

CIRCULAR ECONOMY
TRAINING AND CAPACITY
BUILDING WORKSHOP

STRENGTHENING THE IMPLEMENTATION OF A CIRCULAR ECONOMY IN INDONESIA



STAKEHOLDER MAPPING REPORT AND RECOMMENDATIONS FOR THE DIFFUSION OF CIRCULARITY INNOVATIONS IN SUPPORTING THE CIRCULAR ECONOMIC TRANSITION IN INDONESIA

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Table of Contents

1

Introductions 2

Background 3

Methodology 4

2

Mapping and Grouping based on the concept of Amoeba of Cultural Change 5

Innovation Diffusion Theory 6

The Concept of Amoeba of Cultural Change 9

Innovator 9

Change Agent 9

Transformers 10

Mainstreamers 10

Laggard 10

Reactionaries 10

Controller 11

Iconoclasts 11

Curmudgeon 11

Spiritual Recluse 11

Unidentified 11

Grouping of Stakeholders into the Amoeba Social System 12

Amoeba Grouping Business Actors & Non-Governmental Organization (NGOs) 13

Grouping of Amoeba Government Agencies 36

3

Mapping and Grouping based on Stakeholder Roles in a Circular Business Ecosystem (with 9R) 60

4

Recommendations for Stakeholder Relations Approach in Relation to the Diffusion Process of Circular Economy Innovation 66

Short-term 68

Medium-term 68

Long-term 68



Introductions

A

Background

The concept of implementing a circular economy has now been widely studied from various perspectives, explaining various things: conceptualization of circular economy principles, circular business models, supply chains, and implementation of circularity in various levels of business activities around the world. The results of these studies characterize a circular economy that focuses on technology implementation and environmental utilization. However, an analysis of stakeholder perspectives is also needed, which includes social aspects and social dimensions to complement the technical and environmental focus in implementing a circular economy.

Lieder and Rashid (2016) argue that mutual support from all stakeholders is needed to effectively implement the idea of a circular economy in society.¹ Moreover, the management of stakeholder relations and collaboration among supply chain members has been seen as a key success factor in the implementation of a circular economy.²

The transition to a circular economy is supported not just by technological advances, but also by socio-institutional conditions and resource quality. As a promoter of circular ecosystems, Potting provides three types of circular economy transitions related to the relationship between technology and socio-institutional conditions of society:³

1. Type 1 Transition

The transition to a circular economy will be determined by the introduction of a specific new technology at the center of the revolution (in other words, the use of core technology or core technology). Changes in social institutions are only required to allow for the introduction of new technologies in society. Examine the rise of bioplastic, which has just recently started to receive social acceptability.

2. Type 2 Transition

The circular economy transition through socio-institutional changes that are at the forefront and the use of technology is not as dominant as in the type 1 transition. Innovation to implement technology plays only a small role or even plays no role at all (innovation in core technology only develops bit by bit regularly). One example is the implementation of a store without packaging (bulk store).

3. Type 3 Transition

The transition to a circular economy is characterized by socio-institutional changes that are supported by enabling technology. In achieving this type of transition, the use of specific technology is no longer necessary. For example, the application of one of the circular business models: the sharing economy. This form of business model allows for the transition of changing consumer behavior from initially owning the product to 'only' buying the service. This change certainly involves social-institutional, but this is not possible without information technology to connect service providers and users.

¹ M. Lieder, A. Rashid, "Towards Circular Economy implementation: A comprehensive review in context of manufacturing industry," *Journal of Cleaner Production* 115 (2015).

² Gubta, S., Chen, H., Hazen, B., Kaur, S., Gonzalez, E. "Circular economy and big data analytics: A stakeholder perspective," *Technological Forecasting and Social Change* 7 (2019), pp. 466-474.

³ Potting et al., "Circular Economy: Measuring Innovation in the Product Chain," *PBL Netherlands Environmental Assessment Agency* (2017).

B

Methodology

The author distributes questionnaires to stakeholders who are divided into the government, business people, associations, and non-governmental organizations (NGOs) as parties who play an important role in the implementation of a circular economy. The questionnaires were distributed for four weeks from October 12 to November 5, 2021, via email and office visits to 133 target stakeholders, then 95 respondents were obtained. The purpose of the questionnaire is to get an overview of the initial understanding, actions, and expectations of several stakeholders regarding the implementation of a circular economy in Indonesia. Furthermore, this questionnaire is expected to be an input for the Ministry of National Development Planning of the Republic of Indonesia in formulating policies related to the circular economy and approaching related parties.

This report was prepared as the first step in making a circular economy transition starting with identifying the roles of stakeholders. In this report the mapping of stakeholder roles is carried out using two methods:

1. Mapping and grouping based on the Concept of Amoeba of Cultural Change

In general, the concept of Amoeba of Cultural Change from Alan AtKisson describes the division of stakeholder roles based on their position in a social system and their level of acceptance of innovation (in this case means a Circular Economy), this concept departs from Everett Rogers' theory of Innovation Diffusion.

2. Mapping and grouping based on the role of stakeholders in the circular business ecosystem

The roles and relationships of stakeholders in the supply chain cycle in the circular economy business ecosystem are mapped based on the 9R principle. The use of the 9R principle in the circularity approach is more comprehensive because it is based on the function of the product, whereas other circularity approaches only focus on the product.



2

Mapping and Grouping Based on the Concept of Amoeba of Cultural Change

A

Innovation Diffusion Theory

The theory of diffusion of innovation explains how a new idea or technology spreads in culture and social society. According to this theory, the diffusion of innovation is (1) an innovation (2) that is communicated through certain channels (3) over time (4) among the members of a social system. While innovation itself can be defined as an idea, practice, or object that is considered new by the individual or group that will adopt it.⁴

In this study, the circular economy in Indonesia is an innovation that will be disseminated into the social system in Indonesian society. The theory of diffusion of innovation is used as a framework for the analysis and formulation of recommendations so that the circular economy mainstreaming process can occur effectively and efficiently.

To disseminate innovation, it is important to recognize the classification of members in a social system based on the speed at which innovation is adopted, who adopts it first then the others. Rogers distinguishes it into five classifications: 1) Innovators, 2) Early Adopters, 3) Early Majority, 4) Late Majority, and 5) Laggards. Each group is interconnected with other groups to form a unique communication network.⁵

In terms of personality variables, early adopters in a system differ from later adopters. Early adopters have higher aspirations for formal education, higher status jobs, and so on, as well as greater

empathy, less dogmatism, greater ability to handle abstractions, greater rationality, greater intelligence, a better attitude toward change, greater ability to cope with uncertainty and risk, a better attitude toward science, less fatalism and greater self-efficacy, and higher aspirations for formal education, higher status jobs, and so on.

Finally, the adopter category has different communication behavior. Early adopters have more social participation, are more interconnected in their interpersonal network system, are more cosmopolitan, have more contact with change agents, are more exposed to mass media channels, and are more exposed to interpersonal communication channels, are more actively seeking information, and have greater knowledge of innovation, and a higher level of influence.

Understanding the classification of adopters in this social system is important to develop an effective

communication strategy for each classification so that critical mass can occur. Critical mass occurs when enough individuals in a system have adopted the innovation so that the next level of innovation adoption can take place on its own. If the critical mass does not occur in a short time, the next adoption process will weaken and fail.

The process of adopting a circular economy by a producer or consumer does not necessarily occur. Producers need time to seek information about the advantages and consequences of a circular economy. After knowing the advantages and benefits of a circular economy, producers still need time to take a stand against the innovation, and then decide to adopt or reject the new idea. After implementing the circular economy, producers will again need time to consider the continuation of the implementation of the circular economy they are doing. There are five stages that each individual goes through in making these decisions:⁶

1. Knowledge

The stage when individuals (or other decision-makers) are exposed to the existence of innovation and gain an understanding of its function. Parameters that influence individuals in absorbing knowledge about innovation are: 1) previous conditions (previous practice, perceived needs/problems, level of idea innovation, social system norms); 2) characteristics of the decision-making unit (socio-economic characteristics, personality variables, communication behavior)

⁴ Everett M. Rogers, *Diffusion of Innovations*, (Simon & Schuster, 2010)

⁵ *Ibid.*

⁶ *Ibid.*

2. Persuasion

The stage when individuals (or other decision-makers) after obtaining information and understanding the benefits of a circular economy, then form favorable or unfavorable attitudes towards innovation. An individual's persuasion is influenced by their perception of the characteristics of the innovation (relative advantage, compatibility, complexity, trialability, observability)

3. Decision

The stage when individuals (or other decision-makers) choose to adopt or reject a circular economy.

4. Implementation

The stage when the individuals (or other decision-makers) implement the new idea.

5. Confirmation

The stage is when the individual seeks reinforcement or confirmation of the decision to implement an innovation, but the individual can reverse their decision if influenced by ideas that contradict the innovation.

Appropriate communication channels need to be designed in such a way as to ensure an individual goes through all five stages. A communication channel is a means used to convey a message from a source to a receiver. Rogers categorizes communication channels (1) as interpersonal media or mass media and (2) originating from local or cosmopolitan sources (communication channels that are outside the social system being investigated). Mass media channels are means of transmitting messages involving mass media such as television, newspapers, and other social media, which allow a source or several individuals to reach a wide

audience. Interpersonal channels involve face-to-face exchanges between two or more individuals.⁷

Mass media channels are relatively more important at the awareness and knowledge raising stage, and interpersonal channels are relatively more important at the persuasion stage in the innovation decision-making process. Cosmopolitan channels are relatively more important at the knowledge stage, and local channels are relatively more important at the persuasion stage in the innovation decision-making process. Mass media channels are relatively more important

than interpersonal channels for early adopters than later adopters. The cosmopolitan channel is relatively more important than the local channel for early adopters compared to later adopters.

Furthermore, the innovation decision-making period is the length of time it takes an individual or organization to go through the innovation-decision-making process. The rate of increase in awareness and knowledge of innovation is faster than the rate of adoption. Earlier adopters have a shorter innovation-decision-making period than later adopters.

⁷ *Ibid.*

Innovations with the following five characteristics can increase individual beliefs and attitudes towards innovations to adopt them:

1. Relative Advantage

Innovation is considered relatively better than the previous ideas. The level of relative profit is often expressed in terms of economic benefits. In addition, the relative advantage can also be studied through the amount of savings, security, benefits for the environment, or its effect on the social position that will be received by the communicant as an adopter.

2. Compatibility

Innovations that are consistent with sociocultural values and beliefs, past experiences, and recipient needs are more acceptable. Innovations that are contrary to values and beliefs will be difficult to accept.

