowing domestic SMEs to leverage safe and secure country's platforms in order to facilitate access to potential markets in other countries. Stimulating SMEs with export capabilities to use trade privileges. In addition, providing preparedness and remedies for people who are affected by Free Trade Agreements (FTA) and international collaborative frameworks.*

Sub-strategy 4.4 *Encouraging collaboration between SMEs within the same segment and with large corporations within the supply chain, especially in the S-curve industries. This aims to enhance competitiveness throughout the supply chain. Promoting network building and business alliances. Pairing and encouraging large corporations with potentials to provide comprehensive assistance to SMEs in the supply chain. Organizing forums for exchanging business ideas and experiences to develop sustainable collaboration among SMEs at all levels.*

Strategy 5 Raising the efficiency of the public sector's SME promotion schemes:

Sub-strategy 5.1 *Expanding business development services that reach specific needs of SMEs as well as developing a referral system by expanding on the government's coupon initiative. Developing registration and capacity assessment systems for private providers of business development services to ensure that SMEs choose business development services with quality and government-certified standards.*

Sub-strategy 5.2 Supporting the Office of SME Promotion (OSMEP) as a policy-making body to fully integrate SME assistance and promotion services. Allocating sufficient budgets for continuous SME promotion through the SME Promotion Fund.

Sub-strategy 5.3 Adjusting monitoring and evaluation mechanisms and processes by establishing common indicators across all agencies and allowing more engagement by representatives of SMEs, the private sector and academia to ensure co-ownership of the policies between the government, the private sector and the people.

Strategy 6 Creating an enabling ecosystem conducive for startups and innovation-driven entrepreneurs as well as providing access to appropriate sources of funding and linkages to international networks and markets:

Sub-strategy 6.1 Reviewing and revising laws to increase ease of business operations, especially those for startups. For example, recruiting personnel with globally acknowledged technological expertise and company formation specialists to develop an enabling ecosystem as well as advance startups who require an ecosystem and business practices in starting, running, and progressing unconventional businesses.

Sub-strategy 6.2 Alleviating constraints on fundraising to allow public-private partnerships in developing seed funding and private equity funds for individuals, which give startups mentors in business building. These will allow access to capital and continuous fundraising, and opportunities to establish networks with funders abroad while attracting international talent to join local startups.

Sub-strategy 6.3 Supporting a linkage between startups and the international market by encouraging startups to participate in incubation programs, especially international incubation. Fostering collaboration with special development zones for startups and leading foreign universities in order to give young startups opportunities to achieve Series C or higher status.

Strategy 7 Enhancing social enterprises' business capabilities:

Sub-strategy 7.1 Enacting an organic law under the Social Enterprise Promotion Act B.E. 2562 (2019) to mitigate constraints in social enterprise registrations to encourage more registrations by non-juristic enterprises. Stimulating the setting up of social enterprise funds.

Sub-strategy 7.2 Supporting the development of specific sustainable business models for social enterprises through collaborative mechanisms among the public sector, the private sector and the Social Enterprise Association. Promoting collaboration with international experts.

Sub-strategy 7.3 Offering benefits and incentives for joint investment with social enterprises to encourage large private companies to correspond with corporate social responsibility policies by supporting the growth of domestic social enterprises.

Milestone 8: Thailand Has Smart Cities as well as Safe and Livable Regions with Sustainable Growth

1. Past Development Situation

The 9th Strategy of the 12th National Economic and Social Development Plan aims for economic growth distribution and an increase in income per capita. However, past development outcomes of the 9th strategy have not been fully achieved.

Although past **regional development** mostly resulted in a reduction in income inequalities, economic activities continue to concentrate in Bangkok and the Central and Eastern regions. In fact, Bangkok accounts for the highest proportion of provincial Gross Provincial Product (GPP) to Gross Domestic Product (GDP). It was the only province with an increasing share of GPP from 32.7 per cent in 2017 to 33.8 per cent in 2019 whereas other regions had faced a decrease in their shares of Gross Regional Product (GRP) to GDP over the same period. The GRPs of the Northern, North-eastern, Southern, and Southern Border regions account for 7.7 per cent, 9.4 per cent, 7.9 per cent and 0.8 per cent of GDP, respectively.

Meanwhile, **spatial development** has made considerable progress, especially 10 Special Border Economic Zones (SBEZ). These SBEZs have received BOI (Board of Investment) promotion with a total investment of 8,658 million baht from 2015 to 2021 (as of June). In these SBEZs, there are 4,975 new companies set up with total registered capital of 9,823.03 million baht while more than 456,052 foreign workers have been employed since 2017-2021 (as of May). During 2016-2021, total infrastructure investment, including highways, airport facilities, bridges, and custom offices amounted to 47,223.45 million baht. In the Eastern Economic Corridor (EEC), BOI had granted an investment promotion of 1,455.121 billion baht from 2016 to 2020.

Regarding **urban development**, Thailand has increasingly become urbanized. In 2020, around 23 million people (34.47 per cent of the total population) lived in urban areas or municipalities, which had increased from 21 million people (33.91 per cent of total population) in 2011.

Currently, all levels of development have experienced repercussions of the global economic downturn and the COVID-19 pandemic, which caused severe economic and social impacts. The economy **in each region** has shrunk due to a stop to or suspension of manufacturing and services, especially in tourism and export-oriented industries. A large number of workers have suffered from downsizing and dismissals. Most of the population have experienced a decrease in incomes, while some people faced income shortages. The unemployment rate has soared and many workers moved back to their hometowns to take up agricultural work. Therefore, adaptation and adjustments are needed in the upcoming development of the manufacturing and service sectors. Emphasis should be put on development to strengthen local economies and production and services for the domestic market to meet consumers' changing demands, especially for health-related products.

Although the **Special Economic Zones** have been affected by a slowdown in investments, some segments continue to attract interest and continuous investments, especially local target industries. Therefore, the focus of development should be on ensuring infrastructure readiness as well as reviewing and revising investment promotion and facilitation measures to accommodate investments. Once the COVID-19 pandemic abates, the Special Economic Zones will again attract more attention and confidence from investors and draw more investments to the area.

Urban development has also been comparatively affected. Similar to the regional development, trade and services in urban areas will need to adapt to the new normal and people will also have to change their consumption and commuting behaviors. These changes might bring about negative consequences, especially on the social and environmental aspects of cities. Therefore, Thailand needs to urgently resolve these issues to ensure sustainable area and urban development, resilience, responsiveness to changes, and inclusive access to public services and good quality of life for all population groups.

2. Development Goals

2.1 Connections between Milestone 8 and the main targets and goals of the 13th National Economic and Social Development Plan and the National Strategy

Milestone 8, whereby Thailand has smart cities as well as safe and livable regions with sustainable growth, is consistent with three areas of the National Strategy (2018-2037), namely: **1) Competitiveness enhancement** with the goal: Thailand becomes a developed country with stable and sustainable economic growth; **2) Social cohesion and equity** with the goal of distributing economic and social hubs and providing opportunities for every sector to take part in national development at all levels, as well as enhancing the capability of local communities in areas of development, self-reliance and self-management to build a high-quality society; and **3) Eco-friendly development and growth** with the goal of ensuring utilization and development growth based on balanced natural resources within the ecosystem's capacity.

Milestone 8 also corresponds to all of the five targets of the 13th Plan, namely: **1) Target 1: Restructuring the manufacturing and service sectors towards an innovation-based economy** by enhancing local economies and enabling local enterprises to connect to the value chain of the national-level manufacturing sector while disseminating benefits to local economies; **2) Target 2: Developing human capital for the new global era** by creating a quality workforce in line with the needs of the labor market and strengthening the security of life through area and urban development; **3) Target 3: Creating a society of opportunities and fairness** by making cities livable with a good quality of life for all people, taking ecological landscape into consideration; **4) Target 4: Ensuring the transition of production and consumption towards sustainability** by encouraging cities to use natural resources efficiently as well as reduce waste and pollution for the health and well-being of people at all levels; and **5) Target 5: Enhancing Thailand's capability to cope with changes and risks under the new global context and overcome future threats** by stimulating cities to shift to smart cities through the digital transformation of local governments as well as build preparedness for disaster and adaptation to all forms of changes.

2.2 Goals, Indicators and Targets

Target 1 There is an increase in the growth of regional economies and investment in Special Economic Zones.

Indicator 1.1 GRP per capita is not lower than GDP per capita.

Indicator 1.2 Investment in the Special Economic Zones increases according to the development targets of the 9th Master Plan on Special Economic Zones under the National Strategy, with 500 billion baht of investment in the Eastern Economic Corridor, 100 billion baht in the Southern Economic Corridor and 10 billion baht in SBEZs.

Target 2 There is a decrease in the uneven income distribution to regions.

Indicator 2.1 The GINI coefficient of the regions is lower than the country's GINI coefficient.

Indicator 2.2 Employment rate in the regions is higher than that in 2020 (except for Bangkok where the employment should not exceed 13 per cent of the country's total employment).

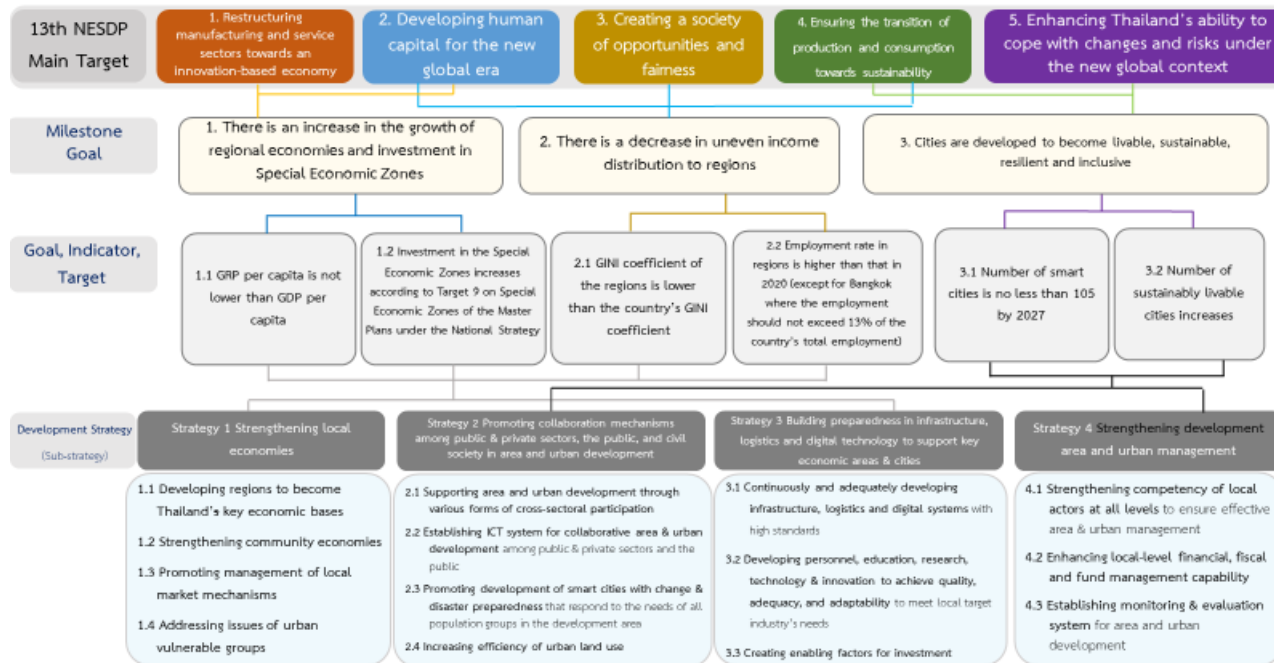
Target 3 Cities are developed to become livable, sustainable, resilient and inclusive.

Indicator 3.1 The number of smart cities is no less than 105 by 2027.

Indicator 3.2 The number of livable and sustainable cities increases.

3. Strategy Map

Milestone 8: Thailand has development areas, smart cities as well as safe and livable regions with sustainable growth



4. Development Strategies

Strategy 1 Strengthening local economies:

Sub-strategy 1.1 *Developing the regions to become the country's key economic bases* in accordance with the regional and economic corridor development plans, which include the Northern Economic Corridor, Northeastern Economic Corridor, Central-Western Economic Corridor, Southern Economic Corridor, Special Border Economic Zones, and Eastern Economic Corridor. Using these economic areas as important means to spread growth to the regions. Developing supply chains to connect within and between areas as well as with neighboring areas and other countries. Determining target industries in the areas where the new economy bases are located in line with local potentials. Connecting SMEs and community enterprises to the supply chain in the target industries to create economic opportunities, to extensively distribute the benefits of development, and to advance key economic bases to accommodate investment and employment. Further developing the Eastern Economic Corridor to ensure balanced and sustainable growth and to become an industrial and service base with advanced technology and innovation by promoting investment and employment in the area as well as encouraging continuous technology transfer.

Sub-strategy 1.2 *Strengthening community economies* by using networks in the community, such as households, temples and schools, as key driving mechanisms. Fostering knowledge transfers to the community from local educational institutions to boost development capacity and add value to economic activities in line with local identity, social and cultural capital and local potentials. Promoting the development of good quality, standard and safe products and services based on research, technology and innovation as well as local knowledge. Developing databases and e-service platforms for the purpose of planning on product development and manufacturing. Increasing the community's competitiveness to ensure sustainable income generation. Encouraging the setting up of clustering and strong networks, including community enterprise groups, SMEs and farmers' collectives, to build immunity to all forms of change during crises. Promoting shareholding among community members. Strengthening community-level financial institutions to increase access to funding by businesses and enterprises in the community, also allowing local financial institutions to play a role in systematically transferring knowledge on capital management, liquidity and liability management together with developing new types of loans to meet the needs and capability of the community. Promoting platform usage to generate local employment and equitable access to employment.

Sub-strategy 1.3 *Promoting local management of market mechanisms* to forge a balance between local production and consumption and to generate income from external markets. Advocating for innovation in local supply chain management to reduce losses from overproduction, cut costs and time in transporting products between community and regional hubs, as well as maintain product quality. Supporting employment generation and the employment of locals throughout the supply chain to accommodate the working age population in the areas and returnees following the aftermath of the COVID-19 pandemic. Promoting the adoption of digital technology in circulating products and services within the development area and the city, community enterprises, SMEs and farmers' collectives. Stimulating consumption in line, and in balance with, local production based on the Sustainable Consumption and Production (SCP) principle. Reviewing and revising rules and public policies that induce concentration of certain agricultural products and hinder procurement from producers in that consumption area.

Sub-strategy 1.4 Addressing issues regarding urban vulnerable groups. Increasing access to urban infrastructure, such as urban design based on the universal design principles and housing security. Providing inclusive welfare for all inhabitants in order to improve quality of life for vulnerable groups to ensure good physical and mental health. Increasing the capacity of urban community networks to assist and provide initial care for the vulnerable both in normal time and during crises.

