Annex 3

Details of pre-conference survey result

There were three sets of questionnaires targeting three different stakeholder categories, namely:

- Standards Bodies
- Policymakers
- Industries/Businesses

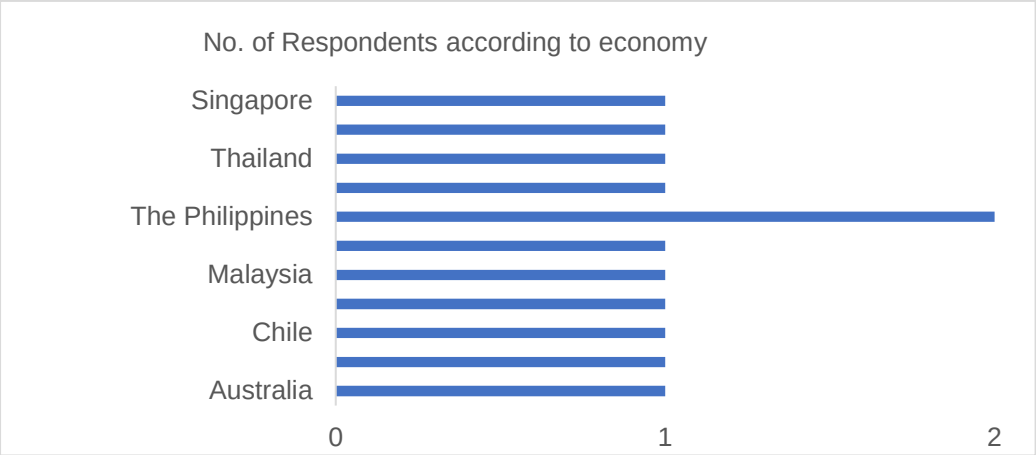
This Annex shows the details of the result of these three sets of surveys.

Survey 1 – Standards Bodies:

13th SCSC Conference: Standardization in Circular Economy for a more sustainable trade: Pre-conference survey results for Standard Bodies

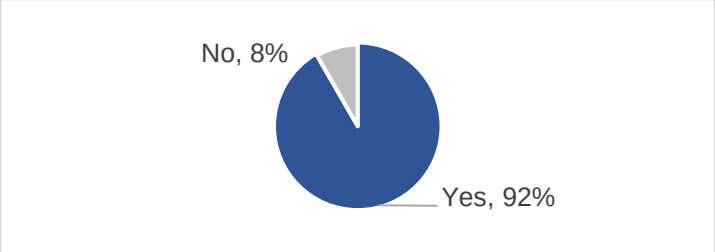
1. Respondent Profile:

N=12



2. Knowledge of CE Standards:

2.1 Awareness of CE initiatives

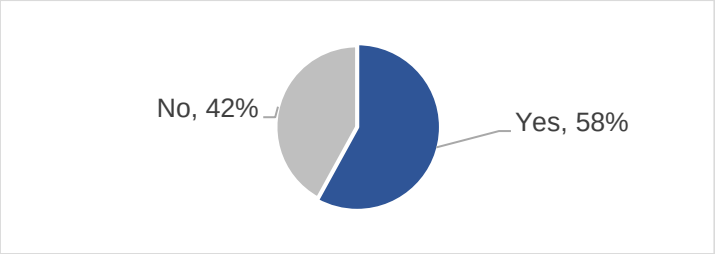


Examples of global CE initiatives:

Initiatives	Mentioned by
ISO/TC 323	6 economies
Ellen MacArthur Foundation initiatives	2 economies
EU Circular Economy Action Plan	1 economy
Global Alliance on Circular Economy and Resource Efficiency	1 economy
World Circular Economy Forum	1 economy
Underwriters Laboratories' CE standards	1 economy
Finland's road map to circular economy 2.0	1 economy
Transition Agenda Circular Economy - Netherlands	1 economy

The respondents found ISO/TC 323 being the most recognizable global CE initiatives in the APEC region, followed by Ellen MacArthur Foundation.

2.2 Awareness of global CE standards incorporated in government policies



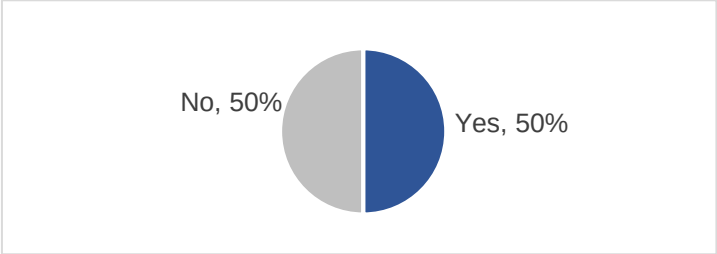
Examples of Global CE Standards:

Economy	Standards & Policy
Indonesia	ISO 14040 and 14044. These standards are adopted in the government regulations (Ministry of Environment and Forestry) to rate the environmental performances of a company.
Malaysia	1. MS 2697:2018 MOTOR VEHICLE AFTERMARKET - REPAIR, REUSE, RECYCLE AND REMANUFACTURE (4R) FOR PARTS AND COMPONENTS - CODE OF PRACTICE; National Automotive Policy 2020 (NAP 2020); Ministry of International Trade and Industry (MITI) 2. MS 2696:2018 MOTOR VEHICLE AFTERMARKET - SERVICE AND SPARE PARTS (2S) - CODE OF PRACTICE; National Automotive Policy 2020 (NAP 2020); Ministry of International Trade and Industry (MITI) 3. MS EN 643 (P) 2021 PAPER AND BOARD - EUROPEAN LIST OF STANDARD GRADES OF PAPER AND BOARD FOR RECYCLING; National Policy on the Environment (DASN/NEP); Ministry of Environment and Water (KASA) 4. MS EN 17085 (P) 2021 PAPER AND BOARD - SAMPLING PROCEDURES FOR PAPER AND BOARD FOR RECYCLING; National Policy on the Environment (DASN/NEP); Ministry of Environment and Water (KASA)
Singapore	1) SS EN 12620 Specification for aggregates for concrete 2) S 587 Management of end-of-life ICT equipment 3) SS 627 Specification for different grades of industrial recycled water from refineries, and petrochemical, chemical and utility plants 4) SS 628 Specification for compost used in agriculture and horticulture 5) SS 661 Specification for clean and green urban farms - Agriculture These standards are used to support government agencies in the use of sustainable building materials, recycling of ICT products and water and sustainable farming practices.
Thailand	Standards- Plastic recycling traceability and assessment of conformity and recycled content - requirement Policy - Action plan for plastic waste management Authority - Pollution Control Department
USA	UL 1974 on repurposing batteries. To support circular economy in EV batteries, New York's 2020 Uniform Fire Prevention and Building Codes allows use of storage batteries previously used in other applications, such as electric vehicle propulsion, if the equipment is refurbished by a battery refurbishing company approved in accordance with UL 1974 (https://www.nyserda.ny.gov/-/media/Files/Programs/clean-energy-siting/uniform-fire-prevention-building-code.pdf)

Findings:

- Strong evidence that standards have been playing instrumental roles in supporting policies in APEC region for partial CE components, processes, or product design such as environmental performances, repair, reuse, recycle, remanufacture, compost, etc.
- Sectors with interest in more than 1 APEC economies is Motor Vehicle, e.g., Malaysia and USA. Other sectors of interest are paper and board, construction materials, ICT equipment, agriculture, and plastic.