3. Complexity

The difficulty level of innovation to understand and use will affect people's willingness to adopt it. The more difficult it is for an innovation to be implemented, the longer the adoption process will take.

4. Trialability

When individuals can try an idea on a small scale and have a positive experience, the innovation is more likely to be accepted. Before an idea can be fully adopted, it must be properly evaluated.

5. Observability

When an individual can see (observe) the adoption of an innovation and its results, the likelihood of wishing to adopt it increases. If the impact of innovation can be observed, it will be more acceptable to adopt it.

In addition to the characteristics of the innovation, other parameters that affect the rate of adoption (the relative speed with which an innovation is adopted by members of a social system) are:

1. Decision-making style for innovation (optional, collective, authority/power)
2. At different stages in the innovation-decision process, the nature of the communication channels that spread innovation (mass media or interpersonal media)
3. The social system's structure (norms, degree of network connectedness, etc.)
4. To what extent are the change agents' efforts to spread innovation.

B The Concept of Amoeba of Cultural Change

Alan AtKisson (1999) describes the condition of a social system in achieving and implementing an innovation that can be analogous to the condition of an Amoeba. Achieving this innovation, requires the cooperation of all members of the social system, as all parts of the Amoeba's body will move together to reach its food.⁸ Amoeba is a description of several parameters at once described in the Diffusion Theory of Innovation Everett Rogers, so this concept is used as a framework for classifying adopters in social systems.

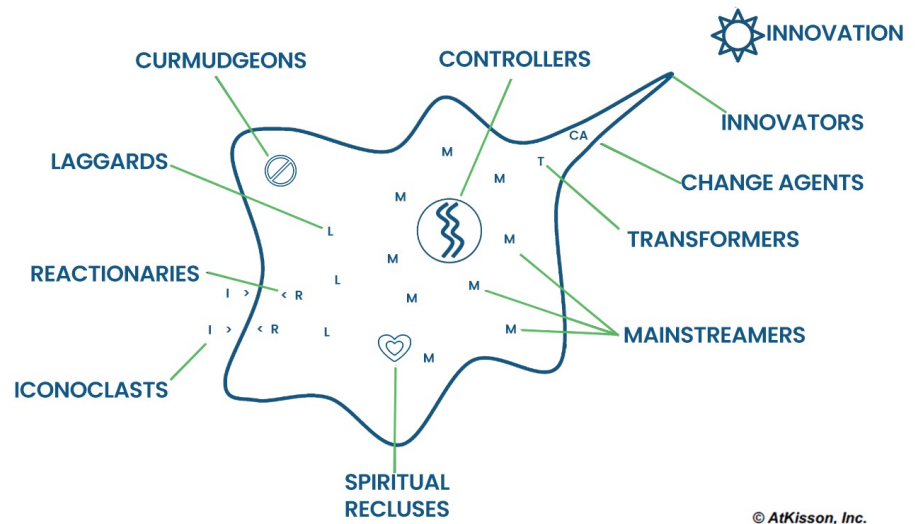


Figure 1. Depiction of Amoeba as a System of Social Change
Source: AtKisson (1999)

The classification of adopters in the social system by analogy to the Amoeba of Cultural Change is grouped as follows:

1. Innovator

Innovators are individuals or organizations who create, discover, or initiate a new idea (innovation) – in this case, the circular economy. However, in general, Innovators have difficulty translating the concept of innovation and selling the idea. Therefore, Innovators need Change Agents to translate and find new ways to explain the circular economy concept in a comprehensive language, so that other stakeholders can believe in the benefits of implementing a circular economy.

2. Change Agent

Change Agents are individuals or organizations who absorb circular economy ideas from Innovators and then find new ways to communicate the circular economy to others. Change Agent “repackages” the idea of a circular economy so that it’s easier to convince people to try or adopt it. This group is an organization founded with a business model according to a circular economy or can encourage other parties to implement a circular economy. For Change Agents to influence other stakeholders to start implementing a circular economy, a ‘stage’ is needed so that they can voice innovation more in the five innovation acceptance criteria.

⁸ Alan AtKisson, *Believing Cassandra*, (Scribe Publications, 1999)

3. Transformers

Transformers are influential (large and/or reputable) producers or consumers (can be individuals or organizations) who are interested in implementing a circular economy. Once they implement an innovation, others are likely to follow suit. Transformers tend to be busy but interested in listening to innovations. This group is a stakeholder who is interested in implementing a circular economy, and/or has started to be involved in a circular economy forum or community. In the questionnaire, stakeholders belonging to the Transformers group stated that they are interested in implementing a circular economy, are interested in being involved in circular economy forums/communities, have plans for implementing a circular economy, and/or are interested in participating in training on circular economy. In addition, their interest can also be seen in the publication of their plans related to the circular economy.

For Transformers to be interested in understanding and starting to adopt a circular economy, it takes an approach that focuses on their pain points and priorities to convey how the circular economy can help achieve their priorities. In addition, it is also important to approach Transformers by involving Change Agents that are following their business sector.

4. Mainstreamers

Mainstreamers are producers or consumers in general, who implement a circular economy if the incentives are visible and have seen many stakeholders starting to implement (early and late majority). Stakeholders who fall into the Mainstreamers category at first tend to find it difficult to understand an innovation because the innovation is still less common, but actually, they will be interested if Transformer has implemented it and the incentives are visible. In the questionnaire, Mainstreamer stated that he needed incentives to start implementing a circular economy in his agency.

For Mainstreamers to understand innovation, an approach is needed that explains the circular economy as simply as possible, and it requires an emphasis on incentives for implementing a circular economy (from the government or controller) compared to general or existing concepts (in this case, Linear Economy).

5. Laggard

Laggards are producers or consumers who do not reject circular economy innovations, but only want to start implementing them when they have to (because of regulations). They are the last stakeholders to implement a circular economy because they feel that what they are doing today (business-as-usual) is still good and still provides them with benefits, and the absence of regulations governing the circular economy makes them not interested in implementing it. In the questionnaire, Laggard stated that he needed government regulation to start implementing a circular economy in their institute.

The laggard is better not to be intensively involved in the implementation of a circular economy in Indonesia, because when the majority of the system has begun to shift to implementing a circular economy, Laggard will eventually follow suit. However, to encourage Laggard to implement a circular economy, it is necessary to emphasize regulation by involving technical ministries.

6. Reactionaries

A reactionary is a producer or consumer who refuses to implement a circular economy and tries to hinder its implementation because it is considered detrimental (financial, power, or psychological). In the questionnaire, the Reactionary stated that it was not the time for Indonesia to implement a circular economy. Reactionary is better not to be involved intensively in efforts to implement a circular economy because its contradictory actions will make the efforts made less efficient and not on target.

7. Controller

A controller is a person or mechanism that establishes rules so that producers or consumers are willing or able to implement a circular economy. Stakeholders belonging to the Controller category have the authority to make conducive policies and coordinate with various policy makers so that Indonesia can move to implement a circular economy within a certain time. In companies, they are the leaders (BOD, CEO), and in government, they are the officials who enforce the rules.

For the things done by the Controller to be effective, it requires coordination and clear goals for implementing a circular economy in Indonesia, emphasizing incentives from the circular economy to attract the attention of Mainstreamers, and making regulations to convince Laggard.

8. Iconoclasts

Iconoclasts are stakeholders outside producers/consumers (NGOs, academics, mass media, activists, and individuals) who strongly criticize all parties who run a Linear Economy (waste of natural resources, hedonistic lifestyle, etc.) They attack producers and consumers who do not agree with the circular economy, but sometimes also criticize Change Agent if Iconoclast does not agree with the innovations brought. These groups are critics, not idea-generators, so they tend to attack the leading parties.

Their role is to point out the problems of business-as-usual practice, this activity can motivate change in the majority of stakeholders. If the activities that Iconoclast is doing are running effectively, this group can distract the Reactionary which can then launch the Change Agent activity.

9. Curmudgeon

Curmudgeons are producers or consumers who have tried to implement a circular economy, but they failed in the process and then they became pessimistic about the circular economy and tended to refuse. Curmudgeon is also better not to be intensively involved in efforts to implement a circular economy.

10. Spiritual Recluse

A spiritual Recluse is an individual or organization that focuses on long-term issues related to vision, ethics, and beliefs. They can help shape public opinion (opinion leaders, influencers), but they may not. To implement a circular economy, involving a Spiritual Recluse that supports the implementation of circular economy will greatly help encourage other stakeholders.

11. Unidentified

Stakeholders who fall into the unidentified category are those who have not seen their contribution and direction to implementing a circular economy so that in the context of a circular economy they cannot be grouped into other amoeba groups. In the questionnaire, others stated that they do not yet have a target for implementing a circular economy in institutions.

An understanding of the character of each group above is useful for choosing which groups need to be involved first and the approach that should be used. In the early stages of innovation diffusion, it is important to involve change agents, transformers, and controllers. Change agents are important because they can communicate, improvise, and modify innovations in such a way that it is easier for adopters to understand and implement. That is, change agents are parties who can improve the five characteristics of innovation (see the explanation in the previous section) so that it is more convincing for individuals to want to adopt it. Transformers are the main target of change agents. They are influential producers and consumers who at a very early stage had an interest in circular economy innovation. With or without the help of change agents, they then implement it and because of its great influence, then influence other producers and consumers (mainstreamers) to also adopt a circular

economy. Controllers need to be involved from the start to encourage the diffusion of circular economy innovations with clear rules of the game, including incentives or disincentives.

The stakeholders that have been previously identified in this study are then grouped based on the characteristics of the classification of innovation adopters above. Stakeholders who fall into the unidentified category are those whose activities are related to the environment or related to the activities of other stakeholders, but do not influence or are directly influenced by efforts to mainstream the circular economy so that they are considered irrelevant at this time.

The concept of Amoeba of Cultural Change applies to various innovations, but it is very relevant to topics of environmental sustainability because in overcoming environmental problems through innovation, cultural change is required. However, no matter how great

and important innovation is for the welfare of mankind, the innovation will not be able to create change if the innovation is not diffused. Therefore, it is necessary to map stakeholders in a system, because each stakeholder has a different role in the innovation diffusion process.

It should also be noted that to create a big change (in this case the transition to a circular economy), changes cannot occur all at once, in the sense that a special approach is needed such as knowing which stakeholders need to be involved (who are open to innovation) and which ones should be involved. Excluded (which rejects an innovation). Understanding the concept of Amoeba Cultural Change is important to spread the concept and practice of a circular economy which is a holistic innovation, as well as to promote the combination of new ideas and technologies.