Strategy 2 Promoting collaboration mechanisms among the public sector, the private sector, the public, and civil society in area and urban development:

Sub-strategy 2.1 Supporting area and urban development through various forms of cross-sectoral participation. Promoting urban development through various forms, including urban development charters and urban development companies. Exploring the feasibility of enhancing the charters' driving mechanisms to ensure continuity in urban development. Taking lessons from successful cases such as the Khon Kaen model, which attracts investment and boost the employment of locals, to scale up in other areas. Promoting the role of social enterprises in area and urban development, as well as in developing new businesses and creating jobs, by providing initial protection measures from business and financial risks. Imparting skills and knowledge to the community for self-reliance; for example, through health enterprises for social benefits, which focus on urban farming as well as making the city a food safety zone. Expanding the network to connect together social enterprises in the development area and city to foster sustainable economic and social security. Revising government regulations to better allow collaboration between the government and development partners, including the private sector, the public, and civil society. Encouraging connecting ecological areas between cities. Promoting collective planning and implementation to ensure the appropriateness, flexibility and agility of solutions.

Sub-strategy 2.2 Establishing an ICT system for collaborative area and urban development among the public sector, the private sector and the public. Reviewing and revising regulations that obstruct access to ICT data in order to promote collaboration among development partners. Supporting the disclosure and sharing of data between the public sector, private sector and the public to benefit area and urban development planning. Supporting open-access research, innovation, data collection and processing for the purpose of area and urban management, including city data collection and management system, ICT system for local-level budgeting and project management, and digital skills enhancement.

Sub-strategy 2.3 Promoting the development of smart cities with change and disaster preparedness that respond to the needs of all population groups in the area. Placing importance on smart city development with considerations of communities' traditional values in accordance with the goals of the Master Plan under the National Strategy, achievable through collaborations among the local private sector, inhabitants and civil society. Assessing the city's digital preparedness and strengthening the capacity of cities with potentials to enable them to advance into smart cities, also by instilling appropriate knowledge and understanding of digital technology. Designing townhall mechanisms for collective planning on technology adoption to ensure transparent and effective urban management.

Sub-strategy 2.4 Increasing efficiency of urban land use, taking into account urban planning that encompasses all aspects. Encouraging land readjustment process together with the development plan of the adjusted lands with public participation following the livable and

sustainable city framework. Improving the landscape in line with urban culture and environment. Supporting a feasibility study on land and structural use to accommodate the Transit Oriented Development. Increasing green and public areas in the city as well as diminishing urban sprawls to improve residents' quality of life.

Strategy 3 Building preparedness in infrastructure, logistics and digital technology to support key economic areas and cities:

Sub-strategy 3.1 *Continuously and adequately developing infrastructure, logistics and digital systems with high standards* and full coverage of the area/city to facilitate the expansion of economic activities and public needs. Developing transport and logistics infrastructure to ensure safe, convenient and effective transportation and transports of goods and raw materials. Developing telecommunication infrastructure which is modern, inclusive, and of high quality. Developing scientific, technology and innovation infrastructure to support research and development for commercialization. Promoting the adoption of digital technologies to create value add as well as encouraging entrepreneurs to carry out digital transformation in business operations. Developing the city's infrastructure and facilities to accommodate tourism and related services.

Sub-strategy 3.2 *Developing personnel, education, research, technology and innovation to achieve quality, adequacy, and adaptability to meet the needs of local target industry and services* so as to continuously support the expansion of the industrial and service sectors, particularly personnel in creative economy, tourism, agriculture/bio-industry, and future industries, which require advanced technologies and innovations. Encouraging collaboration among educational institutions, research institutes, the public sector and the private sector in producing research and innovation-related personnel to address local issues, develop local capacity, and design/develop products with international-level quality to meet the demands of market. Boosting competitiveness of all levels of local enterprises and linking them with the supply chains of external businesses. Enhancing the capability of farmers, community entrepreneurs, SMEs and startups in order for them to become smart farmers and tech startups. Developing labor skills to cater to creative services.

Sub-strategy 3.3 *Creating enabling factors for investment* to promote local trade and investment based on fair competition and social responsibility. Forging the private sector's role in developing advanced tech industries by facilitating its business operations through measures on clustering of industries and services. Offering incentives to attract investors and foreign experts to invest/reside in the development area. Easing access to funding and innovation in comprehensive business operations and investment with modern technologies. Reviewing and revising laws to facilitate investment, especially in the target industry with advanced technology and eco-friendly industries. Continuously publicizing relevant information to investors along with fostering understanding among local populations to ensure acceptance and support for development.

Strategy 4 Strengthening development area and urban management:

Sub-strategy 4.1 *Strengthening the capacity of local actors at all levels to ensure effective development area and urban management.* Supporting development area and city planning to ensure sustainability and livability according to the boundaries of ecological spatial plans. Applying data and indicators in assessing a city's sustainability while formulating development strategies with participation of all local partners during every step. In this respect, sustainably livable areas and cities shall place importance on the efficient use of natural resources;

reductions in all forms of waste, pollution and GHG emissions; extensive management of waste and wastewater with appropriate technology, safety, and preparedness against all forms of disasters. Pushing for key development areas and cities to develop investment plans in line with the development plan based on cross-sectoral participation, such as livable and sustainable cities and urban development charters, to ensure concrete implementation. These include an investment plan to revive a city's economy in specific development area or high value economic zones and plan to invest in, and develop, a mass transit system to connect and provide convenience to all groups of the population. Promoting research and study on the tools and power of local governments in development areas along with urban management to ascertain their ability to cope with the challenges of the VUCA (volatility, uncertainty, complexity and ambiguity) of the world. Establishing an urban learning zone to incubate innovation in area development management and collective problem solving, which might lead to sandboxes to test new ideas such as the disclosure and sharing of data, the forging of local knowledge, understanding and awareness on health and hygiene, food production systems, and healthy consumption behaviors through a network of community volunteers, such as Village Health Volunteers (VHV), for preparation against epidemics and emerging diseases.

Sub-strategy 4.2 *Enhancing local-level financial, fiscal and fund management capability.* Revising regulations to allow local governments to have financial agility and ability to generate incomes and raise funds from local populations. Improving tax measures to support social enterprise activities on urban development and land use for public benefit, such as urban agriculture. Exploring the possibility of setting up funds for new initiatives, such as a fund for structural and environmental improvements for health benefits that prioritize the design and restoration of buildings and the environment for economic activities, housing, and disease prevention and control. Designing and experimenting with diverse incentive mechanisms for cultural preservation of key development areas and cities, including historical towns and historic building clusters, as well as the surrounding or co-existing communities.

Sub-strategy 4.3 *Establishing a monitoring and evaluation system for area and urban development* with a focus on a learning process to improve and develop creative innovations for local development. Funding the evaluation of area and urban development with a focus on targets, outcomes, and impacts, particularly for important projects in terms of budget size and spatial coverage. Encouraging public participation and awareness in the evaluation of area and urban development by allowing the public to make suggestions to ensure the accountability of local governments.

Milestone 9: Thailand Has Less Intergenerational Poverty and Adequate, Appropriate Social Protection

1. Past Development Situation

Intergenerational transmission of poverty has long been a chronic and structural problem which is likely to intensify in the future. Even though the proportion of Thailand's poor has continuously decreased, a significant number of people are still trapped in poverty, receiving no benefit from the country's economic growth and passing poverty down to the next generation. According to the Thai People Map and Analytics Platform (TPMAP) in 2022, there were **597,248 households that are prone to fall under intergenerational poverty in so-called "intergenerational poor households"**¹, accounting for 15 per cent of all households with children and young people. This number is likely to increase due to the impacts of the COVID-19 pandemic which has resulted in a prolonged economic slump, consequently narrowing the opportunities for the poor to escape the poverty trap.

An analysis reveals that that most intergenerational poor households have no savings, low education levels and a high dependency ratio. The most important factor contributing to household intergenerational poverty is a lack of financial security due to a lack of savings (73.4 per cent), followed by inadequate education (17.2 per cent) with children aged six to 14 have not completed the nine-year compulsory education. Many children drop out of the educational system because their families cannot afford the expenses. Meanwhile, almost 70 per cent of leaders in these households have only primary education or less. In terms of demographics, the dependency ratio of children and the elderly to working age population is as high as 90 per cent and the proportion of household members aged six to 14 is as high as 23.7 per cent. Furthermore, most heads of the intergenerational poor households are agricultural workers (48.5 per cent), followed by elementary workers (28.8 per cent). More than 30 per cent of the intergenerational poor households are in the Northeastern region, followed by the Southern (25 per cent) and Northern Regions (18 per cent).

Due to the lack of educational opportunities and necessary skills, children from intergenerational poor households can often enter into the labor market only as low-skilled or semi-skilled workers. The intergenerational transmission of poverty not only negatively impacts the future income level and quality of life of these young people but also threatens the country's overall economic and social security, especially as Thailand becomes an ageing society and today's children and teens, once they reach working age, will have to shoulder a heavier burden of caring for the elderly. Therefore, the eradication of intergenerational poverty by providing intergenerationally poor children with education and skills development to allow them to reach their full potentials as well as sustainably lifting their families out of poverty is critical to the country's development during the implementation of the 13th National Economic and Social Development Plan.

In addition, Thailand needs to develop adequate social protection systems for populations across different age groups in order to cope effectively with demographic and other changes.

¹ Intergenerational poor households are households with children and young people aged 0 to 18 with income or non-income deprivation in at least one of four areas, namely *health* (newborn weight of less than 2,500 grams, or children aged 0 to 12 not fully vaccinated); *environment* (lack of housing security or access to clean water); *education* (children lack pre-schooling, do not complete mandatory education, or do not continue in high school or equivalent, or household members who are not in employment or training, or lack literacy and numeracy); and *financial security* (household income lower than 38,000 baht/person/year or no savings). Analyzed data came from big data on lifelong human development (TPMAP).

Currently, Thailand’s social protection systems suffer from gaps and inadequate levels of benefits for basic needs. Regarding social protection for children in early childhood, the provision of Child Support Grant suffers from exclusion errors as 30 per cent of eligible households have not received the benefits. Moreover, the 600-baht amount accounts for only 16 per cent of average expenses for children in this age group. A lack of access to childcare for children between 0 to two years old is a hurdle for many households as between the ages of 3 months and 2 years mothers are no longer entitled to maternity leaves whereas public early childhood development centers cannot accept children of this age. Meanwhile, private child care centers are few and expensive, so most parents need to send their children to live with grandparents in their hometown, depriving them of parental care and exposing them to a risk of delayed development. More than 22 per cent of children between the ages of 0 and four do not live with their parents.

In the working age population **a number of workers lack appropriate income security.** In 2021, there were almost 20 million informal workers, accounting for 52 per cent of all workers, who are not protected by Social Security System or the Civil Service Benefits and are lacking income security when facing sickness, incapacitation, or unemployment. Although informal-sector workers can opt into the voluntary retirement savings systems with government co-contributions as a way to ensure old-age income security, only around 35 per cent of informal-sector workers do. In addition, the enormous shift in the labor market towards non-standard forms of employment, particularly in the platform economy, has left several workers without protection under labor laws. As a result, these platform workers suffer from a lack of basic welfare and risk experiencing unfair treatment.

Meanwhile, the elderly in this cohort also lack social welfare to ensure a good quality of life. In 2020, 8.3 per cent of the elderly population lived in poverty without incomes or other forms of social security benefit, except the government’s Old-Age Allowance of 600 to 1,000 baht for living expenses. In addition, there are a number of dependent senior citizens who do not receive appropriate care. As of January 2022, only 54.2 per cent of the dependent elderly can access long-term healthcare services through the Universal Health Coverage program. Decent living conditions are also an important factor in the welfare of the elderly because unsafe living conditions can cause harm and lead to dependency.

Apart from the adequacy and coverage of specific social protection for each age group, **Thailand’s overall social protection still suffers from a lack of systemic governance** as social protection programs are served by several agencies working incoherently without integration from policy to implementation level and in terms of database systems, resulting in inadequate benefit levels for some target groups. Moreover, an absence of monitoring and evaluation leads to budget losses in ineffective programs and negatively impacts fiscal sustainability. There is also a lack of emergency preparedness and response, resulting in delayed, ineffective, and inaccurate assistance.

2.1 Connections between Milestone 9 and the main targets and goals of the 13th National Economic and Social Development Plan and the National Strategy

Milestone 9, whereby Thailand has less intergenerational poverty and adequate, appropriate social protection, aligns with two goals of the 13th Plan, namely: **1) Target 2: Developing human capital for the new global era** by developing social security and protection to ensure Thai people’s security in life; and **2) Target 3: Creating a society of opportunities and fairness** by giving vulnerable and marginalized groups opportunities in economic and social mobility.

Milestone 9 is also consistent with two areas of the National Strategy, namely: 1) **Developing and Strengthening Human Capital** under the goal of creating an enabling environment for lifelong human development; and 2) **Social Cohesion and Equity** with the goals of creating fairness and reducing inequalities in all dimensions, as well as distributing economic and social hubs and providing opportunities for every sector to take part in national development at all levels.

2.2 Goals, Indicators, and Targets

Target 1 Intergenerational poor households have opportunities for upward socioeconomic mobility and can escape poverty sustainably.

Indicator 1.1 All households identified as intergenerationally poor in 2022 can escape the intergenerational poor household status by 2027.

Indicator 1.2 Adjusted net enrollment rate of children from intergenerational poor households is no less than 100 per cent at lower secondary level and 70 per cent for higher secondary level or equivalent.

Indicator 1.3 The number of children from intergenerational poor households who have become skilled workers or completed higher education or equivalent increases by no less than 50 per cent.

Indicator 1.4 The proportion of children in early childhood from intergenerational poor households who suffer from developmental delay decreases by 20 per cent.

Target 2 Thai people of all age groups have adequate social protection for their livelihood.

Indicator 2.1 The social protection composite index score is no less than 100. The social protection composite index includes three dimensions and the following indicators:

1. Social protection for children

(1) Access to early childhood care (0 to two years) increases by no less than 50 per cent.

2. Social protection for working age population

(1) Workers insured for Social Security benefits account for no less than 60 per cent of the total workforce.

(2) The number of subscribers to the voluntary retirement saving system with government co-contributions increases by no less than 100 per cent.

(3) Workers in all forms of employment are protected by labor laws.

