KUALA LUMPUR
HIGH LEVEL DIALOGUE
ON ASEAN ITALY
ECONOMIC RELATIONS

POSITION PAPER

Energy transition and circular economy in ASEAN: state of the art, national plans and investment opportunities

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Due to their rapid economic expansion, ASEAN nations now have to deal with **issues of sustainability and resilience** as well as the trade-off between economic development and socioeconomic integration and sustainable management of natural resources.

Energy-intensive, carbon-emitting production is driving the expanding economic dynamism and growth, and in the next years, **energy demand is anticipated to rise** in line with this trend. Rapid urbanization brought on by socioeconomic development is straining all forms of ASEAN infrastructure. Finally, given that some countries in the region are more sensitive to natural disasters and phenomena due to their geographic location, climate change-induced occurrences are likely to make resilience problems worse.

The need for resilience and sustainability in ASEAN countries is then analyzed in this Position Paper, with regard to **five different green and circular pillars**: clean energy transition, circular economy, sustainable urban development, innovative agriculture and healthy and productive oceans.

Partnership with Italy, with multiple areas of expertise in pivotal aspects of the resilience and sustainability framework (i.e., agriculture 4.0, circular economy, energy and urban infrastructures and the educational system), could provide ASEAN countries with useful tools and benchmarking for winning the sustainability challenge.

ASEAN socio-economic analysis and main trends

1. The Association of Southeast Asian Nations (ASEAN), founded in 1967, has among its aims to accelerate the economic growth, social progress and cultural development, mainly through the promotion of a strengthened collaboration among the Member States (which are Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, Philippines, Singapore, Thailand, Viet Nam) in order to encourage further growth in the agriculture and industry, and trade sectors.

2. With a population of over 660 million and a GDP of about $3 trillion in 2020, ASEAN is the **3rd largest economy in Asia and the 5th largest in the world** after the US, China, Japan and Germany. During 2020, the spread of Covid-19 has weakened the demand and disrupted the supply chains, resulting in a general decline in trade and production, and consequently in GDP. One of the most impacted industries by the pandemic has been tourism. Travel contributed the highest proportion to both ASEAN's total exports and imports of services in 2019, at 31.6% and 20.7% respectively, prior to a sharp drop in 2020 to 10.3% and 8.0% respectively.

3. However, the region is recovering soon and with high growth rates. In fact, ASEAN averaged an annual GDP growth rate of **4.4%** between 2011 and 2019, and after a contraction of -3.3% in 2020 due to COVID-19, it is expected to grow by 56% by 2026, becoming the world's **4th largest economy by 2030.**

4. Households and non-profit institutions serving households (NPISHs) consumption has made an important contribution to the growth of ASEAN countries in the last years, as it accounts for more than 60% of GDP. In the period 2008 – 2020 it increased significantly at an annual growth rate of +5.7%, reaching $1.6 trillion in 2020, and it is expected to reach $4 trillion by 2030. Moreover, ASEAN countries have one of the highest saving rates in the world (about **30%**), which is going to support the GDP and consumption growth in the next years.

5. ASEAN average GDP per capita in 2020 was $4,533, down by 6.1% compared to 2019 due to COVID-19, but with a very positive trend over the last 10 years (CAGR of **3.1%**). However, the income is very heterogeneous among ASEAN's countries, ranging from a low of approximately $1,286 in Myanmar to $59,785 in Singapore.

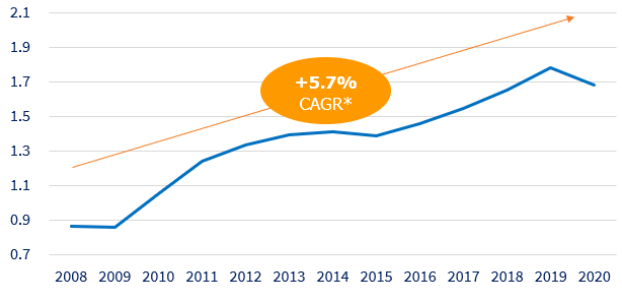

Figure 1. *Households and NPISHs Final consumption expenditure (trillion $). (Source: The European House – Ambrosetti elaboration on The World Bank data, 2022)*

6. **Unemployment remains low** in comparison with other Asian countries, at an average value of 3.0% in 2021 (up from 2.8% in 2016).[1] Youth unemployment is slightly higher (8.8% in 2020)[2] and after a downward trend between 2016 (8.8%) and 2019 (7.6%) it has significantly increased due to Covid-19 crisis. To increase young people involvement in the labor market, ASEAN is putting efforts into improving student retention in its education system (the rate of enrolment in lower secondary school is around 80%). In fact, if the job market is able to include more and higher-skilled young workers, potential youth unemployment concerns would be lessened.

7. ASEAN is becoming increasingly integral to international relations. If ASEAN countries were taken as a single entity, they would rank **3rd in the world for import and export values** (after USA and China). ASEAN countries in 2020 export 7.4% ($1.7 trillion, -10% compared to 2019) and import 7% ($1.5 trillion, -12% compared to 2019) of total global exports and imports of goods and services, respectively.

The 5 green and circular transition pillars in the ASEAN area: Facts and Figures.

8. ASEAN region is **among the most vulnerable regions** in the world to the impacts of climate change. According to the Climate Risk Index, five of the twenty countries most affected by climate change over the period 2000-2019 are located in the ASEAN region: Myanmar, the Philippines, Vietnam, Thailand, and Cambodia.

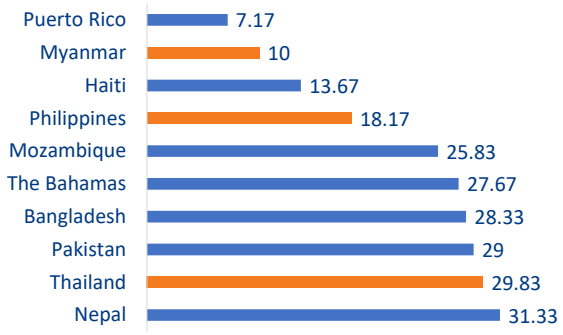

Figure 2. *The Long-Term Climate Risk Index (CRI): The 10 countries most affected from 2000 to 2019 (scores - annual averages). (Source: GERMANWATCH, 2022)*

In particular:

- Myanmar ranks 2nd country in the world, with an annual average of 57 climate-related extreme events and average annual losses of about 7,000 lives and 0.80% of GDP.
- The Philippines ranks 4th country in the world, with an annual average of 317 climate-related extreme events and average annual losses of about 860 lives and 0.54% of GDP.
- Thailand ranks 9th country in the world, with an annual average of 146 climate-related extreme events and average annual losses of about 138 lives and 0.82% of GDP.

