TECH FOR GOOD INSTITUTE

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What Impact Means to Digital Economy Companies in Southeast Asia

A Review of Stakeholders, Issues of Focus and Disclosures of Digital Economy Companies across SEA-6

Research Partner

NUS National University of Singapore | Centre for Governance and Sustainability
NUS Business School

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About This Study

Digitalisation has and will continue to drive Southeast Asia's post-pandemic recovery and economic transformation. At the same time, the pace of this transformation has prompted close examination of the kind of growth that would best serve society and generations to come. As creators, distributors and users of digital technology, Digital Economy Companies (DECs) play an influential role to advance this agenda for Southeast Asia.

This study aims to understand how DECs in the six largest markets in Southeast Asia – Indonesia, Malaysia, Philippines, Singapore, Thailand and Vietnam – currently frame their impact beyond delivering economic growth. Relying on publicly available information of 439 digital economy companies, this study identified the stakeholders and issues on which DECs chose to focus in 2022. This study also assesses how DECs publicly communicated and reported their non-financial performance. Data was collected with online media monitoring software Meltwater, on the basis of over 50 keywords related to key social, environmental and governance issues associated with the digital economy, as defined by the Global Reporting Initiative.

By understanding the way DECs currently think about their impact, this report seeks to serve as a catalyst for conversations and recommendations on how stakeholders in the digital ecosystem may align their interests for inclusive, equitable and sustainable growth across the region.

Acknowledgements

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About the Partners

Tech for Good Institute

The Tech for Good Institute (TFGI) is a non-profit organisation on a mission to leverage the promise of technology and the digital economy for inclusive, equitable and sustainable growth in Southeast Asia.

With a population twice the size of the U.S. and strong demographics, Southeast Asia's digital economy is evolving rapidly. Technology has and will continue to have a tremendous impact in aiding the region's development. We are optimistic about technology's potential to advance growth, within cultural, social, political and economic contexts that will shape the trajectory of innovation.

TFGI serves as a platform for research, conversations and collaborations focused on Southeast Asia while maintaining global connections. Our work focuses on topics at the intersection of technology, society, and the economy, and is intrinsically linked to the development in Southeast Asia. Through research, effective outreach and evidence-based recommendations, we seek to understand and inform policy with rigour, balance and perspective.

TFGI was founded by Grab with the goal of promoting a thriving and innovative Southeast Asia for all. We welcome opportunities for partnership and support, both financial or in-kind, from organisations and individuals committed to fostering responsible innovation and digital progress for sustainable growth in the region.

The Institute is also grateful for the contributions of Ethan Ng, Mellyana Frederika, Melissa Tan, Matin Mohdari, Seah Hui San, Regina Ng, Keith Detros and Ming Tan in this report.

For more information about the Institute, please visit www.techforgoodinstitute.org

About the NUS Centre for Governance and Sustainability

The Centre for Governance and Sustainability (CGS) was established by the National University of Singapore (NUS) Business School in 2010.

Its primary objective is to spearhead relevant and high-impact research on corporate governance and corporate sustainability issues that are pertinent to institutions, government bodies and businesses in Singapore and the Asia-Pacific. As a pioneer of thought leadership, CGS conducts public lectures, industry roundtables and academic conferences on topics related to governance and sustainability. CGS is the national assessor of corporate sustainability and corporate governance performance of listed companies in Singapore. In tandem with growing demands from consumers and investors for financial returns achieved with integrity, coupled with environmental and social considerations, CGS has a slew of research focusing on sustainability reporting in Asia Pacific, sustainable banking, nature reporting and climate reporting in ASEAN.

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Executive Summary

The digital economy is reshaping Southeast Asia, transforming lives and driving the region's development. Beyond catalysing economic growth, digitalisation can advance Southeast Asia for inclusive, equitable, climate-resilient and sustainable growth. Digital economy companies (DECs) play a vital role in realising this potential.

DECs in Southeast Asia are catalysts to realise sustainable growth and development through digital transformation.

Digital technologies are general purpose technologies. Digitalisation will be a horizontal enabler across all industries. As demonstrated during the pandemic, digital technologies have the potential to sustain, improve or transform society and the economy. By identifying and solving problems and gaps in the market, DECs have an important role in shaping the trajectory of digital transformation of Southeast Asia.

The stakeholder landscape for DECs is evolving rapidly.

Investors, customers and other businesses are currently prioritised as stakeholders by DECs. This is unsurprising, given that a majority of the companies are young and focused on scaling their businesses, However, as the digital economy matures, other stakeholder groups can be expected to gain importance for DECs.

Governments are currently not among the top stakeholders identified by DECs, but this is expected to change. The rapid growth of the digital economy, uncertainties around the impact of emerging technologies and social concerns over new business models are prompting greater scrutiny by the public and civil sectors. As governments respond, DECs will need to invest in engaging with regulators and policymakers.

In the meantime, investors, employees and business partners have a crucial role to shape the trajectory of DECs to achieve financial return as well as positive impact for the region.

Expectations for DECs to operate responsibly are growing.

DECs will need to shift from addressing immediate "licence to operate" issues to demonstrating responsible products, services and operations as demand for transparency and accountability gains momentum.

Currently, DECs are most likely to focus on cybersecurity and data protection, diversity, equity and inclusion, and local community issues. Looking ahead, DECs will be held accountable, not just from commercial and service delivery perspectives, but also from social, environmental and governance perspectives.

DECs have clear intentions for Tech for Good.

However, this simple phrase encompasses a landscape of different expectations, from risk mitigation, to operational philosophies, to strategic choices. The "Say-Do-Act" gap exists, but the opportunity for DECs to make a positive non-financial impact is clear.

DECs in SEA-6 are uniquely placed to deliver fit-for-purpose solutions to meet the needs of young, ambitious and mobile-native populations. Technology may enable and scale solutions, but innovation begins with identifying the right problems to solve and then driving adoption of solutions. DECs embedded within the markets they serve are well-suited to achieve all of the above.

For DECs to fulfil their potential in accomplishing Tech for Good, they must adapt with the changing regulatory, risk and market environment.

Increasingly, DECs are under pressure to demonstrate profitability while mitigating risk and demonstrating benefit to people and the planet. As digital technologies evolve rapidly, operating responsibly is a moving goalpost. At a minimum, DECs should consider measuring and communicating performance on:

- **Environment:** Scope 1, 2, 3 GHG emissions, Climate-related targets
- **Social:** Cybersecurity, Data protection, Product or service safety, Employee upskilling or reskilling, Employee wellbeing
- **Governance:** Anti-corruption, Compliance and Competitive behaviour

Southeast Asia presents significant opportunities for DECs to pursue areas that advance sustainable growth.

DECs can contribute to addressing complex issues, such as climate resilience and inclusive growth. By supporting Southeast Asia's developmental priorities, DECs can find a ready market for fit-for-purpose products and services that meet the needs of the region. By aligning with national priorities, DECs can demonstrate their capability to generate sustainable value to society, which in turn opens up opportunities for them to scale and grow.

1. The Potential of Digital Transformation

Digitalisation is reshaping Southeast Asia, transforming lives and driving the region's development. Platform-enabled activities, for example, are catalysing growth across Southeast Asia for digital and non-digitally native businesses alike.[1] Superapps alone saw some US$50bn worth of investments from 2016 to 2020, and are expected to offer a US$23bn revenue opportunity by 2025.[2] Furthermore, digital transformation has often been hailed as an important enabler of sustainable development in a post-pandemic world.[3] For example, the International Telecommunications Union has compiled over 200 case studies on how artificial intelligence (AI) alone may positively impact the implementation of the United Nations Sustainable Development Goals (SDGs) across environmental, social and economic targets.[4] Recognising the potential of technology to be a development driver, governments have invested in digitalisation, digital connectivity and digital financing for their post-pandemic recoveries.

Southeast Asia is no exception. The six countries covered in this study (Indonesia, Malaysia, Philippines, Singapore, Thailand and Vietnam – collectively known as "SEA-6") have developed digital transformation roadmaps and digital economy plans to sustain the digital momentum prompted by the pandemic. For example, Indonesia's National Medium-Term Development Plan for 2020–2024 explicitly identifies digitisation, automation and AI not just for increasing productivity, but also for development in areas ranging from education, governance, financial inclusion and small business development.[5]

Box 1. What is a Digital Economy Company (DEC)?

Adopting the Organisation for Economic Cooperation and Development's (OECD) definition of the digital economy, this study defines DECs as "companies either involved in economic activity as producers of digital content, goods and services,[6] or reliant on digitalisation to provide consumers with goods and services". DECs are firms and businesses whose economic activities significantly rely on digital input, such as technologies, services and data. DECs may be categorised as being involved in three tiers of economic activity:

- **Core:** Economic activity from producers of digital content, and ICT goods and services. These DECs focus on information and communications technology, or online-only digital platforms. For example, telecommunications companies, Google, Facebook and LinkedIn.
- **Narrow:** Economic activity from companies that are reliant on digital input. These DECs develop uses for technology relevant to their contexts and market segments. For example, Grab uses data and technology to facilitate transactions between producers and consumers, bringing small businesses and consumers into the digital economy.
- **Broad:** Economic activity from companies significantly enhanced by digital input. These DECs use digital input to improve rather than enable production. For example, many e-retailers exclusively market and sell their products online rather than investing in offline marketing and brick-and-mortar stores.

1.1. Beyond Tech for Growth

DECs play an influential role in shaping the digitalisation trajectory of the markets they serve. As creators, distributors and users of digital technology, they attract foreign and local investment, create job opportunities and facilitate adoption of digital products and services. However, it is important to understand the social and environmental costs associated with this growth.

The pandemic presented many opportunities for DECs to work with governments to support public services and citizens through innovative digital solutions. For example, the Department of Social Welfare and Development in the Philippines partnered with GCash, a mobile wallet service, to implement the Social Amelioration Programme and disburse cash assistance to drivers who were affected by COVID-19.[7] In Indonesia, the government partnered with Grab and Gojek to distribute COVID-19 loan aid to micro, small and medium-sized enterprises (MSMEs). These companies helped pre-screen loan applications using their own data before referring MSMEs to banks for a final screening. This expedited the distribution of aid and widened the reach of the programme. In addition, digital health platforms such as Halodoc[8], Doctor Anywhere[9] and DoctorOnCall[10] partnered quickly with the health authorities to provide accurate health information and fulfil the increased demand for healthcare services.[11]

Beyond pandemic responses, DECs and their investors have identified business opportunities within local development needs for mutually beneficial outcomes. Digital solutions, for example, have been employed to resolve urbanisation challenges, such as traffic congestion, water and air quality, energy demand, and the health and wellbeing of the community.[12] Companies like Grab and Gojek are transforming the region's transportation landscape by facilitating safe and efficient ride-hailing services.