2.3 Awareness of CE standards practices by industries/businesses



Examples of Global CE Standards:

Economy	Standards and Industry adoption
Indonesia	ISO 14040 & 14044
Japan	ISO 14000. Japan Environment Association has developed a product certification scheme for environment-friendly products in accordance with a standard for low environmental impact products and/or services.
Malaysia	SIRIM ECO 001:2018 - ECO-LABELLING CRITERIA - BIODEGRADABLE AND COMPOSTABLE PLASTIC AND BIOPLASTIC
Singapore	1) SS EN 12620 Specification for aggregates for concrete 2) SS 587 Management of end-of-life ICT equipment 3) SS 627 Specification for different grades of industrial recycled water from refineries, and petrochemical, chemical and utility plants 4) SS 628 Specification for compost used in agriculture and horticulture 5) SS 661 Specification for clean and green urban farms - Agriculture The standards mentioned in the response to Question 10 are used by organisations in the building and construction, chemical, ICT recycling and farming industries.
USA	The Cradle to Cradle (C2C) standard is being used by many companies, such as in apparel & footwear. The complementary methods that will most likely be part of ISO 59020(Measuring Circular Economy) will include LCA, LCT, MFA, and economic and social tools. UL 2799 has been adopted by some companies, including Apple and its suppliers to support their environmental claim (https://www.apple.com/sg/environment/) in consumer electronics industry.

Findings:

- Industries have been adopting standards supporting related to different parts of CE components or processes, or sector/product specific standards
- Most appear to be voluntary adoption to show businesses' commitment to CE. Some of them are supported by public policies, e.g., the case studies in Singapore.

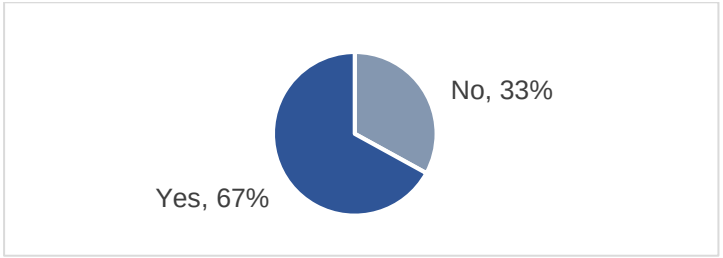
2.4 Importance of standards in the APEC region and their economies (open-ended):

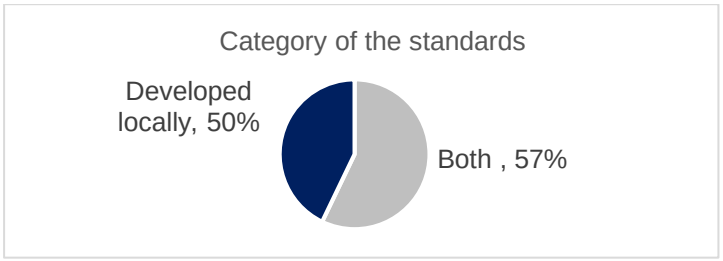
Respondents mentioned the following examples of international standards that are important to support APEC and their economy's priorities:

International Standards	No. of mention
ISO/TC 323 and its work items	6 economies
ISO/TC 207 and its standard e.g., ISO 14040, 14044, 14068	2 economies
ISO 15270:2008 Plastics — Guidelines for the recovery and recycling of plastics waste.	1 economy
Standards for products involving secondary materials to gain acceptance from consumers and stakeholders and would indeed reduce the generation of waste thru prolonged use of products.	1 economy

3. CE related activities in the economy:

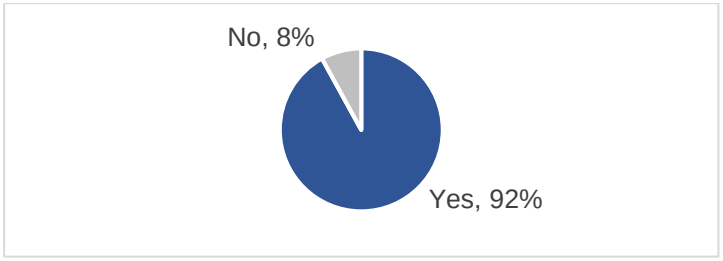
3.1 CE related standards developed in economy



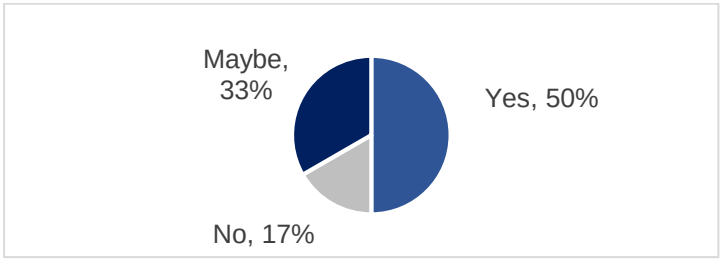


Number of standards developed	
Based on international standards	7
Developed locally	13

3.2 Participation of economies in the development of CE standards at an international level



3.3 Adoption of CE related international standards as local standards



Examples of CE standards adopted from existing international standards:

- **General comment:** While ISO/TC 323 is still developing standards, APEC economies are waiting for the standards for adoption locally.
- **Malaysia**
  1. MS ISO 15270:2008 (CONFIRMED:2017) PLASTICS - GUIDELINES FOR THE RECOVERY AND RECYCLING OF PLASTICS WASTE (ISO 15270:2008, IDT)
  2. MS ISO 14064-2:2007 (CONFIRMED:2013) GREENHOUSE GASES - PART 2: SPECIFICATION WITH GUIDANCE AT THE PROJECT LEVEL FOR

QUANTIFICATION, MONITORING AND REPORTING OF GREENHOUSE GAS EMISSION REDUCTIONS OR REMOVAL ENHANCEMENTS
3. MS ISO 14046:2017 ENVIRONMENTAL MANAGEMENT – WATER FOOTPRINT – PRINCIPLES, REQUIREMENTS AND GUIDELINES (ISO 14046:2014, IDT)
4. MS EN 643 (P) 2021 PAPER AND BOARD - EUROPEAN LIST OF STANDARD GRADES OF PAPER AND BOARD FOR RECYCLING
5. MS EN 17085 (P) 2021 PAPER AND BOARD - SAMPLING PROCEDURES FOR PAPER AND BOARD FOR RECYCLING

- **Singapore**
  1. SS EN 12620 Specification for aggregates for concrete

Examples of Locally Developed CE standards:

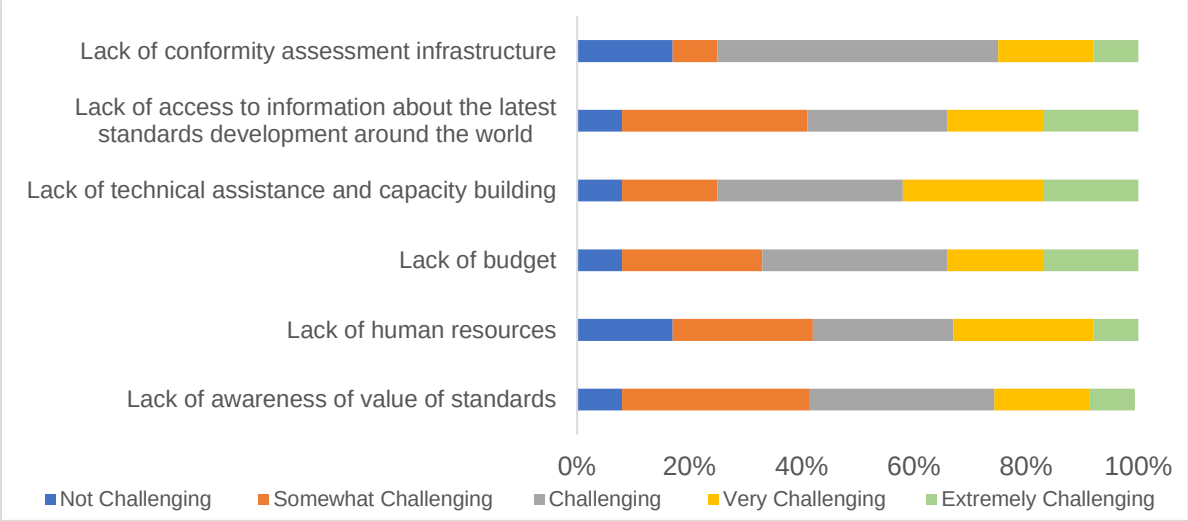
- **Indonesia**
  - ISO TC 323 in progress
- **Malaysia**
  - MS 2697:2018 MOTOR VEHICLE AFTERMARKET - REPAIR, REUSE, RECYCLE AND REMANUFACTURE (4R) FOR PARTS AND COMPONENTS - CODE OF PRACTICE
  - MS 2696:2018 MOTOR VEHICLE AFTERMARKET - SERVICE AND SPARE PARTS (2S) - CODE OF PRACTICE
- **Singapore**
  - SS 587 Management of end-of-life ICT equipment
  - SS 627 Specification for different grades of industrial recycled water from refineries, and petrochemical, chemical and utility plants
  - SS 628 Specification for compost used in agriculture and horticulture
  - SS 661 Specification for clean and green urban farms – Agriculture
- **Chinese Taipei**
  - Standards related to incorporation of reused materials into products such as cement and floor coverings.
- **Thailand***
  - Framework for implementing the principles of the circular economy in organizations – Guide
  - Circular Economy Management system for Organization-Requirement
  - Plastic recycling traceability and assessment of conformity and recycled content – requirement
- **USA**
  - UL 3600 Measuring and Reporting Circular Economy Aspects of Products, Sites and Organizations
  - UL 2799 Zero Waste to Landfill
  - UL 2809 Environmental Claim Validation Procedure for Recycled Content
  - UL 1974 Evaluation for Repurposing Batteries

* The title of these standards is identical to existing BS, AFNOR and EN standards, so they might be adoption, but TISI included them as locally developed.

4. Stakeholder engagement:

4.1 Challenges in encouraging stakeholder participation in the development of CE related standards

Rating of challenges in encouraging stakeholder participation in development of CE-related standards

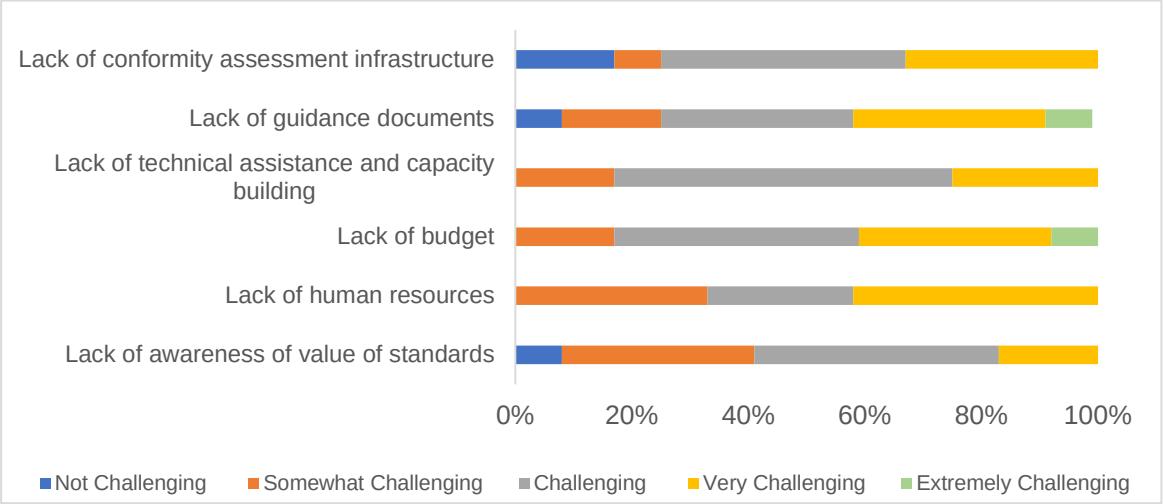


Commentary

- In addition to the challenges stated in the graph, respondents also highlighted language barriers and lack of government infrastructure to develop and administer CE as hinderances to increasing stakeholder participation.
- Lack of technical assistance and capacity building is deemed to be very or extremely challenging factors for encouraging stakeholder participation in CE standard developments, followed by lack of budget.

4.2 Challenges in encouraging stakeholder adoption of CE related standards

Rating of challenges in encouraging stakeholder adoption of CE related standards

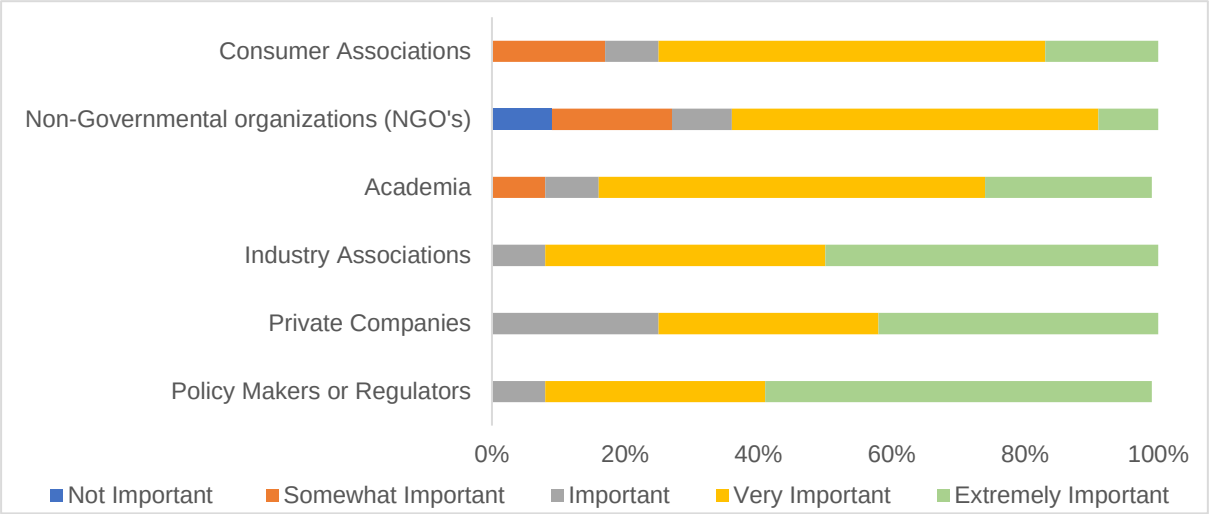


Commentary

- Lack of budget and lack of guidance documents were voted my majority as extremely or very challenging in encouraging stakeholder adoption of CE-related standards.