9. Therefore, it is crucial for the region to address all issues related to climate change and sustainability. The analysis of the state of the art of the green and circular economy in ASEAN countries will follow the **5 green growth opportunity areas** identified by the Asian development Bank:

- Clean Energy Transition.
- Circular Economy.
- Healthy and Productive Oceans.
- Sustainable urban Development.
- Innovative Agriculture.

Clean Energy Transition

10. ASEAN energy mix has been historically being dominated by fossil fuels (coal, gas and oil), this allowed access to cheap and reliable energy, boosting its socioeconomic growth. The fast economic growth of the region has pushed the **energy consumption**, but the "traditional" energy mix has caused an increase of the environmental impact of the Region.

11. In 2020, the total installed capacity in ASEAN reached 285,089 MW, compared with just 144,184 MW in 2010[3] . However, in 2020, **66.5%** of ASEAN's total power capacity was covered by fossil fuels.

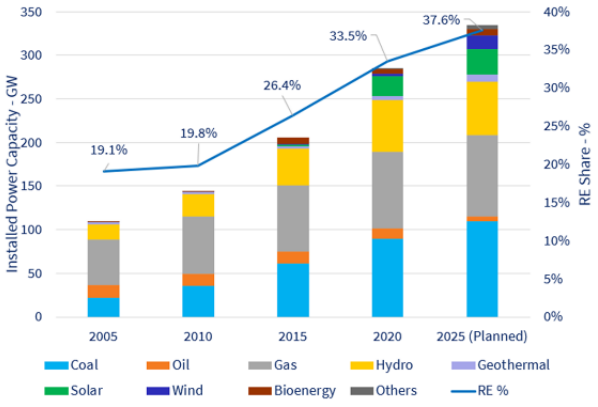

Figure 3. *ASEAN installed power capacity (GW) and Renewable Energy share, 2005 -2025. (Source: ASEAN Power updates, 2022)*

[1] Source: The World Bank, 2022.
[2] Source: The World Bank, 2022.
[3] Source: ASEAN power updates, 2021

The increase in power production together with the high use of fossil fuel have resulted in increased **greenhouse-gas emissions** and made the energy sector the largest emitter of greenhouse gases (GHG) of the region. CO_2 emissions has grown steadily in the last two decades in ASEAN countries: between 2000 and 2018 they grew by around **114%**, accounting for **4.7%** of global emissions in 2018.

12. Luckily, this emissions growth has decelerated in some major emitters in the region (Indonesia, Malaysia, Singapore, Thailand and Vietnam), thanks to an improvement in energy efficiency and a gradual switch in energy fuel mix towards lower emission sources (gas and renewables).For instance, in 2020, around **82%** of new power capacity installed was renewable, mainly solar, which is prevalent in Vietnam, and hydro, mainly used in Lao PDR, leading ASEAN region to reach 33.5% of renewable energy share in 2020, only 1.5% under the target of 35% RE by 2025. This percentage is expected to grow significantly in the next years reaching 37.6% by 2025.

13. The top four CO_2-producing states in ASEAN are Indonesia, Thailand, Vietnam and Malaysia, which together produce about **84%** of the Region's total emissions. Looking at per capita data, however, the scenario changes: the country with the worst per capita emissions is Brunei Darussalam (16.6 tons per capita), followed by Singapore (8.4), Malaysia (7.6) and Thailand (3.7).

Circular Economy

14. Resource consumption in Asia is expanding rapidly compared to other regions. Even if some counties in Asia promoted a circular economy model, from 1970 to 2017, **direct material consumption (DMC) in East and Southeast Asia grew 1.2% annually**, much more than in Europe (0.6%) and North America (0.5%). As a result, East and Southeast Asia accounted for almost **23.4%** of global DMC in 2017, a significant increase from 7.9% global DMC contribution registered in 1970.[4]

15. **Municipal Solid Waste** (MSW) has become a serious issue in recent years, since waste creation has risen dramatically as a result of fast urbanization and industrialization, population growth and improved lifestyles. In ASEAN MSW is **1.14 kg/capita/day**, higher than the world's average (0.74) and than other Asian countries like China (1.02) and India (0.34). Moreover, there is a high variability among country with Singapore being the worst with 3.76 kg/capita/day, followed by Brunei Darussalam (1.4) and Malaysia (1.17), and Myanmar being the best with 0.53. In terms of annual MSW generation the region produces **150 million tons per year**, with Indonesia, Thailand, and Vietnam accounting for more than 3/4 of the total production.

16. The MSW produced in ASEAN nations is primarily made up of organic waste, plastic, paper, glass, and metal, though the exact composition varies per nation. In **Indonesia**, 60% of the MSW is organic waste, followed by plastic (14%) and paper (9%). In Malaysia 45% of the MSW is organic waste, followed by plastic (13.2%) and paper (8.2%); In Singapore, 10.5% of the MSW is organic waste, followed by metal (20.8%), construction debris (16.9%) and plastic (16.5%). In Thailand, 64% of the MSW is organic waste, followed by plastic (17.62%) and paper (8%). In Vietnam, 55% of the MSW generated in the country is organic waste, followed by plastic (10%), paper (5%) and metal (5%).[5]

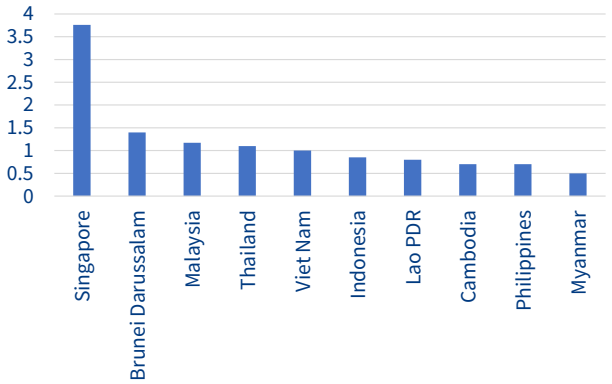

Figure 4. *Waste generated per capita in ASEAN countries. (Source: UN environment, 2022)*

17. In ASEAN, a large part of waste management is handled by the **informal sector**. The informal sector is mostly interested in the high-value plastic (HVP) waste, which due to its positive market value is extracted and sold to traders or recyclers through an established waste value chain. In Indonesia, for example, the informal sector recycles around **700,000 metric tons of plastic waste** every year, and in Viet Nam, out of 323 kilotons (kt) of plastic waste collected for recycling domestically, 309 kt (more than 95%) is reported to be recycled by the informal sector.[6]

18. Other important issues are **water pollution** and **water management**. Population growth, rapid urbanization and climate change has put under pressure the natural water resources in Southeast Asia. Many rivers in the region are highly polluted with domestic, industrial, and agricultural waste. Actual wastewater treatment system in urban centers is unable to fulfill the treatment demand, especially due to the rapid increase of population in the urban and peri-urban areas. The region's health, sanitation, and aquatic biodiversity are all threatened by the constant discharge of untreated wastewater due to poor wastewater management.