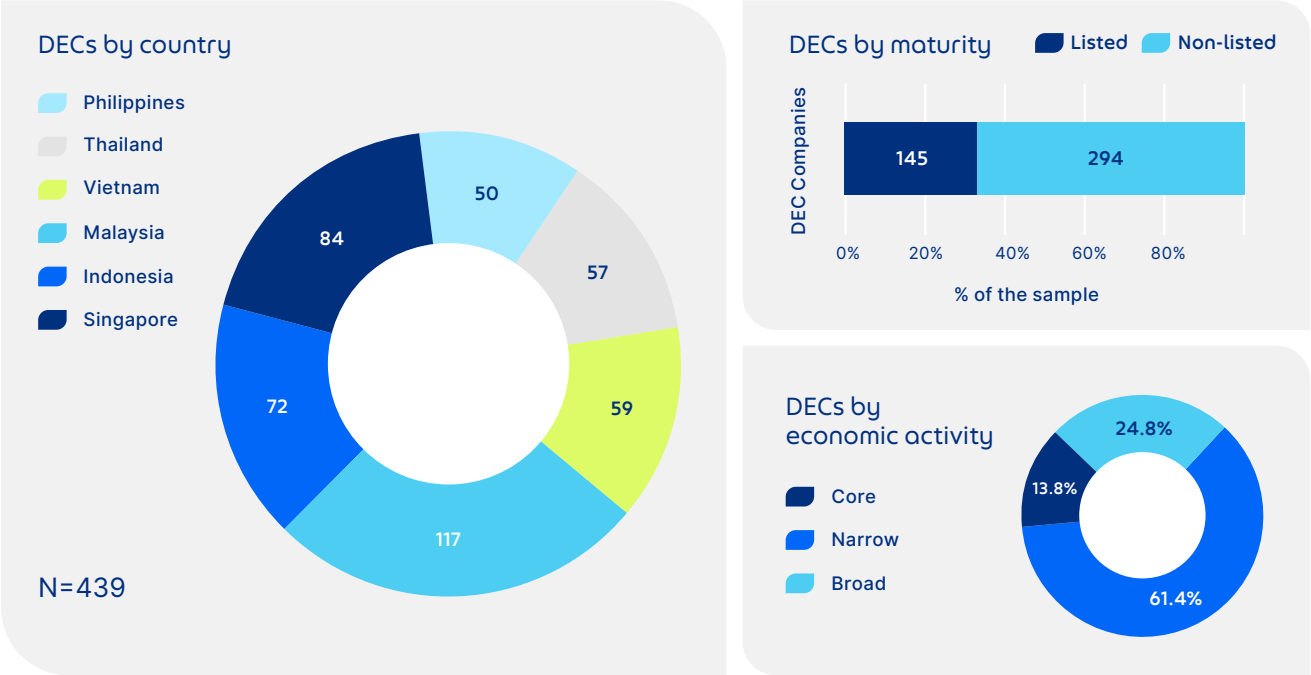
Thus, DECs have the potential not only to drive economic growth in the region, but to meet the needs of citizens.

1.2. Scope of this Project

This study assesses the extent to which companies at the vanguard of the digital economy are currently identifying, communicating and acting upon their potential to deliver positive impact beyond financial growth.

This study used the OECD definition of DECs (Box 1) to identify 439 DECs, with at least 50 businesses operating in each SEA-6 country. The sample ranged from startups to more mature and publicly-listed companies, and spanned the core, narrow and broad definitions of key digital economic activity (Figure 1).

Figure 1. Scope of this Study



Source: Tech for Good Institute & NUS Centre for Governance and Sustainability, 2023

The data was analysed along three key lines of inquiry:

- Who are the priority stakeholders of DECs?
- What are the issues of focus for DECs?
- How are DECs communicating and reporting on their efforts?

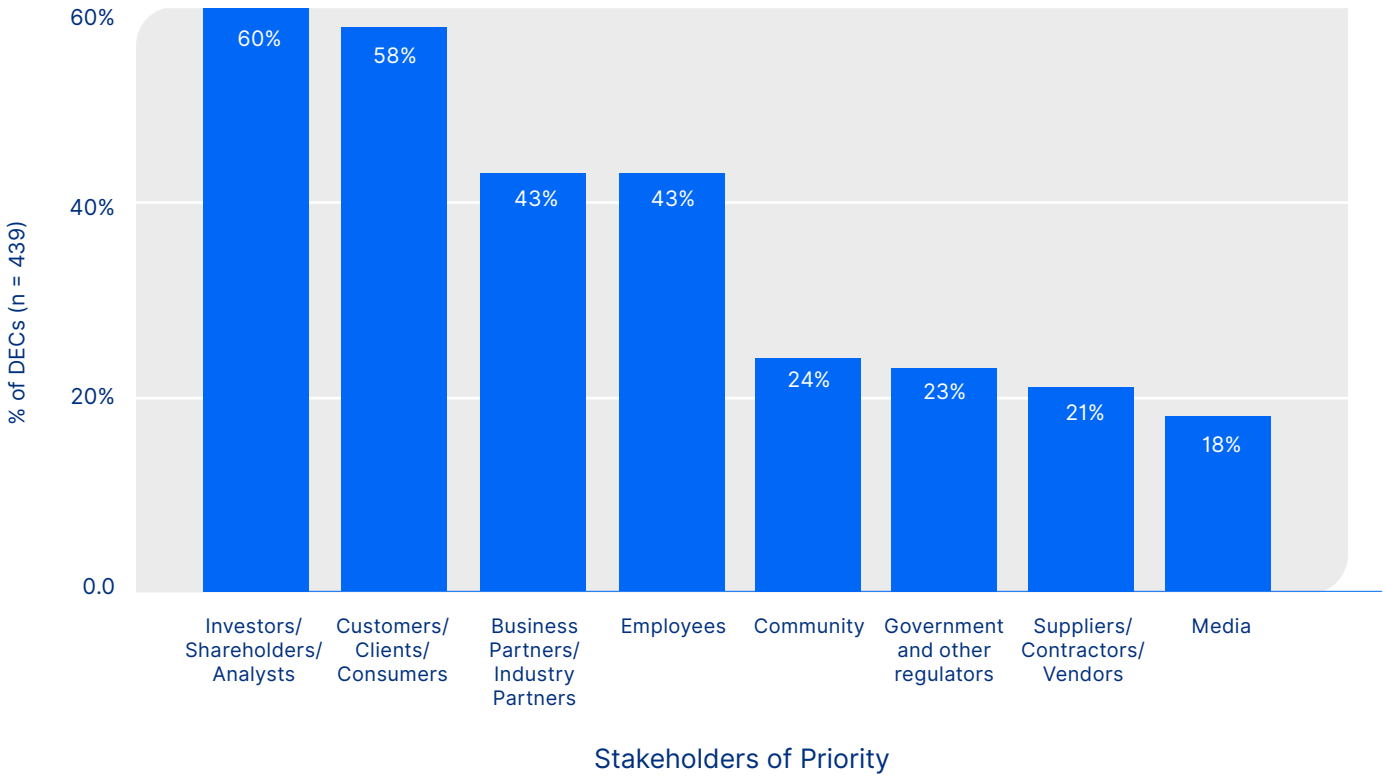
2.
Tech for Good, for whom?

Stakeholders shape motivations and priorities. To understand **how** DECs frame their impact, we first identified **who** DECs focused on when communicating strategy and progress.

2.1. Current key stakeholders

Unsurprisingly, investors and customers were the top-cited stakeholders for DECs (Figure 2). This finding is to be expected, as current and prospective investors are needed to ensure business viability, while building a consumer base is essential for scale and growth. In addition, DECs focused on business partners and employees as top priority stakeholders. Understandably, building a reliable supply chain and talent pool is crucial for surviving in a fast-paced and competitive space.

Figure 2: DEC Stakeholders of Priority in SEA-6



Source: Tech for Good Institute & NUS Centre for Governance and Sustainability, 2023

Each SEA-6 country largely mirrors the regional trend. In a departure from this trend, Singapore DECs identify employees on top of their list, rather than investors and customers, likely due to a talent crunch. The 2022 Global Tech Trends survey found that 87% of Singapore businesses were reskilling their IT workers to address digital talent gaps.[13] Meanwhile, the government and regulators are ranked higher in Malaysia, Indonesia and Vietnam.

Figure 3: DEC Stakeholders of Priority in SEA-6, by country

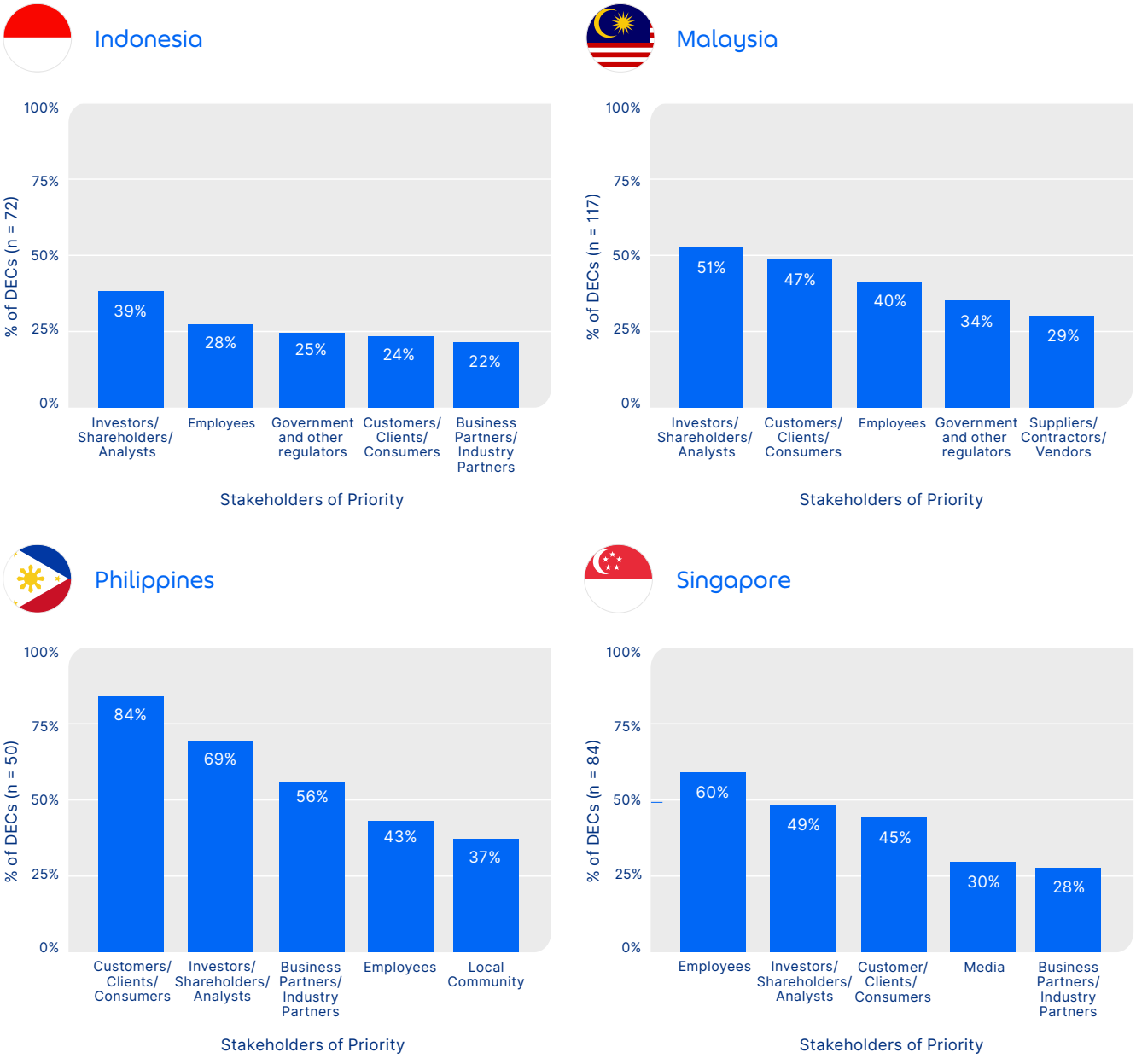
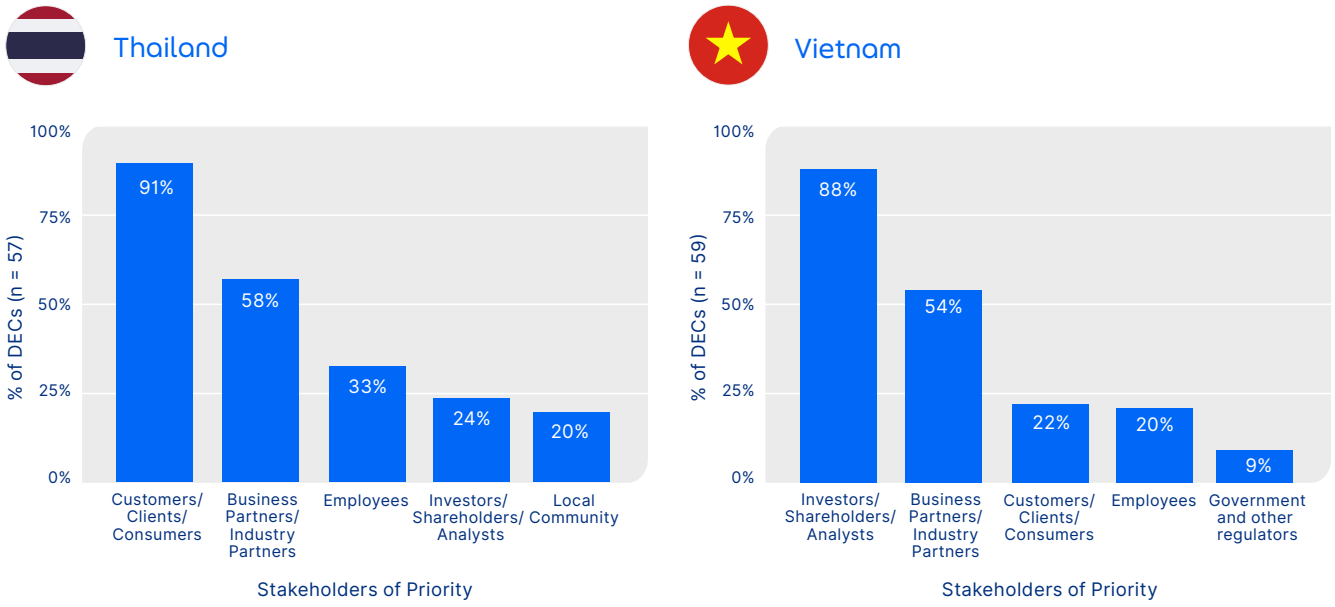