4.3 Level of importance for the following stakeholders to be engaged in circular economy standardization

Rating of level of importance for the following stakeholders to be engaged in circular economy standardization



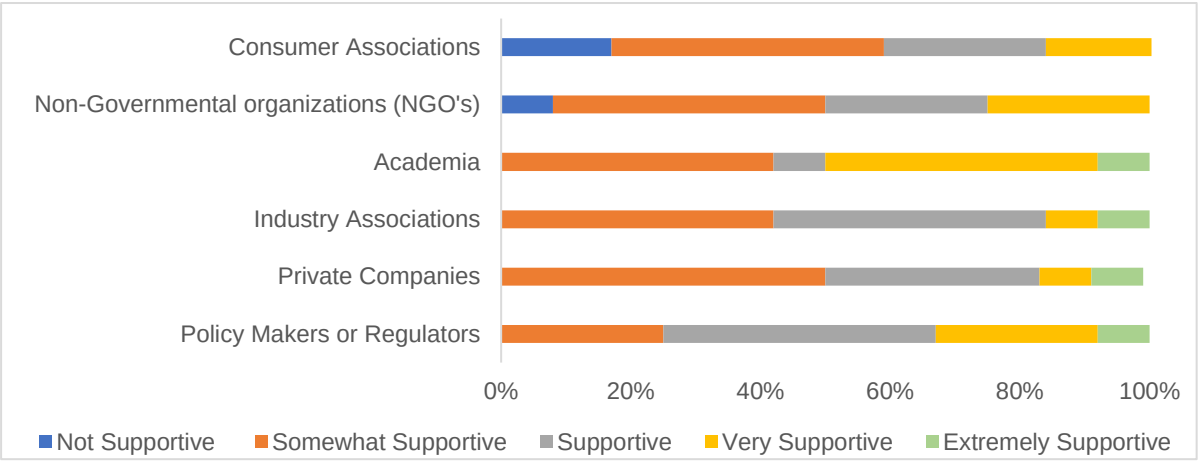
Commentary

- Policy makers or regulators are perceived as having the most important engagement among all stakeholders by majority of the stakeholder.

  Involvement of all stakeholder categories is found to be important. Even for the stakeholder category perceived to be the least important group, NGOs, over half of the respondent still think they are very to extremely important.

4.4 Level of support from stakeholders to participate and implement CE-related standards for CE priorities in the economy

Rating of level of support from stakeholders to participate and implement CE-related standards



Commentary

- Academia and policy makers/regulators are rated as very or extremely supportive among stakeholders in participating and implementing CE-related standards for CE priorities in the economies
- Consumer associations were ranked as providing lowest support

4.5 Steps to improve stakeholder participation and adoption of standards related to CE (open-ended)

- **Raise Awareness**
  - Standards bodies could organize awareness workshop to promote the standards related to CE to improve adoption of standards
  - Promote CE standards among the different stakeholder by highlighting the benefits of these standards
- **Increase Participation through supports**
  - Translation support to increase participation
  - Gather stakeholder participation through provision of support resources with a global clear policy
- **Education on standards**
  - There is a need to provide more education on the standards development processes, e.g., ISO, and increase understanding of how the resulting standards fill a need that can provide all economies - large and small - with the framework to impact CE for their regions.
  - Advocacy and comprehensive education hand in hand with establishing Government infrastructure to adopt and sustain CE initiatives
- **Relevance of standards and stakeholder engagement**
  - Standards need to be clearly written and have a clear target audience. Examples of a standard being used by a specific entity (e.g. government, corporation) with concrete evidence of success are the best way to encourage uptake of a standard.
  - Consultations with potential industries need to be done at the national level and collaboration between government-private sector is helpful as one of the initiatives to improve participation.

5. <u>Challenges to adopt international standards related to CE</u>

Respondents have identified the points below as the most common challenges (open-ended):

- **Global relevance and efficiency of international standards consensus building process**
  - Achieving consensus on key aspects of defining CE and determining metrics to circularity and progress toward UN SDGs are some challenges.
  - Diversity in different member economies (e.g. climate, culture, life style) should be well-reflected in the international standards on CE to facilitate adoption of such international standards by each member economy.
  - Speed of development of the ISO standards - the market need is growing however they are unlikely to be completed within the next 12 months
- **Inclusion to developing economies**
  - Compliance with the requirements of developing economies.
- **Disruption and readiness of industry**
  - Getting buy-in from potential industries to implement CE, cost of implementation & limitation of technology advancement
  - Acceptance from both development partners and consumers Shifting to new product design and change in business model requiring huge investments
- **Other domestic issues (stakeholder support and awareness)**
  - Lack of standards expertise, technical regulations, technology and identified stakeholders related to CE.
  - Low understanding and awareness about CE among policymakers.
  - The benefits of adoption will require all key players to adopt CE standards. However, it is challenging to bring a group of key players in the public and private sectors to collaborate and adopt the same CE standards in order to derive the benefits. There is not enough understanding and acceptance by businesses and organizations.
  - The CE is almost an exclusive private industry effort and the Government is not engaged in this private initiative.

6. Contribution of CE standards:

6.1 Contribution of CE-related standards to implementation of CE-related policies/government initiatives/roadmap/industry

Respondents commented the following as key examples:

- **Effective multistakeholder consensus building platform**
  - Standards allow governments and other stakeholders to be on the same page with respect to what a circular economy is or is not. Ideally, standards allow stakeholders to work with the same definitions and conceptual frameworks so that the current state of play can be assessed, and progress measured over time.
  - Through consultative and participatory approach
  - CE standards provide a way for industry to communicate improvements in products, processes, and organizations
- **Development of policies/government initiatives**
  - Used as one of the main references in developing CE-related policies/government initiatives
  - Acts as a catalyst for companies and organizations to make the transition to a more CE friendly society
  - Provides framework on how to implement CE related initiatives
- **CE standards as a common language**
  - International standards allow stakeholders to be on the same page in relation to CE as the same definitions and frameworks are being used
    - Provides a way for industry to communicate improvements in products, processes, and organizations
    - Enable government bodies and companies to take actions more easily towards the transition from a linear economy to a circular economy

6.2 Contribution of CE-related standards to trade

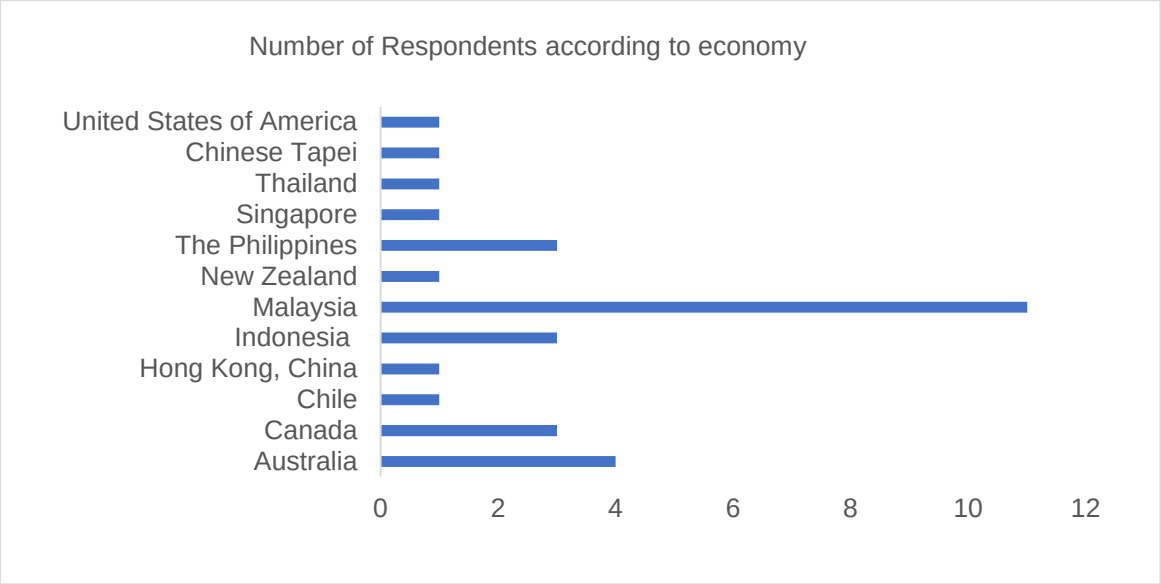
- **Enables a common understanding on CE**
  - CE related international standards will ensure a common understanding on CE terminology, principles and framework thus facilitating trade related to circular economy business model and value chain
- **Promotes value creation**
  - CE standards enable value addition for products, increase cost efficiency, reduce environmental pressures, improve resource efficiency and material usage
    - Increases transfer of recycled resources across the product value chain (i.e., end-of-life products, secondary materials/waste) from one economy to the other
  - Higher efficiency brought about by CE-related standards will lead to lower costs and gain support from consumers
- **Encourage sustainable and environmentally friendly practices**
  - Opportunity to integrate recycled/reusable raw materials into existing global supply chains across industries by:
    - Reducing the disposal of waste by diverting the waste as a resource in recovery activities
  - Standards will encourage incorporation of social and economic aspects along with environmental considerations as a path towards a more sustainable society.