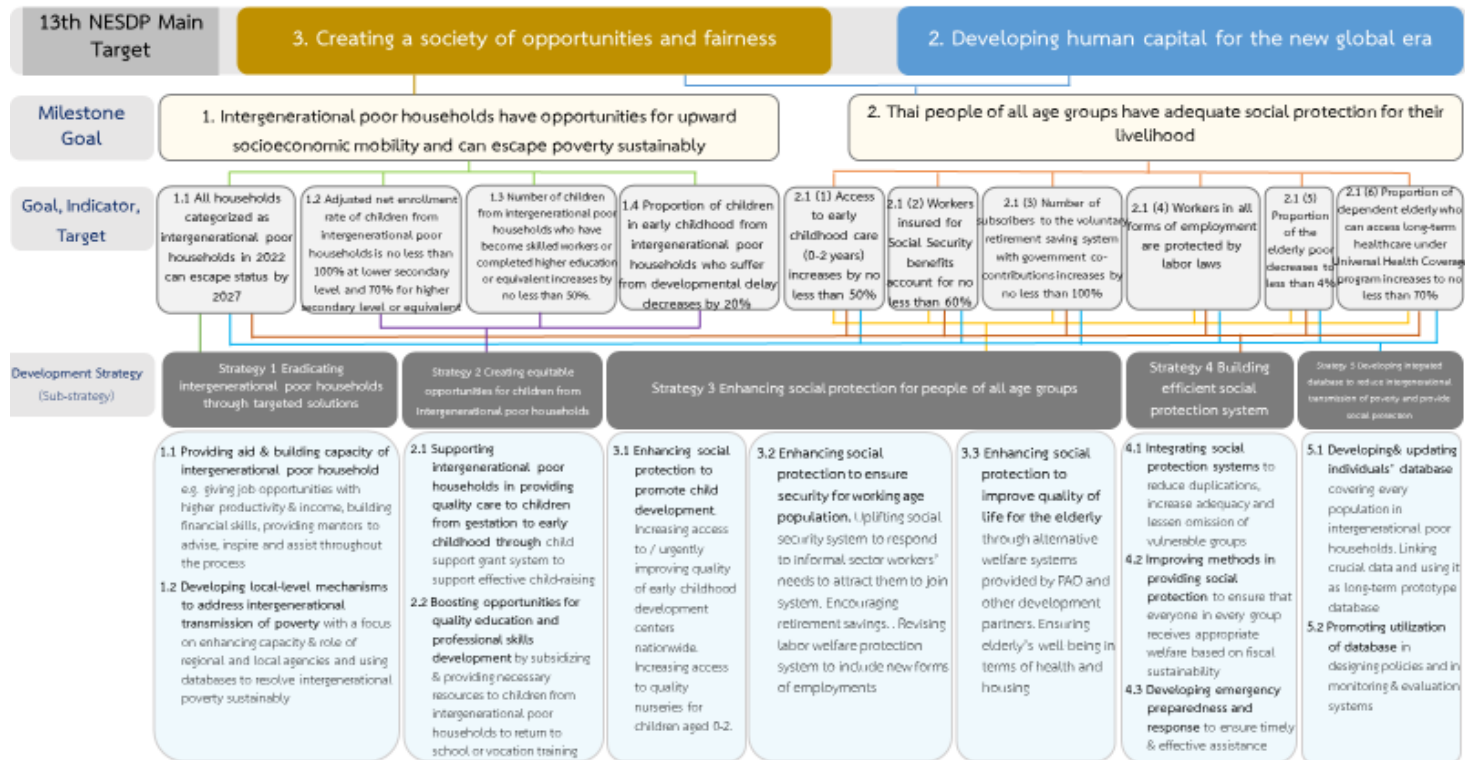
3. Social protection for the elderly

(1) The proportion of the elderly poor decreases to less than 4 per cent.

(2) The proportion of the dependent elderly who can access long-term healthcare under the Universal Health Coverage program increases to no less than 70 per cent.

3. Strategy Map

Milestone 9: Thailand has less intergenerational poverty and adequate, appropriate social protection



4. Development Strategies

Strategy 1 Eradicating intergenerational poor households through targeted solutions:

Sub-strategy 1.1 Providing aid and building the capacity of intergenerational poor households to ensure suitable living conditions for child development. Providing specific social protections for those with limited capacity. Putting an emphasis on building job opportunities with higher productivity and income through labor skill development. Identifying suitable jobs for the households' capabilities, local contexts, and the country's development direction. Supporting access to finance and necessary resources to make a living, enhancing financial knowledge and skills, together with providing mentors to advise, inspire and assist throughout the process.

Sub-strategy 1.2 Developing local-level mechanisms to address intergenerational transmission of poverty with a focus on enhancing the capacity and increasing the role of regional and local agencies in addressing intergenerational poverty. Integrating cross-sectoral collaboration to drive development strategies while using databases to identify intergenerational poor households, examine their needs, create operational guidelines to resolve their problems, and ensure close monitoring and evaluation in order to resolve intergenerational transmission of poverty sustainably.

Strategy 2 Creating equitable opportunities for children from intergenerational poor households:

Sub-strategy 2.1 Supporting intergenerational poor households in providing quality care to children from gestation to early childhood. Increasing the efficiency of Child Support Grant system by addressing exclusion errors, adopting conditional disbursement processes that triggers desired outcomes, and revising eligibility criteria and benefits to align with economic and social conditions.

Sub-strategy 2.2 Boosting opportunities for quality education and professional skills development. Subsidizing and providing necessary resources to children from intergenerational poor households to ease the burden of educational expenses in and outside schools and in both physical and virtual classrooms. Developing a monitoring and support system to help poor children return to education or professional skills development as appropriate.

Strategy 3 Enhancing social protection for people of all age groups:

Sub-strategy 3.1 Enhancing social protection to promote child development. Increasing access to and urgently improve the quality and standard of early childhood development centers (child development centers) nationwide. Increasing access to quality child care centers for children aged 0 to two years old, together with supporting local administrative organizations with readiness to expand the services of early childhood development centers to include children aged 0 to two. Promoting the establishment of quality child care centers in communities, workplaces and government agencies in order to allow parents to return to the labor market while living with their children.

Sub-strategy 3.2 Enhancing social protection to ensure security for working age population. Uplifting the social security system to respond to the needs of informal workers, specifically improving procedures for contribution payments and benefits to increase variety and flexibility. Encouraging retirement savings by incentivizing informal workers to join the voluntary saving system. Revising the conditions and benefits of the retirement saving system to allow participants to save and receive increased benefits. Developing financial data services to assist

participants in planning their retirement savings efficiently. Revising and developing laws to enhance the labor welfare protection system by including new forms of employments, such as temporary workers and platform workers, and ensuring equal or similar protection as traditional employees.

Sub-strategy 3.3 *Enhancing social protection to improve the quality of life for the elderly.* Particularly supporting alternative welfare systems provided by local administrative organizations and other development partners. Integrating data on welfare and financial support for the elderly to avoid duplication and facilitate the provision of targeted assistance to the elderly poor. Improving access to long-term healthcare for the dependent elderly by enhancing the capacity of the Universal Health Coverage program. Promoting the role of local administrative organizations, private facilities, independent caregivers and trained/qualified family members. Encouraging the elderly to reside in their homes by improving living conditions, especially for the elderly poor, as well as ensuring adequate housing options, including housings for those who need special care and housings specially designed for the elderly.

Strategy 4 Building an efficient social protection system:

Sub-strategy 4.1 *Integrating the social protection system* starting from collaboratively setting goals of social security provision, establishing clear structures and roles of relevant agencies at the national, regional and local levels and linking databases of all agencies to enable collaboration so as to reduce duplications between projects and measures. Improving the adequacy of benefits. Reducing exclusion errors of vulnerable groups; namely, people with disabilities, homeless people, people with multiple vulnerabilities and people facing difficulties.

Sub-strategy 4.2 *Improving methods in providing social protection* to ensure that people of all groups receive appropriate welfare based on fiscal sustainability. Focusing on a careful evaluation of every project/measure to improve efficiency and effectiveness of social protection programs. Terminating or reducing budgets of projects/measures with no or low impacts to truly align budgeting with the country's development goals. Promoting social protection financed by co-payments, especially for groups with capacities. Supporting the role of local administrative organizations in providing welfare to local populations. Attracting more participation in the tax systems.

Sub-strategy 4.3 *Developing an emergency preparedness and response.* Identifying levels, approaches and channels for monetary and non-monetary relief, as well as preparing database of target groups, initial budget sources, and the role of relevant national, regional and local agencies in providing support to those affected by socio-economic crises and natural disaster to ensure timely and effective assistance.

Strategy 5 Developing an integrated database to reduce intergenerational transmission of poverty and provide social protection:

Sub-strategy 5.1 *Developing and updating individuals' database* that covers population from intergenerational poor households. Linking crucial data for the reduction of intergenerational poverty and the integration of social protection plans. Establishing the country's panel database with annual data collection and updates.

Sub-strategy 5.2 *Promoting the utilization of databases* in designing policies and measures as well as in monitoring and evaluation to help provide the targeted intergenerational

poor with efficient social welfare measures. Sharing data across sectors, including the public sector, the private sector, civil society and academia, to ensure coherent implementation.

Milestone No. 10 Thailand is a Circular Economy and Low Carbon Society

1. Past Development Situation

Over the past years Thailand's economic expansion relied heavily on the use of raw materials and intermediate goods, while efficiency in the use of natural resources to generate products and services remained low. According to 2019 data, the proportion of intermediate consumption to GDP is at 61.85 per cent — higher than that of Japan and South Korea at 46.38 per cent (2016) and 58.65 per cent (2018), respectively. A report of the Economic and Social Commission for Asia and the Pacific (ESCAP) indicated that Thailand's domestic material consumption in 2016 was 2.06 kilogram per U.S. dollars — higher than Asia Pacific and OECD averages. This demonstrates low efficiency in the use of fundamental resources (biomass, metal ores, non-metals, and fossil fuels) for economic development, wasteful usage, and lower-than-anticipated value-added generation.

The overexploitations of natural resources beyond the ecosystem's capacity, together with limitations in management, lead to the degradation of natural resources and intensifying environmental problems. As Thailand's economic expansion, which mostly relies on raw materials and intermediate goods while having low resource efficiency, puts heavy demands on natural resources beyond the ecosystem's capacity, natural resources degradation becomes inescapable. Meanwhile, waste and pollution problems worsen. Thailand faces the problems of soil degradation, threats against biodiversity, destruction of the coastal ecosystem, and unmet needs of water resources. Although slightly increased, forest coverage is still lower than the 12th NESDP's target of 40 per cent.

Problems regarding waste and pollution are:

1) Garbage: Garbage volume grew by 2 per cent per year during the past 10 years (2010-2019). Municipal solid waste, accounting for 22 per cent, or 6.4 million tons, in 2019 has not been properly managed and become a serious problem affecting water quality, river systems and marine animals. Most of the garbage in the ocean is plastic, which has increased by 21,700 to 32,600 tons per year, affecting marine and coastal ecosystems. Community and industrial waste amounted to 2.041 million tons in 2019 and was likely to increase, especially used electrical and electronics appliances which are not comprehensively managed.

2) Air pollution: PM 2.5 levels regularly exceed acceptable standards every year, especially in industrial areas and big cities with large populations and chronic traffic congestions.

3) Water pollution: During 2020, 1.7 million cubic meters of community wastewater per day, accounting for 18 per cent of all community wastewater, was not properly treated. There is also the problem of microplastic contamination. Research data showed that 90 per cent of crustaceans and corals under study had microplastic accumulations in their tissues.

GHG emission continues to increase despite a pledge for zero emissions by 2050 of 173 countries (as of December 2020). The Third Biennial Update Report (2016) showed that Thailand released 354.36 million tons of carbon dioxide equivalent (CO₂eq) from various activities — a slight increase from the 2013 volume of 342.11 million tons CO₂eq. The energy and transport sector released the highest volume of carbon dioxide at 253.89 million tons CO₂eq (71.65 per cent), followed by the agricultural sector (52.16 million tons CO₂eq), the industrial processes and product use (31.53 million tons CO₂eq), and waste (16.77 million tons CO₂eq). Considering the

volume of reabsorbed GHGs by forestry and land use (91.13 million tons CO₂eq), the net GHG emission volume was 263.22 million tons CO₂eq.

Challenges facing milestone implementation: A decline in natural resources, intensifying environmental problems and growing pollution as well as the increasing release of GHGs are key challenges to the achievement of the sustainable development goals (SDGs), which have become Thailand's and international priority. The SDGs are also key determinants for the achievement of the 20-years National Strategy's "Security, Prosperity, and Sustainability" goal and consistent with the government's focus on the BCG economy for sustainable development, the particulate pollution management plan, the plastic waste management roadmap (2018-2030) and the action plan on plastic waste management Phase 1 (2018- 2022), as well as the pledge to reduce GHG emissions according to the Paris Agreement from business-as-usual at least by 20 to 25 per cent by 2030. In addition, the country is in the process of developing Thailand's Long-Term Low Greenhouse Gas Emission Development Strategy: LT-LEDS (Revised Version) aiming towards zero emissions. It is anticipated that Thailand's GHG emissions will peak between 2030 and 2040. However, the BCG economic model still needs operationalization with cross-sectoral integration at all levels of the plan, while a deeper cut in GHG emissions in line with global trend remains a challenge and needs concrete guidelines and implementation consistent with development goals in other areas.

2. Development Goals

2.1 Connections between Milestone 10 and the main targets and goals of the 13th National Economic and Social Development Plan and the National Strategy

Milestone 10, whereby Thailand is a circular economy and low-carbon society, is consistent with four targets of the 13th Plan, namely: 1) **Target 1: Restructuring the manufacturing and service sectors towards an innovation-based economy** by enhancing competitiveness through knowledge, creativity and innovation; 2) **Target 3: Creating a society of opportunities and fairness** by creating opportunities and spreading income to communities; 3) **Target 4: Ensuring the transition of production and consumption towards sustainability** through efficient use of natural resources in manufacturing and consumption and within ecological limits; and 4) **Target 5: Enhancing Thailand's capability to cope with changes and risks under the new global context**, in particular climate change.

Milestone 10 also responds to the following three areas of the National Strategy (2018-2037):

- 1) **Security** under the goal of maintaining stability and benefits of marine and terrestrial natural resources and the environment for sustainable richness and benefits;
- 2) **Competitiveness enhancement** in next-generation industry and services with the goal of driving the country's development with innovation and technology of the future, together with building enabling ecosystems and supporting the sustainable development of industries and services; and
- 3) **Eco-Friendly Development and Growth** by reducing GHG emissions, building a low-carbon society, supporting investments in eco-friendly infrastructure projects, developing and applying innovation and technology to reduce pollution and environmental impacts.

2.2 Goals, Indicators, and Targets

Target 1 To increase values through the circular economy and efficient use of resources.

Indicator 1.1 GDP from the circular economy increases and contributes no less than 1 per cent of economic growth by 2027.

Indicator 1.2 Domestic material consumption decreases by no less than 25 per cent by 2027.

Indicator 1.3 Material circularity indicators for target products (plastic, construction materials, agriculture-food) increase by no less than 10 per cent by 2027.

