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# Charting New Pathways for APEC: A Sustainable Future Inspired by the Bio-Circular-Green (BCG) Economy

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## KEY MESSAGES

- Climate change is arguably the largest threat challenging mankind globally. Sustainability is deeply affected. For example, rising sea levels due to global warming can displace up to 167 million people just in APEC.
- Many challenges are interlinked with climate change. This means that solutions cannot be siloed. Instead, solutions need to be cross-cutting, interconnected, and collaborative. Such solutions can be guided by the Bio-Circular-Green (BCG) Economy that integrates three policy approaches: (1) the bio-economy; (2) the circular economy; and (3) the green economy.
- The BCG Economy provides guidance in three ways: (1) reframing how development should be approached; (2) rethinking how resources should be utilized; and (3) reminding why inclusive and active participation is important for realizing a sustainable future in APEC.
- BCG Economy solutions allow interventions to close its loopholes. It does this by internalizing the effect of weak links (rebound effects) into the policy design itself, thereby strengthening policies that relied only on the bio-economy, the circular economy, or the green economy separately.
- The transition towards a sustainable future inspired by the BCG Economy requires not just safeguarding against weak links but also supporting its key drivers: (1) the regulatory environment; (2) technology and innovation; and (3) stakeholder participation.
- Policymakers can support these key drivers by addressing its challenges. For example, regulations on environmental services tend to be implemented by multiple agencies but without a clear coordinating strategy to prevent sectoral silos. What the BCG Economy can do is to strengthen institutions by promoting good governance. This could take the form of regular channels for coordination and idea-sharing across agencies, an economy-wide coordinating strategy, or sound regulatory instruments such as carbon budgeting and ex-ante environmental impact assessments, among others.

In 2020, APEC Economic Leaders charted a renewed pathway that would bring the region towards an open, dynamic, resilient, and peaceful community. Through the APEC Putrajaya Vision 2040,<sup>1</sup> APEC has committed to pursue three economic drivers: (1) trade and investment; (2) innovation and digitalization; and (3) strong, balanced, secure, sustainable, and inclusive growth, that would each bring the region closer towards a sustainable future.

These drivers include objectives to address all environmental challenges and to pursue green and inclusive growth. However, achieving these objectives requires navigating through multiple challenges, both domestically and regionally. For instance, the COVID-19 pandemic alone resulted in widespread economic slowdown and dampened trade, which caused massive unemployment, among others. In fact, APEC GDP declined by 1.8 percent in 2020 while the rest of the world dropped by 4.8 percent.<sup>2</sup>

This pandemic, however, is not the only challenge that continues to affect the region. For instance, APEC faces environmental degradation, rising cost of living, food insecurity, worsening climate change, more frequent and severe natural disasters, and inequalities. Arguably, the worsening climate change situation carries the largest threat for not only APEC but also the rest of the world. In fact, a 2021 APEC Policy Support Unit (PSU) report emphasized that worsening climate change can be costly for the region (e.g., GDP losses up to 18.3 percent by 2050) and it also disproportionately affects already vulnerable populations, such as indigenous people and those living in poverty.<sup>3</sup>

These regional challenges affecting APEC are interlinked, which means that their impact on communities can overlap and multiply, undermining APEC's progress to fulfilling its commitments under

the APEC Putrajaya Vision 2040. Clearly, there is a need for economies to resolve these challenges now if future generations are to live better. Solutions to these widespread challenges, however, are best guided by a holistic framework that provides economies with a common understanding of where to anchor individual and collective efforts. One such framework is the Bio-Circular-Green (BCG) Economy that integrates three policy approaches: (1) bio-economy; (2) circular economy; and (3) green economy.<sup>4</sup>

This policy brief explores how the BCG Economy is a useful guiding framework in developing holistic solutions to the regional challenges affecting APEC. It also discusses the different drivers and challenges that policymakers need to be aware of when charting new pathways inspired by the BCG Economy. A number of policy approaches have been identified for policymakers to consider.

## Climate Change and the Regional Challenges in APEC

In 2015, a total of 196 Parties agreed, through the Paris Agreement,<sup>5</sup> to legally bind each other to limit global warming to well below 2.0°C compared to pre-industrial levels — or preferably to 1.5°C, as agreed by Parties during the 26<sup>th</sup> Conference of the Parties (COP26) in 2021.<sup>6</sup> Achieving these objectives requires APEC to collectively reduce net greenhouse gas (GHG) emissions by 3.8 percent per year until net zero is achieved by 2070, although much more is needed to achieve the preferred 1.5°C goal.<sup>7</sup>

Limiting global warming is of direct relevance to APEC since worsening conditions have a direct impact on people. For example, rising temperatures can cause polar ice to melt, thereby leading to higher sea levels. Estimates reveal that the global mean sea level can rise by as much as 0.4 meters in 2050 or 3.7 meters in 2150, compared to

<sup>1</sup> APEC, 'APEC Putrajaya Vision 2040', (Singapore: APEC, November 2020),

[https://www.apec.org/meeting-papers/leaders-declarations/2020/2020\\_aelm/annex-a](https://www.apec.org/meeting-papers/leaders-declarations/2020/2020_aelm/annex-a)

<sup>2</sup> APEC, 'APEC Regional Trends Analysis, February 2022 Update: Multiple Headwinds Derail Recovery', (Singapore: APEC, February 2022),

<https://www.apec.org/publications/2022/02/apec-regional-trends-analysis-february-2022-update-multiple-headwinds-derail-recovery>

<sup>3</sup> APEC, 'APEC Regional Trends Analysis, November 2021: APEC's Climate Change Challenge; Toward a Resilient Recovery: Policies Matter', (Singapore: APEC, November 2021),

<https://www.apec.org/publications/2021/11/apec-regional-trends-analysis-november-2021-apec-s-climate-change-challenge-toward-a-resilient-recovery-policies-matter>

<sup>4</sup> The green economy is closely associated with the blue economy. These two differ only on the type of resource group that it focuses on (i.e., the green economy focuses on land resources while the blue economy focuses on maritime resources). For simplicity, these two will be considered to mean the same thing in this policy brief.

<sup>5</sup> United Nations Framework Convention on Climate Change (UNFCCC), 'The Paris Agreement', accessed 4 October 2022, <https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement>

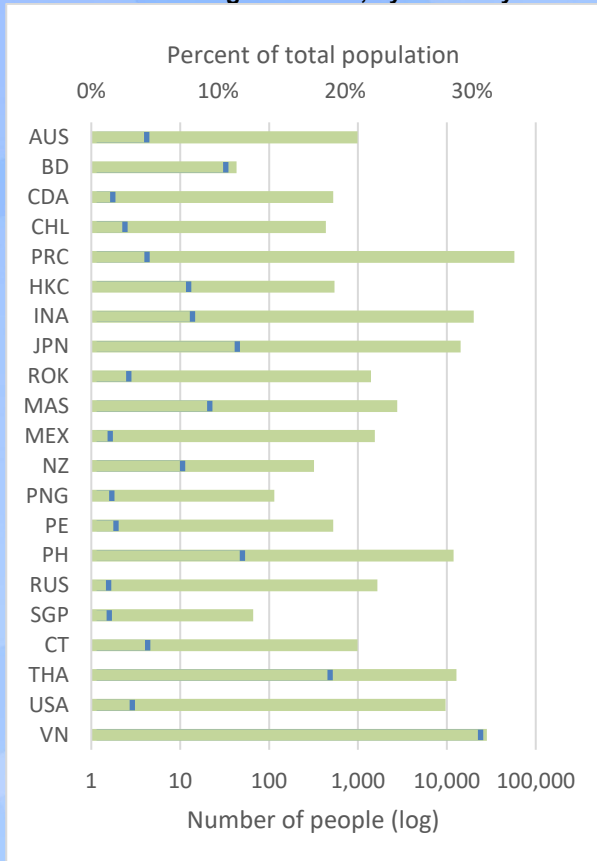
<sup>6</sup> UNFCCC – United Kingdom 2021, 'COP26 Outcomes', accessed 4 October 2022,