19. The percentage of ASEAN population with access to improved water sources is quite high (93% in 2020), even though there differences among ASEAN countries and with rural areas. However, this means that still **46.2 million people** don't have access to at least drinking water services.

Healthy and Productive Oceans

20. Increasing use of plastics, unsustainable or even illegal fishing practices and increasing water acidity due to excessive carbon dioxide in the air endangers the biodiversity of the oceans, threatening in particular the survival of coral reefs.

[4] International Resource Panel 2019.

[5] United Nation Environment program, 2017.

[6] Asian Development Bank Institute, 2022

Coral reefs in Southeast Asia have one of the highest levels of biodiversity in the world and are also crucial to the country's economy and in particular to the development of the fishing and tourism sectors. Unfortunately, increasing water pollution has also put human health at great risk due to microplastics entering the food chain.

21. Due to the high concentration of the population along rivers and coastlines much of the resulting plastic pollution ends up in the ocean. Pollution is estimated to cost **US$3.1 billion a year** to the Region's tourism, fishing, and shipping industries.

22. During the past few decades ASEAN region has experienced an unexpected rapid growth in the production of plastic. Today, five of the top 10 countries in the world for the amount of mismanaged plastic waste that ends in the oceans are ASEAN states. In particular, almost **60%** of the world plastic waste entering the oceans comes from five ASEAN countries: the Philippines, Malaysia, Indonesia, Viet Nam and Thailand[7] .

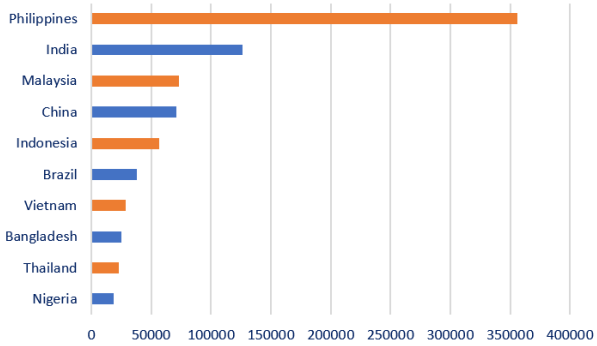

Figure 5. *Top 10 Countries in the World that release the most plastic into the oceans (tons 2021). (Source: World Population Review, 2022)*

Philippines, for example, generates 2.7 million tons of plastic waste each year, with an estimated **20%** of it ending up in the ocean and around 70% of Indonesia annual plastic waste (6.8 million tons) is considered mismanaged.

23. Without any improvement in the waste management, the mismanaged plastic waste generation in Asia is expected to **double from 52 megatons (Mt) in 2020 to 129 Mt per year in 2060**.[8]

Sustainable Urban Development

24. The distribution of people among cities and rural areas has significantly changed in the past two decades, from only **37.9%** of the population who lives in urban area in 2000 to 50% in 2020, percentage that is expected to reach **65%** by 2050.

25. Urban population on average increased **2.6%** yearly (CAGR) in the last two decades, due to the increase in population and to the rural-urban migration. This is particularly true in **Indonesia**, where in the last two decades rural population has decreased by about 4 million inhabitants while urban population grown by **66 million people**, and Thailand, where rural areas lost more than 9 million people, around 21.5% of rural population.

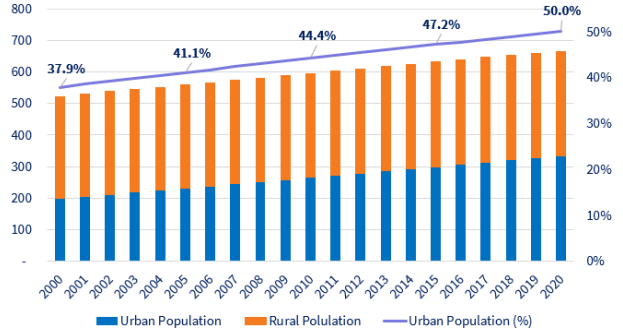

Figure 6. *ASEAN population in Urban and Rural area and percentage of Urban population (Source: The European House – Ambrosetti elaboration on The World Bank data, 2022)*

26. The region is projected to see **one of the largest expansions** in a growing urban middle class, creating one of the world's largest middle income emerging markets after China and India by 2050. Although there are still substantial differences among ASEAN countries, middle class growth rates are commonly high. For example, Vietnam has an estimated middle class of 25% of the population but with growth rates up to 2030 averaging 5.5 percent per year. Malaysia, on the other hand, although a more mature market with a middle class of about 78% of the population, still has estimated growth rates of 2.9 percent through 2030.

27. Rapid urbanization, if not managed well, could lead to proliferation of **environmental and health issues**, putting under pressure the actual urban infrastructure (water treatment systems, transportation systems, buildings and power plant). This will have a negative impact on air pollution, water quality and on slum resident that are often particularly vulnerable to climate change related extreme events.

28. Air pollution is one of the biggest issues in Southeast Asia, however it varies widely among cities and countries. In rural areas the main source of air pollution is biomass burning followed by vehicle emissions, while in urban areas the most important sources are vehicle and industrial emissions. According to the World Health Organization (WHO), in 2016, an estimated **2.4 million premature deaths** were attributed to air pollution in ASEAN countries. In 2021 only **0.4%** of ASEAN cities met the WHO PM2.5 Guideline and among the 15 most polluted regional cities 6 are in Thailand, 4 in Vietnam, 3 in Indonesia and 2 in Malaysia. At the same time, 12 out of 15 least polluted cities of the Region are in Malaysia.