Target 2 To sustainably conserve, rehabilitate and utilize natural resources.

Indicator 2.1 Thailand's Environmental Performance Index ranks higher — among Southeast Asia's top 3 countries with a score of 55 or higher by 2027.

Indicator 2.2 Forest coverage increases by 33 per cent for natural forests and 12 per cent for forest plantations for economic values by 2027.

Target 3 To establish a low-carbon sustainable society.

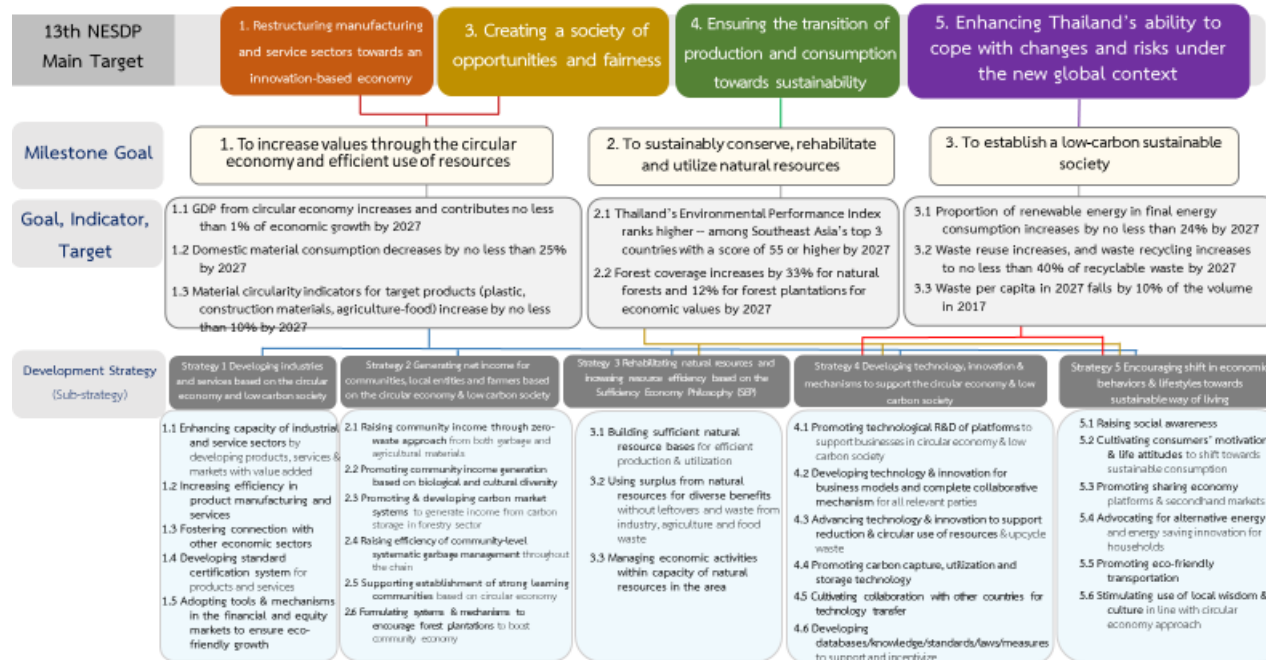
Indicator 3.1 The proportion of renewable energy in the final energy consumption increases by no less than 24 per cent by 2027.

Indicator 3.2 Waste reuse increases and waste recycling increases to no less than 40 per cent of recyclable waste by 2027.

Indicator 3.3 Waste per capita in 2027 falls by 10 per cent of the volume in 2017.

3. Strategy Map

Milestone 10: Thailand is a circular economy and low-carbon society



4. Development Strategies

Strategy 1 Developing industries and services based on the circular economy and a low-carbon society:

Sub-strategy 1.1 Enhancing the capacity of industrial and service sectors by developing products, services and markets with value add. Developing tools and mechanisms as well as research and knowledge to increase efficiency in the circular use of materials so as to boost productivity and add value to the circular economy.

Sub-strategy 1.2 Increasing efficiency in product manufacturing and services in line with the circular economy and a low-carbon society. Implementing the Extended Producer Responsibility policy framework. Encouraging private sector investments to raise the efficiency of manufacturing processes and services with a specific aim to reduce, reuse, recycle, and minimize waste in manufacturing and service processes. Stimulating the use of green energy. Promoting support mechanisms and incentives in adjusting production methods to enable lower carbon emissions.

Sub-strategy 1.3 Fostering connections with other economic sectors, including the agriculture, industry and tourism sectors, by building linkages of production systems from upstream production to downstream manufacturing and consumption in line with the circular economy.

Sub-strategy 1.4 Developing a standard certification system for products and services. Formulating standards for production and service processes, products and services certification systems, and guidelines for the implementation of the circular economy.

Sub-strategy 1.5 Adopting tools and mechanisms in the financial and equity markets to ensure eco-friendly growth. Constructing collaborative mechanisms between the government and private sector. Promoting green financial measures and investments as well as sustainability reporting standards, sustainability accounting standards, as well as investments in eco-friendly economic activities.

Strategy 2 Generating net incomes for communities, local entities and farmers based on the circular economy and a low-carbon society:

Sub-strategy 2.1 Raising community incomes through a zero-waste approach from both garbage and agricultural materials. Encouraging communities to use garbage and agricultural residues to create new products with added value while helping them boost incomes and cut expenses. Instilling collaborations between local communities and businesses in using leftovers from production processes to develop products for use in the community.

Sub-strategy 2.2 Promoting community income generation based on biological and cultural diversity. Encouraging income generation from natural resources and cultural conservation. Boosting the capacity of local populations by equipping them with ecotourism knowledge and awareness of local identity and cultural heritage. Developing environmental management systems at tourist destinations.

Sub-strategy 2.3 Promoting and developing carbon market systems to generate incomes from carbon storage in the forestry sector. Researching and developing knowledge and databases for carbon trade, including data on measurements of carbon emissions from manufacturing and services, evaluation of carbon storage capacity in the forestry sector, and other carbon storage activities. Establishing a certification system for carbon emissions and storage in line with international standards. Facilitating carbon market trade for both emitters and capturers.

Sub-strategy 2.4 Raising the efficiency of community-level systematic garbage management throughout the chain. Encouraging community-level garbage reduction and sorting systems as well as promoting pre-disposal garbage sorting practice for recycling, particularly as materials for community and industrial production. Supporting conversions of municipal waste and leftovers from production processes into energy. Pushing for model communities with the capability for generating income from converting sorted garbage into products with locally appropriate innovation and technology.

Sub-strategy 2.5 Supporting the establishment of learning communities based on the circular economy. Encouraging the setting up of model communities based on the circular economy that corresponds with local lifestyles and knowledge, as well as transferring knowledge and lessons learned to other communities to sustainably improve their quality of life and expand community networks.

Sub-strategy 2.6 Formulating systems and mechanisms to encourage forest plantations to boost communities' economy. Building mechanisms to inspire the planting of new forests in degraded or abandoned areas. Implementing the Tree Bank initiative. Developing a tracing system for timber production, processing, and trade throughout the production chain. Supporting research and development in viable tree varieties and innovation to create value add from timber. Incentivizing the planting of trees with economic value.

Strategy 3 Rehabilitating natural resources and increasing resource efficiency based on the Sufficiency Economy Philosophy:

Sub-strategy 3.1 Building sufficient natural resource bases for efficient production and utilization. Exploiting natural resources with mindfulness of the ecological limits and self-healing capacity. Forging a balance between conservation and sustainable utilization and equitable benefits sharing. Conducting a value evaluation of natural resources to increase the efficiency of natural resources management.

Sub-strategy 3.2 Using surpluses from natural resources for diverse benefits without leftovers and waste from industry, agriculture and food waste. Analyzing material flows to efficiently manage leftovers from manufacturing and consumption and developing a circular system to make use of industrial leftovers and agricultural residues. Reducing pre-market losses and food waste. Developing a platform to connect circular economy businesses to knowledge and innovation, as well as revising regulations to allow recovering valuable materials from industrial waste.

Sub-strategy 3.3 Managing economic activities within the capacity of natural resources in the area. Ensuring efficient and sustainable resources management. Resolving conflicts related to natural resources and the environment. Defining appropriate land use within the capacity of natural resources. Developing and enhancing land management standard. Establishing an environmental

management system in the area, as well as fostering a balance between conservation and sustainable utilization.

Strategy 4 Developing technology, innovation and mechanisms to support the circular economy and low carbon society:

Sub-strategy 4.1 Promoting technological research and development of platforms to support businesses in the circular economy and a low-carbon society. Adopting advanced technologies and innovations, creativity and local knowledge to increase resource efficiency and reduce waste from production processes. Encouraging the development of data management platforms as well as platforms to strengthen a capacity for the transition towards the circular economy and a low-carbon society. Integrating collaborative networks to develop technology in ecological designs, waste management, business development and exchanges of surpluses between businesses and industries.

Sub-strategy 4.2 Developing technologies and innovations for business models and a complete collaborative mechanism for all relevant parties. Adopting private-public participation principles to support businesses to transition to circular economy business models. Creating new businesses with products and services designed to be long-lasting and use recyclable materials, and for-hire or pay-as-you-go business models to promote resource sharing.

Sub-strategy 4.3 Advancing technology and innovation to support the reduction and circular use of resources and upcycle waste. Encouraging technology and innovation in mono-material packaging, second use, and upcycling for more extensive production and use.

Sub-strategy 4.4 Promoting carbon capture, utilization and storage technology. Capturing carbon dioxide from the energy and industrial sectors. Arranging for funding for research and development, as well as boosting financial and fiscal incentives to attract private sector investments. Developing infrastructure for carbon storage and transport.

Sub-strategy 4.5 Cultivating collaborations with other countries for technology transfers. Setting up an international collaboration network to promote the sharing, exchange and development of knowledge on policies, science, technologies, innovations, research and applications.

Sub-strategy 4.6 Developing databases/knowledge/standards/laws/measures to support and incentivize. Revising laws to facilitate the circular economy and reduction of GHG emissions in all sectors. Implementing financial and fiscal measures to raise the standards of manufacturing processes to reduce pollution and increase resource efficiency. Developing database systems, knowledge and guidelines on the circular economy and a low-carbon society in line with international standards. Strengthening the capacity of agencies and personnel at the national, local, and community-levels in resource efficiency and pollution reduction. Promoting transfers of eco-friendly technologies and innovations with low carbon emissions.

Strategy 5 Encouraging a shift in economic behaviors and lifestyles towards sustainable ways of living:

Sub-strategy 5.1 Raising social awareness. Advocating for living in harmony with nature. Promoting awareness, conscience, and attitudes across all sectors towards the importance and

comprehensive realization of the circular economy and a low-carbon society. Nurturing eco-friendly consumer characteristics and behaviors.

Sub-strategy 5.2 Cultivating consumers' motivation and life attitudes for a shift towards sustainable consumption. Developing mechanism and tools — economic and otherwise — to incentivize and encourage consumers to change their behaviors to eco-friendly lifestyles based on accurate, reliable and transparent information. Supporting practices leading to the procurement of eco-friendly products and services. Encouraging the recycling of household waste and discarded packaging materials. Boosting product labeling, such as green labels, carbon footprint labels, and energy labels to facilitate consumers' decision making.

Sub-strategy 5.3 Promoting the sharing of economy platforms and secondhand markets. Determining rules, regulations and laws to promote and regulate sharing economy businesses. Developing a collaborative network between manufacturers and consumers. Building a platform to connect service users and service providers for the purpose of trade and exchange of goods and products to ensure circularity and resource efficiency.

Sub-strategy 5.4 Advocating for alternative energy and energy saving innovation for households. Developing basic infrastructure and data systems for the management, production and use of alternative energy. Supporting research and development of efficient technologies in alternative energy. Promoting affordable energy-saving innovations. Raising awareness and disseminating information to encourage the public to choose technologies with efficient energy consumption and long-term cost reductions.

Sub-strategy 5.5 Promoting eco-friendly transportation. Promoting the use of mass transit systems. Developing an eco-friendly public transport networks with low carbon emissions and countrywide coverage. Supporting the manufacturing and use of efficient clean-energy vehicles.

Sub-strategy 5.6 Stimulating the use of local wisdom and culture in line with circular economy approaches. Promoting approaches to community use of limited resources with maximum efficiency. Supporting the use of local wisdom in creating products and services with innovation and creativity for self-reliance. Reviving, developing, and accommodating knowledge transfers to raise public awareness and understanding of the values and benefits of protecting local wisdom and culture.

Milestone 11: Thailand Can Mitigate Risks and Impacts of Natural Disaster and Climate Change

1. Past Development Situation

Population growth, expansion of human habitation and physical infrastructure development have inevitably destroyed the environmental balance, thus bringing about climate change and aggravating natural disaster around the world. Thailand has frequently experienced natural disasters in many forms; namely, tropical cyclones, thunderstorms, storm surges, landslides, floods, droughts, forest fires and haze pollution, earthquakes and tsunamis. In the Global Climate Risk Index 2020, Thailand was ranked 8th among countries for its high degree of vulnerability to climate change impacts. Over the past 20 years, the country suffered 147 disasters, particularly the 2004 tsunami on the Andaman coast, the great flood of 2011, and a magnitude 6.3 earthquake in Chiang Rai Province in 2014. Meanwhile, the World Risk Report 2020 ranked Thailand 90th out of 181 countries with Level-3 overall risks (medium level) out of five levels. Thailand was found to have a high level of exposure, a medium level of vulnerability due to a low adaptive capacity, and a medium level of response preparedness despite a low level of susceptibility.

Most natural disasters in Thailand are predictable seasonal recurrences. However, climate change, which is a consequence of a rise in global temperatures due to higher greenhouse gas emissions, tends to amplify the severity and frequency of Thailand's natural disasters. Besides, there have occurred unprecedented and unpredictable disasters such as earthquakes and tsunamis, resulting in significant damages and massive losses of lives, properties and natural resources.

The most devastating natural disaster in Thailand are floods. The great flood of 2011 caused 1.4 trillion baht in total losses and damages (World Bank report), affecting 65 provinces, more than 13 million households in Bangkok and causing 813 deaths. Meanwhile, Thailand continues to suffer from a regular, chronic problem of flooding. In 2017, accumulated rainfall was the highest in 67 years, costing the country 1,050.3 million baht in damages and affecting 3.6 million people. Besides, Thailand suffers from continuous and intensifying **droughts**. In 2019, damages from droughts amounted to 797.7 million baht with 18.7 million people affected – a more than tenfold increase from 73.5 million baht and 0.06 million people in 2017. The agricultural sector suffers the most impacts from floods and droughts as the sector accounts for more than 70 per cent of the country's total water usage. Agricultural areas are increasingly affected by floods and droughts despite a decrease in total agricultural areas. As regards agricultural household incomes, which are 40 per cent below the poverty line, the repercussions of floods and droughts on the agricultural sector inescapably worsen inequality.