<https://ukcop26.org/the-conference/cop26-outcomes/>

<sup>7</sup> APEC, 'APEC Regional Trends Analysis, November 2021: APEC's Climate Change Challenge; Toward a Resilient Recovery: Policies Matter'.

baseline 2000.<sup>8</sup> Such increases can place coastal populations at risk of displacement. In fact, Figure 1 shows that all APEC economies will be affected by this displacement but not everyone will experience it the same way. Rising sea levels can displace up to 167 million people across the region.

**Figure 1: Coastal population at risk of displacement due to rising sea levels, by economy**



Number of people (green); Percent of total population (blue)  
 Note: 2015 population living in areas where elevation is below 5 meters. Data parameters based on WorldPop Global High-Resolution Population Denominators and TerraSAR-X add-on for Digital Elevation Measurement 90m (no urban concept).  
 Source: APEC Policy Support Unit (PSU) calculations based on data from the Center for International Earth Science Information Network (CIESIN), Columbia University, and CUNY Institute for Demographic Research (CIDR), City University of New York, (<https://doi.org/10.7927/d1x1-d702>).

<sup>8</sup> W.V. Sweet et al., 'Global and Regional Sea Level Rise Scenarios for the United States: Updated Mean Projections and Extreme Water Level Probabilities Along U.S. Coastlines', (United States: National Oceanic and Atmospheric Administration, February 2022), <https://aambpublicoceanservice.blob.core.windows.net/oceanserviceprod/hazards/sealevelrise/noaa-nos-techrpt01-global-regional-SLR-scenarios-US.pdf>

<sup>9</sup> A. Fritz and R. Ramirez, 'Hurricane Ian's Rapid Intensification is Part of a Trend for the Most Dangerous Storms', *CNN Philippines*, 29 September 2022,

Higher sea levels possibly displacing coastal populations is not the only direct threat since rising temperatures can also lead to stronger storms and harsher extreme temperature events such as heatwaves. These disasters, in turn, can strain agriculture systems (leading to poor harvest), disrupt communities (even deaths), or undermine recovery (such as from the pandemic). For example, the onslaught of Typhoons Hinnamnor and Noru and Hurricane Ian caused landslides and flooding in some economies, which disrupted industries and forced thousands of people to evacuate.<sup>9</sup> Several disasters like these befall the region every year, an occurrence that climate scientists warn could grow more frequent and severe as global warming continues.

### The BCG Economy as a Guiding Framework to Sustainability

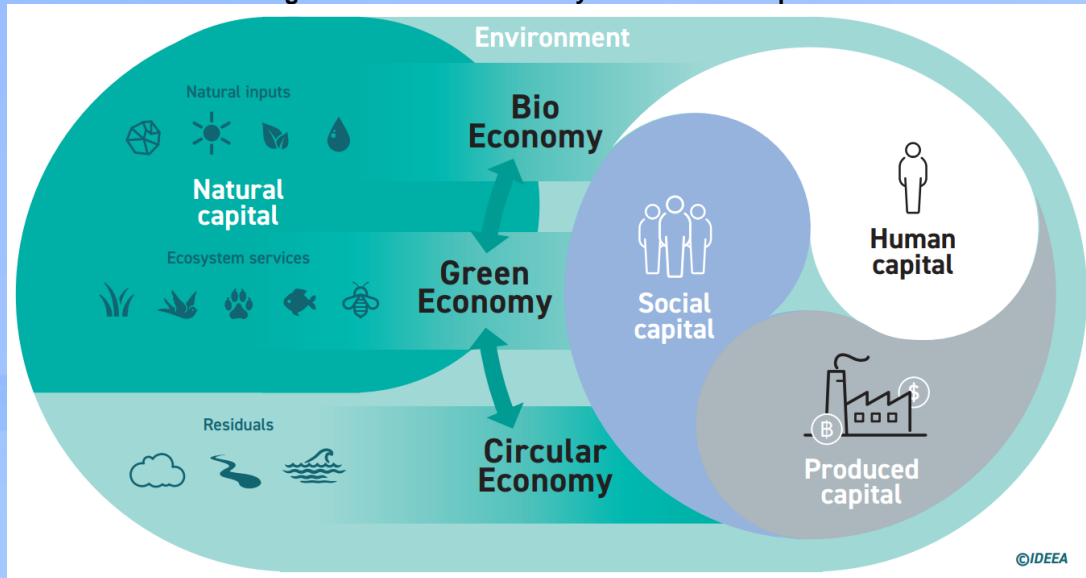
The interlinkages between climate change and the regional challenges facing APEC mean that solutions cannot be siloed. Instead, solutions need to be cross-cutting, interconnected, and collaborative. The development of these solutions can benefit from a holistic approach such as those inspired by the BCG Economy.

Figure 2 shows that the BCG Economy sustainably connects the environment (natural capital) and the society (social, human, and produced capitals).<sup>10</sup> A simple illustration of what this framework shows is that society produces harmful residuals as a consequence of economic activity, but the impact of these residuals on the environment can be mitigated or eliminated through using cleaner inputs (bio-economy), reusing or recycling (circular economy), or incorporating ecosystem services into the production system (green economy). However, better human capital (e.g., skills and education) and social capital (e.g., institutions and values) are necessary to make this scenario possible.

<https://www.cnnphilippines.com/world/2022/9/29/Hurricane-Ian-Super-Typhoon-Karding-climate-change.html>

<sup>10</sup> The Asia Foundation and the Institute for Development of Environmental-Economic Accounting (IDEAA), 'Understanding the Bio-Circular-Green (BCG) Economy Model', (Singapore: APEC, August 2022), [https://www.apec.org/publications/2022/08/understanding-the-bio-circular-green-\(bcg\)-economy-model](https://www.apec.org/publications/2022/08/understanding-the-bio-circular-green-(bcg)-economy-model)

Figure 2: The BCG Economy and the Four Capitals



Concept	Definition
Bio-economy	A knowledge-based production and use of natural/biological resources, together with biological processes and laws, that allow providing goods and services to the economy in an environmentally-friendly way. <sup>11</sup>
Circular Economy	A regenerative system in which resource input and waste, emission, and energy leakage are minimized by slowing, closing, and narrowing material and energy loops. This can be achieved through long-lasting design, maintenance, repair, reuse, remanufacturing, refurbishing, and recycling. <sup>12</sup>
Green Economy	An economy that results in improved human well-being and social equity while significantly reducing environmental risks and ecological scarcities. <sup>13</sup>

Source: Definitions compiled based on various sources. Framework lifted from Figure 2 of The Asia Foundation and IDEEA, 'Understanding the Bio-Circular-Green (BCG) Economy Model'.