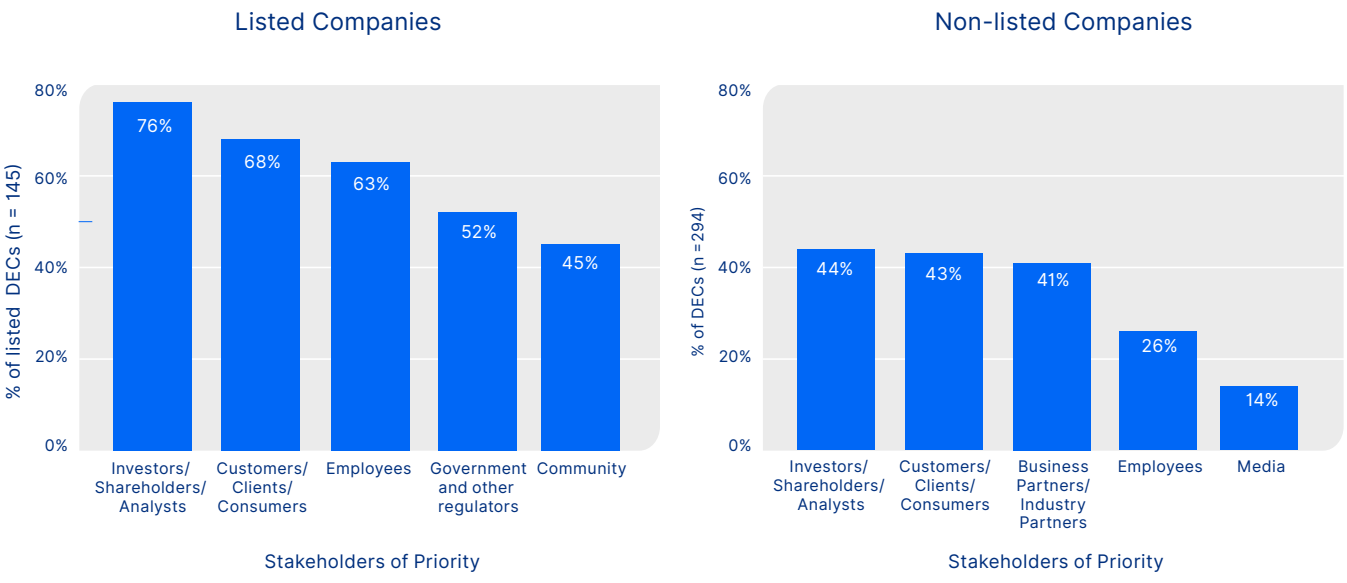
Figure 3: DEC Stakeholders of Priority in SEA-6, by country (continued)



Source: Tech for Good Institute & NUS Centre for Governance and Sustainability, 2023

Both listed and non-listed DECs identified investors, consumers, business partners and employees as key stakeholders essential for the improvement and expansion of the company. Listed companies placed more emphasis on the government and regulators as stakeholders. Close collaboration with governments and regulators allows listed DECs to ensure compliance, maintaining transparency to their shareholders and earning investor confidence.

Figure 4. DECs Stakeholders of priority, by maturity



Source: Tech for Good Institute & NUS Centre for Governance and Sustainability, 2023

On the other hand, non-listed companies count the media as one of their top stakeholders. Young companies, including startups, leverage media engagement to boost visibility, grow their brand and attract potential investors. The media also plays a vital role in shaping public opinion. Coverage of startups, especially from reputable media sources, helps consumers to gain more awareness of digital products and services, which in turn help young startups to expand their consumer base.

2.2. Evolving stakeholder landscape

While the focus on primary stakeholders such as investors and consumers will remain, we anticipate increasing attention on secondary stakeholders, such as the government and regulators. Just as listed DECs have recognised the importance of engaging policymakers and regulators, non-listed DECs are likely to encounter regulatory hurdles as they grow. This trend is evident in mature tech ecosystems. In Australia, for example, there is "strong support for the establishment of non-adversarial fora to facilitate ongoing, non-transactional exchanges to build and mature knowledge sharing among government and industry." Of course, the context and incentives for engagement must respect the norms of each country.[15]

As investors seek sustainable returns, consumers are demanding transparency and accountability in business practices. Companies increasingly need to demonstrate integrity across strategies, systems and services to build trust.[16] Research by the Tech for Good Institute shows that the perception of the service provider's integrity outweighs the propensity to trust technology across SEA-6.[17]

As DECs mature and look beyond immediate survival to long-term value creation, communicating non-financial impact in a manner that is globally consistent, comparable and credible will help engage in an ever-evolving stakeholder landscape.

3.
Priorities and Progress

To identify the relevant and top of mind issues for DECs, researchers compiled the material topics identified by DECs in their sustainability reports, together with issues singled out by the companies through public and investor relations communications. In this report, these will be collectively referred to as 'issues of focus.'

3.1. Anticipated material issues for Digital Economy Companies

While the digital economy may be regarded as a specific vertical of the overall economy, the range of digital economic activity undertaken by DECs stem from the nature of digital technologies as general purpose technologies.

Therefore, DECs span many industries undertaking core, narrow and broad digital economic activity. This diversity poses a challenge when identifying material issues for the digital economy. The material issues faced by DECs stem from their operations, as well as innovative approach to product and service delivery. The Sustainability Accounting Standards Board (SASB), for example, identifies six sub-industries within the Technology and Communications sector alone, while e-commerce is classified under the Consumer Goods sector.[18] Disruptive business models such as telehealth, ride-hailing and fintech straddle sector-specific analysis in comparison to incumbent players.

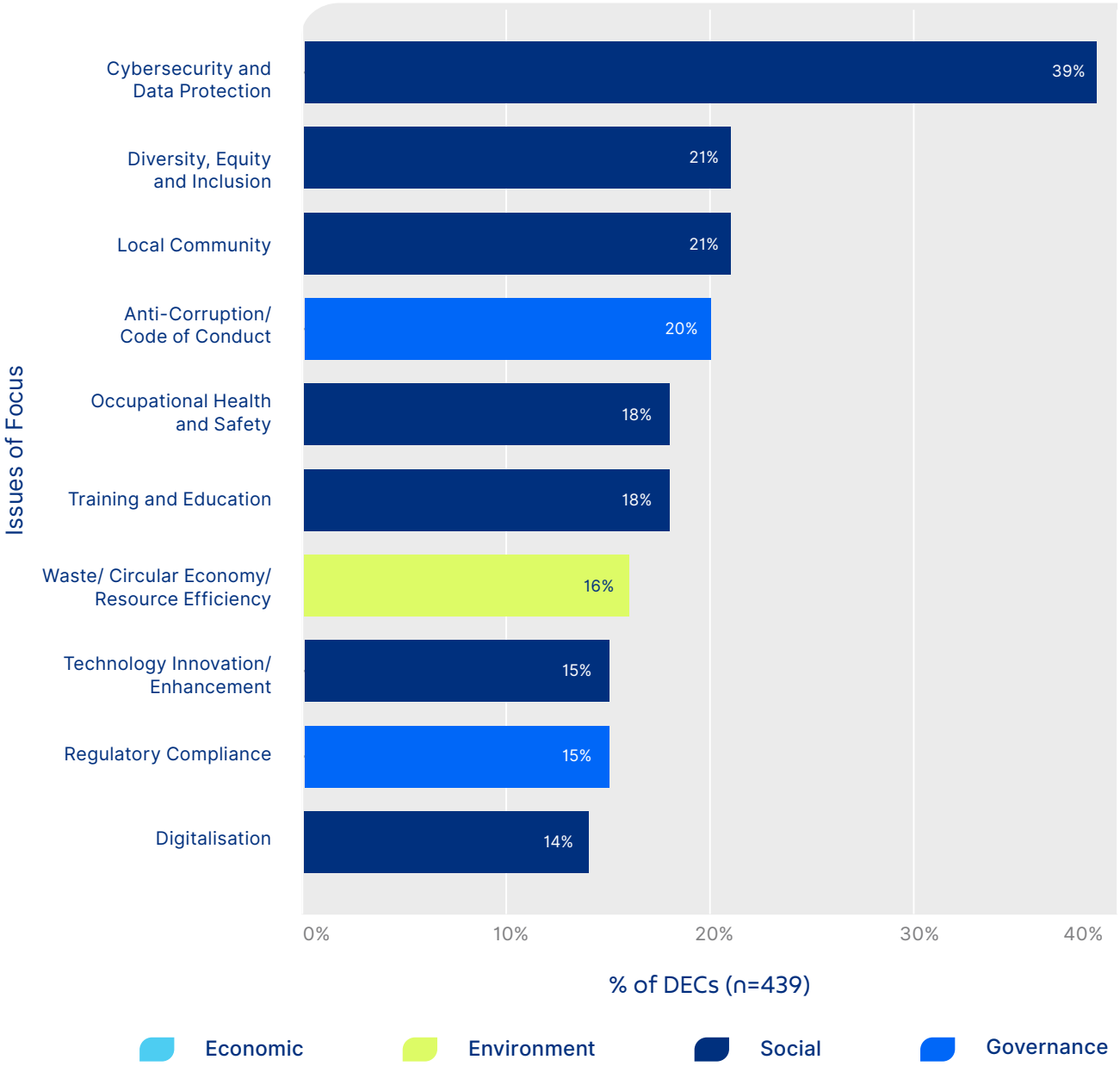
SASB provides an indication of key material issues for the more mature industries, namely Electronic Manufacturing Services and Original Design Manufacturing, Hardware, Semiconductors, Internet Media and Services, Software and Information Technology Services, Telecommunication Services and e-commerce. With the exception of e-commerce, most of these lie within the core and narrow definitions of digital economic activity.