In addition, other natural disasters that cause damage to lives and properties are storms, including thunderstorms, tropical cyclones, typhoons and depressions, which may strengthen into floods and storm surges. According to the data of the Department of Disaster Prevention and Mitigation, storms caused more than 130 million baht in damages and almost 900 deaths in 2019. **Landslides**, which occurred simultaneously with or after flash floods following rainstorms, became more frequent and severe due to human actions such as deforestation, farming on slope areas, and soil erosion. Finally, **earthquakes and tsunamis**, although less frequent, can induce extensive damages to lives and properties. The 2004 tsunami devastated six provinces and took 5,395 lives, while 8,457 people were injured and more than 2,187 went missing. Damages to the tourism industry along the Andaman coast cost 30 billion baht. Although Thailand is not

located on a major fault, tremors can be felt five to six times every year from earthquakes in Myanmar, Laos, and Indonesia, as well as minor quakes along minor faults in the Western and Northern Regions of the country. In 2014, a magnitude 6.3 earthquake, the biggest on record, hit the northern part of the country with the epicenter at the Phayao fault in Pan district of Chiang Rai province.

Disaster management and prevention: Despite having a systematic framework to prevent and manage disasters before, during and after the events, there are still obstacles and challenges in many aspects facing disaster responses and management of government agencies, especially limited capacity to cope with high-intensity natural disasters. Whereas most of Thailand's natural disasters are predictable, government agencies focus on passive measures, such as providing assistance, relief and rehabilitation. Government budget allocation does not pay sufficient attention to proactive measures, such as preparedness, prevention and mitigation, because the quantitative outcomes of proactive measures are relatively difficult to measure.

As for climate change preparedness, Thailand is highly vulnerable to threats from natural disasters and climate change while having limited capability to cope with disasters and their risks. While some sectors are becoming more aware, however, the implementation of necessary measures are still slow. Hence, there is an urgent need for Thailand to reduce its exposure and increase its capability in coping with risks and adapting to natural disasters and climate change. This is also one of the key development issues in the 13th Plan under the goal of mitigating and preventing the impacts of natural disasters and climate change on the country's economy, society, environment and security, particularly in an environment where climate change and natural disasters have the tendency to escalate.

Additional concerns include the fact that key economic players attach importance to collaborative efforts to reduce greenhouse gas emissions and mitigate global warming and also use these as a condition for international trade and investment. Thailand is becoming an aging society and fiscal constraints drive Thai society towards greater vulnerability to the impacts of natural disasters and climate change.

2. Development Goals

2.1 Connections between Milestone 11 and the main targets and goals of the 13th National Economic and Social Development Plan and the National Strategy

Milestone 11, whereby Thailand can mitigate risks and impacts from natural disasters and climate change, is aligned with two targets of the 13th Plan, namely: **1) Target 4: Ensuring the transition of production and consumption towards sustainability**, and **2) Target 5: Enhancing Thailand's capability to cope with changes and risks under the new global context**.

Milestone 11 is also consistent with the following three areas of the National Strategy:

1) **Security** under the goals: a) The country is secure in every dimension at all levels through managing the country's environment for security, safety and peace at all levels; and b) Military units, security service agencies, the public, private and civil sectors are equipped with the capacity to be prepared for the prevention and management of security-related issues.

2) **Competitiveness enhancement** under the goal: Thailand becomes a developed country with stable and sustainable economic growth in the aspect of "National security industry," which aims to promote the development of an industry related to disaster management; for instance, a warning system, responsive disaster preparation, and assistance before and after disasters.

3) **Eco-Friendly Development and Growth** under the goals: To ensure balanced utilization and economic growth of the natural resource and environmental base by balancing development with ecosystem capacity, which is achievable by forging climate-friendly sustainable growth with a focus on reducing greenhouse gas emissions and building a low-carbon society; improving the disaster management system and building coping and adaptive capacities among the population to minimize losses and damages from disasters and climate change impacts; promoting investment in climate-friendly infrastructure projects; handling all forms of water-related disasters through a water management system for crisis conditions in order to effectively control and reduce losses and risks from water-related disasters in accordance with scientific principles, as well as enable comprehensive and timely collaboration on disaster management within the regions.

2.2 Goals, Indicators, and Targets

Target 1 here is a decrease in damages and impacts of natural disasters and climate change.

Indicator 1.1 The number of disaster mortality, missing, and directly affected decreases in comparison with the 12th NESDP's average in each disaster category.

Indicator 1.2 Direct disaster economic losses on Gross Domestic Product (GDP) (including damages to infrastructure and disruptions of essential basic services) decrease in comparison with the 12th NESDP's average.

Indicator 1.3 Damages from natural disasters in terms of area and value decrease in comparison with the 12th NESDP's average.

Target 2 There is a decrease in risks from natural disasters and climate change.

Indicator 2.1 There are risk maps showing areas at risk of natural disasters and climate change, including key areas at the local or provincial levels, which are connected to key economic, social and environmental databases.

Indicator 2.2 There are area-based risk prevention plans for natural disasters and climate change, especially for key areas.

Indicator 2.3 There is an effective early warning system (i.e., having comprehensive coverage of key disasters, the linkage between local, national and international level, precision, timeliness, and effective access to vulnerable groups).

Target 3 Thai society is immune to natural disasters and climate change.

Indicator 3.1 The number of communities, local governments, volunteers and partners with the capability to fundamentally cope with risks from natural disasters and climate change increases to 80 per cent by 2027. Moreover, there are trainings on the prevention and mitigation of natural disasters and climate change nationwide.

Indicator 3.2 There are achievements in building local awareness and participation in transferring information from affected areas to the national disaster warning center.

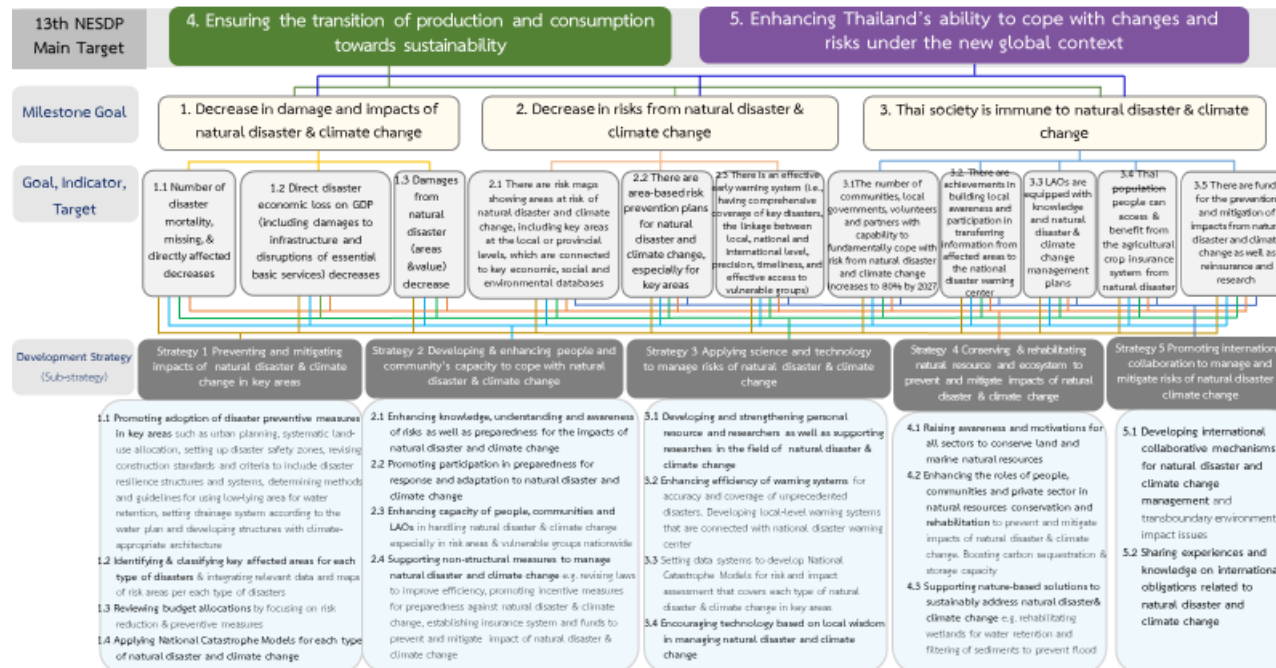
Indicator 3.3 Local administrative organizations are equipped with knowledge and natural disaster and climate change management plans.

Indicator 3.4 Thai people can access and benefit from the agricultural crop insurance system in the case of natural disasters.

Indicator 3.5 There are funds for the prevention and mitigation of impacts from natural disasters and climate change as well as reinsurance and research.

3. Strategy Map

Milestone 11: Thailand can mitigate risks and impacts of natural disaster and climate change



4. Development Strategies

Strategy 1 Preventing and mitigating the impacts of natural disasters and climate change in key areas²:

Sub-strategy 1.1 Promoting the adoption of disaster preventive measures in key areas, such as urban planning, systematic land-use allocation, as well as setting up disaster safety zones. Revising construction standards and criteria to include disaster resilience structures and systems. Determining methods and guidelines for using low-lying areas for water retention, and setting up drainage systems according to the water plans and developing structures with climate-appropriate architecture.

Sub-strategy 1.2 Identifying and classifying key affected areas for each type of disasters. Integrating relevant data and risk maps for each type of disasters in order to formulate prevention and solution plans. Forging collaborations among locals, communities and relevant agencies. Integrating budget allocations, as well as clearly designating agencies responsible for plan implementation.

Sub-strategy 1.3 Reviewing budget allocations by focusing on risk reduction and preventive measures rather than emergency responses and rehabilitation measures. Conducting comparative cost and benefit analyses of risk reduction and preventive measures to inform budget allocations. Allocating budgets by prioritizing key areas affected by natural disasters and climate change.

Sub-strategy 1.4 Applying National Catastrophe Models for each type of natural disaster and climate change to improve solution mechanisms with designated responsible agencies in key affected areas in order to evaluate the effectiveness of preventive measures and consequently formulate appropriate action plans.

Strategy 2 Developing and enhancing people and community's capacity to cope with natural disasters and climate change:

Sub-strategy 2.1 Enhancing knowledge, understanding and awareness of risks as well as preparedness for the impacts of natural disasters and climate change. Incorporating knowledge on disasters and climate change management into curricula at all educational levels. Establishing learning centers. Encouraging access to warning centers and utilizing early warning data systems efficiently.

Sub-strategy 2.2 Promoting participation in preparedness for responses and adaptations to natural disasters and climate change.

Sub-strategy 2.3 Enhancing the capacity of people, communities and local administrative organizations in handling natural disasters and climate change, especially vulnerable groups. Encouraging the setting up of networks among local administrative organizations, communities and civil society to ensure self-prevention and management of the impacts from natural disasters and climate change.

Sub-strategy 2.4 Supporting non-structural measures to manage natural disasters and climate change, such as revising and consolidating laws related to natural disaster management. Promoting incentive measures for preparedness against natural disasters and climate

² Key areas refer to urban areas and structures, and zones with significant economic or historical values.

change. Establishing insurance systems and funds as well as formulating business continuity plans to prevent and mitigate the impacts of natural disasters and climate change.

Strategy 3 Applying science and technology to manage risks from natural disasters and climate change:

Sub-strategy 3.1 Developing and strengthening personnel and researchers as well as supporting research in the field of natural disaster and climate change to be systematic, continuous, comprehensive and applicable for local and national contexts.

Sub-strategy 3.2 Enhancing the efficiency of early warning systems for accuracy and coverage of unprecedented disasters. Developing local-level warning systems that are connected to the national disaster warning center, focusing on upgrading equipment and technology to support the current warning system and connect it with other countries. Adopting Information and Communication Technology (ICT) in sending notifications to the public to ensure efficiency, timeliness, and better access to vulnerable groups.

Sub-strategy 3.3 Setting up data systems to develop National Catastrophe Models for risk and impact assessments that cover each type of natural disaster and climate change in key areas.

Sub-strategy 3.4 Encouraging the use of technology based on local wisdom in managing natural disasters and climate change.

Strategy 4 Conserving and rehabilitating natural resources and ecosystems to prevent and mitigate the impacts of natural disasters and climate change:

Sub-strategy 4.1 Raising awareness and building motivation for all sectors to conserve land and marine natural resources.

Sub-strategy 4.2 Enhancing the roles of people, communities and the private sector in natural resources conservation and rehabilitation to prevent and mitigate the impacts of natural disasters and climate change. Increasing carbon sequestration and storage capacity, particularly through watershed forests, mangrove forests, natural water sources and wetlands.

Sub-strategy 4.3 Supporting nature-based solutions to sustainably address natural disasters and climate change. For example, rehabilitating wetlands for water retention and filtering sediments to prevent floods; mitigating droughts by rehabilitating watershed forests, building small local-level water retention systems, and improving land use; and preventing coastal erosion by reviving original coastal ecosystems as natural defenses.

Strategy 5 Promoting international collaboration to manage and mitigate risks from natural disasters and climate change:

Sub-strategy 5.1 Developing international collaborative mechanisms for natural disaster and climate change management and transboundary environmental impact issues, such as water management in the Mekong River basin, haze pollution from forest fires both at the bilateral and multilateral levels through signing memoranda of understanding. Moreover, building technical cooperation on disaster risk reduction with neighboring countries, and collaboratively developing technologies and innovations.

Sub-strategy 5.2 *Sharing experiences and knowledge on international obligations related to natural disasters and climate change.* Applying knowledge managements and good practices from other countries to Thailand's social and cultural contexts.

Milestone 12: Thailand Has a High-Capability Workforce Committed to Lifelong Learning and Responsive to Future Developments

1. Past Development Situation

Currently, **Thailand's workforce development is facing important structural changes.** Whereas the country's shift towards an ageing society will result in quantitative workforce shortages, a decrease in workforce productivity following the COVID-19 pandemic is triggering qualitative shortages, which could possibly become constraints on economic expansion. Other issues of concern include the rapid growth of low-cost global online innovations or knowledge pools; shortened knowledge lifecycles, particularly on fast-changing digital technology; a shift in learning trends towards individual interest; the private sector's tendencies towards recruitments based on competency rather than educational qualifications; and epidemics and emerging diseases that affect lifestyles and behaviors and also reflect the significant role of civil society networks in vigorously and collaboratively resolving problems amidst a lack of efficient support from the public sector. It is therefore necessary to expedite the country's workforce development to equip people with high capabilities and leadership qualities so as to forge changes in attitudes and skills and boost the country's competitiveness.