In 2021, a BCG Economy solution was successfully implemented in the sugar cane industry in Thailand, which was threatened by droughts.<sup>14</sup> Traditionally, sugar cane factories produced tons of agricultural waste in the form of leaves and bagasse (residual fiber) whereas farmers generated harmful ultra-fine dust when fields were cleared through burning. What policymakers did was to create value from those agricultural wastes by converting them into renewable fuel sources (i.e., new revenue sources) and, at the same time, promoting the use of mechanical harvesters as a cleaner alternative to burning fields (i.e., less pollution and improved living conditions). It is important to note that these changes are not an isolated effort since different stakeholders (government, factories, and farmers) have to cooperate with each other.

This simple illustration and the case example from Thailand show that the interlinkages inherent to BCG Economy solutions can be used to move the region towards a sustainable future — one that sees the environment and the society moving forward together. However, this interlinked nature also implies at least one important shortfall: the effect of weak links (rebound effects). For example, gains from cleaner production can be offset when the circular economy is overwhelmed by increased consumption and production patterns, thereby causing a rebound effect.<sup>15</sup> What BCG Economy solutions can do is to then incorporate behavioral interventions (e.g., education) that prevent the circular economy from getting overwhelmed.

What this means is that BCG Economy solutions must always be accompanied by improvements in the quality of policy design and policy

<sup>11</sup> youmatter, 'Bioeconomy Definition: Benefits, Economic Growth and Sustainability', accessed 4 October 2022, <https://youmatter.world/en/definition/bioeconomy-definition/>

<sup>12</sup> S. Singh, 'Circular Economy: Don't Let Waste Go to Waste', (Singapore: APEC, January 2020), <https://www.apec.org/publications/2020/01/circular-economy---dont-let-waste-go-to-waste>

<sup>13</sup> United Nations Environment Programme (UNEP), 'Towards a Green Economy: Pathways to Sustainable Development and Poverty Eradication – a Synthesis for Policy Makers', (France: UNEP, 2011),

[https://sustainabledevelopment.un.org/content/documents/126 GER\\_synthesis\\_en.pdf](https://sustainabledevelopment.un.org/content/documents/126 GER_synthesis_en.pdf)

<sup>14</sup> Sugar Asia, 'Thai Farmers Adopt Bio-Circular-Green Economy (BCG) in Agriculture', 25 July 2021, <https://sugar-asia.com/thai-farmers-adopt-bio-circular-green-economy-bcg-in-agriculture/>

<sup>15</sup> T. Siderius and K. Poldner, 'Reconsidering the Circular Economy Rebound Effect: Proposition from a Case Study of the Dutch Circular Textile Valley', *Journal of Cleaner Production* 293 (2021): 1-12., <https://doi.org/10.1016/j.jclepro.2021.125996>

implementation (particularly in addressing weak links) since this will define whether BCG Economy solutions can actually make a difference. Simply, the BCG Economy seeks solutions that internalize the effect of these weak links into policy design and implementation, thereby closing loopholes in policies that relied only on the bio-economy, the circular economy, or the green economy separately.

As a guiding framework to sustainability, the BCG Economy can be used to holistically design policies and programs, thereby reducing the risk of weak links. There are at least three ways that the BCG Economy can guide policymakers: (1) reframing how development should be approached; (2) rethinking how resources should be utilized; and (3) reminding why inclusive and active participation is important.

### **Reframing how development should be approached**

Traditional approaches to development focused mostly on increasing production and expanding trade without regard for its impact on the environment and on people, but climate change necessitates economies to reframe this idea. For example, the BCG Economy reframes this as socioeconomic welfare that must go together with environmental sustainability.

One way of charting such a pathway is by advancing the clean energy transition (e.g., biogas and other renewables) across all energy-intensive sectors (i.e., buildings, transport, and industry). After all, about three-fourths of global GHG emissions in 2016 came from these sectors.<sup>16</sup> The importance of clean energy was also highlighted in the Glasgow Climate Pact wherein economies agreed to not just phasedown unabated coal power and phase out inefficient fossil fuel subsidies but also to rapidly scale up the deployment of clean power generation and energy efficiency measures, among others.<sup>17</sup> The current generation of renewable electricity in APEC, however, is still inadequate. In fact, Figure 3 shows that the share of renewable electricity has never gone beyond 30 percent of total generated electricity ever since 1990. It is worth highlighting that APEC Energy Ministers agreed in 2014 to double the share of

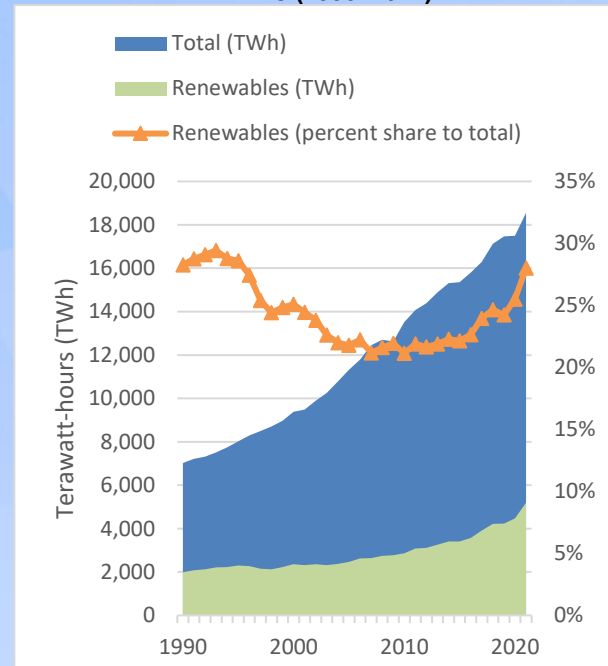
<sup>16</sup> H. Ritchie and M. Roser, 'Emissions by Sector', *Our World in Data*, accessed 4 October 2022, <https://ourworldindata.org/emissions-by-sector>

<sup>17</sup> T. Fransen et al., '5 Ways the Glasgow Climate Pact Aims to Reduce Greenhouse Gas Emissions', *World Resources Institute*, 10 March 2022, <https://www.wri.org/insights/glasgow-climate-pact-reduce-ghg-emissions>

<sup>18</sup> APEC, '2014 APEC Energy Ministerial Meeting: Beijing Declaration', (Singapore: APEC, 2014),

renewables in the APEC energy mix from 2010 levels by 2030.<sup>18</sup> Improvements have been steadily progressing,<sup>19</sup> but a more ambitious goal is necessary if carbon neutrality is to be reached by 2050, underscoring the need to even more rapidly accelerate investments in renewables.

**Figure 3: Development of renewable electricity in APEC (1990–2021)**



Note: Renewables include electricity production from hydropower, solar, wind, biomass and waste, geothermal, wave, and tidal sources.

Source: APEC PSU calculations based on Our World in Data (<https://ourworldindata.org/>).

However, transitioning to clean energy alone is not enough since consumption patterns and societal expectations also need to change. For example, the traditional idea of development being achieved through continuously increasing production (even with clean energy) would eventually exhaust other parts of the environment (e.g., forest areas cleared for mining or agriculture activities or damaging biodiversity as a result of overfishing) — a development that runs counter to the BCG Economy. This means that the clean energy transition should be accompanied by a shift on people's consumption habits and what they expect development to look like (i.e., change in mindset,

[http://mddb.apec.org/Documents/2014/MM/EMM/14\\_emm11\\_0\\_08.pdf](http://mddb.apec.org/Documents/2014/MM/EMM/14_emm11_0_08.pdf)

<sup>19</sup> G. Sweetnam, 'Progress Toward Energy Intensity Reduction Goal and Renewable Energy Doubling Goal', (Japan: Asia Pacific Energy Research Centre (APERC), June 2022), <https://aperc.or.jp/file/2022/7/26/plenary-0726-4-Progress-toward-Energy-Intensity-Reduction-Goal-and-Renewable-Energy-Doubling-Goal.pdf>

such as redefining how success is measured in a non-growth-oriented world).