29. Covid-19 has highlighted the problem of population living in slums. Without an adequate access to improved water and sanitation and without a sufficient living area, people living in slums are more exposed to catastrophic event related to climate change and to the spread of the pandemic, without any possibility to have access to the necessary treatment.

30. However, the trend is heterogeneous, with some countries that have shown very positive results in the last two decades, such as Vietnam, Cambodia, Lao PDR and Thailand, and other countries (Philippines, Myanmar and Indonesia) that, after a reduction in the percentage of

[7] Asian Development Bank Institute, 2022

[8] Lebreton and Andrady, 2019.

urban population living in slums between 2000 and 2010, experienced a worrying increase. In particular, in 2018 only 13.8% of Vietnamese urban population lives in slums, a huge improvement if compared with the 48.8% in 2000. In Thailand population living in slum has passed from 27% in 2010 to 23.7% in 2018. In Indonesia, after the encouraging results from 2000 (34.4%) to 2014 (21.8%) the trend has worsened dramatically to 30.6% of the population living in slums in 2018, more than 28 million people.

Innovative Agriculture

31. ASEAN's rapid economic expansion boosts salaries and living standards, promotes urbanization, and produces a growing, wealthier, and better educated middle class. These factors, when combined with predicted population growth, have a significant impact on not only the overall level of demand for food, agriculture, and forestry goods, but also the safety, quality, and composition of demand. As a result of these socioeconomic and demographic shifts, there is a greater need for higher-quality, more hygienic, and more diverse food products.

32. Agriculture is a way of life in ASEAN, in most countries, the food, agriculture, and forestry (FAF) sector remains a critical industry and a substantial source of employment and income for a huge portion of the population. **ASEAN is one of the world's most important producer and supplier of grains**, mainly rice (around 30% of global production), sugar (around 10% of global production) and the world's largest producer of palm oil and natural rubber, both of which have risen fast in recent years, with over a 138 million hectares of agricultural land. ASEAN is also among the world's major producers and exporters of fish products (almost 25% of global production).

33. The value added generated by agriculture, forestry and fishing grew significantly during the years with a **CAGR of 3.1%** in the period 2010-2020.

With a total added value of $319 billion generated in 2020, this sector account for the **10.6% of total GDP**. In some countries such as Cambodia, Myanmar and Laos, the sector accounts for a bigger portion of total GDP, respectively 22.4%, 22.0% and 16.2%. However, **91.7%** of regional value added is concentrated in just 5 countries (Indonesia, Thailand, Vietnam, Philippines and Malaysia).

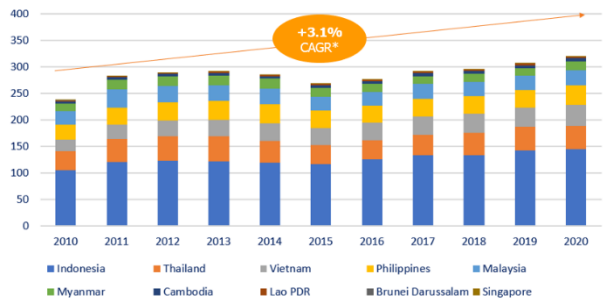

Figure 7. *Agriculture, forestry, and fishing, value added (Billion $). (Source: The European House – Ambrosetti elaboration on The World Bank data, 2022)*

34. Climate change, overfishing, unsustainable farming methods, food waste, and other issues are putting the industry at risk. It will take a lot of work to guarantee that the region's agricultural sector, which is a major source of food and revenue, continues to promote proper care of the earth's resources.

ASEAN Framework plans for circularity and agriculture development.

35. As stated in the first chapter, the Asian Development Bank identified **5 green growth opportunities for the ASEAN area**, which require an estimated total amount of annual capital investments of **172 billion of USD** until 2030, to be subdivided among clean energy transition investments (82.5 billion of Euros in annual capital investments), circular economy models (54 billion of Euros), sustainable urban development and transport models (26.8 billion of Euros), productive and regenerative agriculture (6.9 billion of Euros) and healthy and productive oceans (1.8 billion of Euros). The growth opportunities offered by these efforts can generate around **30 million jobs** in ASEAN area by 2030.

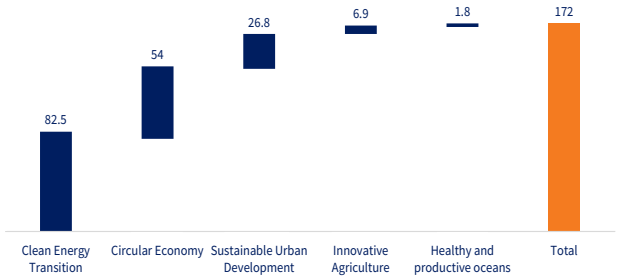

Figure 8. *Annual capital expenditure required in ASEAN area (billion $). (Source: The European House – Ambrosetti elaboration on Asian Development Bank data, 2022)*

36. In particular, in the latest years ASEAN focused on sustainable development and circularity, as the definition of a **Framework for Circular Economy for the ASEAN Economic Community** certifies. The Framework's goal is to shift from the current Member States' linear economy, which is inefficient and wasteful, to a restorative and resilient circular model, including not only the environmental perspective but also the role of trade, technological innovations and financial markets.

37. The Framework considers **3 main strategic goals**, which are to build a resilient economy for ASEAN countries, to use resources in an efficient way and to define a sustainable growth path. In order to achieve these targets, **6 guiding principles** have been defined, among which there are the promotion of ASEAN integration and the development of regional value chains through circular economy initiatives, the encouraging of a Community-wide cooperative mechanism to share knowledge and technologies useful to advance circular economy initiatives, and the consideration of broader socioeconomic impacts of circular economy initiatives, which should consider each Member State's socioeconomic development priorities.

38. The Framework also identifies 5 strategic priorities:

- Adopt **harmonized standards** for circular and reused, second-hand products.
- **Promote free trade** among ASEAN Countries to ensure the **diffusion of best available circular technologies** and facilitate movements of second-hand goods.
- **Develop digital solutions** and tools for resource management and a **circular economy common policy framework**.

- Use of **blended financing, green, transition and sustainable bonds and carbon pricing**, in addition to the ASEAN Green Catalytic Finance Facility and the ASEAN Infrastructure Fund.
- Foster **energy efficiency and the use of renewable energy**, especially enhancing the role of a smart and sustainable agriculture in resource management.