Efforts have been made in the development of human capital in all age groups by improving the quality of all levels of education, which includes raising standards, enhancing educational processes, adopting teaching technologies and innovations, as well as developing education innovation areas — education sandboxes — with increased independence and social responsibility. The role of development partners in educational programs and learning has also been promoted, particularly in providing vocational and higher education in diverse forms, such as dual vocational and co-operative education. Efforts have also been directed towards the reduction of educational disparities by identifying and providing support to marginalized children and learners through the Equitable Education Fund (EEF).

Meanwhile, the Constitution of the Kingdom of Thailand B.E. 2560 (2017) stipulates that the State shall ensure that every child receives quality education for 12 years from pre-school to the completion of compulsory education free of charge, and the State should provide assistance to children, youth, women, the elderly, persons with disabilities, indigent persons and underprivileged persons to be able to have good-quality living. In this connection, education-related laws have been revised to give the educational system more agility and consistency with changes. These include the Early Childhood Act B.E. 2562 (2019), the Higher Education Act B.E. 2562 (2019), and the draft National Education Bill.

However, human capital development in each age group still needs further enhancement. While **child development in children from conception to early childhood has a tendency to improve**, there is also a need to develop additional skills in coordination with brain development, together with elevating the standards of childcare center infrastructure. In developing **school-age children**, an emphasis should be put on *primary education* as Thai learners have lower educational achievements than those in countries with a similar level of development. On the other hand, classroom education is not connected with life outside school, and some children and youth have negative attitudes towards education. Hence, there is a need to give these groups opportunities to develop knowledge in line with the Multiple Intelligences theory as well as forge positive attitudes towards education in order for them to embrace intellectual growth and self-development to keep abreast of new challenges. As for *vocational and higher education*, it has been found that the

competencies of graduates do not meet the needs of the labor market despite the fact that vocational schools have adjusted their programs to respond to the target industries and improved their teachings to attract talent, such as providing science and technology-based vocational learning. Continuation to higher diploma levels still faces some constraints. In addition, wages offered to graduates at this level are not attractive enough to draw more learners. On the other hand, universities face decreasing numbers of students as well as challenges from technological changes that enable online education through various platforms that have low operational costs and capabilities to offer individualized content. Therefore, universities can no longer target only formal students. They need to offer quality experience-focused education for learners of all age groups with anywhere-anytime accessibility and affordability.

Worse still, the COVID-19 pandemic has caused prolonged school suspension and therefore affected the quality of learners at all levels, which inevitably results in learning loss. With regard to **working age**, challenges remain in the quantitative and qualitative shortages of workers and a lack of functional competency, life skills, problem-solving skill, entrepreneurship, and capacity in self-management and teamwork skills. In addition, the proportion of informal workers is found to account for 53.7 per cent of the workforce and is likely to rise due to changes in work patterns and a rise in the number of workers taking independent jobs sporadically and for a short time, known as gig workers, who require continuous motivation for self-development. Finally, many of **the elderly** still have the capacity to work and are still motivated to self-develop after retirement.

Producing a high-capability workforce to drive the country towards innovation-based development requires several supporting factors, such as advanced technologies and innovations, which play an important role in learning and capacity building, an adequate number of educational institutions and training platforms, as well as learners' familiarity with technology for reskilling and upskilling. However, there is a lack of databases on labor demand and supply as well as data on required competencies for each job position in order to provide educational programming and training effectively.

Lifelong learning is an important tool for the development of people in an ageing society. Learners need to constantly adapt, learn, and build new competencies together with being able to transfer their skills effectively and seamlessly across training institutions. Nevertheless, the Thai population at large still lacks life skills in several areas — for example, financial literacy — which puts many people in spiraling debt traps from institutional loans and otherwise, and a lack of digital and media literacy to handle misinformation. An enabling ecosystem is therefore needed in order to support quality lifelong learning among all population groups both online and offline. Inclusive measures are also required so as to eliminate obstacles for those without access to education and enable them to learn and enhance their skills.

2. Development Goals

2.1 Connections between Milestone 12 and the main targets and goals of the 13th National Socio-Economic Development Plan and the National Strategy

Milestone 12, whereby Thailand has a high-capability workforce committed to lifelong learning and responsive to future developments, is aligned with two goals of the 13th Plan, namely: **1) Target 2: Developing human capital for the new global era** by developing human capital in all age groups in all aspects, creating a high-competency workforce with an ability to generate works of the future in line with the needs of the target manufacturing sector, and producing smart

entrepreneurs who can develop and use technologies and generate innovations; and **2) Target 3: Creating a society of opportunities and fairness** by promoting lifelong learning, developing an ecosystem for lifelong learning, and setting learning options for those who cannot attend formal education.

Milestone 12 is also consistent with the following areas of the National Strategy:

1) Competitiveness enhancement under the goal: Thailand's national competitiveness is increased.

2) Developing and Strengthening Human Capital under the goals: Thai people are skilled, righteous and equipped with qualities required for the 21st century; and: Thailand has an adequate social ecosystem suitable for life-cycle development.

3) Creating social opportunities and equity under the goals of creating fairness and reducing inequality in all dimensions, and creating economic and social activities across regions, and providing opportunities for every sector to take part in national development at all levels.

2.2 Goals, Indicators, and Targets

Target 1 Thai people in all age groups are developed to their full potentials; have necessary capacity for the modern world; are equipped with good qualities according to social norms, integrity, ethics, and immunity against global disruptions; and harmoniously coexist with others in society.

Indicator 1.1 Thailand's Child Development Index increases to 88 per cent by the end of the plan.

Indicator 1.2 The percentage of students with lower proficiency than the basic level of Programmed for International Student Assessment (PISA) in all three subjects in all school categories decreases by 8 per cent by the end of the plan.

Indicator 1.3 Life Assets of Thai children and youth increase by 3 per cent by the end of the plan.

Indicator 1.4 The number of university students participating in work integrated education increases by 30 per cent by the end of the plan.

Indicator 1.5 Labor productivity increases by no lower than 4 per cent per year.

Indicator 1.6 The number of senior citizens facing multi-dimensional poverty decreases by 20 per cent per year.

Target 2 Thai workforce has high capability in line with the needs of target manufacturing sectors as well as an ability to generate jobs of the future.

Indicator 2.1 Thailand's Skills score in the Global Competitiveness Index by World Economic Forum increases by 20 per cent by the end of the plan.

Indicator 2.2 Thailand's World Talent Rankings, rated by the International Institute for Management Development, increases by 3 per cent per year.

Indicator 2.3 There is an increase in the number and values of startups.

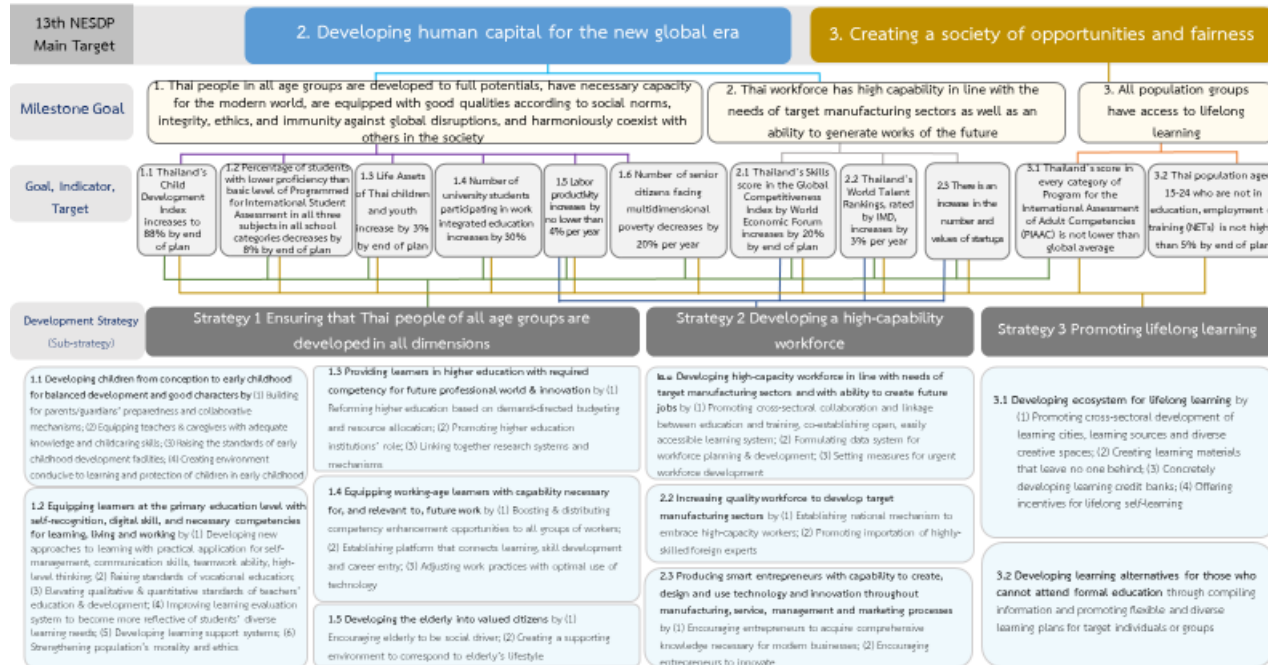
Target 3 All population groups have access to lifelong learning.

Indicator 3.1 Thailand's score in every category of the Program for the International Assessment of Adult Competencies (PIAAC) is not lower than the global average.

Indicator 3.2 The proportion of the Thai population aged 15 to 24 who are not in education, employment or training (NEETs) is not higher than 5 per cent by the end of the plan.

3. Strategy Map

Milestone 12: Thailand has a high-capability workforce committed to lifelong learning and responsive to future developments



4. Development Strategies

Strategy 1 Ensuring that Thai people of all age groups are developed in all dimensions:

Sub-strategy 1.1 Developing children from conception to early childhood for balanced development and good characters by:

1) *Building preparedness for parents/guardians as well as collaborative mechanisms* to provide pregnant women with quality services and provide children with age-appropriate development from conception to the age of six;

2) *Equipping teachers and caregivers with adequate knowledge and child-caring skills*, especially with early childhood development psychology and the ability to work with parents /guardians in promoting child learning and age-appropriate development in line with brain development, physical development, and healthcare and nutrition to stimulate good and balanced development in children before school age;

3) Raising the standards of early childhood development facilities and providing sufficient resources to become a quality mechanism for early childhood development at the local level;

4) Creating an environment conducive to the learning and protection of children in early childhood to ensure their balanced development and age-appropriate cognitive abilities. Encouraging participation of family, community, local administrative organizations, civil society and the private sector in the process. Developing informational systems with individual records for each child to pass on to educational institutions to ensure continuous development.

Sub-strategy 1.2 Equipping learners at the primary education level with self-recognition, digital skills, and necessary competencies for learning, living and working by:

1) *Developing new approaches to learning with practical implementation* to ensure self-management, communication skills, teamwork capability, and high-order thinking together with proactive learning. Piloting at educational institutions that have shown readiness to implement the approaches with support from local universities in providing relevant knowledge and expertise in new learning approaches.

2) *Raising the standards of vocational education* by developing curricula co-designed by industry experts, businesses and higher technological based educational institutions to ensure that graduates have the competencies in line with market needs, are employable, and have the capacity to become entrepreneurs.

3) *Elevating the qualitative and quantitative standards of teachers' education and development* by planning on a number of teachers needed for each field, developing curricula to equip teachers with academic knowledge, learning management skills, the ability to use technology and innovation through online platforms. Developing a screening system that reflects aptitudes for teaching. Transforming the role from that of "a teacher" to "a coach" who facilitates learner-centered processes. Pushing for the elevation of the teaching profession to a highly regarded profession.

4) *Improving the learning evaluation system to become more reflective of students' diverse learning needs* and in line with the development of personalized education so as to facilitate students' future careers.

5) *Developing learning support systems through* (1) *addressing learning loss in school age* by developing practices and support systems in educational institutions, as well as promoting mixed and home-based learning programs during emergency situations; (2) *increasing the efficiency of counseling systems* by training teachers and counselors to help learners plan their learning as well as professional and life journey based on individual interests and aptitudes; (3) *making educational institutions a safe space for all learners in both actual and virtual societies* by developing appropriate physical infrastructure suitable for learning; building knowledge and understanding among teachers, educational personnel and learners of a harmonious environment based on the respect of diversity in terms of opinions and identities; promoting life-skills learning at school; and establishing welfare protection guidelines to protect learners, particularly from physical and verbal violence and bullying; (4) *improving the budget and educational resources allocation system* to focus on learners' development based on equality and fairness, and scaling up the coverage of technological and digital infrastructure to cover all areas; (5) *decentralizing educational administrations and increasing the private sector and civil society's role in educational management* by improving laws and regulations to increase independence in education management, curriculum design, budgeting and personnel management. Propelling educational innovations according to school and local contexts. Promoting the role of the private sector, local administrative organizations and civil society in education programming and investment; (6) *providing special support for gifted learners* by developing a system to identify, manage and support gifted learners according to the Multiple Intelligences theory by means of scholarships, internships in leading organizations and professional jobs where they can utilize their gifts to their fullest potentials; (7) *providing learners with special needs* with diverse opportunities and access to education, including education options for dropout students. Developing supporting mechanisms and revising regulations to allow the private sector, civil society and nonprofit organizations to provide appropriate care and services to learners with special needs; for example, establishing guidelines for the private sector's participation in setting up training centers or rehabilitating sentenced learners.

6) *Strengthening the population's morality and ethics.* Retaining Thai traditions, culture and norms, along with ensuring their congruence with the present-day context, in order for them to become the foundation of Thai society as well as "soft power" in promoting "Thainess" to the international community.

Sub-strategy 1.3 *Providing learners in higher education with required competencies for the professional world of the future and innovation by:*

1) *Reforming higher education based on demand-directed budgeting and resource allocation* directed to learners, together with developing and improving educational programming, standards, and quality assurance system. Promoting private sector engagement and resource mobilization in educational programming.

2) Promoting higher education institutions' role in addressing learning losses due to the COVID-19 pandemic. Connecting learning and working through personalized learning programs. Building and strengthening collaborations in educational programming between the public and private sectors. Supporting innovation in education programming with advanced educational innovations to produce a workforce that meets the country's needs. Encouraging higher education institutions to raise the quality of education and personnel so as to support development with regard to social and community contexts.

3) *Linking research systems and mechanisms* of research networks with domestic and international centers for excellence to embrace world-class researchers and technologists in developing and expanding on research on national development. Promoting collaborations among higher education institutions, researchers and startups in the form of holding companies to develop innovation-based businesses. Encouraging higher education institutions to conduct research with SMEs in the manufacturing and service sectors to facilitate a transition towards innovation-based economy and boost the country's competitiveness.