### **Rethinking how resources should be utilized**

The BCG Economy also emphasizes on resourcefulness, primarily through using new technologies (e.g., smart technologies) or advancements in science (e.g., biotechnology and precision agriculture).<sup>20</sup> Two ideas are important for being more resourceful: (1) circularity; and (2) innovation.

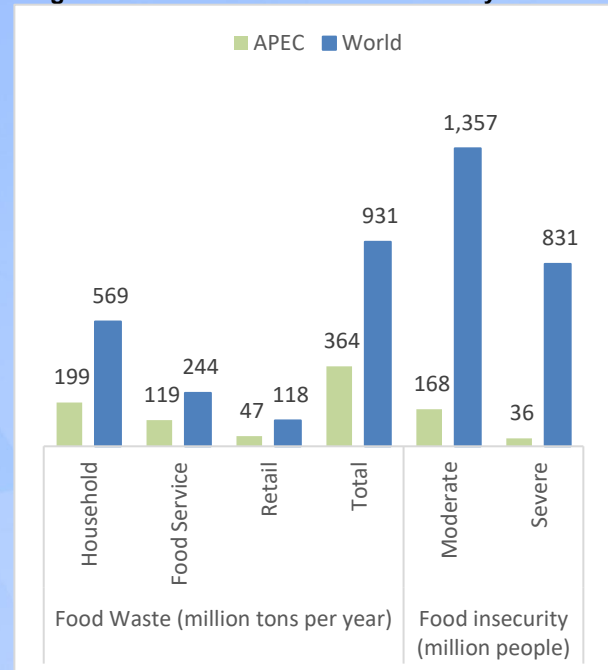
Both of these ideas can be applied on food waste. For example, the APEC region generates substantial food waste of around 364 million tons per year, which accounts for 39 percent of global food waste (Figure 4). More than half of these are actually contributed by households. Transforming this food waste into something productive is important because wastes can have adverse implications on the environment (e.g., estimates reveal that up to 10 percent of global GHG emissions are coming from food that is never eaten).<sup>21</sup> One example of transforming this waste is by converting it into biogas and then generating electricity. In fact, food waste could even come from another economy. Alternatively, more innovative uses could be promoted. For example, the Aurora Renewable Energy & UV Sequestration (AuREUS) system upcycles certain wastes and converts them into a solar panel that absorbs stray UV light, which is also capable of transforming buildings into vertical solar farms.<sup>22</sup> At the end of the day, any amount of food waste is socially unacceptable when millions of people are left hungry (Figure 4).

However, food is not the only key commodity to monitor since inorganic resources such as minerals are equally important, especially for advancing science and benefitting from new technologies. The cost of important minerals, for example, has started to increase. Index prices (relative to baseline 2017) have increased to 174 for silicon, 202 for steel, and 334 for lithium in 2022 due to rising demand, disrupted supply chains, and concerns about tightening supply<sup>23</sup> — underscoring the need for better recycling and innovating more efficient product designs, among others.

<sup>20</sup> L. Eurwilaichitr, 'Bio-Circular-Green Economy Model: Resilient and Sustainable Development Initiatives for International Collaboration', (Thailand: National Science and Technology Development Agency (NSTDA)), <https://www.nedo.go.jp/content/100945219.pdf>

<sup>21</sup> UNEP, 'Food Waste Index Report 2021', (Nairobi: UNEP, 2021), <https://www.unep.org/resources/report/unep-food-waste-index-report-2021>

**Figure 4: Food waste and food insecurity in APEC**



Note: Food waste data year varies by economy. Food insecurity data based on a 3-year average (2019–2021). Food insecurity data for Brunei Darussalam; China; Hong Kong, China; and Papua New Guinea are unavailable. A household is considered moderately food insecure if at least one adult (within the year) has been exposed to low quality diets or forced to reduce food intake because of limited resources, whereas it is severely food insecure if at least one adult has gone hungry for a whole day because of limited resources. Food insecurity data for Chinese Taipei is based on low-income (severe) and mid-income (moderate) households.

Source: APEC PSU calculations based on UNEP, 'Food Waste Index Report 2021'; Food and Agriculture Organization (FAO) – Suite of Food Security Indicators (<https://www.fao.org/faostat/en/#home>); Chinese Taipei – Ministry of Health and Welfare (<https://dep.mohw.gov.tw/DOS/cp-5337-62357-113.html>); and Chinese Taipei – Council of Agriculture.

### **Reminding economies why inclusive and active participation is important**

With its holistic approach, the BCG Economy naturally involves the active participation of large groups of stakeholders, even having cross-border engagements. This means that policymakers need to properly coordinate efforts and ensure accountability among stakeholders in the context of BCG Economy solutions. Otherwise, individual and collective efforts alike could be undermined by weak links (e.g., air and water pollution can cross borders and inadvertently affect neighboring economies).

<sup>22</sup> The James Dyson Foundation, 'AuREUS: Aurora Renewable Energy & UV Sequestration', accessed 5 October 2022, <https://www.jamesdysonaward.org/2020/project/aureus-aurora-renewable-energy-uv-sequestration/>

<sup>23</sup> International Energy Agency (IEA), 'World Energy Investment 2022: Overview and Key Findings', accessed 4 October 2022, <https://www.iea.org/reports/world-energy-investment-2022/overview-and-key-findings>

Within this context, the growing role of the private sector (firms and households) in advancing the BCG Economy should be emphasized. In fact, the International Energy Agency (IEA) highlighted that around 70 percent of the USD 3.9 trillion global clean energy investment required to achieve net zero emissions by 2050 need to come from private investment, underscoring the need for policymakers to shape a conducive environment for low-cost financing.<sup>24</sup>

Inclusive participation extends beyond the private sector since the broader community also includes sectoral coalitions, civil society, public-private initiatives, and local government units, among others. This whole-of-society approach works in multiple layers. For instance, it can start off within an economy (or even within sub-regions of an economy) wherein local stakeholders' efforts are contextualized to their locality's environment. This allows stakeholders to develop different solutions and to better manage policies holistically (i.e., contributions made at a local level, if guided by a common goal, can build-up and make an impact at a greater and wider scale).<sup>25</sup>

Eventually, these efforts that started off domestically can be elevated to an international level. For example, these can be through the conferences organized by multilateral interlocutors, which saw growing interlinkages between actions led by governments and those initiated by local and international non-government organizations (e.g., Lima-Paris Action Agenda).<sup>26</sup> APEC itself, as a regional forum, has the opportunity to incubate new ideas and advance discussions on BCG Economy solutions. As of September 2022, however, APEC's architecture does not specifically house a separate working group on the environment. Alternatively, approaches can also be through international cooperation such as bilateral and multilateral agreements (e.g., the free trade agreement between the United Kingdom and New Zealand contained an entire chapter on the environment, with an Annex listing over 290 environmental goods).<sup>27</sup>