Figure 9. *Framework for Circular Economy for the ASEAN Economic Community. (Source: The European House – Ambrosetti elaboration, 2022)*

39. In addition to the mentioned strategy, ASEAN Economic Community aims at **supporting food security and agricultural development**. Among the strategic priorities envisaged, there are a greater access to finance for micro and small enterprises, including food, agriculture and forestry (FAF) small producers; developing **innovative rural financing mechanisms**, in addition to public incentives and private funding, would enable them to reduce initial costs of adopting new technologies, which, in turn, will **improve productivity and product quality in ASEAN agri-food industry**. Moreover, the Community promotes partnerships among small producers and big companies to foster market access and opportunities, the adoption of common regional standards and **the exchange of best practices and technology**. Another priority includes support for the setting up of cooperatives and organizations of the small-scale agricultural sector, besides education and training programs for the development of production, financing, managerial and entrepreneurial capacities of small-scale farmers. Finally, the Community aims at strengthening **small-scale agribusinesses' resilience against climate change**, promoting production diversification and the adoption of climate-resilient innovations and technology through financing mechanisms improvement and technical assistance packages.

40. ASEAN also defined a **Vision and Strategic Plan for ASEAN Cooperation in Food, Agriculture and Forestry for the period 2016-2025**. Among the Strategic Thrusts there is the enhancing of quantity and quality of production with green, sustainable technologies and resource management systems.

41. The green transition of ASEAN area agricultural sector and, more in general, of the Member States' infrastructure and economy, is largely funded by ASEAN Infrastructure Fund, and in particular by **ASEAN Catalytic Green Financing Facility** (ACGF), whose mission is to accelerate the development of green infrastructure in ASEAN by better utilizing public funds to create bankable projects and catalyze private capitals and technologies. In the period 2019-2021, the ACGF earmarked a total amount of funds of almost **USD 2.4 billion** from the Asian Development Bank, partners co-financing and the ASEAN Infrastructure Fund, and diverted a yearly average of USD 72 million investments in capital expenditure and USD 191 million in operations & maintenance from the private sector in green infrastructure projects. Among the 2022-2024 targets, the ACGF envisages at least USD 450 million in financing from public and private sources and USD 500 million in partners funds leveraged, to de-risk and finance at least 6 new green infrastructure projects to reduce CO_2 emissions in ASEAN area.

42. Considering some virtuous examples among ASEAN Member States, **Malaysia** represents a benchmark in providing incentives to investments in green technologies and circular economy: among the **Green Technology Incentives** there is the **Green Investment Tax Allowance** for purchasing green technology equipment and assets for renewable energy, energy efficiency, green buildings and integrated waste management projects (covering 100% of initial capital expenditure). Some examples of incentivized green technologies are solar thermal systems and collectors, energy efficient industrial furnaces, energy efficient technologies involved in waste management and hydro pumps. In addition to the mentioned incentives there is the **Green Income Tax Exemption**, which provides an income tax exemption equals to the 70% on statutory income for green services (including system design and feasibility studies, advisory and consulting, energy audit and management, testing and commissioning services for renewable energy and energy efficiency projects; services related to electric vehicles and charging stations; testing and commissioning of green buildings equipment and systems) and solar leasing activities.

43. **Viet Nam**, by its side, provides a strong national incentive framework for agricultural projects. In particular, incentives consist in **preferential Corporate Income Tax rate** (10%-15% CIT rate for the life of the project), **import duty exemptions for imported goods** to form fixed assets and materials imported for manufacturing and **land rental fee exemptions** (depending on location and scale of the project) for farming, processing of agriculture, production of plant varieties and preservation of agriculture products' projects. In the innovation field, Viet Nam guarantees a 10% corporate income tax for 15 years (up to 30 years for large-scale projects or those using new or high technology) and both import duty and land rental fee exemptions to projects in R&D and hi-tech enterprises, including **agricultural enterprisers applying hi-tech**. The same incentives are provided to renewable energy projects.

44. In order to conceptualize the main objectives and the paths of activities of the Country, **Thailand** defined its **Bioenergy-Circular Economy-Green Economy (BCG)** Model, which represents the Thai Economic Model post COVID-19. The strategy's focus is set on energy, food, employment and health security, and sustainable natural resources and the environment, considering **6 dimensions** among which there are the enhancing of Thailand's competitive advantage biodiversity and cultural diversity, the fulfillment of 10 out of 17 Sustainable Development Goals and providing local communities with opportunities and wealth.

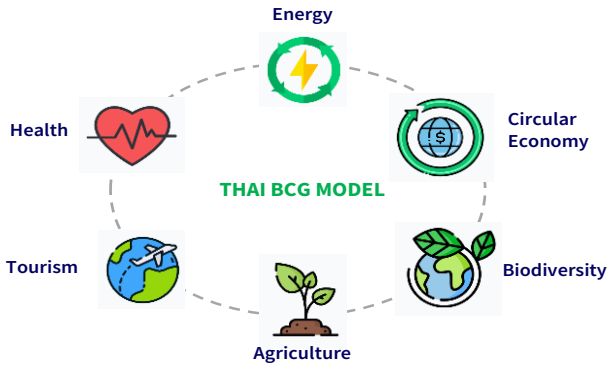

Figure 10. *Target sectors of Thailand's BCG Strategy and the National Determined Contributions. (Source: The European House – Ambrosetti elaboration, 2022)*

The target sectors considered to reach the goals are then Cultural diversity and biodiversity, Food and Agriculture, Medical and Wellness, Energy, Material and Biochemicals, Tourism and Circular Economy. All these actions should lead to a decrease in GHG emissions by **20-25% by 2030**.

45. Also, **Indonesia** has been paying attention to circular economy topic. In fact, UNDP estimated that circular economy measures to be implemented in the 5 focus sectors (Food&Beverage, Textiles, Construction, Wholesale and Retail trade and electrical and electronic equipment, which together make up the 33% of GDP and employ roughly 43 millions of people), would lead to an **increase of GDP growth rate by 0.6% in 2030**, to the generation of **4.4 million net jobs by 2030** (of which the 75% could be for women), and to about **126 million tons of CO_2 emissions savings**[9]. The annual capital investments required to capture the opportunities offered by a circular economic system have been estimated to be equal to **USD 21.6 billion** (1.1 times the amount of Foreign Direct Investments flows in Indonesia in 2018). Indonesian government grants a Super tax deduction for investments in tangible fixed assets and land used for main business activities in labor intensive industries, including agriculture. The incentive consists in a reduction in net income of 60% of the investment, and a reduction in gross income of up to 300% for certain R&D activities carried out in Indonesia.