Sub-strategy 1.4 *Equipping working-age learners with capability necessary for, and relevant to, the future work by:*

1) *Boosting and distributing competency enhancement opportunities to all groups of workers* both by reskilling and upskilling through collaborations between educational institutions, local administrative organizations, the private sector, civil society and government development agencies. Planning and creating short courses to forge foundational and necessary skills for life and work. Improving rules and regulations to allow flexibility in diverse forms of implementation, especially in relation to technologies and forms of work in the future. Introducing a subsidizing scheme as credits for acquiring future skills to every population in order for them to undertake government-certified/supported skill development courses.

2) *Establishing platforms that connect learning, skill development and career entry.* Designating responsible agencies to support those wishing to advance skills and career development. Associating all forms of learning and providing standard certifications to learners. Fostering entrepreneurs who work with the manufacturing and service sectors in an area.

3) *Adjusting work practices* with optimal use of technologies to allow flexibility in working from anywhere. Incubating an organizational culture of encouraging talents to maximize their full potentials as well as promoting fair workplaces in order to eradicate corruption and enhance the organizations' competency. Adhering to human rights principles, particularly labor rights, to ensure the security and safety of the workforce.

Sub-strategy 1.5 *Developing the elderly into valued citizens by:*

1) Encouraging the elderly to become drivers of social change. Giving them opportunities to impart knowledge, experience, wisdom to people of other generations to ensure development continuity and intergenerational exchanges. Allowing the elderly to work according to their individual capacities. Developing advanced learning materials and short courses to build knowledge, digital competency, business skills and life skills appropriate for each group of senior citizens.

2) Creating a supporting environment to correspond to the elderly's lifestyles so as to ensure a happy life and wellbeing. Fostering an understanding of old age among people of other age groups. Developing innovations to support the elderly's lifestyles.

Strategy 2 **Developing a high-capability workforce:**

Sub-strategy 2.1 *Developing a high-capacity workforce in line with the needs of target manufacturing sectors and with an ability to create jobs of the future by:*

1) *Promoting cross-sectoral collaborations and linkages between education and training* as well as co-establishing an open, easily accessible learning system. Developing and enhancing a supportive environment to attract and retain high-capability personnel who possess

career competencies, life skills, digital skills, problem-solving skills, entrepreneurial skills, as well as self-management and teamwork skills. Offering incentives and supportive mechanisms for training and educational programming for high-capability personnel. Advocating for knowledge and personnel exchanges through international cooperation mechanisms to assist in the development of a high-capability workforce in line with the country's development direction.

2) *Developing information systems for workforce planning and development*, including collecting data on workforce demands and supplies and identifying in-demand competencies throughout the supply and value chains for each of the target manufacturing and service industries.

3) *Establishing measures for urgent workforce development* by piloting education programs areas which are deemed essential for the country's development, such as artificial intelligence and data analysis.

Sub-strategy 2.2 *Increasing the quality workforce so as to develop target manufacturing sectors by:*

1) *Establishing a national mechanism to embrace high-capacity workers*, both Thais and foreign nationals born in Thailand, and encourage them to use their capacities to serve in the public and private sectors. Providing borderless work environments that accommodate remote working with leading international public and private institutions. Supporting sabbatical leave as a means to enhance a high-capacity workforce's knowledge and potentials. Creating professional culture, organizational culture and a work environment that allow a quality workforce to utilize their full potentials while staying happy at work.

2) *Promoting the import of highly skilled foreign experts* through incentives to attract foreign experts to settle in the country and work in the field of technology and innovation. Incentivizing locally graduated foreign students to remain in the country to take part in innovation development.

Sub-strategy 2.3 *Developing smart entrepreneurs with the capability to create, design and use technology and innovation throughout the manufacturing, service, management and marketing processes by:*

1) *Encouraging entrepreneurs to acquire comprehensive knowledge necessary for modern businesses*. Fostering new beliefs that bring about awareness and gaining new knowledge. Strengthening skills in data application and analysis in order to inform business planning and risk management through convenient, concise and time-effective learning formats in both formal and informal education responsive to each individual's needs, through learning technologies. Building a community of entrepreneurs to share learning and inspirations for change.

2) *Encouraging entrepreneurs to innovate* to support the value creation in future industries through establishing sandboxes for entrepreneurs to compete and test concepts, promoting investments for innovation development, as well as business matching and funding.

Strategy 3 Promoting lifelong learning:

Sub-strategy 3.1 *Developing an ecosystem for lifelong learning by:*

1) *Promoting all sectors in society to develop learning cities, learning facilities and diverse creative spaces* both physically and virtually. Incentivizing educational institutions, local administrative organizations, NGOs, civil society, and the private sector, particularly startups, to

build and develop quality learning facilities and creative spaces that offer up-to-date content in line with the needs of all groups of learners, together with having wide coverage and high accessibility both in physical and virtual spaces, in order to boost opportunities for learning as well as showcasing individual's capabilities, which are key elements in creating lifelong learning values and behaviors.

2) *Creating learning materials that leave no one behind* by designing learning materials in local dialects and languages for linguistic minorities. Producing alternative learning materials for learners with sight and hearing disabilities. Enabling learners with economic constraints to have access to affordable learning materials.

3) *Concretely developing learning credit banks* to connect all levels and all classes of learning in basic, vocational, formal, non-formal and informal educations, ranging from the secondary, vocational to higher levels, to ensure agility and diverse learning options to all levels of learners.

4) *Offering incentives for lifelong self-learning* through providing funds and training credits for all groups of population, as well as training privileges for learning facility visits. Encouraging the private sector in the field of educational innovation production to offer product usage free of charge as a corporate social responsibility activity.

Sub-strategy 3.2 *Developing learning alternatives for those who cannot attend formal education.* Compiling educational information and promoting flexible and diverse learning plans for target individuals or groups to allow them to plan their learning based on personal goals and undertake skills recognition. Equipping all levels of relevant personnel in the education sector with understanding and capacity to develop learners in special target groups who have complex needs.

Milestone 13: Thailand Has a Modern, Efficient and Responsive Public Sector

1. Past Development Situation

The public sector is one of the key mechanisms to ensure people's good livelihoods and gainful employment as well as drive the country's development. It has a significant role and responsibility to provide services to the public by implementing public policies, development plans and laws in order to bring about tangible outcomes. A key factor for the success in achieving these goals lies in the efficiency of the public sector, which needs to be adaptive to rapidly changing situations in increasingly uncertain and complex conditions.

Several limitations that hinder the public sector's ability to effectively address the needs of the public are, in particular, **the cumbersome government structure and a vast range of agencies with overlapping functions, lack of integration, and limited participation of other development partners**. As a result, the provision of public services is often delayed, unresponsive to the needs of the public, and has a limited area of coverage. The Worldwide Governance Indicators (WGI) demonstrated that Thailand's score for Government Effectiveness dropped from 66.83 in 2018 to 65.87 in 2019. The Thai **public sector also lacks cross-sectoral collaboration to achieve common goals**, as reflected by the execution of the Master plan under the National Strategy in 2020, which was 80.71 per cent underperformed. In addition, the proportion of private sector investment to total investment in public services was only 10.7 per cent in 2020, which was far lower than the Master plan's target of 20 per cent for 2022. Also, cross-sectoral participation in the monitoring of government operations is rather limited and inefficient.

Another major limitation is that **the government infrastructure and work processes still cannot fully support e-government**. Government agencies also lack systematic collection and integration of digital data. Hence, existing data collection is often redundant, scattered, ungrouped, uncategorized, lacking in quality and standard, incomplete, outdated and unready for use. The process to request data is also excessively complicated and time-consuming.

Moreover, **the government data on development resources lacks systematic integration and management** and thus unusable for analyzation to inform decision-making processes, as reflected in the UN E-Government Survey 2020, in which Thailand ranked 57th with the e-government development index of 0.7565 (compared to Singapore's 11th position with 0.9150) and 0.7738 for e-participation index, 0.7751 for human capital index, and 0.7941 for online services index.

Meanwhile, public sector personnel are often trapped in old working styles, deficient in digital skills, creativity, and motivation to keep up with current developments, **unable to adapt to digital technologies**, and lacking in digital culture in the public sector, which sometimes lead to resistance to the use of technology in government administration. One of the key factors is that **public sector employments do not attract younger generations with capacity** due to unattractive selection processes, inadequate remuneration, poor performance management, limited career advancement and competency evaluation. Moreover, an archaic and unprofessional organizational culture does not support self-development or commitment to the organization. As a result, the public sector fails to utilize the full potentials of the workforce.

In addition, **many Thai laws are outdated and uncondusive to the function and adaptation of the public sector as well as to the provision of services to the general public and private sector**. The legal amendment process is time-consuming and therefore unable to keep

up with changes. Novel tools and technologies are not utilized to support the amendment, development and revocation of laws. Besides, there is **no national legal database** to provide access to the legal process or allow cross-sectoral participation in lawmaking. There is also **a lack of awareness of legal compliance and consequences**, resulting in unequal law enforcement, as reflected by the 2020 World Justice Project Rule of Law Index, in which Thailand ranked 83rd (out of 128 countries) in law enforcement efficiency with an overall score of 0.47. Thailand's law enforcement index has a tendency to decline continuously from 0.50 in 2018, to 0.48 in 2019, and 0.47 in 2020.

2. Development Goals

2.1 Connections between Milestone 13 and the main targets and goals of the 13th National Economic and Social Development Plan and the National Strategy

Thailand's public sector needs urgent improvements and adjustments in order to fill the performance gaps and increase its capacity as the main driving mechanism in the government's New Public Management (NPM) principle. Government administration needs to be transformed by applying the principles of efficiency enhancement and the pursuit of performance in civil services to achieve national development goals. Areas for public sector improvement to keep up with changes and strengthen the public sector's capacity are: 1) Making public services responsive, convenient, and cost-effective to the general public and businesses by increasing the quality of services and allowing participations by other sectors; 2) Adjusting public sector administration as well as restructuring the public sector to ensure flexibility, connectivity, openness and efficiency to support changes and the country's development; 3) Adopting digital transformation and transitioning to e-government capable of utilizing data to inform the country's development and administration; 4) Building a public sector administrative system which supports capacity building to possess necessary skills in providing e-government services as well as revising laws, regulations and government measures to support the country's development.

Milestone 13, therefore, corresponds to two main development targets of the 13th Plan, namely: 1) **Target 3: Creating a society of opportunities and fairness** by ensuring inclusive, equitable public services; and 2) **Target 5: Enhancing Thailand's capability to cope with changes and risks under the new global context.**

The development under this milestone will also result in the achievement of the National Strategy in four areas:

- 1) **Security** under the goal: Thai people have better livelihoods;
- 2) **Competitiveness enhancement** under the goals: 1) Thailand becomes a developed country with stable and sustainable economic growth; and 2) Thailand's national competitiveness is increased;
- 3) **Social Cohesion and Equity** under the goals of 1) creating fairness and reduce inequality in all dimensions; and 2) enhancing the capability of local communities in areas of development, self-reliance and self-management to build a quality society; and
- 4) **Public Sector Rebalancing and Development** under two goals: 1) A public sector shift to results based working culture and public interests, which conveniently, responsively and transparently respond to people's needs; and 2) A more adaptable and smaller public sector.

In addition, Milestone 13 is also connected with four topics in the Master plan under the National Strategy, namely: 1) No. 17 Equality and social security; 2) No. 20 Public services and public sector efficiency; 3) No. 21 Anti-corruption and misconducts; and 4) No. 22 Law and justice system.

2.2 Goals, Indicators and Targets

Target 1 Public services are of high quality and accessible.

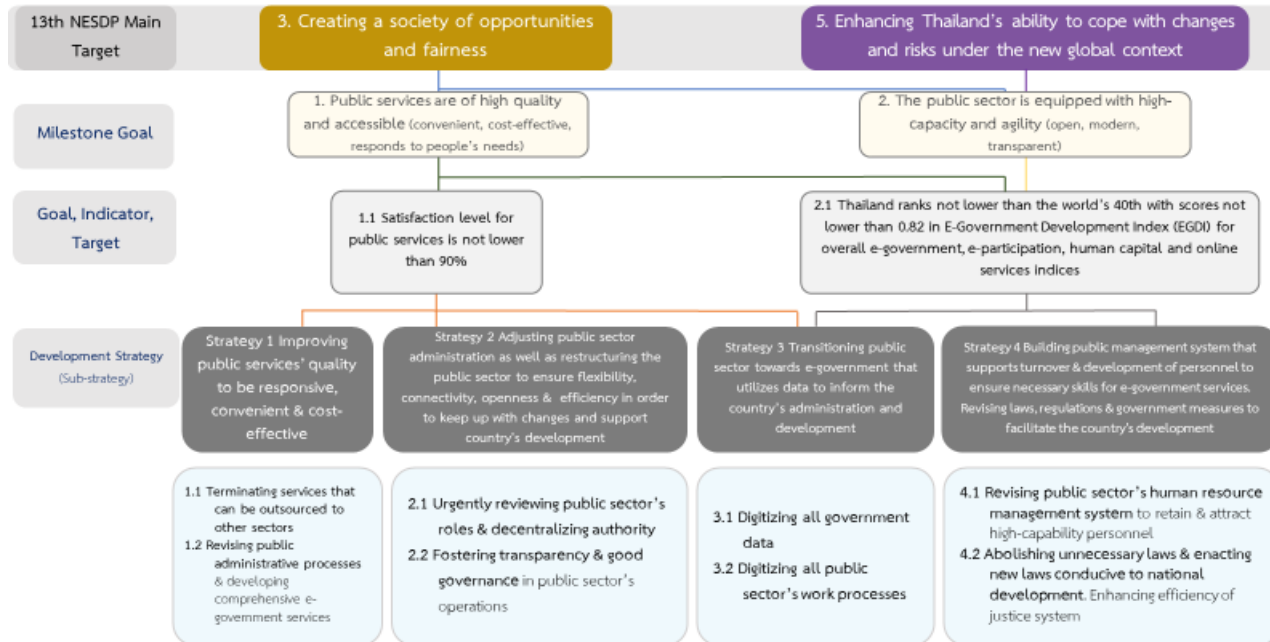
Indicator 1.1 The satisfaction level for public services is not lower than 90 per cent.

Target 2 The public sector is equipped with high capacity and agility.

Indicator 2.1 Thailand ranks not lower than the world's 40th with scores not lower than 0.82 in the E-Government Development Index (EGDI) for the overall e-government, e-participation, human capital, and online services indices.

3. Strategy Map

Milestone 13: Thailand has a modern, efficient, and responsive public sector



4. Development Strategies

Strategy 1 Improving public services' quality in order to be responsive, convenient and cost-effective:

Sub-strategy 1.1 Terminating services that can be outsourced to other sectors. Eliminating public services which are relatively costly compared to that of the private sector or no longer needed to be a government function. Developing mechanisms and incentives for local administrative organizations, the private sector, social enterprises, NGOs and other development partners to offer service innovations to meet public needs and support the country's development with shared benefits and risks.