<sup>24</sup> IEA, 'The Cost of Capital in Clean Energy Transitions', 17 December 2021, <https://www.iea.org/articles/the-cost-of-capital-in-clean-energy-transitions>

<sup>25</sup> National Democratic Institute, 'Environmental Governance: Local Efforts Yield Important Results', 16 April 2021, <https://www.ndi.org/our-stories/environmental-governance-local-efforts-yield-important-results>

<sup>26</sup> United Nations, 'Lima-Paris Action Agenda Matures Into Major Force Driving Climate Action', 9 December 2015, <https://www.un.org/sustainabledevelopment/blog/2015/12/lima-paris-action-agenda-matures-into-major-force-driving-climate-action/>

<sup>27</sup> New Zealand – Ministry of Foreign Affairs and Trade, 'New Zealand–United Kingdom Free Trade Agreement', accessed 4 October 2022,

One example of a successful stakeholder engagement happened in Quintana Roo, Mexico where different civil society organizations (CSOs) started multiple initiatives.<sup>28</sup> For instance, regulatory responses jointly done by a CSO and the Interamerican Association for Environmental Defense resulted in the enhanced legal protection of a protected area. In the same way, multiple CSOs were actively involved in designing and constructing policy for reducing emissions from deforestation and forest degradation (REDD+) — a global framework created through the United Nations Framework Convention on Climate Change.<sup>29</sup>

## Drivers and Challenges of BCG Economy Solutions

The transition towards a sustainable future inspired by the BCG Economy requires not just safeguarding BCG Economy solutions from weak links but also supporting its key drivers. Policymakers can improve the success rate of BCG Economy solutions by strengthening three key elements that drive the BCG Economy: (1) the regulatory environment; (2) technology and innovation; and (3) stakeholder participation.

### Regulatory environment

BCG Economy solutions rely on a conducive regulatory environment to succeed. Such an environment is defined by two broad factors: (1) policy design; and (2) policy implementation. How economies design policies vary among each other since their intrinsic characteristics (e.g., demographics, culture, and political system) are also different. This has implications on policy implementation. For example, regulators can find it difficult to implement laws when these are based on the laws of other economies (or other jurisdictions, if domestic) that were not adapted properly to local circumstances.

Other factors such as the quality of coordination across government agencies, institutional capacity,

<https://www.mfat.govt.nz/en/trade/free-trade-agreements/free-trade-agreements-concluded-but-not-in-force/new-zealand-united-kingdom-free-trade-agreement/new-zealand-united-kingdom-free-trade-agreement-overview-2/>

<sup>28</sup> S. Baker et al., 'The Role of Civil Society Organisations in Climate Change Governance: Lessons from Quintana Roo, Mexico', *Journal of the British Academy* 9, no. 10 (2021): 99-126, <https://doi.org/10.5871/jba/009s10.099>

<sup>29</sup> UNFCCC, 'What is REDD+?', accessed 4 October 2022, <https://unfccc.int/topics/land-use/workstreams/redd/what-is-redd>

access to information, civic engagement, and degree of corruption can affect not just policy design but also policy implementation.<sup>30</sup> One common issue is policy silos, which happen when communication and coordination (links) among policymakers are weak. Policies may be good at empowering sector-specific regulatory bodies but, without a coordinating strategy, this could create sector silos that forego the benefits of synergy or possibly create unnecessary and wasteful duplication of efforts. Chile's Climate Change Framework Law provides a cohesive strategy for coordinating climate actions (Box 1).

Within environmental services, for example, safeguarding against policy silos is important since most APEC economies<sup>31</sup> were found to regulate such services through multiple agencies, both at the central and sub-central level.<sup>32</sup> Some economies were able to legally empower sub-central bodies but the rest had policies that were largely informal, non-existent, or not publicly available, with the degree of functional discretion also being unclear. This can be an issue since environmental services often involve multiple sectors such as health, transport, trade, and construction, among others.

### **Technology and innovation**

BCG Economy solutions will also require technology and innovation, especially access to the right technologies and expertise. Promoting access will involve dissolving a number of barriers to facilitate technological diffusion, especially from developed economies to developing ones. Such barriers can arise because of intellectual property rights (IPR) issues, trade barriers, global value chains (GVCs) constraints, poor access to technical and high-level human capital, problems in accessing credit, and restrictions to foreign direct investment (FDI), among others.<sup>33</sup> These barriers are just some of the reasons why innovation is concentrated in a few economies.<sup>34</sup> While emerging markets are seeing more technological diffusion because of globalization, it still remains below that of advanced economies.

<sup>30</sup> UNEP, 'Dramatic Growth in Laws to Protect Environment, but Widespread Failure to Enforce, Finds Report', 24 January 2019, <https://www.unep.org/news-and-stories/press-release/dramatic-growth-laws-protect-environment-widespread-failure-enforce>

<sup>31</sup> Except for Hong Kong, China; and Singapore.

<sup>32</sup> ITS Global Pty Ltd and the Australian APEC Study Centre at RMIT University, 'Survey of Regulatory Measures in Environmental Services', (Singapore: APEC, November 2016), [https://www.apec.org/docs/default-source/publications/2016/11/survey-of-regulatory-measures-in-environmental-services/toc/survey-of-regulatory-measures-in-environmental-services.pdf?sfvrsn=bb4b702d\\_1](https://www.apec.org/docs/default-source/publications/2016/11/survey-of-regulatory-measures-in-environmental-services/toc/survey-of-regulatory-measures-in-environmental-services.pdf?sfvrsn=bb4b702d_1)

### **Box 1: Chile's Climate Change Framework Law**

Passed on June 2022, Chile's Climate Change Framework Law establishes a conducive regulatory environment for BCG Economy solutions by institutionalizing three important policies. First, it decentralizes climate actions. For example, the law mandates each agency to formulate and implement climate change management instruments that enable progress monitoring (e.g., inclusion of specific and measurable targets).

Second, it creates measurable regulatory instruments. For example, the law institutionalizes an economy-wide carbon budget (with an emissions trajectory and intermediate goals), sectoral carbon budgets (with a specified maximum amount of GHG emissions in a given period), sectoral adaptation and mitigation plans, and regional or local climate action plans (e.g., strategic water resource plans for all of Chile's 101 river basins).

Third, it makes governance inclusive. Although the law created an overseeing body with the power to approve regulatory instruments, it also established sectoral committees that are each represented by scientists, civil society, academia, firms, and local government units, among others.

Source: R. Rios, 'Chile Adopts New Climate Change Framework Law: A Paradigm Shift', *Climate Law Blog*, 22 June 2022, <https://blogs.law.columbia.edu/climatechange/2022/06/22/chile-adopts-new-climate-change-framework-law-a-paradigm-shift/>

For BCG Economy solutions, the diffusion of environmental technologies is particularly important. However, about two-thirds of these technologies actually remain in market niches (e.g., electric vehicles), thereby limiting any potential benefit.<sup>35</sup> Moreover, technology diffusion rates are below average for some sectors, namely: (1) transport and mobility; and (2) agriculture, food, and hospitality, both being diffused at a rate of just 12.2 percent (Figure 5).