C

Grouping of Stakeholders into the Amoeba Sosial Social System

In general, there are two major groups of stakeholders whose roles are identified in a social system: 1) Business Actors and NGOs; and 2) Government Agencies. This is done to see and describe their contribution to circular economy innovation as a whole and follow the conditions that occur in the field.

The identification of the role of stakeholders below uses several criteria from the results of processing the questionnaire as primary data. In addition, identification of the role of stakeholders is also carried out using secondary data, namely the results of

desk research regarding the real role of each stakeholder in contributing to realizing the circular economy transition in Indonesia. From the two data sources, further grouping is done by adjusting the definition of each role of members of the social system in the concept of Amoeba of Cultural Change.

In this analysis of amoeba grouping, it should be emphasized that the analysis is dynamic. This is because, in line with stakeholders starting to move to implement a circular economy, the grouping will change. Therefore, this analysis document is a living document

and the grouping is subject to discussion, according to the current situation.

The results of this grouping are based on questionnaires distributed for four weeks from October 12 to November 5, 2021, via email and office visits to 133 target stakeholders, and then obtained by 95 respondents (consisting of 44 private respondents and 51 government respondents). In addition, grouping is also carried out based on desk research conducted from November 20, 2021, to February 14, 2022.

1. Amoeba Grouping Business Actors and NGOs

Table 1. Amoeba Grouping Business Actors and NGOs: Food and Beverage Business Sector

Amoeba Group	Agency Name	CE implementation and targets under development (based on questionnaire)	Desk Research Results	Recommended contributions to the implementation of a circular economy
Change Agent	Garda Pangan	All product packaging used must be recyclable or returned to us as the manufacturer.	A form of business that uses a circular economy model, namely donating excess food that is still feasible to avoid food waste. ⁹	<ul style="list-style-type: none"> Organize activities or public outreach about CE (example: webinars) Join an association/community that promotes CE Provide training on CE to the public Create a joint work unit that focuses on discussing CE issues with other agencies Collaborate with other business sectors to implement CE initiatives Collaborate with other institutions (eg NGOs, research institutions) to carry out CE initiatives
	Foodbank of Indonesia	Manage food donations that can no longer be consumed to be used as animal feed and fertilizer. The CE target that is being developed is the management of household organic waste on a community scale to be managed as a medium for food production in the community.	A form of business that uses a circular economy model, which is to help save excess and potentially wasted decent food, perform quality control, food storage (warehousing), and food distribution to vulnerable people who need assistance, especially children and the elderly who need assistance. displaced. ¹⁰	<ul style="list-style-type: none"> Organize activities or public outreach about CE (example: webinars) Join an association/community that promotes CE Provide training on CE to the public Create a joint work unit that focuses on discussing CE issues with other agencies Initiating forums or activities that bring together stakeholders Collaborate with other business sectors to implement CE initiatives Collaborate with other institutions (eg NGOs, research institutions) to carry out CE initiatives
	Agrodite	<i>Not filling out the questionnaire</i>	A form of business that uses a circular economy model, namely monitoring and evaluation, research, programs, and training related to the circular economy in agriculture. ¹¹	<ul style="list-style-type: none"> Organize activities or public outreach about CE (example: webinars) Join an association/community that promotes CE Educating the public through social media Provide training on CE to the public Initiating forums or activities that bring together stakeholders Work with communities to implement CE initiatives

⁹ Garda Pangan, "About Us", Garda Pangan, accessed on January 16, 2022 <https://gardapangan.org/tentang-kami/>.

¹⁰ Foodbank of Indonesia, "Tentang FOI", Foodbank of Indonesia, accessed on January 16, 2022 <http://foodbankindonesia.org/siapa-kita/tentang-foi/>

¹¹ Agrodite, "Innovation in Farming", Agrodite, accessed on January 16, 2022 <https://agrodite.com/>.

Change Agent	DamoGO	<i>Not filling out the questionnaire</i>	A form of business that uses a circular economy model, namely by optimizing the food production process in restaurants with applications to estimate food material needs, as well as connecting food ingredients suppliers to avoid food waste. ¹²	<ul style="list-style-type: none"> Organize activities or public outreach about CE (example: webinars) Join an association/community that promotes CE Provide training on CE to the public Create a joint work unit that focuses on discussing CE issues with other agencies Attend a conference to discuss CE implementation in Indonesia Initiating forums or activities that bring together stakeholders Collaborate with other institutions (eg NGOs, research institutions) to carry out CE initiatives
	Surplus (PT Ekonomi Sirkular Indonesia)	<i>Not filling out the questionnaire</i>	A form of business that uses a circular economy model, namely by connecting restaurants with consumers to sell unsold decent food to avoid food waste. ¹³	<ul style="list-style-type: none"> Join an association/community that promotes CE Provide training on CE to the public Create a joint work unit that focuses on discussing CE issues with other agencies Initiating forums or activities that bring together stakeholders
Transformers	PT Nestlé Indonesia	Has carried out mapping to optimize efforts that can be made in implementing greenhouse gas emission reductions along the business chain, to achieve net-zero emissions by 2050.	A form of business that is currently starting to develop a circular economy model, and has the power to influence other businesses to start transitioning to a circular economy.	<ul style="list-style-type: none"> Organize activities or public outreach about CE (example: webinars) Provide training on CE to the public Create a joint work unit that focuses on discussing CE issues with other agencies
	PT. Great Giant Pineapple	<i>Answered 'no'</i>	A form of business that has now begun to develop a circular economy model and has the power to influence other businesses to start transitioning to a circular economy. The form of application of circular economy in this institution is utilizing solid waste from the production process of canned pineapple into organic animal feed, and also utilizing livestock manure into organic fertilizer for pineapple plantations. ¹⁴	<ul style="list-style-type: none"> Create a joint work unit that focuses on discussing CE issues with other agencies Initiating forums or activities that bring together stakeholders Collaborate with other business sectors to implement CE initiatives Work with communities to implement CE initiatives

¹² DamoGO, "Create Taste, not Waste", DamoGO, accessed on January 16, 2022 <https://damogo.co/en>.

¹³ Surplus, "Food Rescue App", Surplus, accessed on January 16, 2022 <https://www.surplus.id/>.

¹⁴ Bappenas, Embassy of Denmark, UNDP, "The Economic, Social and Environmental Benefits of a Circular Economy in Indonesia," Kementerian Negara PPN/Bappenas (2021).

Transformers	PT Indofood Sukses Makmur	Follow KLHK regulations for processing packaging waste	A form of business that is currently starting to develop a circular economy model, and has the power to influence other businesses to start transitioning to a circular economy.	<ul style="list-style-type: none"> Initiating forums or activities that bring together stakeholders
	PT Coca-Cola Indonesia	Targets for water recovery and carbon reduction.	A form of business that is currently starting to develop a circular economy model, and has the power to influence other businesses to start transitioning to a circular economy.	<ul style="list-style-type: none"> Educating the public through social media Provide training on CE to the public Create a joint work unit that focuses on discussing CE issues with other agencies Attend a conference to discuss CE implementation in Indonesia Initiating forums or activities that bring together stakeholders
Mainstreamers	Indonesian Food and Beverage Entrepreneurs Association (GAPMMI)	<i>Not filling out the questionnaire</i>	A form of business that can be influenced to start transitioning to a circular economy model when the incentives are already visible. The initiatives that have been carried out are holding activities or public outreach regarding environmental sustainability in the food and beverage sector with one of the companies that have started the transition to a circular economy, namely PT. Tetra Pak Indonesia. ¹⁵	<ul style="list-style-type: none"> Educating the public through social media Provide training on CE to the public Create a joint work unit that focuses on discussing CE issues with other agencies Work with communities to implement CE initiatives Collaborate with other institutions (eg NGOs, research institutions) to carry out CE initiatives
	PT Nutrifood Indonesia	<i>Not filling out the questionnaire</i>	A form of business that can be influenced to start transitioning to a circular economy model when the incentives are already visible. The initiative that has been carried out is to apply the 3R principle to the production process. ¹⁶	<ul style="list-style-type: none"> Join an association/community that promotes CE Provide training on CE to the public Create a joint work unit that focuses on discussing CE issues with other agencies Collaborate with other business sectors to implement CE initiatives Work with communities to implement CE initiatives

¹⁵ PT. Tetra Pak Indonesia, "Tetra Pak Indonesia dan GAPMMI Persiapkan Pelaku Industri Makanan Minuman untuk Menangkan Pasar Masa Depan", Kontan, accessed on January 16, 2022 <https://pressrelease.kontan.co.id/release/tetra-pak-indonesia-dan-gapmmi-persiapkan-pelaku-industri-makanan-minuman-untuk-menangkan-pasar-masa?page=all>.

¹⁶ SWAONLINE, "Nutrifood Konsisten Terapkan Prinsip 3R", SWAONLINE, accessed on January 16, 2022 <https://kumparan.com/swaonline/notrifood-konsisten-terapkan-prinsip-3r-27431110790540321/1>.

Table 2. Amoeba Grouping Business Actors and NGOs: Construction Business Sector

Amoeba Group	Agency Name	CE implementation and targets under development (based on questionnaire)	Desk Research Results	Recommended contributions to the implementation of a circular economy
Change Agent	Rebricks	Research on the reuse of manufactured products.	A form of business that uses a circular economy model, namely processing plastic sachet waste and rejecting plastic waste into building materials in the form of paving blocks. ¹⁷	<ul style="list-style-type: none"> Join an association/community that promotes CE Provide training on CE to the public Create a joint work unit that focuses on discussing CE issues with other agencies Initiating forums or activities that bring together stakeholders
	Green Building Council Indonesia (GBCI)	<i>Answered 'no'</i>	An institution that is committed to educating on the application of environmental sustainability based on best practices and facilitating the transformation of the building industry into a more sustainable one. In addition, GBCI also has a green building certification called Greenship which can reduce energy consumption in Indonesia through the development of the right location and improvement of building management. ¹⁸	<ul style="list-style-type: none"> Provide training on CE to the public Initiating forums or activities that bring together stakeholders
Transformers	Indonesian Cement Association	Higher utilization target of bottom ash, fly ash, copper slag, biomass, RDF.	An association that has the vision to support the development and economic growth in Indonesia by paying attention to conservation and sustainable development policies. This association consists of members of companies that are currently developing a circular economy model including PT. Solusi Bangun Indonesia and SCG Indonesia. With the profile of the association's members, this association also has the power to influence other businesses to start transitioning to a circular economy.	<ul style="list-style-type: none"> Organize activities or public outreach about CE (example: webinars) Educating the public through social media Provide training on CE to the public Create a joint work unit that focuses on discussing CE issues with other agencies Initiating forums or activities that bring together stakeholders Work with communities to implement CE initiatives Collaborate with other institutions (eg NGOs, research institutions) to carry out CE initiatives

¹⁷ Rebricks, "What We Do", Rebricks accessed on January 16, 2022 <https://rebricks.id/what-we-do>.