Survey 2 – Policymakers/Regulators:

13th SCSC Conference: Standardization in Circular Economy for a more sustainable trade: Pre-conference survey results for Policymakers/Regulators

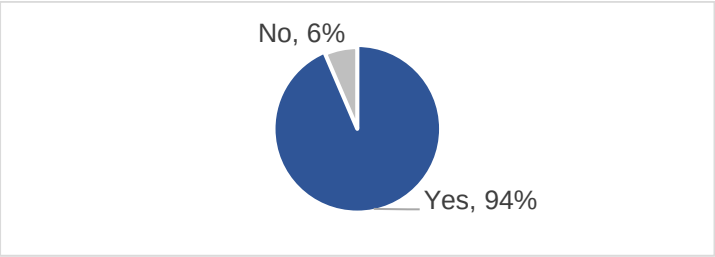
1. Respondent profile:

N=31



2. Knowledge of CE standards:

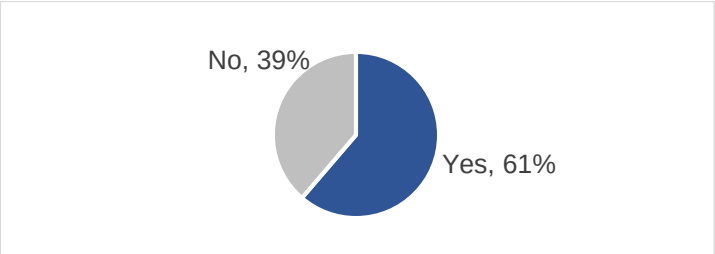
2.1 Awareness of Global CE initiatives



Examples:

- Ellen MacArthur Foundation
- Global Plastic Action Partnership
- Global Alliance on CE & Resource Efficiency (GACERE)
- Platform for Accelerating the Circular Economy

2.2 Awareness of CE related Standards

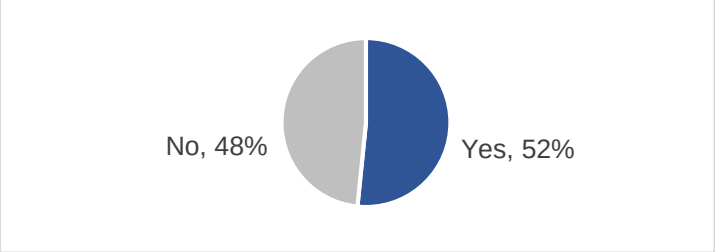


Examples:

- AS 5377
- The ISO/TC 323 Circular Economy
- ISO/TC 323 BS8001
- ISO 14001:2015 Environmental Management System
- ISO Standards on energy efficiency and conservation - ISO 50001 and 5000

3. CE-related activities in the economy:

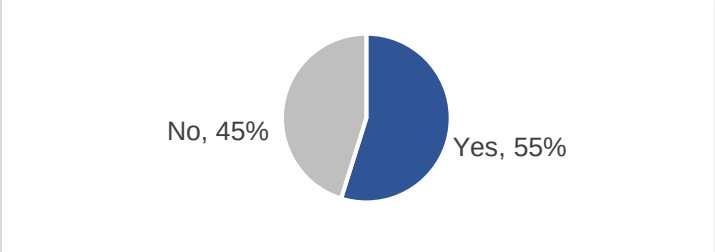
3.1 CE related roadmaps within economy



Examples:

- **Australia**: CSIRO - Circular Economy Roadmap
- **Hong Kong, China**: Waste Blueprint for Hong Kong 2035
- **Indonesia**: Guidance for plastic recycle, Extended Producer Responsibility 2020 - 2030
- **Malaysia**: Circular economy roadmap for solid waste management (under development), National Science, Technology and Innovation Policy, 10-10 Malaysia Science, Technology, Innovation and Economy Framework (MySTIE), Ministry of Science,Technologi and Innovation Strategic Plan 2021-2025 , Construction Industry Transformation Programme, National Agricommodity Policy, Circular Economy Roadmap for Plastics (being finalized), Pelan Halatuju Ekonomi Kitaran Sektor Plastik (Malaysia's Roadmap towards Zero Disposable Plastics, 2018 – 2030)
- **New Zealand**: National Waste Strategy
- **The Philippines**: Energy Efficiency and Conservation Roadmap 2017-2040
- **Chinese Taipei**: Circular technologies and advanced material R&D district, Green consumption and transaction. Energy and resource integration and industrial symbiosis, Demonstration circular industrial park (Dalinpu ,Kaohsiung)

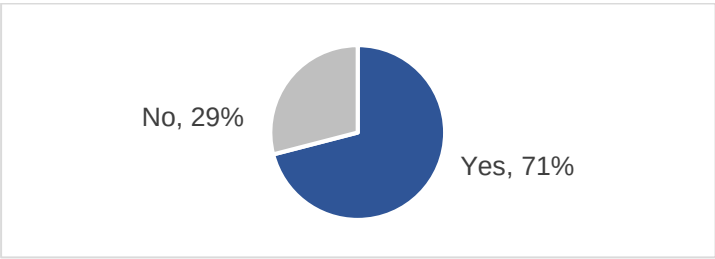
3.2 CE related policies/regulations under the economy's purview



Examples:

- **Australia:** Recycling and Waste Reduction Act 2020, National Food Waste Strategy, National Waste Policy
- **Canada:** Mining Value from Waste initiative, Circular Built Environment Roadmap
- **Malaysia** : Circular Bioeconomy Model, National Solid Waste Management Department, National Policy Statement on Radioactive Waste and Used Nuclear Fuels, Atomic Energy Bill, National Construction Policy 2030, National Cleanliness Policy
- **New Zealand**: Waste legislation review, Product stewardship/Waste minimisation act, Waste disposal levy
- **Thailand**: 1. Ban and reduce single use plastic in 5 years. 2. 100% recycle plastics use for new product in 10 years (No Plastic waste). 3. Renewable energy (biomass on agriculture waste) such biomass power plant. 4. Renewable material (bioplastic) tax incentive for composting plastic products.
- **The Philippines**: Department Circulars on Energy Efficiency and Conservation, Product & Sectoral Energy Performance Standards and Building Guidelines,
- **Chinese Taipei:** Enterprise assistance for several aspect. E.g: financial support, assist enterprise apply CE standards, Promotion for Circular Technology and Materials Innovation and R&D District