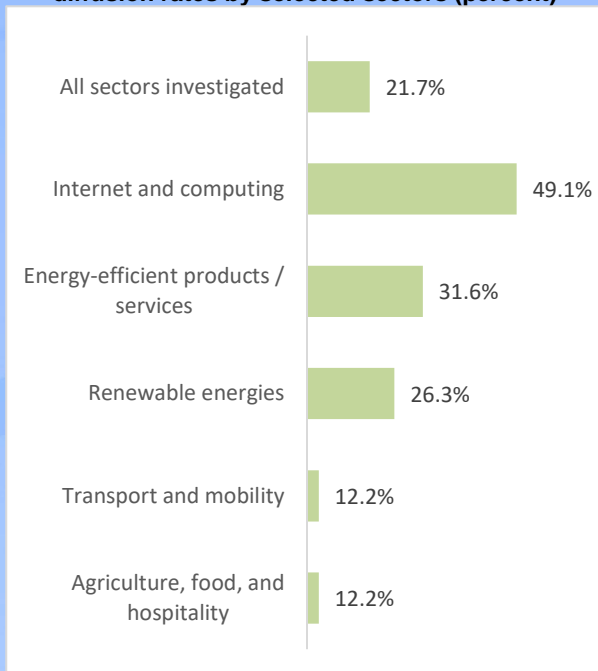
<sup>33</sup> K. Lybecker and S. Lohse, 'Innovation and Diffusion of Green Technologies: The Role of Intellectual Property and Other Enabling Factors', (Switzerland: World Intellectual Property Organization, 2015), [https://www3.wipo.int/wipogreen/docs/en/globalchallengesreport\\_lybecker\\_lohse.pdf](https://www3.wipo.int/wipogreen/docs/en/globalchallengesreport_lybecker_lohse.pdf)

<sup>34</sup> J. Eugster et al., 'Technology Diffusion and Global Living Standards', *VoxEU*, 12 June 2019, <https://voxeu.org/article/technology-diffusion-and-global-living-standards>

<sup>35</sup> K. Fichter and J. Clausen, 'Diffusion of Environmental Innovations: Sector Differences and Explanation Range of Factors', *Environmental Innovation and Societal Transitions* 38 (2021): 34-51, <https://doi.org/10.1016/j.eist.2020.10.005>



**Figure 5: Average environmental technology diffusion rates by selected sectors (percent)**



Note: Based on a total of 130 investigated cases.

Source: Adapted from Table 4 of K. Fichter and J. Clausen, 'Diffusion of Environmental Innovations: Sector Differences and Explanation Range of Factors'.

Technological diffusion is complex because it is influenced by different factors, which often involves different stakeholders' efforts coming together. Of course, the product or service itself is important, but other factors such as the adopter's degree of involvement throughout the innovation process or their characteristics (e.g., size, location, reputation, development level, human capital, and policy restrictions) are equally important.

Broader factors going beyond the firm also play a key role in technological diffusion. For example, different sectors can have different capacities to promote and sustain innovation activities (e.g., existence of industry trade associations lobbying for government funding), and different sectors can be characterized by various diffusion paths (e.g., dependencies to historical ties, competition, and network effects). The government also has a very important role in facilitating the successful diffusion

<sup>36</sup> S. Yeo, 'How the Largest Environmental Movement in History was Born', *Future Planet*, 22 April 2020, <https://www.bbc.com/future/article/20200420-earth-day-2020-how-an-environmental-movement-was-born>

<sup>37</sup> R. Eccles and S. Klimenko, 'The Investor Revolution', *Harvard Business Review*, 2019, <https://hbr.org/2019/05/the-investor-revolution>

<sup>38</sup> K. White et al., 'The Elusive Green Consumer', *Harvard Business Review*, 2019, <https://hbr.org/2019/07/the-elusive-green-consumer>

<sup>39</sup> G. Barboza, 'Endogenous Consumers' Preferences as Drivers of Green Corporate Social Responsibility', *Social Responsibility Journal* 15, no. 4 (2019): 424: 450,

of technologies, particularly through defining the regulatory environment and cooperating with firms.

### **Stakeholder participation**

Stakeholder participation is important to BCG Economy solutions since this can help communities gain more awareness that, in turn, changes people's mindset and creates a lasting impact on policy agendas. After all, only when people see the value of sustainability can they fully move towards it. For example, the grassroots movement Earth Day<sup>36</sup> started to bring environmental challenges into public consciousness (including lawmakers' agenda) in 1970. Its success inspired a movement that would last through the years, which is now celebrated by over 190 economies yearly.

Better community awareness can also lead to changes in consumer behavior, which then influences key players such as firms. For instance, a growing number of companies worldwide have become sensitive to greening consumer preferences that encouraged the adoption of responsible business practices and the integration of environmental, social, and governance (ESG) principles into business operations.<sup>37</sup> Likewise, communities can also promote sustainable practices through peer influence.<sup>38</sup>

However, peer influence and consumer behavior can only affect the market when information asymmetries are corrected.<sup>39</sup> For example, consumers may be unaware of the negative effects of purchasing a particular good or service due to greenwashing (i.e., a practice where firms actively market themselves as environmentally-friendly when they are actually not).<sup>40</sup> Similarly, consumers may be unaware that the price of indulging in the convenience of urban last-mile deliveries are more emissions, pollution, and traffic congestion.<sup>41</sup> Correcting these information asymmetries are relevant for BCG Economy solutions since promoting responsible consumption is a key driver of sustainability (e.g., households account for more than half of global food waste).

<https://doi.org/10.1108/SRJ-03-2018-0071>

<sup>40</sup> C. Edwards, 'What is Greenwashing?', *Business News Daily*, 6 August 2022,

<https://www.businessnewsdaily.com/10946-greenwashing.html>

<sup>41</sup> K. Whiting, 'Online Shopping is Polluting the Planet – But It's Not Too Late', *World Economic Forum*, 10 January 2020, <https://www.weforum.org/agenda/2020/01/carbon-emissions-online-shopping-solutions/>

In addition, promoting practice-based participation is important for gaining support from local communities in the context of environmental management projects. This includes activities such as regular information dissemination, stakeholder involvement in day-to-day activities, and inclusive participation in policymaking. In fact, estimates based on 92 biosphere reserves across 36 economies suggest that local residents become more supportive of these projects when they regularly receive information, join policymaking, and are allowed representation in management activities.<sup>42</sup> Resource users (e.g., farmers, fisherfolk, foresters, and hunters), meanwhile, are responsive only to increased involvement in day-to-day activities. This differentiated effect on stakeholders mean that participation requires different approaches to be effective.

### **Policy Approaches to Realize a Sustainable Future Inspired by the BCG Economy**

Realizing a sustainable future inspired by the BCG Economy requires policies that enable a conducive regulatory environment, improve access to technology and innovation, and promote inclusive and active stakeholder participation. However, it is important to recognize that policy interventions need to be contextualized to an economy's intrinsic characteristics for it to be most effective. A number of policy approaches have been identified below for policymakers to consider.

#### ***Strengthen institutions through good governance and sound regulatory instruments***

BCG Economy solutions rely on having strong institutions. One way of strengthening institutions is through good governance. This includes continuously upskilling government workers (e.g., through scholarship programs), establishing regular channels for coordination and idea-sharing across agencies (e.g., through joint councils or working groups, including representatives from the private sector, academia, youth, and other interest groups), or establishing an economy-wide coordinating strategy, among others. For example, Singapore's Green Plan 2030 guides different agencies to implement coordinated programs, such as revised carbon tax levels that are complemented by higher grant supports on energy efficient

<sup>42</sup> A. Roldan et al., 'Does Stakeholder Participation Increase the Legitimacy of Nature Reserves in Local Communities? Evidence from 92 Biosphere Reserves in 36 Countries', *Journal of Environmental Policy & Planning* 21, no. 2 (2019): 188-203, <https://doi.org/10.1080/1523908X.2019.1566058>

<sup>43</sup> Singapore – National Climate Change Secretariat, 'Good Progress Made on the Singapore Green Plan 2030 as Government Accelerates Decarbonisation and Sustainability Efforts', 8 March 2022,

technologies, thereby supporting firms amid higher carbon taxations.<sup>43</sup>

Expanding the available toolkit of sound regulatory instruments is also important. For example, policymakers can consider establishing an economy-wide carbon budget based on a target for carbon dioxide emissions (e.g., under the Paris Agreement) that is then allocated to sub-central units (sectoral carbon budgets) based on their implementation plans.