¹⁸ Bappenas, Embassy of Denmark, UNDP. (2021). *op. cit.* pp. 29

Transformers	PT Solusi Bangun Indonesia, Tbk	The target number of replications for the RDF facility initiative, the target for the volume of waste and domestic waste utilization, and the target for the Thermal Substitution Rate (TSR).	A form of business that is currently starting to develop a circular economy model, and has the power to influence other businesses to start transitioning to a circular economy.	<ul style="list-style-type: none"> • Provide training on CE to the public • Create a joint work unit that focuses on discussing CE issues with other agencies
	SCG Indonesia	<i>Not filling out the questionnaire</i>	A form of business that is currently developing a circular economy model, and has the power to influence other businesses to start transitioning to a circular economy. The commitment to a circular economy can be seen in the long-term target to reduce 28% of GHG emissions by 2030 through 1) product and service development with material innovation, 2) waste collection and processing for recycling, and 3) new business model by transforming to the product as a service. ¹⁹	<ul style="list-style-type: none"> • Create a joint work unit that focuses on discussing CE issues with other agencies • Work with communities to implement CE initiatives
Mainstreamers	PT Amarta Karya (Persero)	<i>Not filling out the questionnaire</i>	A form of business that can be influenced to start transitioning to a circular economy model when the incentives are already visible. The initiatives that have been carried out are the utilization of coconut coir waste in furniture and packaging materials to replace wood. ²⁰	<ul style="list-style-type: none"> • Organize activities or public outreach about CE (example: webinars) • Educating the public through social media • Provide training on CE to the public • Create a joint work unit that focuses on discussing CE issues with other agencies • Initiating forums or activities that bring together stakeholders • Work with communities to implement CE initiatives • Collaborate with other institutions (eg NGOs, research institutions) to carry out CE initiatives
Unidentified	Environmental Management Contractors Association Indonesia (AKTALI)	<i>Not filling out the questionnaire</i>	A form of business that has not seen its contribution and direction in implementing a circular economy.	<ul style="list-style-type: none"> • Organize activities or public outreach about CE (example: webinars) • Join an association/community that promotes CE • Educating the public through social media • Provide training on CE to the public • Create a joint work unit that focuses on discussing CE issues with other agencies • Attend a conference to discuss CE implementation in Indonesia • Initiating forums or activities that bring together stakeholders • Collaborate with other business sectors to implement CE initiatives • Work with communities to implement CE initiatives • Collaborate with other institutions (eg NGOs, research institutions) to carry out CE initiatives

¹⁹ The Siam Cement Public Company Limited, "Sustainability Highlights 2019," *The Siam Cement Public Company Limited* (2019).

²⁰ Josep Lopiwudhi, "AMKA Lihat Potensi Cuan yang Besar dari Hilirisasi Sabut Kelapa", TangerangRaya, accessed on January 16, 2022 <https://www.tangerangraya.id/inspirasi-bisnis/pr-1952161275/amka-lihat-potensi-cuan-yang-besar-dari-hilirisasi-sabut-kelapa?page=all>.

Table 3. Amoeba Grouping Business Actors and NGOs: Wholesale and Retail Business Sector (Plastic Packaging)

Amoeba Group	Agency Name	CE implementation and targets under development (based on questionnaire)	Desk Research Results	Recommended contributions to the implementation of a circular economy
Change Agent	Refill Cycle	Having a target to reach more customers and socializing the refill culture so that it can have a greater impact on reducing plastic waste, especially sachet packaging. In addition, the target is to reduce the use of 63 million plastic sachet waste in 2023.	A form of business that uses a circular economy model that aims to create a sustainable retail system that can reduce plastic pollution, by selling household products such as cooking oil, detergent, shampoo, and others without packaging, but by refilling using consumer packaging. ²¹	<ul style="list-style-type: none"> Join an association/community that promotes CE Create a joint work unit that focuses on discussing CE issues with other agencies Initiating forums or activities that bring together stakeholders
	The Plastic Bag Diet Movement	<i>Not filling out the questionnaire</i>	An institution that has the vision to make Indonesia Free of Plastic Bags by inviting people to be wiser in using plastic bags and other single-use plastics and switch to using items that are used repeatedly to save the environment from the dangers of plastic bags. The plastic bag diet campaign strategy is carried out with regulation, education, and facilitation. ²²	<ul style="list-style-type: none"> Maintaining the current circular economy practice.
	ADUPI (Indonesian Plastic Recycling Association)	Increase plastic recycling rate.	A form of business that uses a circular economy model, which is a non-profit organization consisting of more than 500 registered members who form the largest plastic recycling chain ecosystem in Indonesia from upstream to downstream, starting from groups of collectors, waste banks to the recycling industry itself, including academics and plastic recycling practitioners who are active in Indonesia. In addition, ADUPI also has a circular economy program, namely the "National Circular Economic Movement". The program, which has been implemented in several areas in Greater Jakarta and Banten, aims to increase the absorption of used plastic bottles as raw materials and establish a circular economy for the welfare of plastic recyclers. So far, the Circular Economy Movement program has succeeded in maximizing the absorption of single-use plastic bottles, it was recorded that from the end of March 2021 to December 31, 2021, eight ADUPI fostered partners managed to collect 4,009,245 kg of plastic bottles. ²³	<ul style="list-style-type: none"> Maintaining the current circular economy practice.

²¹ Siklus, "About Us", Siklus, accessed on January 17, 2022 <https://www.siklus.com/id/tentang-kami>.

²² Kurniadi, H., Hizasalasi, M., "Strategi Kampanye Diet Kantong Plastik Oleh GIDKP di Indonesia," *Prosiding 2nd Celsictech-UMRI* (2017).

²³ ADUPI, "Program ADUPI", ADUPI, accessed on February 13, 2022 <https://www.adupi.org/program-adupi/>.

Transformers

<p>PT. Namasindo Plas</p>	<p>In the process of producing recycled PET resin.</p>	<p>A form of business that is currently starting to develop a circular economy model, and has the power to influence other businesses to start transitioning to a circular economy.</p>	<ul style="list-style-type: none"> • Join an association/community that promotes CE • Educating the public through social media • Provide training on CE to the public • Create a joint work unit that focuses on discussing CE issues with other agencies • Initiating forums or activities that bring together stakeholders • Collaborate with other business sectors to implement CE initiatives • Work with communities to implement CE initiatives
<p>Unilever Indonesia</p>	<p>The targets for implementing a circular economy include: 1) Reduce virgin plastic packaging by 50% by 2025, with a third (over 100,000 tonnes) coming from reducing plastics; 2) 100% recyclable, compostable/ reusable packaging by 2021; and 3) Help collect and process more plastic packaging than will be sold by 2025.</p>	<p>A form of business that is currently starting to develop a circular economy model, and has the power to influence other businesses to start transitioning to a circular economy.</p>	<ul style="list-style-type: none"> • Maintaining the current circular economy practice.
<p>Danone Indonesia</p>	<p>The targets for implementing a circular economy are 1) Using recycled materials for products up to 50% by 2025, and 2) Using alternative packaging materials that can be reused, recycled, or made into compost.</p>	<p>A form of business that has now begun to develop a circular economy model, and has the power to influence other businesses to start transitioning to a circular economy.</p>	<ul style="list-style-type: none"> • Maintaining the current circular economy practice.
<p>Tetra Pak Indonesia</p>	<p>The targets for implementing a circular economy include: 1) Recyclable Packaging: Designing, Increasing production in the Supply Chain and deploying new types with increased paper content, decreased polymer content and foil release. Future sustainable packaging made only from renewable packaging materials, 100% Recyclable, compliant with a low-carbon circular economy; 2) Packaging Materials from Renewable and Recycled Sources: Using renewable and recycled sources of raw materials in our packaging portfolio. Started in 2011 with bio/plant based caps moving forward to new solutions,</p>	<p>A form of business that is currently starting to develop a circular economy model, and has the power to influence other businesses to start transitioning to a circular economy.</p>	<ul style="list-style-type: none"> • Provide training on CE to the public

Transformers

such as paper straws, alternative barriers to aluminum foil, strips and bio-based inks; 3) Anti-waste Solutions : Developing new types of sustainable Packaging caps (eg, tethered lids and paper straws); 4) Post Consumption Packaging Collection and Recycling : Collection and recycling to reach 70% level by 2030 so that Tetra Pak Packaging is recognized as the recycling packaging standard. In 2019 we became a signatory to the New Plastics Economy Global Commitment, of the Ellen MacArthur Foundation and have committed to also using recycled materials to replace plastic raw materials in our packaging by 2025 in Europe and 2030 globally; 5) Reducing Carbon Footprint in Tetra Pak factories & Our Customers factories : Reducing carbon in customer operations, through energy savings of Tetra Pak Capital Equipment and Services, as well as TP operations by achieving Net-Zero impact; 6) Reducing Water Consumption : Water Stewardship by helping our customers first and our suppliers second (ie paper production) to reduce their water consumption; 7) Responsible Raw Material Management : Encouraging sustainability in sourcing our materials for primary and secondary packaging (pallet film & Cardboard) through certification (eg FSC – Forest Stewardship Council), biodiversity protection and reforestation (land use); and 8) Food Waste Minimization and Availability: Help reduce food waste across the value chain through the entire Tetra Pak portfolio and partnerships with partners while securing food availability in communities and developing countries.

The Body Shop
Indonesia

Has had a Bring Back Our Bottle program since 2008 and currently the return rate is at 22%, while the target for increasing returns on empty packaging from consumers is up to 30%.

A form of business that is currently starting to develop a circular economy model, and has the power to influence other businesses to start transitioning to a circular economy.