Sub-strategy 1.2 Revising public administrative processes together with developing comprehensive e-government services. Adjusting the role of government from controller to regulator or facilitator to ensure convenience and speed, specifically in various approval processes. Eliminating unnecessary procedures and integrating services across agencies throughout all government functions. Setting a target of making every public service deemed necessary as a government function all-inclusive through a concrete cross-organizational integration of work from the policy-level to budgeting, human resource planning, and monitoring and evaluation so as to ensure consistency and achievement of common goals.

Strategy 2 Adjusting public sector administration as well as restructuring the public sector to ensure flexibility, connectivity, openness and efficiency in order to keep up with changes and support the country's development:

Sub-strategy 2.1 Urgently reviewing the public sector's roles as well as decentralizing authority. Adjusting the public sector's roles and missions in accordance with the country's development directions and future situations. Decentralizing government administration, especially in the public-sector structure, manpower, budgeting, and procurement, so as to increase flexibility, agility, and efficiency in national and provincial administration. Reviewing and revising laws and regulations to facilitate decentralization and integration among public agencies. Strengthening the capacity of local administrative organizations to take over certain tasks from the central government. Prioritizing designating mechanisms to allow public agencies to adjust work processes or create innovations beyond the constraints of existing regulations.

Sub-strategy 2.2 Fostering transparency and good governance in the public sector. Enabling a disclosure of information through various technologies and allowing the public to access and engage in delivering information, facts and opinions, and monitoring government performance through multiple communication channels. Integrating information management tasks and utilizing acquired information in a decision-making process for collaborative development and problem solving in order to diminish corruption.

Strategy 3 Transitioning the public sector towards e-government that utilizes data to inform the country's administration and development:

Sub-strategy 3.1 Digitizing all government data. Collecting and digitizing all information related to the management of the country's resources in terms of budgets, human resources. Integrating information from all public agencies in a standardized digital form with accuracy, security, and readiness for utilization without duplications or overburden to the informants. Connecting the public sector's data with those of the private sector to be used in analyses and processing and inform policy-related decision making and public services in order to

correspond with the development context in an up-to-date manner. Publicly disclosing essential information for cross-sectional usage to support the country's development. Prioritizing and urgently developing a system to integrate data essential for the public sector's policy-related decision-making processes in overall resource management.

Sub-strategy 3.2 Digitizing all public sector's work processes. Redesigning work processes as well as eliminating unnecessary or low-necessity paperwork and procedures. Adopting digital technology throughout the work process — from planning, to implementation, monitoring and evaluation — with the aim to provide multichannel/multimodal services to the public and businesses with agility, convenience, and speed.

Strategy 4 Building a public sector administrative system that supports capacity building and self-development of public sector personnel to possess necessary skills for e-government services, as well as revising laws, regulations and government measures to facilitate the country's development:

Sub-strategy 4.1 Revising the public sector's human resources management system to retain and attract high-capability personnel in order to help propel the country's development. Putting an emphasis on connections between the organization's strategic plan and human resource management strategies that can bring about concrete achievements. Revising approaches of implementation to ensure appropriateness in the size and costs of the public sector. Converting positions that can transfer their tasks into key positions essential for the country's development. Revising employment arrangements to increase variety and flexibility as well as cover contractual or other non-lifetime employments, while reducing lifetime employment in respond to the current contexts and conditions of the labor market. Attracting talents to work in the public sector to ensure timely and efficient completion of missions. Placing importance on creating innovative spaces and employment arrangements to accommodate fast, substantial and appropriate changes. Supporting the comprehensive development of digital competencies among all public sector personnel, together with fostering attitudes, ethics, knowledge and skills. Developing a personnel evaluation system which supports and reflects their capacity in systematically steering towards the country's development goals at the organizational, team, and individual levels. Formulating a human resources management system capable of optimizing the human resources to maximize the benefits of the country's development.

Sub-strategy 4.2 Abolishing unnecessary laws and enacting new laws conducive to the country's development, as well as enhancing the efficiency of the justice system. Attaching importance to strong law enforcement. Adjusting the public sector's role to become a facilitator that supports the private sector and the public in development missions. Reforming and enacting laws with measurable goals focusing on the well-being of Thai people and the enhancement of the country's competitiveness. Improving the efficiency of the justice system. Encouraging cross-organizational work integration to ensure speedy work processes, fairness to the affected parties, and convenience for the broad public. Designating a responsible agency to urgently revise outdated laws. Revoke unnecessary, redundant or obstructive laws which hinder public administration or adaptation, especially laws that obstruct the transition into e-government at all levels and laws that discourage the monitoring of government functions. Developing and integrating a secure, convenient, easy-access and easy-to-understand national legal database according to the nature of the entities accessing the database.

Part 5



Implementation of the Thirteenth National Economic and Social Development Plan (2023-2027)

Achieving the goals of the 13th National Economic and Social Development Plan (2023-2027) requires a systematically integrated cooperation of all sectors and implementation processes that: 1) translate the goals and strategic approaches of the plan into operations at the levels of measures, plans and projects with coherence; 2) genuinely reflect the development goals; 3) push for integrated, collaborative operations on common development missions shared by relevant agencies; and 4) facilitate co-operations with other sectors who are development parties in order to join forces in driving successful development outcomes. Moreover, the success of the 13th Plan also relies on budget allocation mechanisms that support the plan's execution, together with monitoring and evaluation processes that are efficient and based on participation so as to support relevant agencies with useful information in their improvement of plans and processes to better respond to the goals. These will facilitate the successful implementation of the plan and further support the development to realize the vision: **“Thailand becomes a developed country with security, prosperity and sustainability in accordance with the Sufficiency Economy Philosophy”**.

5.1 Principles for Plan Implementation

5.1.1 Adoption of PDCA cycle (Plan-Do-Check-Act cycle) as a framework to foster systematic operation processes that are continually developed and improved upon. The cycle covers four interconnected stages: planning; executing; following-up, monitoring and evaluating; and improving and adapting operations in response to the monitoring results.

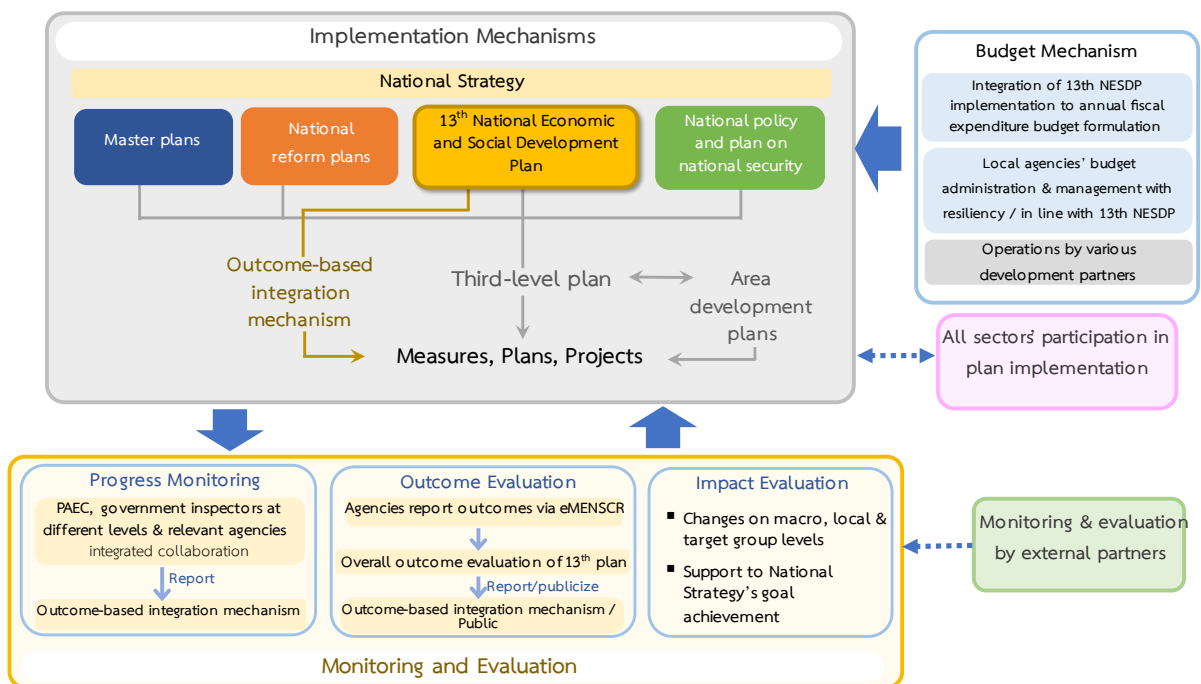
5.1.2 Emphasis on outcomes by focusing on measuring the success of operations with concrete goals, indicators and target values, both in terms of efficiency and effectiveness, in every process of the quality management cycle.

5.1.3 Combined multi-dimensional mechanisms — namely, **the strategic mechanism**, which focuses on creating factors that are important keys to the goals, as well as prioritizing operations according to their importance and urgency; **the function-based mechanism**, which is the fulfillment of official roles and responsibilities according to each agency's specialization; and **the area-based mechanism**, which translates development plans into action through the overall view at the regional and provincial levels with consideration of the area's socio-geographical conditions.

5.1.4 Operation through co-operations from all sectors to gain acceptance and reduce limitations originated from operations by any single agency or solely by the public sector, with concentration on collaborative operations and common targets.

5.2 Implementation Guidelines

Implementation Process of the 13th National Economic and Social Development Plan



5.2.1 Implementation mechanisms

Implementation mechanisms consist of operations through two parallel mechanisms: namely, the **Outcome-based Integration Mechanism**, which aims at driving the 13th Plan to achieve target outcomes by integrating operations of relevant agencies in the public sector and by cooperating with other sectors; and the **Function-based Mechanism that includes the Area-based Mechanism**, which operate along the regular missions of relevant agencies and at the area-level. The keys elements of implementing the 13th Plan through the two mechanisms are as follows:

1) **Outcome-based integration mechanism** is a strategic operation mechanism that focuses on fostering the integration of operations by all relevant agencies in the public sector, connecting the operations with the incumbent national committees, and cultivating cooperation between the public sector and other sectors — the private sector, civil society, academic sector, population, and other development partners — in striving to achieve the goals stipulated in the milestones in a concrete manner. This mechanism **focuses on the formulation or implementation of measures, plans and projects of high priority in achieving the goals of each milestone, particularly operations that involve many agencies, newly initiated operations, or operations beyond the regular missions of relevant agencies.** Moreover, this mechanism will be instrumental in the inspection and monitoring of work progress as well as in the provision of recommendations to agencies at the operational level.

2) **Function-based mechanism** puts an emphasis on **connecting operations by relevant agencies according to their missions so that they can support the goals of the 13th Plan.** In this regard, the public sector reviews and formulates the 3rd level plans, measures, operation plans and projects so as to implement the 13th Plan through multi-stakeholder mechanisms.

3) Area-based mechanism stresses on formulating regional development plans, provincial development plans, and various area development plans to ensure that they accommodate the implementation of the 13th Plan by designating development guidelines and operation plans and projects that affect the achievement of the 13th Plan's goals as well as other 2nd-level plans, to ensure local solutions and development according to the area's potentials, as well as to support the goals of the National Strategy.

5.2.2 Budget Mechanism

The budget mechanism is a major tool for steering the implementation of the 13th Plan towards outcome achievement in an efficient manner. It comprises:

1) The integration of the 13th Plan implementation to the annual fiscal expenditure budget formulation so that the budget allocation system can support the achievement of the outcomes set in the 13th Plan's goals, by linking development priorities in each year under the 13th Plan to the fiscal budget allocation strategy.

2) The support for local agencies to administer and manage their budget with resiliency and in conformity to the 13th Plan in order to implement key development issues that are suitable for different contexts, potentials and demands of each local area.

3) The promotion of operations by various development partners by supporting the private sector and various development partners with potentials to invest in the manufacturing and service sectors targeted in the 13th Plan, including operations in development activities in which the private sector has expertise under designated measures and transparent inspection so that they can support the investment in its utmost effectiveness and efficiency.

5.2.3 Enhancing the roles of all sectors for participation in the 13th Plan implementation by: 1) encouraging the collaboration of the "HTS" (Home-Temple-School) — which includes communities, local administrative organizations, religious institutions, educational personnel, volunteers, voluntary social workers, and various development partners — to translate the strategies in the 13th Plan into collaborative actions for problem solving and development with participation of the local communities; 2) creating platforms or channels for all partners to express their ideas and opinions; 3) participating in local development activities and join forces with local administrative organizations and other local agencies to implement the 13th Plan, which in turn will help revitalize the community and encourage local communities to become the major forces in national development; and 4) implementing the 13th Plan by promoting collaborations among communities and international organizations, particularly on development issues of high priority at the regional and sub-regional levels.

5.3 Monitoring and Evaluation

The monitoring and evaluation of the 13th Plan implementation covers monitoring and evaluation at the work plan and project levels, particularly work plans and projects with high priority to achieve the goals of each milestone, in order to forward feedbacks to relevant agencies and development partners for a review and improvement of the plans and operation process to ensure that the targets are reached. Feedbacks include a total outcome evaluation of the development in accordance with the indicators of the milestones and the main goals laid down in the plan. Monitoring and evaluation at all levels must strive for integration and participation to

foster efficiency and transparency. The monitoring and evaluation of the 13th Plan implementation include operations in 3 stages, as follows:

5.3.1 Progress Monitoring is the monitoring and evaluation while the projects are underway in order to inspect and monitor whether their operations align with the objectives, goals, and timeframes as well as examine whether there might be any obstacles that might delay or impede the operations from attaining specified outcomes within the designated timeframe. The monitoring relies on mechanisms and agencies at all levels with the mission to monitor the public sector's operations — for example, the Public Sector Audit Evaluation Committee (PAEC), government inspectors at different levels, and relevant agencies — to work together through integrated collaborations, as well as prepare reports, at appropriate intervals, on the monitoring and evaluation results for the outcome-based integration mechanism.

5.3.2 Outcome Evaluation is the evaluation of the completed plans and projects as to whether, and to what degree, they have achieved specified goals, outputs, and outcomes. This also includes an achievement evaluation in accordance with the indicators of the milestones and the main goals of the development plan, both during and at the end of the plan. At this juncture, relevant agencies, both central and local agencies, shall report progress and outcomes of their action plans in the national monitoring and evaluation system. The evaluation is to show both the direct and indirect achievements of the goals set out in the 13th Plan, which will lead to data processing and the presentation of the overall outcome evaluation of the 13th Plan implementation. The overall outcome evaluation is to be publicized, and communication channels for receiving the public opinions are to be arranged.

5.3.3 Impact Evaluation analyzes economic, social, and environmental changes that result from major operations under the 13th Plan. This includes changes on the macro level, the local level, and the target group level, as well as in the capability to support the achievement of the goals set by the National Strategy.