The material issues most commonly cited in these industries within a mature market like the United States are primarily related to environmental conditions, such as Product Lifecycle Management, Supply Chain Management, Material Sourcing, Waste, Greenhouse Gas Emissions, Energy and Water. Supply Chain Management and Material Sourcing also encompass labour concerns, while Recruiting and Managing a Global and Skilled Workforce, including employee inclusion, diversity and performance, follow in materiality of these high-growth global companies. Governance issues such as Competitive Behaviour and Data Privacy round out the most common issues.

3.2. Issues of Focus among DECs in SEA-6

In contrast, the current top issues for DECs in SEA-6 are not environmental, but are skewed toward social matters. Governance and economic issues remain secondary, with environmental issues still emerging. (Figure 5).

Figure 5: Top 10 Issues of Focus among all assessed DECs



Source: Tech for Good Institute & NUS Centre for Governance and Sustainability, 2023

Cybersecurity and Data Protection is the most common issue of focus in the region. Almost 4 in 10 (173 companies, or 39%) of the assessed DECs identified protecting critical networks and safeguarding valuable data as key to their business. DECs in all countries ranked it as the top issue of focus, except Malaysia. While Cybersecurity and Data Protection ranks sixth in Malaysia, almost half of the DECs noted that it is a critical issue for their operations (Figure 6).

In recent years, governments in Southeast Asia have made significant progress in protecting the personal data of its citizens. All countries in SEA-6 have comprehensive data protection laws to safeguard citizens' personal information.[19] As DECs tend to collect and process large quantities of customer data, compliance to these policies are essential to maintaining regulatory license to operate, investor confidence and customer trust.

Cybersecurity is likewise increasingly important for business operations. At the onset of the pandemic in 2021, it is estimated that there was a 600% increase in cyberattacks in Southeast Asia.[20] Cybersecurity concerns have become top leadership issues for 92% of businesses across Singapore, Malaysia, Indonesia, Philippines and Thailand.[21]

Figure 6: Top Issues of Focus, by country

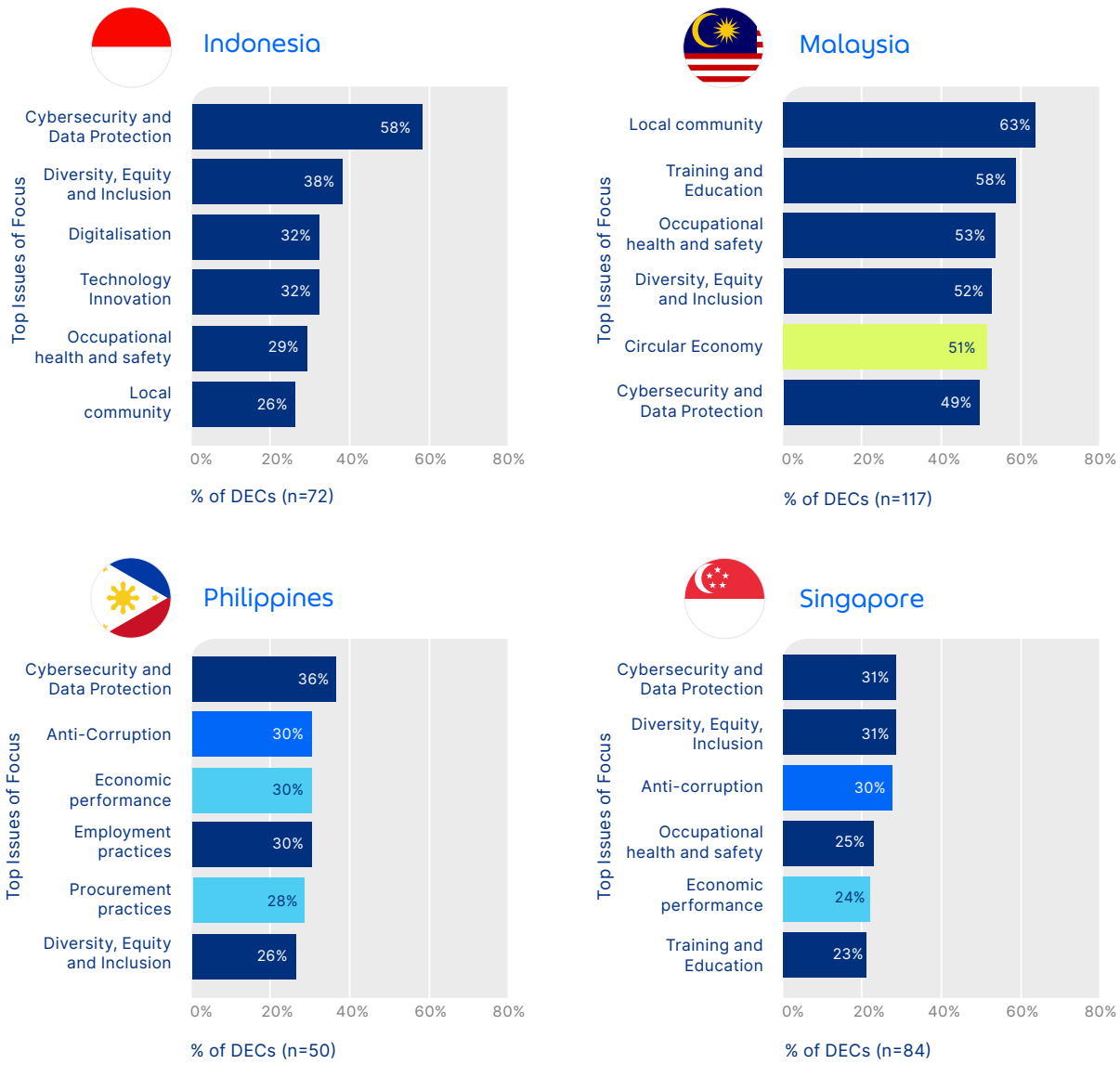
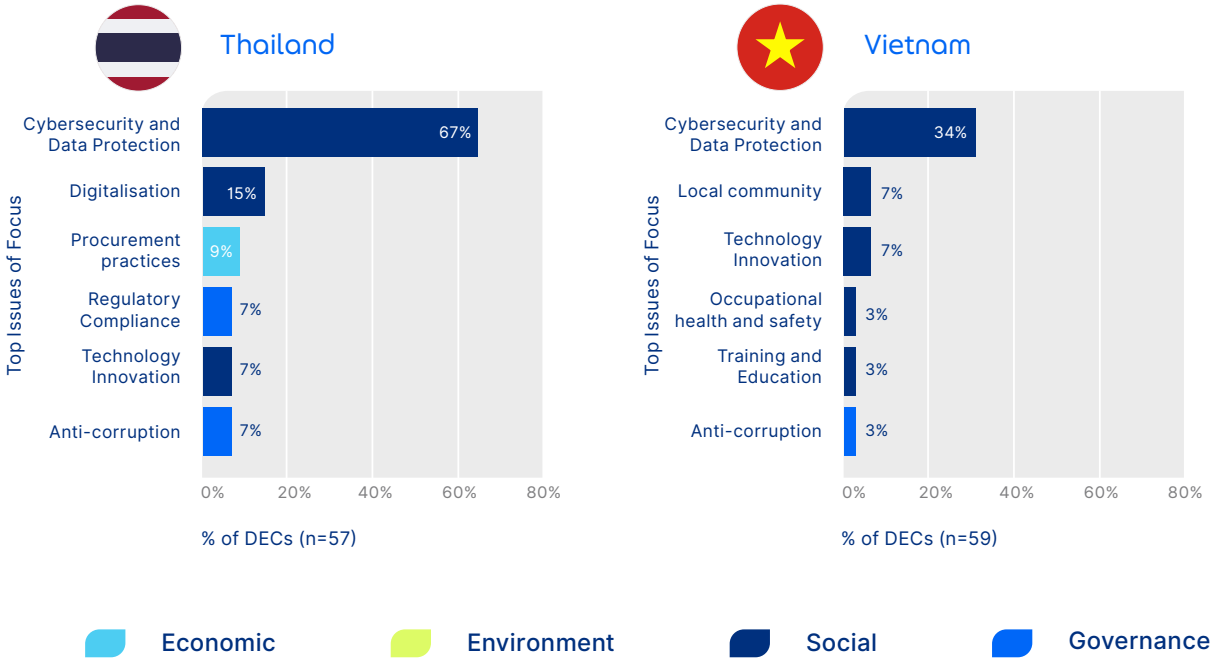


Figure 6: Top Issues of Focus, by country (continued)



Source: Tech for Good Institute & NUS Centre for Governance and Sustainability, 2023

Diversity, Equity, and Inclusion (DEI) is the second most common issue of focus, identified by 21% of companies (93 companies). These companies were largely clustered in Indonesia, Malaysia, Philippines and Singapore. In general, Diversity refers to representation in the workforce, while Equity ensures that all employees are treated fairly, with the same opportunity to grow, contribute and develop. Inclusion encourages full participation, especially in leadership positions and decision-making processes.

Data for this study was collected between April to September 2022, prior to the downsizing of many tech companies. Hiring for digital skills rebounded quickly after the pandemic[21] and 7 in 10 executives indicated a talent crunch for digital and tech talent.