3.3 Other CE related government initiatives within the economy

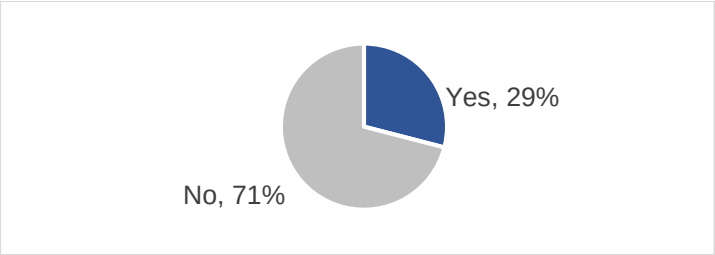


Examples:

- **Australia:** Government accreditation for voluntary product stewardship schemes, Minister's Product Stewardship Priority List, Food Waste for Healthy Soils Fund, Australian Recycling Investment Fund, Cooperative Research Centre Project Grants
- **Canada:** World Circular Economy Forum, Circular Built Environment and Design for Disassembly Initiative, R&D for carbon capture and utilization
- **Indonesia:** Ecolabel scheme
- **Malaysia:** Green Technology Financing Scheme, Malaysia Social Innovation (funding for research), Malaysian Carbon Reduction and Environmental Sustainability Tool, Sustainable INFRASTAR, Green Building Index, My Green Highway Index, Anaerobic Digester Composting 3R programme, Zero Waste Community, Value Food No Waste, Malaysia Sustainable Plastics Alliance (MASPA), Project on single use plastic prevention which look at the policy support on EPR, Investment in recycling infrastructure, Container return scheme

- **New Zealand:** Government's standardisation of kerbside collection systems and consumer package labelling
- **The Philippines:** Encouraging Energy Savings in households through Information, Education & Communication campaigns
- **Thailand:** Collect point on food delivery when you don't need plastic spoon or fork. Get discount for bring the own mug for take home coffee.
- **Chinese Taipei:** The Circular Economy Promotion Plan

3.4 CE related standards being incorporated in policies



Examples:

- ISO 14001:2015 - Environmental Management System
- ISO/TC323
- ISO 50001, 50002, 9001:2015

4. Contribution of CE related standards:

4.1 Contribution towards the implementation of policies/government initiatives/roadmaps (open-ended):

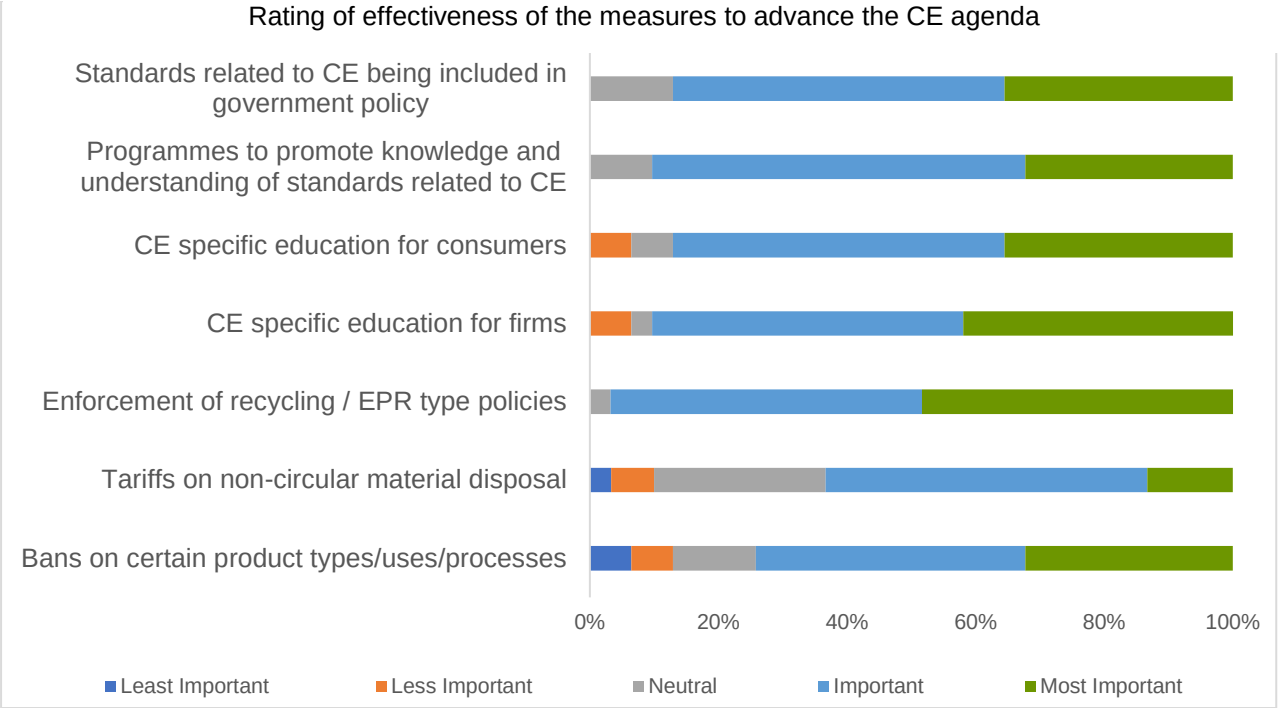
- Ensures uniform and successful implementation of policies between government bodies and enterprises
  - Play an important role in quality assurance which enhances customer protection and confidence while providing a framework for regulatory compliance and assessment
- CE related standards can act as a benchmark for targets in the policies/initiatives/roadmaps and translated into KPIs that can be monitored and improved over time
- CE related standards can define actions that help to turn policies into practice and helps to put into perspective the importance of CE for better appreciation of the implementer while also providing technical guidance on CE compliance obligations
- CE related standards ensures that the implementation of policies and initiatives are in accordance with certain principles and requirements that are applicable to all
- Provides better regulation and enforcement of initiatives as it is backed up by standards
- Acts as a basis for economy's comparison/benchmarking as standards are based on similar parameters or criteria
- Standards can facilitate comprehensive, economy-wide data to support consumer, investment and policy decisions

4.2 In policies/government initiatives/roadmaps to contribute to trade (open-ended):

- Provides an avenue for industry players to cooperate and collaborate and to reduce the over-consumption of natural resources as raw material
- Helps to open more markets as economies are transitioning towards production of products which are based on CE models

- Having CE related standards provides consistency in methods, transparency in process, material specifications for recycled materials, certainty of positive work and health safety outcomes to facilitate ease of trade between economies and acts as risk management
- CE standards can help to avoid unnecessary barriers to trade (i.e., regulatory differences)
- Potential for CE related standards to be translated as the commitment of the nation in ensuring sustainability of the economy which will help to increase investors' trusts and attract multilateral engagement and commitment in trade

4.3 Effectiveness of measures to advance CE agenda within economy:



Commentary

In addition to measures stated, respondents commented the need to incorporate incentives against these measures to create interest

- Promotions should also be used to create awareness of CE agenda in economies
- Enforcement of recycling/EPR type policies is the most effective measure for advancing CE agendas
- Bans on certain products/processes are considered the least effective way of advancing CE agenda