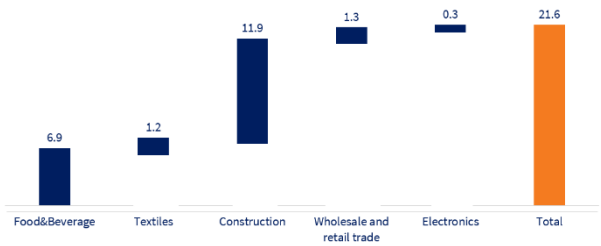

Figure 11. *Annualized investment requirements for circular economy in Indonesia, 2021-2030 (billion $). (Source: The European House – Ambrosetti elaboration on World Bank data, 2022)*

46. Considering one last ASEAN Country example, **Singapore** grants significant economic incentives for projects related to energy efficiency and R&D for products and processes. Among others, the government supports with the **Resource Efficiency Grant** the industrial facilities in the manufacturing sector to be more energy efficient (through the granting of qualifying costs up to the 50% of the total amount), and with the **Energy Efficiency Fund** businesses in various sector to reduce their energy consumption. Moreover, the **Innovation Development Scheme** aims at supporting companies in developing capabilities in the innovation of products, processes and applications, generally providing a cash grant of up to 50% of qualifying project costs for three years. The remaining costs not funded may qualify for the R&D Super Deduction, an enhanced tax deduction that can lead to a tax saving for companies that carry out qualifying Research&Development activity of 42.5% on local R&D and up to 17% for overseas R&D.

47. Lastly, **ASEAN Regional Action Plan** for Combating Marine Debris in the ASEAN Member States (2021 – 2025) aims at defining a scalable, solution-focused joint strategy to address marine plastic debris across the region, mainly addressing the plastic pollution. In fact, as explained in the previous chapter, almost the **60%** of the plastic waste entering the oceans comes from five ASEAN countries. For this reason, the definition of an integrated, regional strategy is fundamental to consider an ASEAN-wide set of policies to reduce Single Use of Plastics (SUPs) and improve recycling rates, eventually reducing quantities of plastics in the ocean. For instance, the Plan promotes the adoption of international good practices, such as the ban on plastic bags introduced in California suggests that the measure reduced plastic bag consumption by 71.5% and took 100% of those plastic grocery bags out of the recycling.

48. Until a few years ago, policies regarding plastic reduction among ASEEAN countries were very heterogeneous, with no coordination and a common vision among the various states. This is why in 2021 the ASEAN Regional Action Plan for Combating Marine Debris in the ASEAN Member states (2021– 2025) was adopted, to develop a scalable, solution-oriented joint plan to combat marine plastic trash throughout the region. The regional action plan's purpose is to **increase cross-border coordination to address the problem of marine plastic pollution**. It focuses on reducing inputs into the system, improving collection, limiting leakage, and creating value for waste reuse.

49. The plan is built according to the key objectives of the Bangkok Declaration on Combating Marine Debris in ASEAN Region (2019), and consists of **14 regional actions** organized under **four pillars**:

- **Policy support and planning**, which include promoting best practices for phasing out single-use plastics packaging, as well as facilitating and establishing trash trading and recycling standards.
- **Research, innovation and capacity**, which include expanding regional expertise and data on waste and microplastics, developing standardized methods for training and data gathering.
- **Public awareness, education, and outreach**, which include strategies to influence behavior change and consumer awareness of labeling and packaging.
- **Private sector engagement**, which include the creation of regional platforms for knowledge, implementation support and to drive innovation and investment.

[9] Source: United Nations Development Programme, 2021.

50. **Thailand** has implemented strict rules during the years in order to reduce its impact on ocean pollution. In 2019 the Government adopted the Thailand Roadmap on Plastic Waste Management with the aim of banning the major single use plastics (plastic bags, plastic cap seals on drinking water bottles, plastic straws and Styrofoam containers), and incentives for using alternatives such as biodegradable plastic. Moreover, the Pollution Control Department has introduced some rules in order to reduce the use of plastic packaging by reducing excesses and replace it with lighter weight alternatives.

51. **Indonesia's** anti-pollution intervention is guided by two main regulations, the Indonesia's Plan of Action on Marine Plastic Debris (2017-2025) and the Extended Producer Responsibility (EPR) implementation roadmap focuses on improving behavior change, enhancing funding mechanisms, policy reform and banning single use plastic from the island. Moreover, there is an obligation for retailers to charge consumers for plastic bag and the permission to use recycled PET in food packaging if they meet the requirements.

Italian expertise and know-how to support the 5 green and circular transition pillars in the ASEAN area.

Clean Energy Transition

52. Aware of the role of the **energy infrastructure** for the socio-economic development of a country, renewable energy has developed rapidly in Italy over the past decade and has provided the country a means of diversifying from its historical dependency on imported fuels. As of 2021, **36.4%** of electric demand is covered from renewables and the share of renewables in final energy consumption has increased to **20.4%** in 2020 (compared with 17.4% in 2016). Italy remains one of the largest European countries in terms of energy consumption from renewable sources, **ranking third** behind France and Germany, with consumption in 2020 of 21.9 Mtoe.

53. Italy's excellence in sustainable energy is demonstrated by its ability to exploit the country's diverse territorial conformation in such a way as to optimize the production of renewable energy, starting with the exploitation of the mountain ranges of the Alps and Apennines where hydroelectric energy production prevails, the prevalence of photovoltaics in the south of the country, which offers a sunny climate suitable for this technology, and the production of wind energy especially on the islands and geothermal energy in the region of Tuscany. The spread of renewables in the country reached an important milestone in 2020 with **100% of municipalities with at least one renewable plant** (more than 7,900 municipalities) and more than 3,000 municipalities where renewable energy production exceeds the electricity needs of households.

54. As of today, **118.5 TWh** are produced in Italy through renewable energy sources, with a major role of hydroelectric (40.7%), followed by photovoltaic (21.3%), wind (16%), bioenergy (15.8%) and geothermal (5.2%). According to the recent declarations of the Italian Ministry of Ecological Transition and the energy operators, the overall energy production from renewables will increase to **238.5 TWh by 2030**, with a larger contribution from photovoltaic (45.4%).