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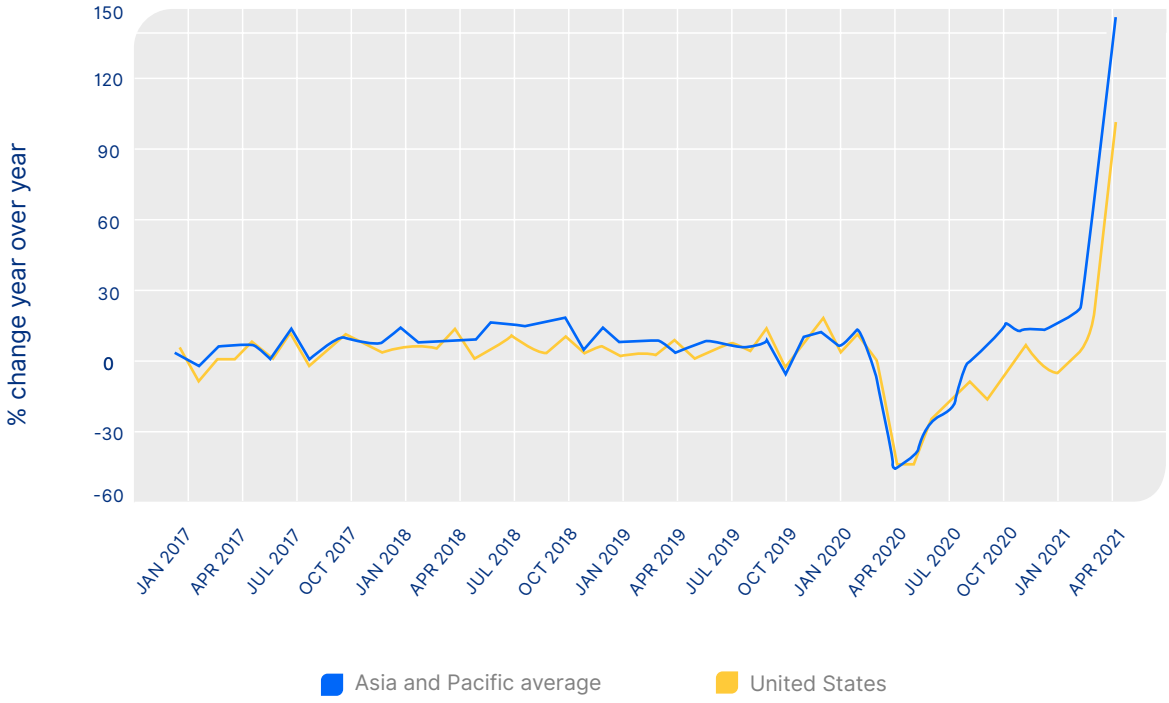
Figure 7. Change in digital hiring rate in Asia and the Pacific vs. the United States



JAN = January, APR = April, JUL = July, OCT = October

Notes:
1 The digital hiring rate is the proportion of LinkedIn members who list digital skills in their profile and indicate a change in employer that month. The change in the rate is measured here year over year.
2 In this figure, the Asia and Pacific average includes Australia, India, Indonesia, Malaysia, the Philippines, and Singapore.
Source: LinkedIn Economic Graph.

On gender equity alone, the region has significant room for improvement. Women make up more than 50% of university graduates but fill fewer than 15% of CEO and board-level positions across all industries. The challenge is particularly acute for the technology industry, where women's participation in school and the workforce is consistently lower. Around 39% of students with technology majors are women, compared with 56% for all other fields of study. In the workforce, women account for 32% of the region's technology sector, compared with 38% of the total workforce.[23] In Singapore, for example, a nationally representative survey found that about half of women in the STEM industry believed that it was harder to get a job and progress in their career due to their gender. Women leaving the STEM career path often cite the lack of inclusive workplaces and mention that they did not feel a sense of belonging.[24]

Beyond its relevance to the workforce, Diversity and Inclusion is gaining prominence in the tech ecosystem. Digital solutions, particularly AI and machine learning, rely heavily on input data due to its unique nature. To ensure the successful development, deployment and governance of digital solutions, it is crucial to prevent inadvertent bias and consider the region's unique cultural diversity and social norms. The 655 million people who live in Southeast Asia form over 100 ethnic groups and speak more than 1,000 languages and dialects. Available datasets may not represent the marginalised groups, and hence the products and services may not be fit for purpose.[25]

Finally, around 21% (90 companies) of DECs emphasised Local Community as a key issue of focus. These companies were clustered in Indonesia, Malaysia and Vietnam. A focus on local communities may be in the form of engagement and development, or managing actual and potential negative impacts on local communities.[26] With data collection for this study taking place just as the COVID-19 pandemic was easing, the impact of local communities was likely fresh in the minds of most companies, which had undertaken significant local community engagement.

There is ample opportunity for DECs to address local community needs even after the pandemic. In particular, DECs can take an active role in bridging the digital divide, which can exacerbate existing social and economic inequalities. For example, in 2020, Grab and Microsoft worked together to develop digital literacy and skills in society. Microsoft's digital literacy curriculum was disseminated through the Grab driver and delivery partner apps. In Vietnam and Indonesia of the same year, more than 500,000 driver and delivery partners were upskilled.[27]

The top three issues of focus for DECs, namely Cybersecurity and Data Protection, Diversity, Equality, and Inclusion, and Local Community, may also be a reflection of the still young and developing digital economy in SEA-6. Maintaining the "license to operate" and attracting and acquiring digital talent remain top priorities, while DECs also strive to create a positive impact to local communities by addressing social and developmental challenges through their products and services.

3.3. Environmental impact not a high priority

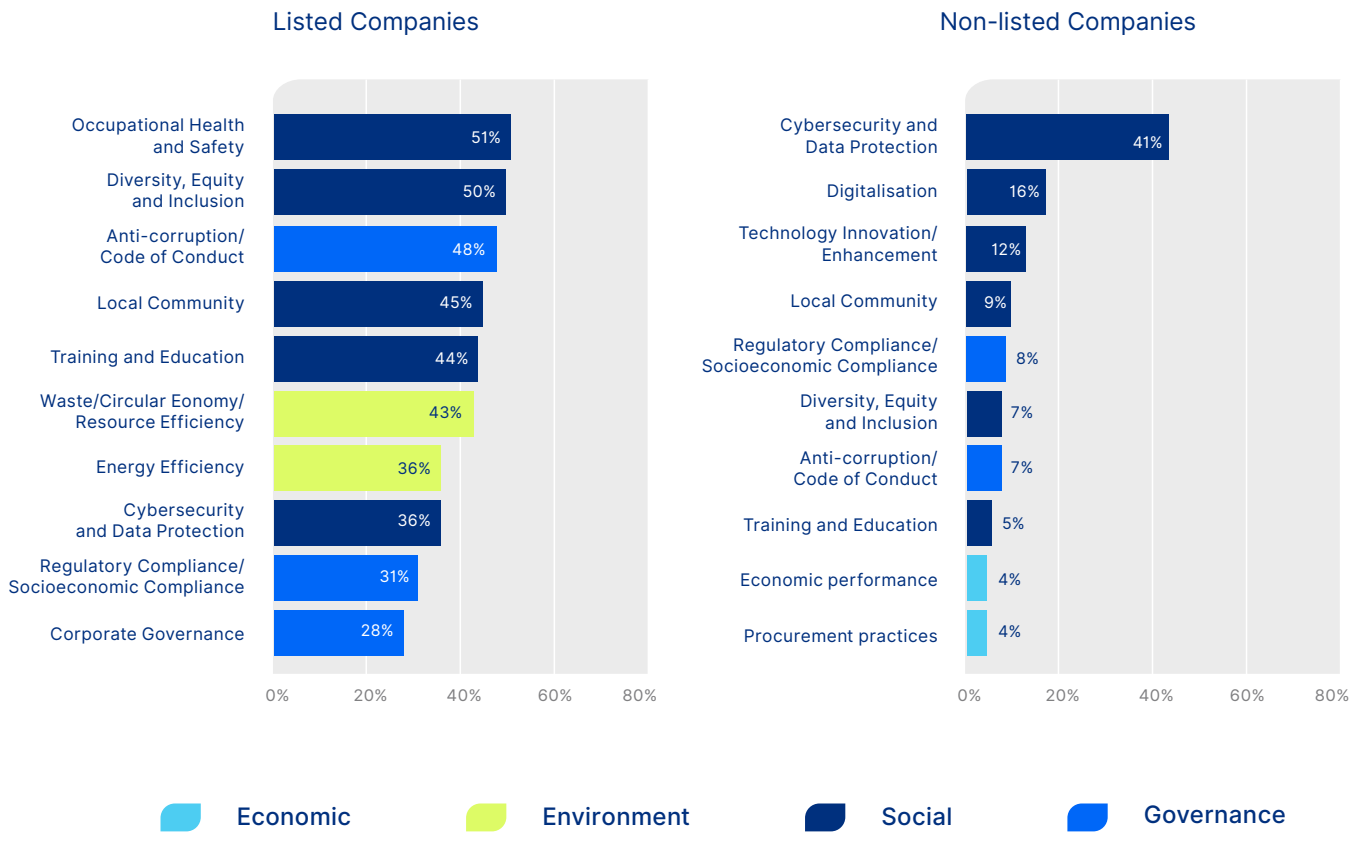
Southeast Asia is susceptible to climate-related disasters, such as rising sea levels, heat waves, floods, droughts, and other unpredictable and intense weather events.[28] Despite the significant economic and social impact of these events, DECs generally did not identify environmental concerns as their main issue of focus.

Across all DECs, only 17% (74 companies) identified any environmental issues as relevant to their company. Issues such as water, climate action, environmental compliance, renewable sources and biodiversity conservation were all among the least-frequently cited topics. This contrasts with the SASB standards, in which Product Lifecycle Management, Supply Chain Management, Materials Sourcing, Waste, Greenhouse Gas (GHG) Emissions, Energy and Water are the most common material issues among key technology and communications industries.

The environmental footprint of DECs is substantial, encompassing energy and water usage from product manufacturing, transport, e-waste disposal and operation of data centres.[29] Overall, the ICT sector is responsible for approximately 3-4% of global GHG emissions. Data centres run on large amounts of electricity, accounting for almost half of the sector's total footprint.[30]

Scope 3 emissions are difficult to measure but important to manage as the digital economy scales across sectors traditionally identified beyond the technology and communications industries. Transport, food delivery and e-commerce alone are projected to reach some 20 metric tonnes of carbon dioxide equivalent by 2030.[31] While the development of the digital economy significantly reduces the carbon emission intensity, it has been found to promote increases in the per capita carbon emissions.[32]

Figure 8. Issues of Focus: Listed vs Non-Listed Companies



Source: Tech for Good Institute & NUS Centre for Governance and Sustainability, 2023

Though DECs in the region have room to grow in terms of focusing on environmental matters, it is important to highlight that listed companies fare better in this regard than non-listed companies (Figure 8). Listed DECs identified waste, circular economy, resource and energy efficiency in their top ten issues of focus. On the other hand, this is not the case for non-listed companies.