4.4 Types of standards needed to support CE related policies but are not yet available (*open-ended*):

- **CE activities not covered**
    - Standards regarding activities directly related to CE approach, for example:
        - Labels / certifications on products that satisfies he principle of CE related activities
        - Products which focus on downstream process (i.e., collection, storage, transportation, and treatment)
- **Extended Producer Responsibility (EPR) related**

    - Standards related to remanufacture, repair, reuse and upgrade specific material; standards for assessing recyclability and recoverability, standards for reuse components and recycled material content, standards to declare critical raw materials in products; stands related to material efficiency aspects.
- **Sector / Industry specific**
    - Development of sector / industry specific standards (i.e., industrial / technology sector) help guide implementation of the CE in enterprises and ensures greenwashing does not occur, example of sector / industries:
        - Emerging technology development on how to fulfil CE criteria
        - Chain of custody for recycling of plastics and specification for recycling of plastics in contact with foods
        - Chemical composition of Electric Vehicle batteries and the technology for reuse

5. Challenges and support required:

Respondents have identified the points below as the most common challenges faced while incorporating standards in policies (open-ended):

5.1 Key challenges:

- **Frequency of policy and focus change**
    - Development of policies are done in piecemeal, resulting in misalignment between government bodies and businesses
    - Policies often do not transcend the four-year term of governments
- **Commitment across different stakeholders**
    - Difficulty in coordination across stakeholders due to differences in types of business / level of development and adoption of these standards (i.e., compliance cost, relevance to the industry)
    - Ability to gain acceptance among policy makers and industry players
    - Resistance faced from manufacturers on standards required (transition period needed and concomitant costs of the transition)
    - Capability of industry players to comply with the standards
- **Harmonizing of regulations and messaging**
    - Large amount of effort required to harmonize standards and messaging due to variance in jurisdictional roles, responsibilities, and the application of standards on a broad range of products results in reluctance from industry to change process to accommodate standards
    - Difficulty in defining circularity and assessing effective means of increasing circularity due to complexity of supply chains and materials
    - Standards are unable to address certain topics related to technology due to the dynamic nature of the industry
    - Lack of dedicated government body to manage CE standards / policies in economy

5.2 Support required by Standardization Bodies to overcome challenges:

- **Provision of funding / incentives**
    - Provide funding to alleviate compliance cost (i.e., to low and medium sized enterprises
    - Support research initiatives
- **Engagement and communication with stakeholders**
    - Create awareness programs to communicate CE standards
    - Share best practices of other economies and examples of the application of standards at different level of development of CE
    - Engagement and consultation with stakeholders to understand types of standards that are urgently needed in accordance with the needs and requirements of their sector
- **Participation in policy development process**

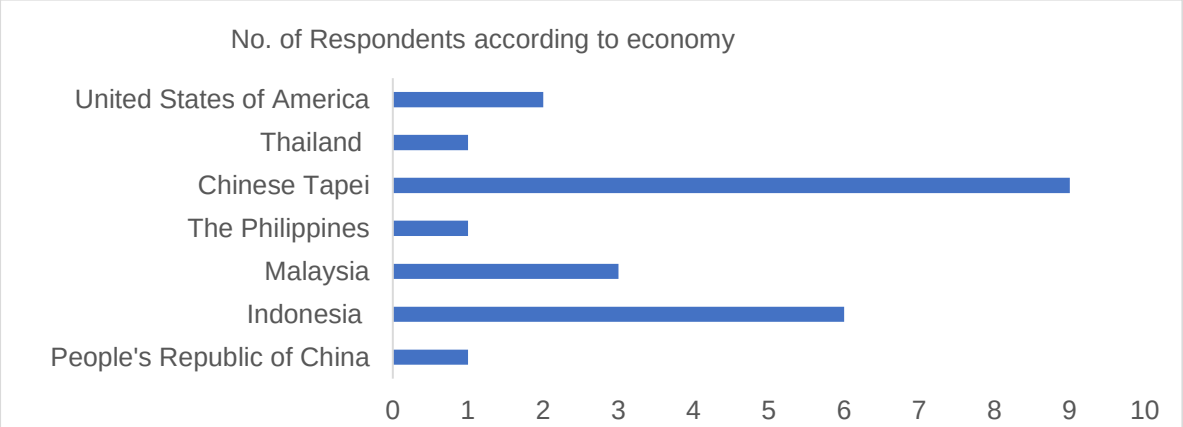
- Provide technical expertise in the policy development process to ensure standards requirement are addressed and implementable as well as verifiable
- Work with industry bodies to develop a uniform set of standards to guide sectors and progressively develop more comprehensive standards
- Provide consistence in labelling, recycling instructions, and messaging for households and for commercial and government purchasing will complement government efforts to facilitate the circular economy transition

Survey 3 – Industries:

13th SCSC Conference: Standardization in Circular Economy for a more sustainable trade: Pre-conference survey results for Industries

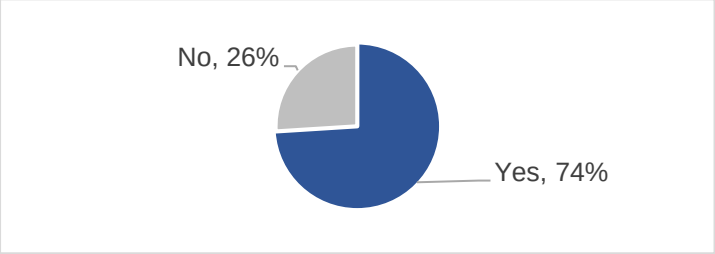
1. Respondent profile:

N=23



2. Knowledge of CE standards:

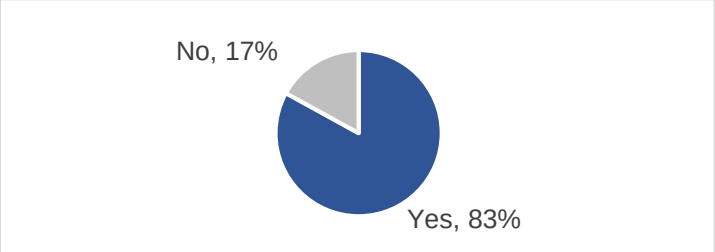
2.1 Awareness of Global CE initiatives



Examples:

- New Plastic Economy by the Ellen MacArthur Foundation
- The Plastics Pact
- ISO TC 323

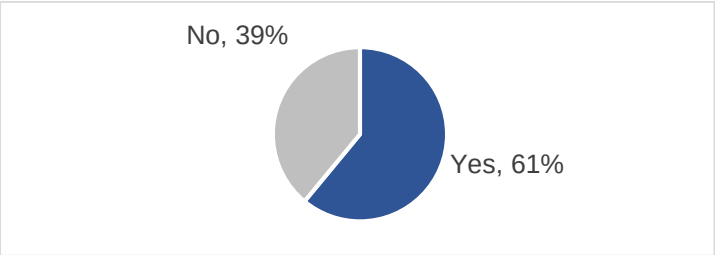
2.2 Awareness of CE related policies/government initiatives/roadmaps in economy



Examples:

- Indonesia
    - Regulation of the minister of Environment and forestry of the Republic of Indonesia No, 75/2019 concerning producer waste reduction road
    - Bappenas has published a report on the potential application of CE on several industrial sectors in Indonesia
- Chinese Taipei
    - Chinese Taipei government promotes “The 5+2 Industrial Transformation Program” which includes Smart Machinery, Biomedical, Green Energy, National Defence, and Circular Economy.
    - Chinese Taipei Office of Circular Economy.