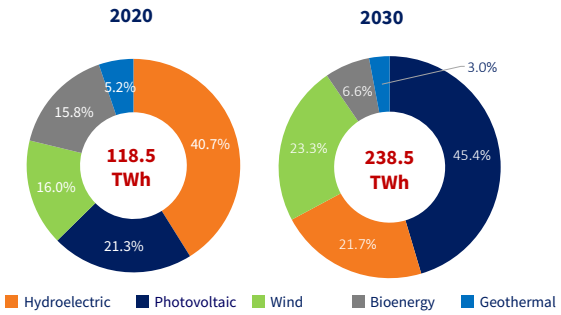

Figure 12. *Total renewable energy production in Italy by sources. (Source: The European House – Ambrosetti elaboration on Terna and Italian Government data, 2022).*

55. In addition, Italy published the Integrated **National Energy and Climate Plan (PNIEC) 2030** in early 2020, with the aim of meeting and exceeding the EU targets on energy efficiency and security, use of renewables and the single energy market, and competitiveness. This will be done through 5 main lines of action: decarbonization, efficiency, energy security, development of the internal energy market, and research, innovation and competitiveness. The goal is to reduce emissions in the large industrial sector by **-56%,** in the tertiary, transport and civil sectors by **-35%,** and to achieve **30%** renewable energy production.[10]

56. Moreover, the plan estimates approximately **€186 billion** of public and private business investment required in energy transition, with the buildings and renewables sectors requiring greater additional investments to reach the 2030 PNIEC policy targets, €99 and €38 billion respectively. The impact of these investments on the economy has been estimated by The European House - Ambrosetti[11] to have further positive effects on GDP with a direct, indirect and induced benefits totalling **€424 billion**. It is important to consider that, in light of the recent more ambitious targets suggested by the European Commission in the "Fit for 55" package, Italy will be revising its national targets upward and consequently also its estimates regarding the need for investment in the short to medium (2030) and long term (2050).

57. In this scenario, The Next Generation EU represents an unprecedented investment opportunity for recovery and energy transition. Italy will receive the **largest share (21%) of subsidies among EU Member States.** The Italian Italian Recovery and Resilience Plan (PNRR) amounts to a total of **€235.12** billion, with **30%** of the resources earmarked for the "Green Revolution" mission, which is the energy transition pillar of the plan. If we consider also other investment measures within the PNRR having an impact on the energy transition, Italy will allocate **€87 billion** to this topic, an amount that is almost as much as France, Spain and Germany together.

[10] Italian Ministry of Economic Development (MiSE), 2020.

[11] Source: "European Governance of the Energy Transition", The European House – Ambrosetti and Enel Foundation, 2021.

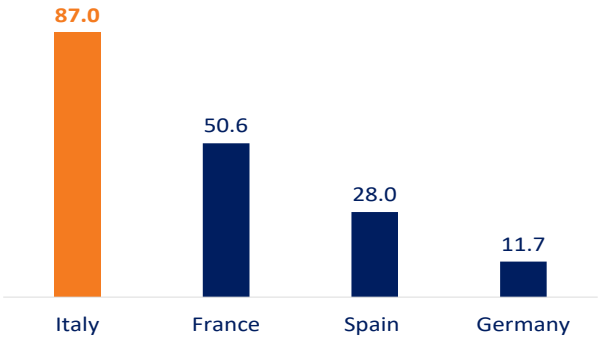

Figure 13. *Funds allocated to green transition in the National Plans of Italy, France, Spain and Germany, (billion Euros), 2021. (Source: The European House – Ambrosetti elaboration on individual national plans, 2022).*

Circular Economy

58. Looking at the **Circular Economy** pillar, Italy ranks among the best countries in Europe, with about **519,000 employees** in the sectors of repair, reuse and recycling (1.71% of total employment). The country has the highest economic value generated per unit of material consumption: every kg of resource consumed generates €3.3 of GDP, against a European average of €1.98. This demonstrates the attention of the Italian production fabric towards efficiency and the implementation of sustainable production systems. In fact, the circular material utilization rate is 19.3% (in 2019), clearly higher than the European average (11.9%), although there is still ample room for improvement, especially when compared to some best practices, like the Netherlands (28.5%) and Belgium (24%).[12]

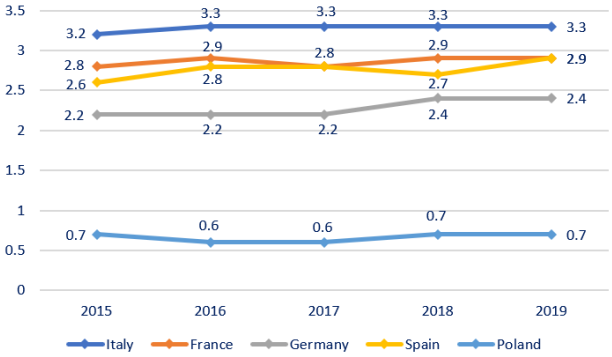

Figure 14. *Resource productivity in the top five European countries, 2015-2019 (€/kg) (Source: Eurostat)*

Healthy and Productive Oceans

59. Italy is aware of the risk the seas are under. The country possesses one of Europe's greatest riches in terms of marine biodiversity with a flora that has more than 2,800 species and a fauna that exceeds 9,300 species. However, Italy's seas are put at high risk by several factors such as pollution, global warming, overexploitation of the seas, unsustainable fishing practices, increasing water acidity, and invasion by alien aquatic species. To address these risks, Italy has undertaken a series of measures such as the **"Salvamare" law**, which will allow fishermen to bring back ashore waste accidentally recovered from the sea and provides for an awareness-raising plan in schools and among citizens. Also important are the ban from 2021 on the sale of many single-use plastic products such as cups, straws and plates, and the target of **30% of protected areas in the sea by 2030.**

Sustainable urban Development

60. One of the main issues in urban development is of course waste management. In Italy, municipal waste fell from 30 million tons in 2020 to 29.5 million tons in 2020, a 1.5% drop from the prior year. From 154 million tons to 158 million tons, special trash rose by more than three percent. Nearly 120 million tons of waste were recycled, or **65%** of the total; while only 14 million tons of municipal waste were recycled (47%)[13]. If compared to the major European nations, Italy follows Germany (67%) in the recycling of municipal waste and Poland (75%) in the recycling of special waste.