- Join an association/community that promotes CE
- Create a joint work unit that focuses on discussing CE issues with other agencies
- Initiating forums or activities that bring together stakeholders
- Collaborate with other business sectors to implement CE initiatives

Transformers	Dow Indonesia	The global target in 2035 is to close the loop by selling reusable and recyclable products.	A form of business that is currently starting to develop a circular economy model, and has the power to influence other businesses to start transitioning to a circular economy.	<ul style="list-style-type: none"> Organize activities or public outreach about CE (example: webinars) Join an association/community that promotes CE Educating the public through social media Create a joint work unit that focuses on discussing CE issues with other agencies Initiating forums or activities that bring together stakeholders Collaborate with other institutions (eg NGOs, research institutions) to carry out CE initiatives
Mainstreamers	INAPLAS	The circular economy concept is applied to the management of waste (especially plastic) in various regions, according to the criteria of each region.	An institution that can be influenced to start transitioning to a circular economy model when the incentives are already visible.	<ul style="list-style-type: none"> Provide training on CE to the public
	Indonesian Essential Council	The target of implementing a circular economy in the citronella oil industry by 2030.	An institution that can be influenced to start transitioning to a circular economy model when the incentives are already visible.	<ul style="list-style-type: none"> Educating the public through social media Provide training on CE to the public Create a joint work unit that focuses on discussing CE issues with other agencies Attend a conference to discuss CE implementation in Indonesia Work with communities to implement CE initiatives
	PT Polytama Propindo	Reduce and/or streamline the use of raw materials and materials.	An institution that can be influenced to start transitioning to a circular economy model when the incentives are already visible.	<ul style="list-style-type: none"> Organize activities or public outreach about CE (example: webinars) Join an association/community that promotes CE Educating the public through social media Provide training on CE to the public Create a joint work unit that focuses on discussing CE issues with other agencies Attend a conference to discuss CE implementation in Indonesia Initiating forums or activities that bring together stakeholders Collaborate with other business sectors to implement CE initiatives Work with communities to implement CE initiatives Collaborate with other institutions (eg NGOs, research institutions) to carry out CE initiatives

Mainstreamers	Indonesian Downstream Plastic Industry Association (APHINDO)	<i>Not filling out the questionnaire</i>	An institution that can be influenced to start transitioning to a circular economy model once the incentives are visible. Currently, APHINDO has expressed its support for plastic waste management in collaboration with other parties such as recycling associations, scavengers associations, and so on. ²⁴	<ul style="list-style-type: none"> Organize activities or public outreach about CE (example: webinars) Educating the public through social media Provide training on CE to the public Create a joint work unit that focuses on discussing CE issues with other agencies Attend a conference to discuss CE implementation in Indonesia Initiating forums or activities that bring together stakeholders Collaborate with other business sectors to implement CE initiatives Work with communities to implement CE initiatives Collaborate with other institutions (eg NGOs, research institutions) to carry out CE initiatives
Unidentified	Indonesian Retail Entrepreneurs Association (APRINDO)	<i>Not filling out the questionnaire</i>	A form of business that has not seen its contribution and direction to implementing a circular economy.	<ul style="list-style-type: none"> Organize activities or public outreach about CE (example: webinars) Join an association/community that promotes CE Educating the public through social media Provide training on CE to the public Create a joint work unit that focuses on discussing CE issues with other agencies Attend a conference to discuss CE implementation in Indonesia Initiating forums or activities that bring together stakeholders Collaborate with other business sectors to implement CE initiatives Work with communities to implement CE initiatives Collaborate with other institutions (eg NGOs, research institutions) to carry out CE initiatives

²⁴ TN, "APHINDO: Industri Plastik Kemasan Terbelit Rumitnya Regulasi", TrustNews, accessed on January 17, 2022 <https://m.trustnews.id/read/242/APHINDO-Industri-Plastik-Kemasan-Terbelit-Rumitnya-Regulasi>.

Table 4. Amoeba Grouping Business Actors and NGOs: Electronic Business Sector

Amoeba Group	Agency Name	CE implementation and targets under development (based on questionnaire)	Desk Research Results	Recommended contributions to the implementation of a circular economy
Change Agent	EwasteRJ	Maximizing e-waste recycling.	A form of business that uses a circular economy model, namely a community that focuses on the issue of electronic waste management. The achievements to date are that more than 30,000 already know about the issue of electronic waste, more than 7 tons of electronic waste are collected, and more than 6.8 tons of electronic waste are recycled. ²⁵	<ul style="list-style-type: none"> Join an association/community that promotes CE
	PT. Siemens Indonesia	The target for implementing a circular economy is net-zero operations in 2030 in line with the SBTi pathway (Science Based Targets Initiative), a net-zero supply chain in 2050, and a 20% reduction in emissions by 2030.	A form of business that has now begun to develop a circular economy model, and has the power to influence other businesses to start transitioning to a circular economy. In addition, Siemens Indonesia is also considered to have strength in resource consumption and energy management in its products and production facilities and equipment. ²⁶	<ul style="list-style-type: none"> Organize activities or public outreach about CE (example: webinars) Join an association/community that promotes CE Educating the public through social media Provide training on CE to the public Create a joint work unit that focuses on discussing CE issues with other agencies Initiating forums or activities that bring together stakeholders Work with communities to implement CE initiatives Collaborate with other institutions (eg NGOs, research institutions) to carry out CE initiatives
Transformers	Schneider Electric	The targets for implementing the circular economy are 1) Circular innovation in the supply chain; 2) Waste-to-Resource sites; 3) Optimization of obsolete stocks, and 4) 100% packaging free of single-use plastic and using recycled cardboard.	It is a form of business that has now begun to develop a circular economy model and has the power to influence other businesses to start transitioning to a circular economy. In addition, Schneider Electric has received Cradle to Cradle certification which replaces the linear economy concept with complete recycling or technical reusability of all products and materials. This certification is obtained for switches and sockets. ²⁷	<ul style="list-style-type: none"> Provide training on CE to the public Create a joint work unit that focuses on discussing CE issues with other agencies Initiating forums or activities that bring together stakeholders Collaborate with other business sectors to implement CE initiatives Work with communities to implement CE initiatives

²⁵ EwasteRJ, "About Us", EwasteRJ, accessed on January 17, 2022 <https://ewasterj.com/about>.

²⁶ Anbumozhi, V., et al., "Assessing the Readiness for Industry 4.0 and the Circular Economy", *ERIA* (2020).

²⁷ Gaurav Sharma, "Circular Economy in Practice - Schneider Receives Cradle to Cradle Certification", Perspectives, accessed on January, 17 2022 <https://perspectives.se.com/blog-stream/circular-economy-in-practice-schneider-products-receive-cradle-to-cradle-certification>.

Transformers	Mitsubishi Electric Corporation	<i>Not filling out the questionnaire</i>	It is a form of business that has now begun to develop a circular economy model and has the power to influence other businesses to start transitioning to a circular economy. The target for implementing a circular economy by Mitsubishi Electric is planned for the medium-term Environmental Plan 2023 by encouraging innovation in goods and services, and by providing integrated solutions. ²⁸	<ul style="list-style-type: none"> • Organize activities or public outreach about CE (example: webinars) • Join an association/community that promotes CE • Educating the public through social media • Provide training on CE to the public • Create a joint work unit that focuses on discussing CE issues with other agencies • Initiating forums or activities that bring together stakeholders • Collaborate with other business sectors to implement CE initiatives • Work with communities to implement CE initiatives • Collaborate with other institutions (eg NGOs, research institutions) to carry out CE initiatives
Unidentified	GAMATRINDO (Indonesian Integrated Lighting Manufacturing Industry Association)	<i>Answered 'don't know'</i>	Is a form of business that has not seen its contribution and direction to implementing a circular economy.	<ul style="list-style-type: none"> • Organize activities or public outreach about CE (example: webinars) • Join an association/community that promotes CE • Educating the public through social media • Provide training on CE to the public • Create a joint work unit that focuses on discussing CE issues with other agencies • Attend a conference to discuss CE implementation in Indonesia • Initiating forums or activities that bring together stakeholders • Collaborate with other business sectors to implement CE initiatives • Work with communities to implement CE initiatives • Collaborate with other institutions (eg NGOs, research institutions) to carry out CE initiatives

²⁸ Mitsubishi Electric, "The Mitsubishi Electric Group's Materiality", Mitsubishi Electric, accessed on January 17, 2022 <https://www.mitsubishielectric.com/en/sustainability/management/management/materiality/index.html>.

Unidentified	Indonesian Electrical Equipment Manufacturers Association (APPI)	<i>Answered 'don't know'</i>	Is a form of business that has not seen its contribution and direction to implementing a circular economy.	<ul style="list-style-type: none"> ▪ Organize activities or public outreach about CE (example: webinars) ▪ Join an association/community that promotes CE ▪ Educating the public through social media ▪ Provide training on CE to the public ▪ Create a joint work unit that focuses on discussing CE issues with other agencies ▪ Attend a conference to discuss CE implementation in Indonesia ▪ Initiating forums or activities that bring together stakeholders ▪ Collaborate with other business sectors to implement CE initiatives ▪ Work with communities to implement CE initiatives ▪ Collaborate with other institutions (eg NGOs, research institutions) to carry out CE initiatives
	Association of Indonesian Household Electronics and Electrical Appliances Industry Companies (GABEL)	<i>Not filling out the questionnaire</i>	Is a form of business that has not seen its contribution and direction in implementing a circular economy.	<ul style="list-style-type: none"> ▪ Organize activities or public outreach about CE (example: webinars) ▪ Educating the public through social media ▪ Provide training on CE to the public ▪ Create a joint work unit that focuses on discussing CE issues with other agencies ▪ Initiating forums or activities that bring together stakeholders ▪ Collaborate with other business sectors to implement CE initiatives ▪ Work with communities to implement CE initiatives ▪ Collaborate with other institutions (eg NGOs, research institutions) to carry out CE initiatives

Table 5. Amoeba Grouping Business Actors and NGOs: Textile Business Sector

Amoeba Group	Agency Name	CE implementation and targets under development (based on questionnaire)	Desk Research Results	Recommended contributions to the implementation of a circular economy
Change Agent	Setali Indonesia	Targets to use local materials, employ local human resources, and manage waste.	Is a form of business that uses a circular economy model, which is an organization engaged in decluttering and thrifting to support the sustainable fashion movement, namely a movement to protect the environment from the dangers of fashion industry waste. ²⁹	<ul style="list-style-type: none"> Join an association/community that promotes CE Create a joint work unit that focuses on discussing CE issues with other agencies
	HeySTARTIC	Target comparison of the use of new materials that are lower than those that are not used.	Is a form of business that uses a circular economy model, which is an organization that encourages sustainable lifestyles through upcycle fashion products, and community empowerment. The circular economy initiatives that have been carried out are connecting companies with consumers to collect and upcycle fashion waste. ³⁰	<ul style="list-style-type: none"> Create a joint work unit that focuses on discussing CE issues with other agencies Initiating forums or activities that bring together stakeholders
Transformers	H&M Indonesia	<i>Not filling out the questionnaire</i>	It is a form of business that has now begun to develop a circular economy model and has the power to influence other businesses to start transitioning to a circular economy. H&M is committed to achieving the target of using 30% recycled materials by 2025. Throughout 2020, H&M has started to apply new technology to recycle fabrics, namely a mixed-fiber recycling technology called Green Machine which produces the first product made from Renewcell's Circulose®. ³¹	<ul style="list-style-type: none"> Organize activities or public outreach about CE (example: webinars) Join an association/community that promotes CE Educating the public through social media Provide training on CE to the public Create a joint work unit that focuses on discussing CE issues with other agencies Initiating forums or activities that bring together stakeholders Work with communities to implement CE initiatives Collaborate with other institutions (eg NGOs, research institutions) to carry out CE initiatives

²⁹IndoRelawan, "Profil Organisasi Setali Indonesia", IndoRelawan, , accessed on January 18, 2022 <https://www.indorelawan.org/organization/5d81d67a80151939ef7629c4>.