2.3 Awareness of CE related standards

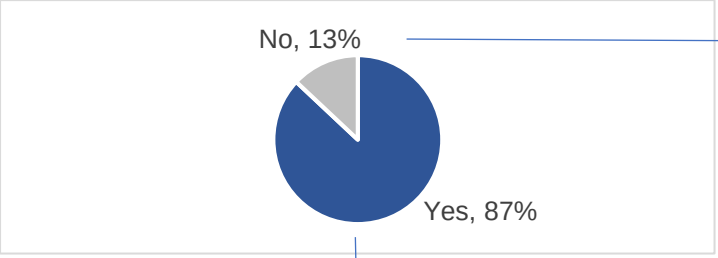


Examples:

- BS8001:2017
- ISO-TC-323
- ISO/WD 59004 - Circular economy- Framework and principles for implementation
- Global Recycle Standard
- GB/T 39200-2020 - Guide for circular economy evaluating—Thermal power industry

3. CE-related activities in the economy:

3.1 Involvement in CE related activities



Areas of Interest:

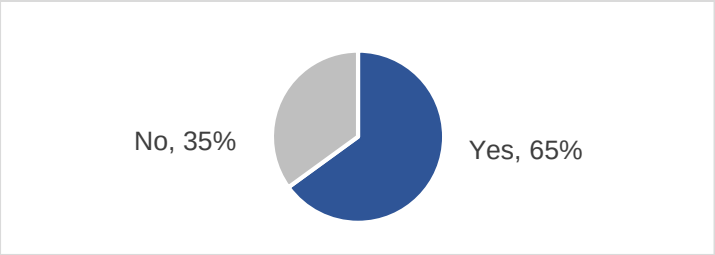
- Industrial Socialization
- IOT and Information Technology
- Developing CE-related activities in Chinese Taipei

Examples:

- Waste Management / Tackling Plastic Waste: Managing packaging waste; recycling and re-using waste material; utilizing recycled paper as paper raw material and optimizing industrial waste by utilizing it as new renewable energy; combines the ideas of recycling, coupons, and recycled products into a recycle platform
- Conducting Life Cycle Assessment, Research and Development on Environmentally Friendly Technology, Waste Recovery and Recycle Technology.

- Cooperate with other industry to use their waste as alternative fuel or material in cement manufacturing

3.2 Incorporation of CE related standards in business activities



Examples:

- New Plastics Economy Global Commitment Framework
- Implement Framework for implementing the principle of the circular economy in organizations guide by TISI
- ISO TC 207

4. Contribution of CE related standards

4.1. Contribution of CE related standards to business / industry (open-ended):

Respondents commented on the following examples:

- Facilitates sharing of best practices through standardization of design and manufacturing
- Acts as a framework / guidance to improve production process to ensure raw material is environmentally friendly
- Enables trust and acceptance of CE products

4.2. Contribution of CE related standards to facilitate business/industry to comply with policies/government initiatives/roadmaps (open-ended):

Respondents commented on the following examples:

- **Help facilitate the integration of CE practices into businesses**:
  - Help better prepare businesses/industries to comply with incoming/current regulations
  - Standards will provide guidelines on how CE will be implemented
  - CE standards serve as a reference point to align the understanding and implementation of CE practices
- **Provision of an evaluation system:**
  - CE standards can help to standardize the ways of treatment for specific industries (i.e., treatment of industrial wastewater)
  - Presence of CE related standards will facilitate trust of stakeholders / consumers of CE products

5. Challenges and support required

5.1. Challenges faced when incorporating CE related standards

Respondents

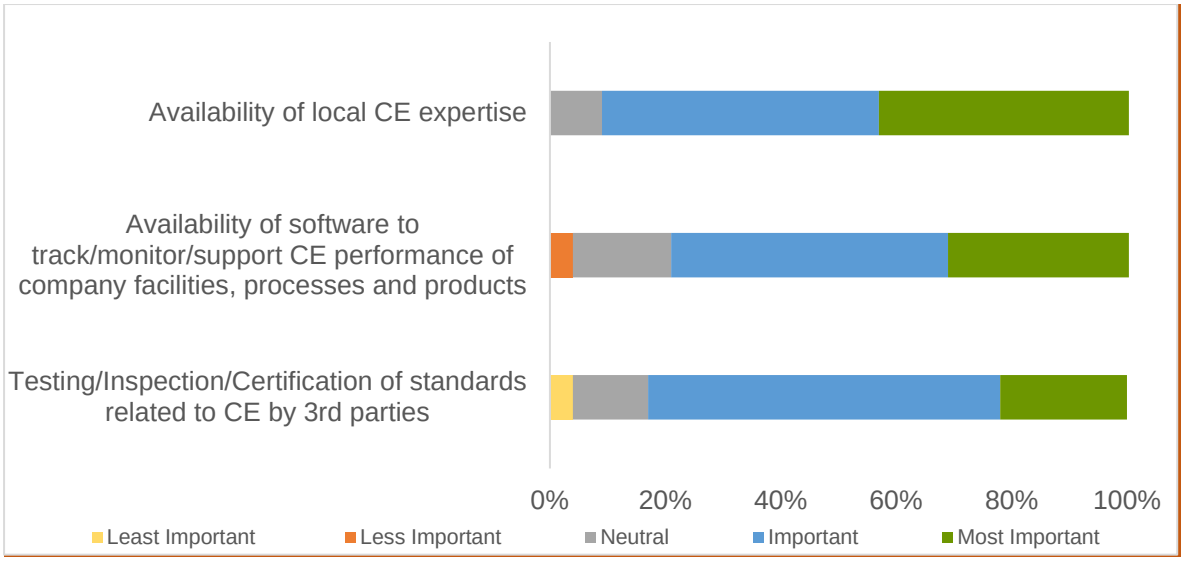
- **Cost and investment:**
  - Initial investment required to adjust to new business processes (especially for SMEs)
- **Business environment:**
  - Current business environment may not be feasible for the implementation of standards
  - Lack of availability of facilities / technology to support CE practices (i.e., recycling facilities for single-use plastics)
  - Market mechanisms need to be present to support and promote the development of CE related practices (i.e., favourable prices)
  - Industries and government need to have shared responsibility and accountability
- **Lack of standardization and understanding of CE related standards:**
  - Lack of standardization / understanding of CE definition which may create inefficiency
  - Lack of staff who understand CE related standards and how to implement the standard in the business activity
  - Lack of a complete CE standard framework for specific industries / uses (i.e., thermal power plants, and the treatment processes of these by-products

5.2. Support from Standardization Bodies to overcome challenges:
Standardization body provide support to overcome these challenges in the following ways:

- **Raising Awareness**
  - Creating awareness through workshops, technical assistance trainings, exhibitions, summits, conferences as well as educating on capacity building processes
- **Establishing a standardization body to guide firms**
  - Presence of a standardization body to smoothly implement and guide different firms in implementing standards
- **Evaluation of CE related trends**
  - Evaluating and predicting related CE trends to upkeep business growth and track benefits of standards

6. Non-policy enablers

Rating of importance of non-policy enablers for implementing standards related to CE in economy



<u>Commentary</u>

- Majority of the respondents perceived availability of local CE expertise as the most important non-policy enabler for implementing standards related to CE in their economy

as opposed to testing/Inspection/Certification third parties that were considered least important.

- In addition to the measures stated, respondents cited the following enablers as important:
    - Academia, pilot projects on implementation of CE Standard in Industry as important non-policy enablers.