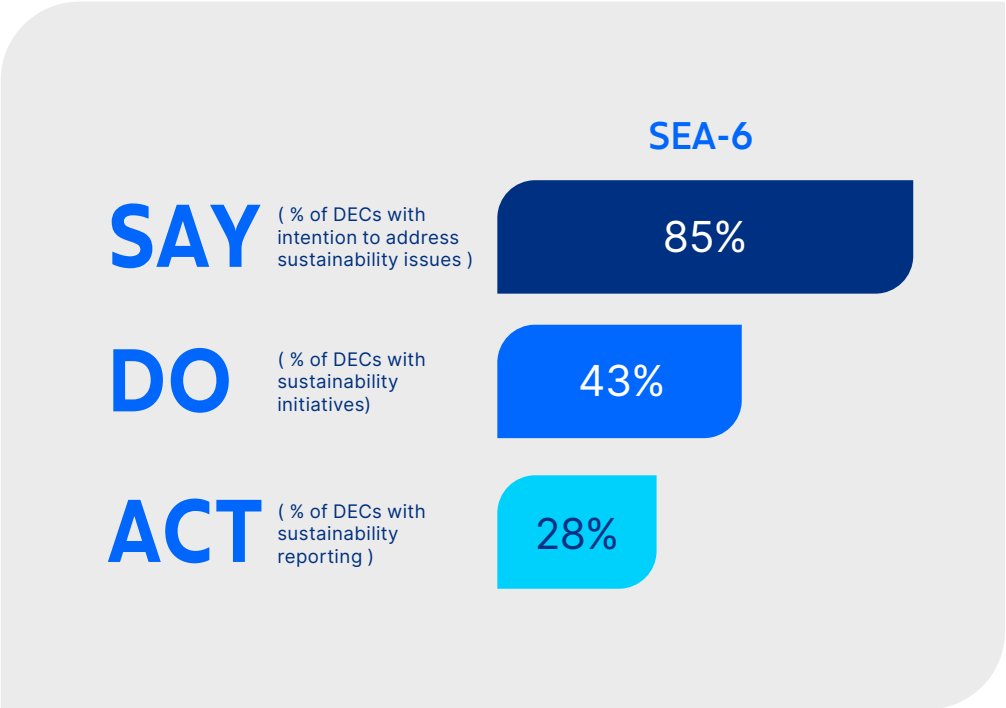
There are several factors that might encourage non-listed companies to start focusing on the environment. Environmentally-aware DECs not only stand to benefit from cost savings, resource efficiencies and meeting compliance requirements, but are also able to build a strong environmental track record and create brand recognition among stakeholders.[33] As reported by E.ON, 65% of consumers prefer purchasing products and services that do not harm the environment while 51% of consumers prefer supporting companies with strong environmental credentials.[34] A focus on environmental issues is not only vital for the climate resilience of the region, but can also be a differentiating factor for DECs to build customer preference and loyalty. Demonstrating impact: Intention, action and reporting

Out of the 439 DECs reviewed in this study, 85% (371 companies) expressed intention towards sustainability and impact, largely through websites or other corporate channels. Fewer than half (189 companies) have implemented initiatives to put these intentions into action. And only a quarter (105 companies) reported on their non-financial impact through annual reports or sustainability reports.

In other words, DECs in SEA-6 are generally framing their approach toward non-financial impact as corporate information rather than as strategic or operational goals against which their performance should be assessed.

This “Say-Do-Act” funnel suggests that DECs are aware of the need to mitigate negative impact or demonstrate positive impact. However, most have yet to integrate environmental, social or governance issues into their business models, products or services, or institutionalise them as organisational practice (Figure 9).

Figure 9. The Say-Do-Act Funnel

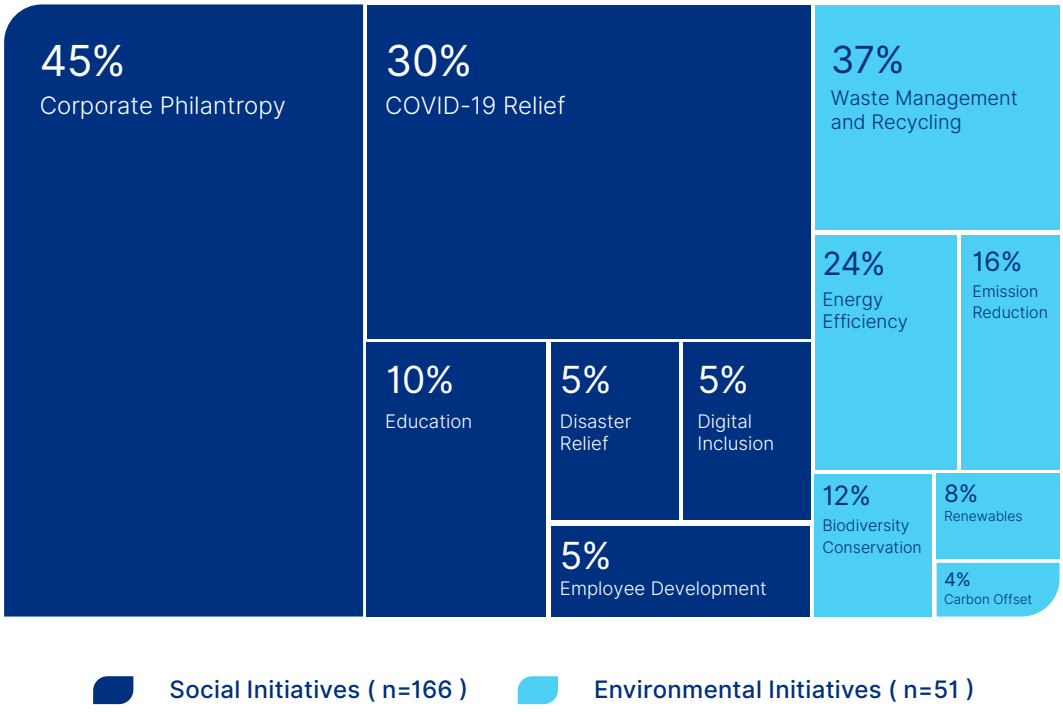


Source: Tech for Good Institute & NUS Centre for Governance and Sustainability, 2023

Of the companies that undertook initiatives to create impact (189 companies), more of them were non-listed companies (120 companies). The initiatives tended to focus on social matters than environmental issues, and were not directly related to the DECs’ core services or products. Philanthropy (45%) and COVID-19 relief (30%) featured prominently. The pandemic presented an immediate opportunity for companies to engage their local community, providing quality education, disaster relief and bridging the digital divide.

On the other hand, some DECs invested in environmental initiatives, including waste management and recycling, minimising energy consumption and emissions, biodiversity conservation, renewables and carbon offset programmes.

Figure 10. Social and Environmental Initiatives of DECs in SEA-6



Source: Tech for Good Institute & NUS Centre for Governance and Sustainability, 2023

Of the 124 companies that reported on their non-financial impact, over 95% (119 companies) are listed. The information was included in annual reports or standalone sustainability reports as part of their statutory reporting requirements. The five non-listed DECs that voluntarily published reports on sustainability include: Singapore's Razer (delisted in 2022), Carousell and Esco Lifesciences, and Indonesia's eFishery and Amartha.

Each of the SEA-6 countries has implemented sustainability reporting requirements for publicly-listed companies, though each jurisdiction has a different set of requirements. Regulators generally recommend or mandate the Global Reporting Initiative (GRI) for environmental, social and governance reporting, and the framework by the Task Force on Climate-Related Financial Disclosures (TCFD) for climate change reporting. In addition, many of the DECs also referenced the Sustainable Development Goals (SDGs).[35] DECs from the Philippines had a particularly high SDG adoption rate. A notable exception was Thailand, where DECs referenced the framework by the International Organisation for Standardisation (ISO) (see Appendix A for an overview of sustainability reporting requirements and most commonly-used reporting frameworks by DECs).

While stating intent is commendable, it is only a first step. Clear targets signify the commitment of the DECs, just as earning or profitability targets communicate the ability of companies to realise strategy and goals. Only 11% (49 companies) disclosed clear related targets on environmental, social and governance (ESG) matters.

In comparison, over 50% of all listed companies in SEA-6, including those outside the digital economy, have disclosed their targets, with around 35% of companies disclosing short-term and long-term targets.[36] Communicating clear goals sends a signal that companies are serious in building strategies to mitigate negative impact and achieve positive non-financial impact.

4. Towards Positive Impact through DECs

Given their scale, integration and coverage of economic activities across all sectors, DECs will play an influential role in shaping the digitalisation trajectory of the markets they serve. DECs have the potential to be key enablers of sustainable growth and development in Southeast Asia. Currently, however, DECs are focused on issues closely linked to maintaining their "license to operate". As the digital economy continues to mature, the changing regulatory, risk and market environment will require them to consider a wider base of stakeholders and create sustainable value.

4.1. Evolving with the changing landscape

The changing regulatory environment

DECs need to survive and secure the means to grow and scale, as reflected by their key stakeholders of priority. At the moment, DECs are engaging most frequently with investors, customers, business partners and employees. As the digital economy continues to mature and develop, they will need to consider including a wider base of stakeholders.

Governments and regulators are expected to become important DEC stakeholders, as rising societal concern over evolving business models and emerging technologies result in greater regulation over the digital economy. For example, Singapore issued a moratorium on new data centres in 2019 due to environmental concerns.[37] While the moratorium has since been lifted, Singapore has launched a pilot programme setting new sustainability criteria for data centres.[38] In addition, the ASEAN Framework for Circular Economy, which was adopted in 2021, reflects the commitment of governments in the region to develop policies that are geared towards sustainable development.

The changing risk environment

DECs currently focus on social issues, such as Cybersecurity and Data Protection, DEI, and the Local Community, rather than governance or environmental issues. Cybersecurity and Data Protection are key concerns to prevent financial and reputational losses. Investing in DEI helps DECs recruit and retain talent, while fostering the development of the local community promotes reputation and potentially greater public participation in the digital economy.

However, it is imperative to look beyond the short-term concerns of daily business operations. According to the latest World Risk Report 2023, experts have identified six of the top ten long-term risks to be environmental in nature.[39] The top four include failure to mitigate climate change, failure of climate change adaptation, natural disasters and extreme weather events, and biodiversity loss and ecosystem collapse. Closer to home, 57% of Southeast Asians note that more frequent and intense weather events will be one of the most pressing challenges the region will face.[40] As the digital economy grows, DECs will increasingly be called upon to account for and mitigate environmental risks.

The changing market environment

Finally, despite expressing commitment to deliver non-financial impact, only 28% (124 companies) of DECs in SEA-6 currently have sustainability reports and use non-financial impact as strategic metrics. DECs should acknowledge the changing market environment where expectations of its main stakeholders are constantly evolving. Investors, customers, industry partners, and employees are increasingly scrutinising corporate impact on society and the environment, both for risk mitigation and as a proxy for a company's integrity, transparency and acccountability.

Integrating sustainability into products, services and operations can also be a differentiator. Professional investors progressively consider ESG aspects of a company to determine whether it is adequately managing risk and aligning its strategy for long-term returns.[41] Impact investing is growing rapidly in many markets in Southeast Asia. Furthermore, 96% of employees expect their employers to balance financial performance with sustainability metrics, including social issues, diversity and equity, and environmental impact.[42] In an increasingly volatile, uncertain, complex and ambiguous operating environment, the business case for corporate responsibility strengthens.

4.2. Recommendations

As the digital economy continues to mature, the corresponding regulatory, risk and market environment is evolving with a trend towards more sustainable business practices. DECs need to continually respond to the changing landscape by recalibrating their strategies and expanding their approaches for long-term sustainable growth.