³⁰HeySTARTIC, "Portfolio", HeySTARTIC, accessed on January 18, Januari 2022 <https://startic.co/climateaction/>.

³¹H&M Group. (2021). Sustainability Performance Report 2020. H&M Group.

Transformers	Lenzing (South Pacific Viscose)	<i>Not filling out the questionnaire</i>	It is a form of business that has now begun to develop a circular economy model and has the power to influence other businesses to start transitioning to a circular economy. The circular economy implementations that have been carried out include 1) Using renewable wood materials sourced from sustainably managed forests and plantations, where fiber can be composted and decomposed naturally (biodegradable); 2) Recycle textile waste using REFIBRA™ technology with a target of recycling 100,000 tons of textile waste by 2028; and 3) Resource efficiency in technology and products by continuously developing innovative technologies, and optimizing the use and processing of raw materials and energy. ³²	<ul style="list-style-type: none"> • Join an association/community that promotes CE • Create a joint work unit that focuses on discussing CE issues with other agencies • Collaborate with other institutions (eg NGOs, research institutions) to carry out CE initiatives
	PT Asia Pacific Rayon (APR)	<i>Not filling out the questionnaire</i>	It is a form of business that has now begun to develop a circular economy model and has the power to influence other businesses to start transitioning to a circular economy. The commitment to implementing APR's circular economy is listed as one of the targets on the Sustainability Agenda to be achieved in 2030 (APR2030), the targets are 1) Viscose production using recycled textiles reaches 20%, were to achieve this APR collaborates with other industry partners to collect, sort and recycle textile waste. In addition, APR also invested 200 million USD through collaboration and technological innovation to further introduce the use of recycled textiles. ³³	<ul style="list-style-type: none"> • Join an association/community that promotes CE • Educating the public through social media • Collaborate with other business sectors to implement CE initiatives

³² Lenzing, "Circular Economy", Lenzing, accessed on January 18, 2022 <https://www.lenzing.com/sustainability/sustainability-management/circular-economy>.

³³ Asia Pacific Rayon, "Asia Pacific Rayon (APR) Sustainability Policy," *Asia Pacific Rayon* (2020).

Mainstreamers	Gabster Fashion Consulting (GFC)	<i>Not filling out the questionnaire</i>	It is a form of business that can be influenced to start transitioning to a circular economy model when the incentives are already visible. GFC is a fashion consulting that currently shows interest in the issue of sustainable fashion from articles written, including on how textile waste is re-cycled, as well as on the development of sustainable fashion business in Indonesia. ³⁴	<ul style="list-style-type: none"> Organize activities or public outreach about CE (example: webinars) Join an association/community that promotes CE Collaborate with other business sectors to implement CE initiatives Work with communities to implement CE initiatives
	Indonesian Textile Association (API)	<i>Not filling out the questionnaire</i>	Is a form of business that has not seen its contribution and direction to implement a circular economy.	<ul style="list-style-type: none"> Organize activities or public outreach about CE (example: webinars) Join an association/community that promotes CE Educating the public through social media Provide training on CE to the public Create a joint work unit that focuses on discussing CE issues with other agencies Attend a conference to discuss CE implementation in Indonesia Initiating forums or activities that bring together stakeholders Collaborate with other business sectors to implement CE initiatives Work with communities to implement CE initiatives Collaborate with other institutions (eg NGOs, research institutions) to carry out CE initiatives
Unidentified	Indonesian Fashion Entrepreneur Designers Association (APPMI)	<i>Not filling out the questionnaire</i>	Is a form of business that has not seen its contribution and direction to implement a circular economy.	<ul style="list-style-type: none"> Organize activities or public outreach about CE (example: webinars) Join an association/community that promotes CE Educating the public through social media Provide training on CE to the public Create a joint work unit that focuses on discussing CE issues with other agencies Attend a conference to discuss CE implementation in Indonesia Initiating forums or activities that bring together stakeholders Collaborate with other business sectors to implement CE initiatives Work with communities to implement CE initiatives Collaborate with other institutions (eg NGOs, research institutions) to carry out CE initiatives

³⁴Gabriella Sheena, "Dapatkah Bisnis Sustainable Fashion Meraih Kesuksesan & Keuntungan?"; Kumparan, accessed on January 18, 2022 <https://kumparan.com/gabriella-sheena/dapatkah-bisnis-sustainable-fashion-meraih-kesuksesan-and-keuntungan-1s08Upl34mx>.

Table 6. Amoeba Grouping Business Actors and NGOs: Sustainable Business Association

Amoeba Group	Agency Name	CE implementation and targets under development (based on questionnaire)	Desk Research Results	Recommended contributions to the implementation of a circular economy
Change Agent	Indonesia Business Council for Sustainable Development (IBCSD)	Using recycled paper and encouraging employees to implement a circular economy in their daily life.	Is a form of business that uses a circular economy model, which is an association consisting of CEOs who are committed to promoting sustainable development. One of the work programs includes encouraging the implementation of a circular economy.	<ul style="list-style-type: none"> Work with communities to implement CE initiatives
	Packaging and Recycling Association for Indonesia Sustainable Environment (PRAISE)	The #BijakBerplastik movement is one of DANONE AQUA's real steps towards a circular economy.	Is a form of business that uses a circular economy model, which is an industry association that actively supports the management of packaging waste in a holistic, integrated, and sustainable way in Indonesia. In addition, PRAISE also has the vision to encourage the creation of a circular economy by strengthening collaboration and networking with all stakeholders.	<ul style="list-style-type: none"> Maintaining the practice of implementing a circular economy that is currently being carried out.
	Indonesia Global Compact Network (IGCN)	Reducing the use of Styrofoam in institutions, as well as promoting the circular economy and sustainable fashion to the business world.	Is a form of business that uses a circular economy model, which is an institution that is part of the United Nations Global Compact network in Indonesia, which consists of 22 companies and organizations that jointly commit and sign agreements to support, encourage and implement the United Nations Global Compact Principles.	<ul style="list-style-type: none"> Educating the public through social media Provide training on CE to the public Create a joint work unit that focuses on discussing CE issues with other agencies Work with communities to implement CE initiatives

Table 7. Grouping of Amoeba Business Actors and NGOs: Waste Management Services

Amoeba Group	Agency Name	CE implementation and targets under development (based on questionnaire)	Desk Research Results	Recommended contributions to the implementation of a circular economy
Change Agent	Waste4Change	Management of waste tonnage and the number of beneficiaries of the project.	A form of business that uses a circular economy model, which is a company that provides waste management solutions with a strategy of changing the ecosystem for responsible waste management based on collaboration and technology toward the implementation of a circular economy and a waste-free Indonesia.	<ul style="list-style-type: none"> • Create a joint work unit that focuses on discussing CE issues with other agencies
	PT. Reciki Solusi Indonesia	<i>Answered 'no'</i>	A form of business that uses a circular economy model, namely a waste management company that is 100% locally based, which in its implementation adapts to local conditions and business needs to be achieved. In addition, Reciki aims to reduce plastic waste by more than 95% and a minimum reduction of 70% of waste generation, so that it will extend the life of the landfill by at least 10 years from its existing condition.	<ul style="list-style-type: none"> • Educating the public through social media • Provide training on CE to the public • Attend a conference to discuss CE implementation in Indonesia • Initiating forums or activities that bring together stakeholders • Work with communities to implement CE initiatives
	Octopus Waste Management Ltd	The target number of waste generators/ households, partners (preservers and checkpoints), and industrial partners.	A form of business that uses a circular economy model, which is a circular economy platform that helps producers to track and collect post-consumption products, both recyclable and non-recyclable.	<ul style="list-style-type: none"> • Join an association/community that promotes CE
	SMASH. ID - PT. Solusi Hijau Indonesia	Work remotely and digitally effectively.	A form of business that uses a circular economy model, which is an integrated application for waste management throughout Indonesia by connecting the waste bank closest to its customers.	<ul style="list-style-type: none"> • Organize activities or public outreach about CE (example: webinars) • Join an association/community that promotes CE • Educating the public through social media • Provide training on CE to the public • Create a joint work unit that focuses on discussing CE issues with other agencies • Initiating forums or activities that bring together stakeholders
	Gringgo	<i>Did not fill out the questionnaire</i>	A form of business that uses a circular economy model, which is a platform that develops solutions for sustainable development issues, one of which is waste management. This is done by digitizing waste collection data (Gringgo-collect), tracking and monitoring waste collection (Gringgo-envi), as well as sorting and identifying waste using artificial intelligence (SWAi) technology.	<ul style="list-style-type: none"> • Join an association/community that promotes CE • Provide training on CE to the public

Table 8. Grouping of Amoeba Business Actors & NGOs: NGOs

Amoeba Group	Agency Name	CE implementation and targets under development (based on questionnaire)	Desk Research Results	Recommended contributions to the implementation of a circular economy
Iconoclasts	WALHI	<i>Did not fill out the questionnaire</i>	It is a stakeholder who strongly criticizes all parties who run a Linear Economy, while WALHI actively encourages efforts to save and restore the environment in Indonesia. ³⁵	<ul style="list-style-type: none"> • Provide training on CE to the public • Create a joint work unit that focuses on discussing CE issues with other agencies • Collaborate with other business sectors to implement CE initiatives
	WWF	<i>Did not fill out the questionnaire</i>	A stakeholder who strongly criticizes all those who run a Linear Economy, while WWF has a vision for conservation that is in line with the Sustainable Development Goals and contributes to sustainable development in Indonesia, by focusing on equitable natural resource management to ensure future conservation benefits. ³⁶	<ul style="list-style-type: none"> • Provide training on CE to the public • Create a joint work unit that focuses on discussing CE issues with other agencies • Collaborate with other business sectors to implement CE initiatives
	Greenpeace	<i>Did not fill out the questionnaire</i>	It is a stakeholder who strongly criticizes all those who run a Linear Economy, while Greenpeace is an organization whose mission is to make the world a greener and more peaceful environment through environmental campaigns. ³⁷	<ul style="list-style-type: none"> • Provide training on CE to the public • Create a joint work unit that focuses on discussing CE issues with other agencies • Collaborate with other business sectors to implement CE initiatives
Unidentified	Ecoton	<i>Did not fill out the questionnaire</i>	It is an organization that has not seen its contribution and direction to implement a circular economy. Ecoton is an organization focused on river restoration. ³⁸	<ul style="list-style-type: none"> • Organize activities or public outreach about CE (example: webinars) • Join an association/community that promotes CE • Provide training on CE to the public • Create a joint work unit that focuses on discussing CE issues with other agencies • Attend a conference to discuss CE implementation in Indonesia • Collaborate with other business sectors to implement CE initiatives • Collaborate with other institutions (eg NGOs, research institutions) to carry out CE initiatives

³⁵ WALHI, "Visi dan Misi", WALHI, accessed on January 25, 2022 <https://www.walhi.or.id/visi-dan-misi>.