Structured policy reviews that are ingrained into the policymaking process are also useful instruments. For example, mandatory ex-ante regulatory impact assessments for projects of a certain threshold (e.g., value or breadth) can guide policymakers and safeguard the interests of local stakeholders. Such assessments can institutionalize guiding questions that evaluate a project's expected impact on communities and on local biodiversity, among others. Other structured policy reviews (e.g., cost-benefit analysis or ex-post impact evaluations) can then be applied at different levels, depending on the depth or sensitivity that the policy being reviewed requires. Policy reviews can be helpful to set legislative agenda, engage public opinion, identify possible win-win solutions and assist to fine tune policies, but these policy reviews are best done in the context of a transparent process by institutions with independence and clear mandates.<sup>44</sup>

Another way of strengthening institutions is through regional cooperation. While structural reforms are largely domestic in nature, economies can still benefit from sharing best practices among each other as institutions can learn from each other's experiences. APEC, for instance, is a considerable platform for this since structural reform has been an important component in APEC's long-standing agenda.

#### ***Provide investment opportunities to expand the renewable energy sector and niche markets***

Economies can provide investment opportunities that expand the renewable energy sector and niche markets such as electric vehicles. Particular to electric vehicles, governments can facilitate infrastructure investment in charging point stations or provide point-of-sale rebates and value-added tax exemptions that help reduce upfront costs,

<https://www.nccs.gov.sg/media/press-release/joint-media-release-by-nccs-mse-mti-mot-mnd-and-moe-good-progress-made-on-the-singapore-green-plan-2030-as-government-accelerates-decarbonisation-and-sustainability-efforts>

<sup>44</sup> P. Dee, 'The Role of Institutions in Structural Reform', *World Scientific Studies in International Economics*, (2013): 329-350, [https://doi.org/10.1142/9789814508759\\_0012](https://doi.org/10.1142/9789814508759_0012)

thereby encouraging consumers to purchase electric vehicles.<sup>45</sup> Other approaches such as feebates that penalize buyers of high-emitting vehicles and reward those of low-emitting ones can also be useful.

Expansion can also be done by supporting startups. Economies can help startups through encouraging investments in strategically-located labs with access to fabrication devices (e.g., digital printers and laser cutters).<sup>46</sup> Establishing innovation grants, improving access to affordable credit lines (i.e. low-cost financing), and providing access to critical information (e.g., public resources and government-sponsored research) are other ways to support startups investing in these sectors.

The development of these sectors could also be boosted by repurposing the utilization of public funds (without jeopardizing governments' fiscal position) by removing subsidies in sectors not contributing to sustainability and by introducing tax incentives. For instance, Thailand provides tax privileges such as tax reliefs (e.g., corporate income tax exemptions for eight years), lower tariffs on raw materials, and even 200 percent deductions on research and development expenses, among several others,<sup>47</sup> whereas Japan established a JPY 2 trillion Green Innovation Fund that will be complemented by decarbonization tax treatments (e.g., up to 10 percent deductions on the introduction of certain facilities) and financing options attractive to private investors (e.g., green bonds, transition finance, and innovation finance), among others.<sup>48</sup>

### **Foster foreign linkages among firms to facilitate technological diffusion**

Enacting policies that foster foreign linkages among firms will be useful for BCG Economy solutions, especially for sectors with relatively low environmental technology diffusion rates: transport and mobility; and agriculture, food, and hospitality. Foreign linkages, such as FDI and international trade, have been empirically observed to inspire product and process innovation,<sup>49</sup> horizontal (within industry) and vertical (backward or upstream) technology spillovers,<sup>50</sup> and technology transfers among firms.<sup>51</sup> Foreign linkages also have the ability to provide access to the right technologies and to promote cooperation and coordination among firms. Relaxing restrictions to FDI (e.g., market entry, ownership, and local content requirements) can be an important step to fostering these foreign linkages.<sup>52</sup>

Another key policy is to provide the necessary IPR to strike a balance between protecting innovations and facilitating technology transfers. Of course, this should be done together with proper enforcement practices. In addition, compliance to IPR regulations could be costly so regulators should be sensitive to domestic capacity to facilitate and to absorb innovations.<sup>53</sup> Technology diffusion will have little impact when those who need to receive it have insufficient financial and technical capacity to utilize those technologies.

### **Promote practice-based participation to gain local community support**

Stakeholders' practice-based participation in BCG Economy solutions (e.g., awareness through information dissemination, direct involvement in implementation, and inclusion in policymaking

<sup>45</sup> D. Sperling et al., 'Policy Options for Decarbonising Transportation in APEC', (Singapore: APEC, September 2022), <https://www.apec.org/publications/2022/09/policy-options-for-decarbonising-transportation-in-apec>

<sup>46</sup> I. Mundell, 'The Ecosystem: Fab Labs Can Also Make Startups', *Science Business*, 12 April 2022, <https://sciencebusiness.net/news/ecosystem-fab-labs-can-also-make-startups>

<sup>47</sup> C. Theparat, 'BoI Tackles BCG Economy Technology', *Bangkok Post*, 13 February 2021, <https://www.bangkokpost.com/business/2067487/boi-tackles-bcg-economy-technology>

<sup>48</sup> Japan – Ministry of Economy, Trade and Industry, 'Green Growth Strategy Through Achieving Carbon Neutrality in 2050', accessed 4 October 2022, [https://www.meti.go.jp/english/policy/energy\\_environment/global\\_warming/ggs2050/index.html](https://www.meti.go.jp/english/policy/energy_environment/global_warming/ggs2050/index.html)

<sup>49</sup> F. Quimba and S, Jr. Calizo, 'Impact of Foreign Linkages on Innovation Activity of Manufacturing Firms in CALABARZON', *Philippine Journal of Development* 44, no. 1 (2019): 71-94, [https://pidswebs.pids.gov.ph/CDN/PUBLICATIONS/pidspid2017-1\\_innovation.pdf](https://pidswebs.pids.gov.ph/CDN/PUBLICATIONS/pidspid2017-1_innovation.pdf)

<sup>50</sup> A. Fujimori et al., 'Technology Diffusion Through Foreign Direct Investment: A Unit-Level Analysis of the Indian

Manufacturing Industry', (Japan: Research Institute for Economic and Business Administration, Kobe University, July 2020),

<https://www.rieb.kobe-u.ac.jp/academic/ra/dp/English/DP2020-13.pdf>

<sup>51</sup> J. Jordaan, 'Producer Firms, Technology Diffusion and Spillovers to Local Suppliers: Examining the Effects of Foreign Direct Investment and the Technology Gap', *Environment and Planning A: Economy and Space* 49, no. 12 (2017): 2718-2738, <https://doi.org/10.1177%2F0308518X17731942>