First, DECs should operate responsibly.

This means, at the very least, following a "do no harm" principle by examining their systems, processes, products and services to identify and mitigate negative consequences in upstream development and ensure proper downstream impact. Upstream considerations include developing systems with inclusion, security and data protection as part of the design phase. For example, developers can proactively ensure that datasets used to train algorithms are unbiased. On the other hand, downstream considerations include transparency, maintaining consumer choice, protecting user data, enabling sustainable livelihoods, cushioning disruption, and protecting users' health and well-being.

As digital technologies evolve rapidly, operating responsibly is a moving goalpost. DECs should start to consider areas such as supply chain management of hardware, the operational footprint of products and services, and the management of electronic waste (e-waste). In the long-run, DECs will be called upon to account for the technology lifecycle and the entire value chain.

While DECs regard material issues and metrics of impact specific to its business, market segment and context, we propose that all DECs should consider measuring and communicating performance on:

- **Environment:** Scope 1, 2, 3 GHG emissions, with climate-related targets
- **Social:** Cybersecurity, data protection, product or service safety, employee upskilling or reskilling, employee wellbeing
- **Governance:** Anti-corruption, compliance and competitive behaviour

Companies developing, using and deploying AI systems should align to Responsible AI Principles to ensure safety, transparency and fairness to all stakeholders. In addition, DECs can promote consumer trust by raising awareness about how algorithms function by sharing briefs and explainers.[43]

Second, there is great opportunity in Southeast Asia for DECs to pursue areas that advance sustainable growth.

An unmet need can be a viable investment opportunity, and DECs have the potential to "solve social problems, meet the needs of people, and work toward developing sustainable solutions for the future".[44] For instance, according to the United Nations Development Programme's SDG Investor Maps, areas ripe for investor interest in Indonesia, Thailand and Vietnam include EdTech, telemedicine and agritech (Table 1).[45] These sectors are also crucial to alleviate poverty, address asymmetric access to basic services and provide livelihood opportunities.

Table 1: Investable Areas Ripe for Digital Innovation as Identified by SDG Investor Maps[46]

Sector	Desired Outcomes	Investable Areas Ripe for Digital Innovation	Indonesia	Thailand	Vietnam
Health	Greater access to health services	Telemedicine	✓	✓	✓
Agriculture and Aquaculture	Improve productivity and shortening the value chain	Aquaculture supply chain management and input-side digital platforms for farmers	✓		
		Smart farming and precision agriculture, and Value chain development for sustainable and organic agricultural products		✓	
		Agritech solutions to improve farm production			✓

Table 1: Investable Areas Ripe for Digital Innovation as Identified by SDG Investor Maps[46] (continued)

Sector	Desired Outcomes	Investable Areas Ripe for Digital Innovation	Indonesia	Thailand	Vietnam
EdTech	Quality education, skills development and training for underserved	Digital platform for interactive learning	✓		
		Decentralised online learning platform		✓	
		Online vocational skill training			✓
Waste Management	Increasing efficiency and performance to reduce pollution and improve health	Waste management systems and platforms		✓	
		Solid waste processing and treatment			✓
Fintech	Economic stability for low-income groups	Digital insurance platforms	✓		
Transportation	Increasing efficiency to reduce cost and climate impact, while driving economic growth	Smart mobility platforms		✓	

Source: SDG Investor Platform

DECs have the opportunity to address complex issues, such as climate resilience. Digital technologies can support reduction of GHG emissions through informed decision-making, real-time data sensing and control, and process calibration. The energy sector has begun to adopt these technologies. Furthermore, carbon markets rely on trusted and verifiable data. For example, light detection and ranging (LiDAR) sensors can monitor forests digitally for carbon stock monitoring and generation of carbon credits.[47]

DECs can also be the first movers in emerging issues of focus. As machine learning and AI become more prevalent across traditionally "non-tech" industries such as logistics, energy, agriculture and healthcare, DECs have a limited window to lead the debate on responsible AI. Early engagement in emerging issues will instil confidence in investors and regulators, while becoming more trustworthy to employees, customers and the local community.

Third, DECs can align their initiatives to support national priorities of their markets.

DECs are well placed to develop and deploy fit-for-purpose products and services that meet the needs of the region and that account for Southeast Asia's unique cultural diversity. DECs can localise their initiatives depending on the most pressing issue faced by stakeholders in their respective countries. For example, governments in the region are recognising the importance of MSMEs in their economic development. However, MSMEs face digital adoption challenges due to capital difficulties, with a lack of digital and business management skills. Online platforms provide MSMEs with their first foray into the digital marketplace, while acquiring experience and confidence to digitalise further. By aligning with national priorities, DECs can demonstrate its capability to generate sustainable value to society, opening up new opportunities to grow.

The development of the digital economy requires strategic partnerships among key stakeholders with a requirement to ensure that development is inclusive, responsible and resilient. DECs can partner with governments, investors and local communities to grow the economy and leverage technology for sustainable development. By doing so, DECs can contribute to building a resilient digital economy that can effectively adapt to the changing operating environment and keep pace with rapid technology advancements.

Appendices

Appendix A: Overview of sustainability reporting requirements and preferred reporting frameworks in SEA-6

The Global Reporting Initiative (GRI) and the United Nations Sustainable Development Goals (SDGs) remain the most widely-adopted standards, with an increasing uptake of Task Force on Climate-Related Financial Disclosures (TCFD).

Table A.1: Global sustainability reporting standards and frameworks

Organisation	Description
Global Reporting Initiative (GRI)	Founded in 1997, the GRI aimed to establish the first accountability mechanism for companies to uphold responsible environmental conduct principles. Over time, the scope expanded to include social, economic and governance issues. In 2000, the first version of GRI guidelines was launched, providing the inaugural global framework for sustainability reporting. In 2016, the GRI transitioned from providing guidelines to pioneering global standards for sustainability reporting for a multi-stakeholder audience, known as the GRI Standards.
International Integrated Reporting Council (IIRC)	The IIRC was founded in 2010 with a focus on strategic and future-oriented reporting. Although investors were initially considered the primary audience, there has been a recent shift to allow for a broader stakeholder perspective. The IIRC provides an industry-agnostic framework based on seven guiding principles to drive connected reporting, and eight elements that govern the overall content of the integrated report.
International Organization for Standardization (ISO)	The ISO is a network of national standards bodies, which develops and publishes international standards. International standards in various fields have been developed, including ICS13 - Environment, health protection, safety, ISO/TC268 - Sustainable cities and communities, and ISO/TC 322 - Sustainable finance.
Sustainability Accounting Standards Board (SASB)	The SASB was founded in 2011 primarily to develop industry-specific standards for use in US corporate filings. Its aim is to provide investors with comparable non-financial information about financially-material ESG topics, and to facilitate communication between companies and investors with relevant and valuable information for decision-making.

Table A.1: Global sustainability reporting standards and frameworks (continued)

Organisation	Description
Science Based Target Initiative (SBTi)	Founded in 2015, SBTi aims to drive ambitious climate action in the private sector by enabling companies to set science-based emission reduction targets. The reduction targets are in line with the goals of the Paris Agreement (i.e., to limit global warming to well-below 2°C above pre-industrial levels and pursue efforts to limit warming to 1.5°C). SBTi is a collaboration between several organisations - CDP (Carbon Disclosure Project), WRI (World Resources Institute), WWF (World Wildlife Fund), and UNGC (United Nations Global Compact). SBTi established the accepted standard on science-based targets (SBT), setting out 24 criteria and a process for companies to develop and validate their targets.
Task Force on Climate-Related Financial Disclosures (TCFD)	Established in 2017, the TCFD published a reporting framework on the single issue of climate change. It set out recommendations for companies to disclose climate-related information and provide investors with more information on the financial impact of climate risk on a company. In 2020, the New Zealand and UK governments became the first to mandate TCFD reporting, which was initially intended to be voluntary. Finance ministers from the Group of Seven (G7) economies announced in June 2021 their intention to mandate TCFD reporting in their respective countries.
The United Nations Global Compact (UNGC)	The UNGC is a non-binding United Nations pact to encourage businesses worldwide to adopt sustainable and socially responsible policies, and to report on their implementation. UNGC serves to align strategies and operations with universal principles on human rights, labour, environment, and anti-corruption, and to take actions that advance societal goals.
United Nations Sustainable Development Goals (SDGs)	These are a collection of 17 interlinked global goals designed to be a "blueprint to achieve a better and more sustainable future for all."[48] They were set by the UN General Assembly in 2015 and are intended to be achieved by 2030. The SDGs comprise of targets and indicators and are often used in ESG reporting.

Source: NUS Centre for Governance and Sustainability

In Southeast Asia, GRI and TCFD are generally the preferred standards recommended or mandated by various regulators.

Table A.2: Sustainability reporting requirements and preferred reporting frameworks in SEA-6

Country	Sustainability reporting requirements and preferred reporting frameworks
Indonesia	a. Under POJK51/POJK.03/2017, Otoritas Jasa Keuangan (OJK) requires publicly listed companies (PLCs) to publish sustainability reports, gradually starting in 2020. b. Details of sustainability reports are stipulated under SEOJK16/SEOJK.04/2021 and include sustainability governance and performance. c. The sustainability performance covers the economic (production quantity, revenue, eco-friendly product and involvement of local parties), green environment (energy, emission, waste and biodiversity), and social aspects. d. TCFD, GRI and SDG are the preferred frameworks.
Malaysia	a. ESG reporting is required as a listing rule. b. Bursa Malaysia issued a Sustainability Reporting Guide in 2015 and a second edition in 2018 to help embed sustainability in reporting. c. TCFD is the preferred framework.
Philippines	a. The Securities and Exchange Commission (SEC) has followed a "comply and explain" approach from the 2019 reporting period. b. Beginning 2023 (reporting period 2022), all PLCs are mandated to comply with sustainability reporting guidelines set by the regulator. c. SEC is also seeking to introduce voluntary reporting guidelines for non-listed companies. d. GRI, IIRC, SASB, and TCFD are the preferred frameworks
Singapore	a. All companies listed on the Singapore Exchange are required to have sustainability reporting, effective since 2017. b. Sustainability reporting requires five primary components: i. Reporting framework ii. Materiality assessment iii. Policy, practices and performance reporting iv. Target setting v. Statement by the board c. Effective 2022, Singapore-listed companies are also required to: i. Minimally subject the sustainability reporting process to internal or external review ii. Disclose board diversity iii. Propose core ESG factors iv. Carry out mandatory board directors training d. All issuers must now provide climate reporting on a "comply or explain" basis, consistent with the recommendations of the TCFD.

Table A.2: Sustainability reporting requirements and preferred reporting frameworks in SEA-6 (continued)

Country	Sustainability reporting requirements and preferred reporting frameworks
Thailand	a. Effective 2022, it is mandatory for all PLCs to report their ESG performance via Form 56-1 One Report. b. GRI and TCFD are the preferred frameworks
Vietnam	a. The Ministry of Finance of Vietnam requires PLCs to consider the social and environmental consequences of their activities and their social commitments in their annual report. b. This includes: i. Environmental impact ii. Raw materials management iii. Energy and water consumption iv. Compliance with environmental protection laws v. Employee policies vi. Report on responsibility for local community vii. Report on green capital market activities c. No preferred framework; however, PLCs are encouraged to apply globally-accepted reporting and disclosure standards in preparing their sustainability reports.