³⁶ WWF, "Tentang Kami", WWF, accessed on January 25, 2022 <https://www.wwf.id/tentang-kami>.

³⁷ Greenpeace Indonesia, "Kenali Greenpeace", Greenpeace Indonesia, accessed on January 25, 2022 <https://www.greenpeace.org/indonesia/>.

³⁸ Ecoton, "History and Ecoton Profile", Ecoton, accessed on January 25, 2022 <https://ecoton.or.id/en/ecoton-profile/>.

Unidentified

Habitat for Humanity Indonesia	<i>Did not fill out the questionnaire</i>	It is an organization that has not seen its contribution and direction to implement a circular economy. Habitat for Humanity Indonesia is a non-profit organization that aims to help the poor in Indonesia, especially in areas that are categorized as a slum, poor and remote areas. This is done by helping the poor by building livable houses, repairing houses below the proper standard, and creating simple and affordable residential areas or housing for families in need. ³⁹	<ul style="list-style-type: none"> Organize activities or public outreach about CE (example: webinars) Provide training on CE to the public Attend a conference to discuss CE implementation in Indonesia Collaborate with other business sectors to implement CE initiatives Work with communities to implement CE initiatives Collaborate with other institutions (eg NGOs, research institutions) to carry out CE initiatives
The Nature Conservancy (TNC) Indonesia	<i>Did not fill out the questionnaire</i>	It is an organization that has not seen its contribution and direction to implement a circular economy. TNC has a mission to protect land and water areas as life support systems, and provide innovative solutions to achieve harmony between nature and humans through effective natural resource management. ⁴⁰	<ul style="list-style-type: none"> Organize activities or public outreach about CE (example: webinars) Provide training on CE to the public Attend a conference to discuss CE implementation in Indonesia Collaborate with other business sectors to implement CE initiatives Work with communities to implement CE initiatives Collaborate with other institutions (eg NGOs, research institutions) to carry out CE initiatives
Foundation for the Institute of People's Business and Economics (IBEKA)	<i>Did not fill out the questionnaire</i>	It is an organization that has not seen its contribution and direction to implement a circular economy. IBEKA aims to fight inequality by improving knowledge and technology for residents of rural areas. ⁴¹	<ul style="list-style-type: none"> Organize activities or public outreach about CE (example: webinars) Provide training on CE to the public Attend a conference to discuss CE implementation in Indonesia Collaborate with other business sectors to implement CE initiatives Work with communities to implement CE initiatives Collaborate with other institutions (eg NGOs, research institutions) to carry out CE initiatives
Kehati Foundation	<i>Did not fill out the questionnaire</i>	It is an organization that has not seen its contribution and direction to implement a circular economy. Kehati is a catalyst to find innovative ways to conserve, manage and utilize Indonesia's biodiversity sustainably, this is done by collecting and managing resources which are then channeled in the form of grants, facilitation, consultation, and various other facilities to support various biodiversity conservation programs. Indonesia's biodiversity and its use are fairly and sustainably. ⁴²	<ul style="list-style-type: none"> Organize activities or public outreach about CE (example: webinars) Provide training on CE to the public Attend a conference to discuss CE implementation in Indonesia Collaborate with other business sectors to implement CE initiatives Work with communities to implement CE initiatives Collaborate with other institutions (eg NGOs, research institutions) to carry out CE initiatives

³⁹Habitat Indonesia, "About", Habitat Indonesia, accessed on January 26, 2022 <https://habitatindonesia.org/about/>.

⁴⁰Konservasi Alam Nusantara, "Siapa Kami", Konservasi Alam Nusantara, accessed on January 26, 2022 <https://www.kan.or.id/id/tentang-kami/>.

⁴¹IBEKA, "Our Mission", IBEKA, accessed on January 26, 2022 <http://3.ibeka.or.id/wp/index.php/en/our-mission/>.

⁴²KEHATI, "Tentang Kami", KEHATI, accessed on January 26, 2022 <https://kehati.or.id/tentang-kami/>.

Table 9. Grouping of Amoeba Business Actors and NGOs: Other Business Sector

Business Sector	Amoeba Group	Agency Name	CE implementation and targets under development (based on questionnaire)	Desk Research Results	Recommended contributions to the implementation of a circular economy
Energy	Change Agent	Xurya Daya Indonesia	Use renewable energy and recycle batteries	Is a form of business that uses a circular economy model, which is a renewable energy startup in Indonesia that pioneered the No Investment method (without investment) to switch to solar power, for a brighter and cleaner future for Indonesia. ⁴³	<ul style="list-style-type: none"> Organize activities or public outreach about CE (example: webinars) Provide training on CE to the public Create a joint work unit that focuses on discussing CE issues with other agencies Attend a conference to discuss CE implementation in Indonesia Work with communities to implement CE initiatives Collaborate with other institutions (eg NGOs, research institutions) to carry out CE initiatives
Manufacture	Transformers	Chandra Asri Petrochemical	Total plastic waste is processed using a circular economy, namely community empowerment, plastic waste in the sea, socialization, implementation of household waste sorting, and technological innovation.	It is a form of business that has now begun to develop a circular economy model and has the power to influence other businesses to start transitioning to a circular economy.	<ul style="list-style-type: none"> Initiating forums or activities that bring together stakeholders
		PT. HM Sampoerna Tbk	Reducing waste that goes to landfills.	It is a form of business that has now begun to develop a circular economy model and has the power to influence other businesses to start transitioning to a circular economy.	<ul style="list-style-type: none"> Educating the public through social media Provide training on CE to the public Create a joint work unit that focuses on discussing CE issues with other agencies Initiating forums or activities that bring together stakeholders Work with communities to implement CE initiatives
Financing		PT. Sarana Multi Infrastruktur (Persero)	<i>Answered 'don't know'</i>	It is a form of business that has now begun to develop a circular economy model and has the power to influence other businesses to start transitioning to a circular economy. PT. SMI is a company engaged in infrastructure financing. Since 2018, PT SMI has been a pioneer in sustainable financing in Indonesia by issuing the first Environmentally Insight Bonds in Indonesia that support environmental conservation. ⁴⁴	<ul style="list-style-type: none"> Organize activities or public out-reach about CE (example: webi-nars) Join an association/community that promotes CE Work with communities to imple-ment CE initiatives

⁴³Xurya, "About us" Xurya, accessed on January 26, 2022 <https://xurya.com/tentang-kami>.⁴⁴PT SMI, "Laporan Obligasi Berwawasan Lingkungan 2021" PT SMI (2021).

Transportation	Transformers	PT Aplikasi Karya Anak Bangsa (Gojek)	Zero Waste Target for 2030. Currently carrying out the inventory process, so that it can then be implemented based on data and target.	It is a form of business that has now begun to develop a circular economy model and has the power to influence other businesses to start transitioning to a circular economy. Gojek is a multi-service platform for on-demand and digital payments. One of its products is to connect consumers with passenger and goods shuttle services (ride-hailing). With this product, Gojek is committed to reducing emissions by 1) Accelerating the transition to electric vehicles, 2) Developing a platform to provide more environmentally friendly products, and 3) Ensuring that vehicles meet standards to protect air quality. ⁴⁵	<ul style="list-style-type: none"> • Join an association/community that promotes CE • Create a joint work unit that fo-cuses on discussing CE issues with other agencies • Initiating forums or activities that bring together stakeholders
Continuous Reporting	Unidentified	NCSR Indonesia	<i>No answer yet</i>	It is an organization that has not seen its contribution and direction to implement a circular economy.	<ul style="list-style-type: none"> • Provide training on CE to the public • Create a joint work unit that fo-cuses on discussing CE issues with other agencies • Initiating forums or activities that bring together stakeholders
	Unidentified	Global Reporting Initiative	Wide adoption of the 2020 version of the GRI Standard 306 which already applies the circular economy concept.	It is an organization that has not seen its contribution and direction to implement a circular economy.	<ul style="list-style-type: none"> • Join an association/community that promotes CE • Educating the public through social media • Provide training on CE to the public • Attend a conference to discuss CE implementation in Indonesia • Initiating forums or activities that bring together stakeholders • Collaborate with other business sectors to implement CE initiatives • Work with communities to implement CE initiatives • Collaborate with other institutions (eg NGOs, research institutions) to carry out CE initiatives

⁴⁵ Gojek, "Gojek Sustainability Report 2020," *Gojek* (2021).

Research Institute	Unidentified	RMI- Indonesian Institute for Forest and Environment	Answered 'no'	It is an organization that has not seen its contribution and direction to implement a circular economy.	<ul style="list-style-type: none"> • Organize activities or public outreach about CE (example: webinars) • Join an association/community that promotes CE • Educating the public through social media • Provide training on CE to the public • Create a joint work unit that focuses on discussing CE issues with other agencies • Attend a conference to discuss CE implementation in Indonesia • Initiating forums or activities that bring together stakeholders • Collaborate with other business sectors to implement CE initiatives • Work with communities to implement CE initiatives • Collaborate with other institutions (eg NGOs, research institutions) to carry out CE initiatives
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In the **Amoeba** grouping table for business actors and NGOs above, there are several amoeba groups whose stakeholders have not been identified, namely the *Curmudgeon*, *Spiritual Recluse*, and *Reactionary*. This is because the group has not been found in the scope of these stakeholders and the context of a circular economy. In the context of the circular economy, the Innovator is the Ellen Macarthur Foundation, while the Controller group in the private sector is the leader (BOD, CEO) who sets the regulations.