<sup>52</sup> T. Makin, 'Advancing Foreign Investment in APEC', *Hinrich Foundation*, 24 August 2021, <https://www.hinrichfoundation.com/research/article/fdi/advancing-foreign-investment-in-apec/>

<sup>53</sup> R. Falvey and N. Foster, 'The Role of Intellectual Property Rights in Technology Transfer and Economic Growth: Theory and Evidence', (Austria: United Nations Industrial Development Organization, 2006), [https://www.unido.org/sites/default/files/2009-04/Role\\_of\\_intellectual\\_property\\_rights\\_in\\_technology\\_transfer\\_and\\_economic\\_growth\\_0.pdf](https://www.unido.org/sites/default/files/2009-04/Role_of_intellectual_property_rights_in_technology_transfer_and_economic_growth_0.pdf)

processes) is key to gaining local community support. One way of improving awareness is to conduct educational campaigns, especially among consumers and suppliers.<sup>54</sup> For instance, an intensive one-year university course offered in the United States<sup>55</sup> revealed that education had potential long-term influences that shifted consumer preferences and behavior towards pro-environmental decisions,<sup>56</sup> which also led to reduced individual carbon footprints. Reducing information asymmetries that consumers usually face also requires policies that mandate firms to fully disclose information about their goods and/or services' negative effects, for example, by introducing labeling requirements to include climate-related information, such as carbon footprints.

Promoting inclusive participation in crafting policies is equally important. This not only strengthens stakeholders' voice on matters that ultimately affect them but also gives them a tangible stake to ensure that policies are implemented successfully. There are some challenges to overcome though, including: increased demand on time and resources; regulatory capture; and risk of tokenistic engagement (i.e., superficial efforts that do not lead to anything substantial in the long-term).<sup>57</sup> One way of engaging stakeholders is to have in place transparency practices that could provide opportunities for joint initiatives, for participation of interested parties into the policymaking process, and for enhancing public support and reducing policy conflict.<sup>58</sup>

Engaging stakeholders can also require having solid legislative basis for their involvement. For instance, good regulatory practices often involve consultations with relevant stakeholders or include environmental impact assessments — both of which may require a clear legal basis to regularly enforce. This also prevents stakeholders from working in isolation that can possibly lead to inefficient time and resource allocation.

<sup>54</sup> J. Thogersen, 'Consumer Behavior and Climate Change: Consumers Need Considerable Assistance', *Current Opinion in Behavioral Sciences* 42 (2021): 9-14, <https://doi.org/10.1016/j.cobeha.2021.02.008>

<sup>55</sup> E. Cordero et al., 'The Role of Climate Change Education on Individual Lifetime Carbon Emissions', *PLoS ONE* 15, no. 2 (2020), <https://doi.org/10.1371/journal.pone.0206266>

<sup>56</sup> The study highlighted the difficulty of establishing causality between education and long-term behavior changes though the study presented strong insights between these two.

<sup>57</sup> N. Haddaway et al., 'A Framework for Stakeholder Engagement During Systematic Reviews and Maps in Environmental Management', *Environmental Evidence* 6, no. 11 (2017), <https://doi.org/10.1186/s13750-017-0089-8>

### **Support the expansion of BCG Economy solutions in APEC**

International cooperation and collaboration are integral to enabling BCG Economy solutions, which means that there is reasonable value in creating networks that connect multiple stakeholders across economies. For example, an ASEAN BCG Network was launched in January 2022, and it serves as a coalition of public, private, and non-government organizations that collaborate on key areas such as research, innovation, technology management, and commercialization, among others.<sup>59</sup> APEC can support this BCG Network by actively incorporating BCG Economy-related discussions into the agenda of relevant working groups and committees, supporting meaningful capacity-building projects, and designing policy guidelines to support reforms aiming to facilitate the development of BCG Economy solutions. Alternatively, APEC could consider setting up a separate working group to discuss environmental issues more specifically.

Another way that APEC can support the expansion of BCG Economy solutions is through a joint statement on the BCG Economy, similar to how APEC committed to advance women empowerment through the 2011 San Francisco Declaration<sup>60</sup> and to globalize micro, small, and medium enterprises through the 2015 Boracay Action Agenda.<sup>61</sup> These joint statements enabled APEC to chart new pathways together and provided an impetus for advancing individual and collective efforts on these areas.

Access to meaningful data and statistics, however, is essential for advancing and monitoring progress across all of these initiatives. Unfortunately, data on the BCG Economy remain limited, and this can prevent policymakers from making the best choices based on empirical evidence. It is worth noting that some indicators are based on traditional economic approaches that could be incompatible with the BCG Economy (e.g., GDP), thereby requiring some remodeling or creation of new indicators

<sup>58</sup> S. Baker et al., 'The Role of Civil Society Organisations in Climate Change Governance: Lessons from Quintana Roo, Mexico'

<sup>59</sup> NSTDA, 'About ASEAN BCG Network', 6 January 2022, <https://www.nstda.or.th/en/global-alliance/asean-bcg-network/about-asean-bcg-network.html>

<sup>60</sup> APEC, '2011 High Level Policy Dialogue on Women and the Economy', (Singapore: APEC, September 2011), [https://www.apec.org/meeting-papers/sectoral-ministerial-meetings/women/2011\\_women](https://www.apec.org/meeting-papers/sectoral-ministerial-meetings/women/2011_women)

<sup>61</sup> APEC, 'Boracay Action Agenda to Globalize MSMEs', (Singapore: APEC, 2015), [https://www.apec.org/meeting-papers/sectoral-ministerial-meetings/trade/2015\\_trade/2015\\_mrt\\_standalone](https://www.apec.org/meeting-papers/sectoral-ministerial-meetings/trade/2015_trade/2015_mrt_standalone)

altogether.<sup>62</sup> For example, Japan has begun its research on developing a green GDP measure that internalizes reductions in GHG emissions in its economic growth.<sup>63</sup>

## Concluding Remarks

Climate change is arguably the largest threat challenging mankind globally, and many other regional challenges are interlinked with it. This means that solutions cannot be siloed. Instead, solutions need to be cross-cutting, interconnected, and collaborative. This policy brief explored how the BCG Economy is a useful guiding framework in developing holistic solutions to these challenges. In particular, the BCG Economy reframes how development should be approached, rethinks how resources should be utilized, and reminds why inclusive and active participation is important for realizing a sustainable future. It is worth emphasizing that BCG Economy solutions allow interventions to close its loopholes. It does this by internalizing the effect of weak links (rebound effects) into the policy design itself, thereby strengthening policies that relied only on the bio-economy, the circular economy, or the green economy separately. However, the transition towards a sustainable future inspired by the BCG Economy requires not just safeguarding against these weak links but also supporting its key drivers: the regulatory environment; technology and innovation; and stakeholder participation. At the end of the day, everyone — policymakers, academia, businesses, CSOs, the youth, and other stakeholders — plays a key role in making sure that APEC can chart new pathways inspired by the BCG Economy, a future where succeeding generations can live better.

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<sup>62</sup> T. Siderius and K. Poldner, 'Reconsidering the Circular Economy Rebound Effect: Propositions from a Case Study of the Dutch Circular Textile Valley'.

<sup>63</sup> *The Japan Times*, 'Japan Takes Step Into Green GDP Research', 5 August 2022, <https://www.japantimes.co.jp/news/2022/08/05/business/kishida-green-gdp/>