Source: PwC and NUS Centre for Governance and Sustainability. (2022)

Adoption of Sustainability Standards and Frameworks

Across the SEA-6 countries, the top three sustainability reporting frameworks and standards commonly adopted by DECs are the GRI, SDGs and TCFD (Table A.3).

Table A.3 Sustainable reporting standards and frameworks across countries

	GRI	SDG	TCFD	SASB	UNGC	ISO	SBTI	IIRC
Overall	53%	34%	15%	14%	11%	8%	5%	5%
Indonesia	23%	21%	6%	5%	3%	5%	2%	9%
Malaysia	65%	35%	15%	15%	12%	6%	6%	0%
Philippines	63%	88%	50%	38%	25%	0%	0%	13%
Singapore	65%	35%	15%	15%	12%	6%	6%	0%
Thailand	20%	20%	20%	20%	40%	60%	0%	0%
Vietnam	13%	13%	0%	0%	0%	25%	13%	0%

0-25% of DECs >25-50% of DECs >50-75% of DECs >75-100% of DECs

Malaysia, Philippines and Singapore have higher rates of reporting framework adoption due to listing rules and regulatory support implemented in 2018, 2019 and 2017 respectively.[49] While there is no consistent mandate for reporting standards among these three countries, its DECs have a higher rate of GRI Standards adoption in order to fulfil reporting requirements. In general, the GRI Standards are used by more than 50% of assessed listed DECs, as it is recognised by local changes, and it is easily adaptable and suitable for organisations of all types and sizes. This includes topic-specific standards for comprehensive reporting on material ESG factors and issue-specific disclosure.[50]

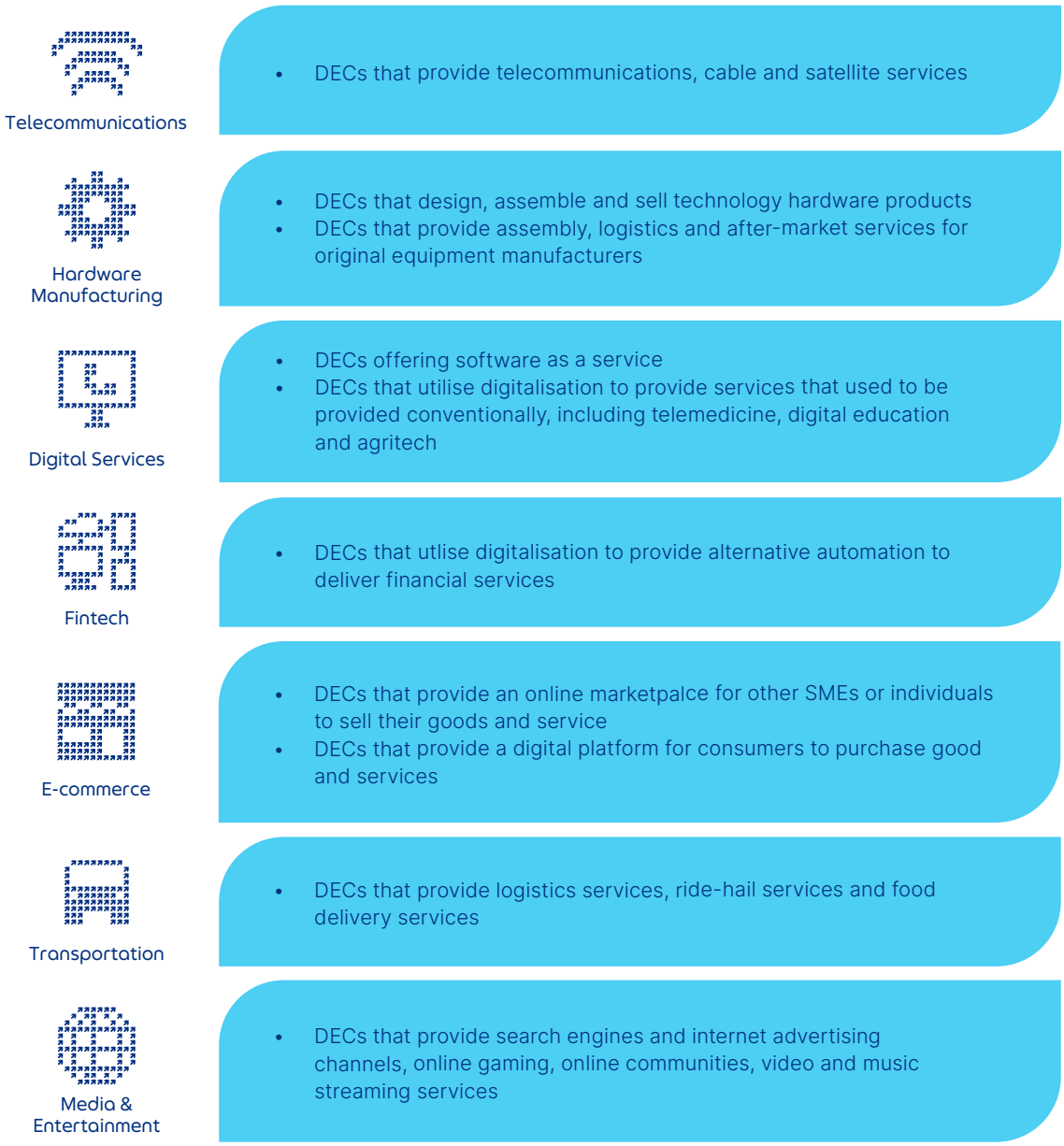
Appendix B: Research methodology

Scope

This study covers DECs in Indonesia, Malaysia, Philippines, Singapore, Thailand and Vietnam listed on Crunchbase. This resulted in a sample of 439 companies, of which 145 are listed on the stock exchanges of their respective countries, i.e., the Indonesia Stock Exchange, Bursa Malaysia, Philippine Stock Exchange, Singapore Exchange, Stock Exchange of Thailand, and Ho Chi Minh Stock Exchange or Hanoi Stock Exchange.

The 439 companies were first classified into sectors spanning telecommunications, hardware manufacturing, digital services, fintech, e-commerce, transportation, and media and entertainment. (Figure B.1). These were further classified into core, narrow and broad categories based on OECD's framework, where core includes telecommunications and hardware manufacturing, narrow includes digital services and fintech, and broad includes e-commerce, transportation, and media and entertainment.

Figure B.1. Categorisation of DECs



Source: Tech for Good Institute & NUS Centre for Governance and Sustainability, 2023

Data sources

Data sources comprise publicly available information from April to September 2022, including Annual Reports and Sustainability Reports, pitch presentation materials, press releases published on corporate websites and social media. Data was on the basis of a set of over 50 keywords related to key social, environmental and governance issues associated with the digital economy, as defined by the Global Reporting Initiative.

The research findings were supplemented with social media engagement and news media coverage obtained from Meltwater software. The input for the searches on Meltwater includes all 439 DECs and a comprehensive list of keywords relevant to environmental, social and governance topics. The topics also include local keywords in the respective country languages (Table B.1). Advanced searches were carried out using Boolean operators, followed by manual filtering to remove irrelevant results.

Table B.1 Keywords for data collection via Meltwater tool

	Environmental	Social	Governance
English Keywords	GHG emission Greenhouse gas Carbon footprint Waste Effluents Circular economy Resource Biodiversity Renewable Pollution Environment Climate change Nature Recycling Raw materials Energy Intensive Discharge Clean energy Eco-friendly	Occupational health and safety Training Education Diversity Equity Inclusion Human rights Data security Cybersecurity Innovation Employment Equal income Fair employer Inclusive Gender bias Workplace support Unfair Benefits Salary Data protection Welfare Career development Job security	Code of conduct Code of ethics Anti-corruption Ethics Ethical Transparent Open communication Trust

Table B.1 Keywords for data collection via Meltwater tool (continued)

	Environmental	Social	Governance
Indonesian Keywords	Alami Daur ulang Bahan baku Memakai energi Energi bersih Ramah lingkungan Energi terbarukan	Gaji Perusahaan yang adil Inklusif Bias gender Dukungan kantor "tidak fair"/"gak fair" Asuransi/ pensium Gaji Mentor/pembimbing Proteksi data Kesejahteraan Pengembangan karir Pensiun "Keragaman"-diversity SARA	Etis Terbuka/transparan Korupsi
Filipino Keywords	kalikasan polusyon kapaligiran fuel emission renewable energy reforestation conservation	sahod benepisyo karapatan karapatang pantao kababaihan kabuhayan trabaho capacity building anti-discrimination/ discrimination	tiwala korapsyon pamamahala accountability public private partnership
Thai Keywords	ธรรมชาติ รีไซเคิล วัตถุดิบ พลังงานสะอาด เป็นมิตรกับสิ่งแวดล้อม	รายได้ที่เป็นธรรม นายจ้างที่เป็นธรรม อคติทางเพศ การสนับสนุนในที่ ทำงาน ไม่เป็นธรรม ผลประโยชน์ เงินเดือน ที่ปรึกษา การปกป้องข้อมูล สวัสดิการ การพัฒนาทางสายอาชีพ ความมั่นคงในการทำงาน	ทางศีลธรรม โปร่งใส ความเชื่อใจ

Table B.1 Keywords for data collection via Meltwater tool (continued)

	Environmental	Social	Governance
Vietnamese Keywords	Thiên nhiên Tái chế Xả thải Năng lượng sạch Thân thiện môi trường Nguyên liệu tái chế Sản phẩm xanh Năng lượng tái tạo Biến đổi khí hậu Hiệu ứng nhà kính Ô nhiễm	Bao trùm Kinh tế bao trùm Toàn diện Tài chính toàn diện Bất bình đẳng giới Bất bình đẳng Thu nhập Bảo vệ dữ liệu Phúc lợi Cơ hội việc làm An toàn lao động Công bằng xã hội nhân quyền An sinh xã hội Thất nghiệp Tệ nạn xã hội phân hóa giàu nghèo	Đạo đức Minh bạch Niềm tin chống tham nhũng

Research framework

Data from DECs were assessed for issues of focus, stakeholder engagement, and modes of communicating and reporting.

GRI standards were used to guide the development of the framework for data coding. As noted above, GRI provides internationally recognised guidelines that facilitate consistent and comparable reporting across sectors, and its standards are widely recommended by stock exchanges in Southeast Asia. GRI is thus an appropriate reference for this study as it assesses the impact of DECs in multiple industries and countries across the region.

The indicators are listed in Table B.2. Quantifiable data was coded on a 1-0 basis, with one point being awarded if the company disclosed information on a particular indicator, and zero points otherwise.

Table B.2: DEC assessment parameters

Stakeholder Engagement

- Who are the companies' stakeholder groups?

Issues of Focus and Material Topics

- What are the material economic, environmental, social and governance issues identified by the companies?

Sustainability Initiatives

- How do companies communicate their impact, ambition and intentions?
- Are the companies' initiatives centred around environmental or social goals?

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