61. Another important step for Italy's future development is to **support and finance sustainable and lasting urban and infrastructural development**. Following the sustainability criteria set by the European Union, a building constructed today pollutes much less, and many are part of an urban redevelopment plan that allows for the recovery of disused and often polluted areas through land reclamation, the use of materials that capture pollution, the planting of trees to reduce the heat island effect, but also allows for the social and cultural redevelopment of degraded urban areas.

62. In this area, the investments envisaged in the RRP are considerable, including Ecobonus and Sismabonus 110%, Transition 4.0, High Speed Railway Lines, Ultra Broadband, Schools Plan, Hospitals Plan and, above all for their geostrategic importance in urban development, the Integrated Urban Plans, Green Ports and Urban Regeneration Projects, which will have significant impacts on Italy's urban and coastal areas.

63. In the infrastructure and construction sector, Italy has considerable knowledge. **Construction** spending will account for about **8.3% of GDP** in 2021 with €148 billion invested (of which €71.5 billion, or roughly 50%, will go toward residential construction). Additionally, the sector directly employs **1.7 million people**, an increase of 7.9% over pre-Covid levels[14].

64. However, the sector is threatened by the lack of skilled labour (in construction as many as 40% of the profiles required are difficult to find), the declining population living in Italy and the high price of materials, especially after the supply crisis following the COVID-19 and the rising price of raw materials due to the war in Ukraine.[15]

Innovative Agriculture

65. With regard the pillar on innovative agriculture, the Italian **agri-food chain** is a strategic asset for the competitiveness of the country, confirming itself as a dynamic and resilient sector even following the pandemic crisis of the last two years. In 2020, it reached a turnover of **€205 billion**, distributed in €144 billion generated by the Food & Beverage sector and €61 billion by the agricultural one.

[12] Circular Economy Network, 2021.
[13] ISPRA, 2021
[14] Source: ISTAT, 2022
[15] Source: Excelsior, 2021

66. The production of the food supply chain translates into the creation of added value (which represents the direct contribution to the country's GDP), which in 2021 is €65 billion, (of which €35 billion in the agriculture, forestry and fishing sector). With more than 1.1 million farms, the agricultural sector in Italy employs **925,400 people** and generates exports worth **€7.8 billion**. Moreover, Italy ranks 4th in Europe for agricultural area dedicated to organic farming with a 16% share.

67. Furthermore, in the last two years in Italy the market for **agriculture 4.0** has exploded, rising from €540 million in turnover in the first half of 2020 to €1.3 billion by the end of the year, reaching **€1.6 billion in 2021** (+23%). The area cultivated with agriculture 4.0 tools by farms reached 6% of the total in 2021, double the previous year's figure. 60% of Italian farmers use at least one agriculture 4.0 solution (+4% over 2020), and more than four out of ten use at least two, particularly management software and machine monitoring and control systems.

68. In this context, the **Common Agricultural Policy (CAP)** and the Recovery and Resilience Plan (RRP) are positioned to support and highlight the country's efforts towards the transition to a sustainable, state-of-the-art agriculture. Some significant investments in the agricultural sector are made in the RRP, such as the €5.27 billion allocated to the Circular Economy and Sustainable Agriculture Component, of which €2.8 billion is devoted to the Measure aimed at developing a sustainable agri-food supply chain, improving its environmental performance, sustainability, and economic competitiveness, with the goal of improving the competitiveness of farms and their environmental performance, strengthening the sector's logistical infrastructure, reducing greenhouse gas emissions and supporting the spread of precision agriculture and the modernization of machinery, also with a view to digitizing the sector.

69. A more contemporary farm will be possible with the help of novel methods for material production, processing, and distribution thanks to the €500 million allocated for innovation and mechanization in the agricultural and food sectors. With less pesticide use, less harmful methods, digitalization, and new technologies for processing, storing, and packaging Made in Italy products, the investment aims to transform Italian agriculture into an Agriculture 4.0.

Tools for economic cooperation between Italy and ASEAN countries in Energy transition and circular economy.

70. In the light of what has been said so far, the Italian economic and social fabric has characteristics and strengths that match well with the needs and opportunities that are present in the ASEAN countries. It is therefore important to strengthen the partnerships between the countries, which can be achieved in different ways. Starting with the conclusion of **Free Trade Agreements** between Europe and ASEAN, which is a very delicate and difficult issue to implement. In recent years, Asean has signed multiple trade agreements with other countries, however the one with the EU has proven to be very complicated, which is why the EU has preferred to sign agreements with individual states, such as those with Singapore (2019) and Vietnam (2020), negotiations with Indonesia, Malaysia, Thailand and the Philippines are still ongoing. However, it is crucial to succeed in finding a common agreement involving all states and Italy could play a facilitating role in these negotiations.

71. Another option could be the development of **Public Private Partnerships** between ASEAN governments and Italian companies, their duration and average economic size would in fact make investments in the region much more attractive, especially as regards the creation of green infrastructure, given the risks and the considerable investments required in this sector. This would allow ASEAN countries to have access to the managerial, commercial and innovation skills of Italian companies, activating a virtuous circle in terms of growth of the know-how present in the region.

72. Also important is the creation of collaborations between **universities and research centres** in Italy and ASEAN countries to carry out projects for the development of innovations, technologies and processes that can stimulate the transition towards a green and circular economy. Italy has shown a growing openness towards students from foreign countries, reaching **5.6%** of foreign students enrolled in universities in the 2020/2021 school year. Agreements for scientific and cultural cooperation between Italy and ASEAN members already exist, but more might be done. The promotion of student, academic, and qualified staff exchange programs between Italy and ASEAN nations should continue.

73. In addition, partnerships between Italian and local enterprises could be promoted for **know-how and good practices' sharing** in green and circular transition fields and ASEAN Countries' private sector development. As said before Italy has an amazing know-how in the renewable energy sector that could represent a perfect match for ASEAN countries need and objectives in terms of sustainable energy.

74. This collaboration would be facilitated by the similar business structure of the two countries, characterised by the presence of many highly **specialised SMEs and large national companies with a strong international presence**. These companies, which in Italy have strong relationships with universities, research centres and financial institutions, could foster increased productivity and innovation within Southeast Asian companies and favour the creation of local extended value chains especially in R&D-intensive sectors.