2. Grouping of Amoeba Government Agencies

Table 10. Grouping of Amoeba Government Agencies: Food and Beverage

Amoeba Group	Agency Name	CE implementation and targets under development (based on questionnaire)	Desk Research Results	Recommended contributions to the implementation of a circular economy
Controller	National Standardization Agency (Directorate of Agro, Chemical, Health, and Halal Standard Development)	Development of circular economy standards to provide guidelines/references for stakeholders regarding the circular economy.	It is an institution that is developing the implementation and mechanism of a circular economy within its agency. The Directorate for Development of Agro, Chemical, Health, and Halal Standards es-tablished the Secretariat of the 13-13 Circular Economy Technical Committee to meet the needs of Indonesian National Standards in the circular economy. ⁴⁶	<ul style="list-style-type: none"> • Educating the public through social media • Provide training on CE to the public • Making regulations that support CE implementation in Indonesia • Provide incentives to businesses implementing CE • Provide technical assistance to business people who are implementing CE in their business activities • Create a joint work unit with other agencies that focus on discussing CE issues • Work with communities to implement CE initiatives • Collaborate with other institutions (eg NGOs, research institutions) to carry out CE initiatives
	Ministry of Industry (Directorate of Beverage Industry, Tobacco Products, and Refreshment Materials)	Is developing green industry and circular economy.	It is an institution that is developing the implementation and mechanism of a circular economy within its agency. Based on the Strategic Plan of the Directorate of Beverage Industry, Tobacco Products and Refreshments for 2020–2024, the application of green industry, circular economy, increasing efficiency and effectiveness of resources in a sustainable manner can harmonize industrial development with environmental sustainability. ⁴⁷	<ul style="list-style-type: none"> • Conduct public outreach on CE (eg webinars, conferences) • Educating the public through social media • Provide training on CE to the public • Provide incentives to businesses implementing CE • Conducting outreach about CE to business people • Provide technical assistance to business people who are implementing CE in their business activities • Create a joint work unit with other agencies that focus on discussing CE issues • Attend a conference to discuss CE implementation in Indonesia • Initiating forums or activities that bring together stakeholders • Work with communities to implement CE initiatives • Collaborate with other institutions (eg NGOs, research institutions) to carry out CE initiatives

⁴⁶Badan Standardisasi Nasional, "KEPUTUSAN KEPALA BADAN STANDARDISASI NASIONAL NOMOR 510/KEP/BSN/11/2020 TENTANG PEMBENTUKAN KOMITE TEKNIS PERUMUSAN STANDAR NASIONAL INDONESIA 13-13 EKONOMI SIRKULAR," *Badan Standardisasi Nasional* (2020).

⁴⁷Kementerian Perindustrian, "Rencana Strategis Direktorat Industri Minuman, Hasil Tembakau dan Bahan Penyegar Tahun 2020-2024," *Kementerian Perindustrian* (2020).

Unidentified	Food and Drug Supervisory Agency (Processed Food Standard-ization)	Dropbox plastic and paper packaging.	It is an institution whose contribution and direction to implement and formulate policies related to the circular economy have not yet been seen.	<ul style="list-style-type: none"> • Educating the public through social media • Provide training on CE to the public • Provide incentives to businesses implementing CE • Conducting outreach about CE to business people • Provide technical assistance to business people who are implementing CE in their business activities • Create a joint work unit with other agencies that focus on discussing CE issues • Initiating forums or activities that bring together stakeholders • Collaborate with the business sector to implement CE initiatives • Work with communities to implement CE initiatives • Collaborate with other institutions (eg NGOs, research institutions) to carry out CE initiatives
	Ministry of Industry (Directorate of Food Industry, Marine Products, and Fisheries)	<i>Did not fill out the questionnaire</i>	It is an institution whose contribution and direction to implement and formulate policies related to the circular economy have not yet been seen.	<ul style="list-style-type: none"> • Conduct public outreach on CE (eg webinars, conferences) • Educating the public through social media • Provide training on CE to the public • Making regulations that support CE implementation in Indonesia • Provide incentives to businesses implementing CE • Conducting outreach about CE to business people • Provide technical assistance to business people who are implementing CE in their business activities • Create a joint work unit with other agencies that focus on discussing CE issues • Attend a conference to discuss CE implementation in Indonesia • Initiating forums or activities that bring together stakeholders • Collaborate with the business sector to implement CE initiatives • Work with communities to implement CE initiatives • Collaborate with other institutions (eg NGOs, research institutions) to carry out CE initiatives

Table 11. Grouping of Amoeba in Government Agencies: Construction

Amoeba Group	Agency Name	CE implementation and targets under development (based on questionnaire)	Desk Research Results	Recommended contributions to the implementation of a circular economy
Controller	Ministry of Public Works and Public Housing (Directorate of Construction Services Development)	Minister of Public Works Regulation Number 11 of 2012 concerning the National Action Plan for Mitigation and Adaptation to Climate Change for 2012–2020, Minister of Public Works Regulation Number 02/PRT/M/2015 concerning Green Buildings for reducing GHG emissions from buildings, and Ministerial Regulations Public Works and Public Housing Number 9 of 2021 concerning Guidelines for the Implementation of Sustainable Construction.	It is an institution that is developing the implementation and mechanism of a circular economy within its agency.	<ul style="list-style-type: none"> • Educating the public through social media • Provide training on CE to the public • Provide incentives to businesses implementing CE • Provide technical assistance to business people who are implementing CE in their business activities • Create a joint work unit with other agencies that focus on discussing CE issues • Attend a conference to discuss CE implementation in Indonesia • Initiating forums or activities that bring together stakeholders • Collaborate with the business sector to implement CE initiatives • Work with communities to implement CE initiatives • Collaborate with other institutions (eg NGOs, research institutions) to carry out CE initiatives
	Ministry of Industry (Directorate of Food Industry, Marine Products, and Fisheries)	<i>Answered 'no'</i>	It is an institution that is developing the implementation and mechanism of a circular economy within its agency. The Ministry of PUPR has issued regulations related to environmentally friendly infrastructure development through PUPR Ministerial Regulation No. 9 of 2021 concerning Guidelines for the Implementation of Sustainable Construction and Minister of PUPR Regulation No. 21 of 2021 concerning Performance Assessment of Green Buildings (BGH). ⁴⁸	<ul style="list-style-type: none"> • Conduct public outreach on CE (eg webinars, conferences) • Educating the public through social media • Provide training on CE to the public • Provide incentives to businesses implementing CE • Conducting outreach about CE to business people • Provide technical assistance to business people who are implementing CE in their business activities • Create a joint work unit with other agencies that focus on discussing CE issues • Attend a conference to discuss CE implementation in Indonesia • Initiating forums or activities that bring together stakeholders • Collaborate with the business sector to implement CE initiatives • Work with communities to implement CE initiatives • Collaborate with other institutions (eg NGOs, research institutions) to carry out CE initiatives

⁴⁸ PUPR, Terapkan Konsep Green Building, Gedung Utama Kementerian PUPR Terima Penghargaan Subroto Bidang Efisiensi Energi Tahun 2021. PUPR, (2021), diakses tanggal 13 Februari 2022 <https://pu.go.id/berita/terapkan-konsep-green-building-gedung-utama-kementerian-pupr-terima-penghargaan-subroto-bidang-efisiensi-energi-tahun-2021>.

Controller	Ministry of Public Works and Public Housing (Directorate of Bridge Construction)	Rehabilitating bridges	It is an institution that is developing the implementation and mechanism of a circular economy within its agency. In 2022, infrastructure completion will be carried out using the OPOR (Optimization, Maintenance, Operation, and Rehabilitation) method, this approach supports the circular economy principle in the construction sector, namely repair (building repairs and renovations) and refurbish (building quality improvement). In addition, this institution also issues Norms, Standards, Procedures, and Criteria for the administration of the Bridge and Road Preservation sector. ⁴⁹	<ul style="list-style-type: none"> • Educating the public through social media • Provide training on CE to the public • Making regulations that support CE implementation in Indonesia • Provide incentives to businesses implementing CE • Attend a conference to discuss CE implementation in Indonesia • Initiating forums or activities that bring together stakeholders • Collaborate with the business sector to implement CE initiatives • Work with communities to implement CE initiatives • Collaborate with other institutions (eg NGOs, research institutions) to carry out CE initiatives
	Ministry of Public Works and Public Housing (Directorate of Road Development)	<i>Answered 'no'</i>		<ul style="list-style-type: none"> • Educating the public through social media • Provide incentives to businesses implementing CE • Conducting outreach about CE to business people • Provide technical assistance to business people who are implementing CE in their business activities • Create a joint work unit with other agencies that focus on discussing CE issues • Attend a conference to discuss CE implementation in Indonesia • Initiating forums or activities that bring together stakeholders • Collaborate with the business sector to implement CE initiatives • Work with communities to implement CE initiatives • Collaborate with other institutions (eg NGOs, research institutions) to carry out CE initiatives

⁴⁹ Kementerian Pekerjaan Umum dan Perumahan Rakyat, "Standar Pedoman", Kementerian Pekerjaan Umum dan Perumahan Rakyat, accessed on February 12, 2022 <https://binamarga.pu.go.id/index.php/konten/standar-pedoman>.

Controller	Ministry of Public Works and Public Housing (Directorate of Road Development)	<i>Answered 'do not know'</i>	It is an institution that is developing the implementation and mechanism of a circular economy within its agency. Based on the Strategic Plan of the Directorate of Sanitation 2020–2024, the implementation of a circular economy in sanitation management is a strategy that will support the policy of developing alternative sources of financing. ⁵⁰	<ul style="list-style-type: none"> • Conduct public outreach on CE (eg webinars, conferences) • Educating the public through social media • Provide training on CE to the public • Making regulations that support CE implementation in Indonesia • Provide incentives to businesses implementing CE • Conducting outreach about CE to business people • Provide technical assistance to business people who are implementing CE in their business activities • Create a joint work unit with other agencies that focus on discussing CE issues • Initiating forums or activities that bring together stakeholders • Collaborate with the business sector to implement CE initiatives • Work with communities to implement CE initiatives
	Ministry of National Development Planning of the Republic of Indonesia/ National Development Agency (BAPPENAS) (Directorate of Housing and Settlements)	Low Carbon Development in RPJMN and RKP	It is an institution that is developing the implementation and mechanism of a circular economy within its agency. In the 2020–2024 RPJMN Draft, it was stated that the direction of policies and strategies in the context of providing access to safe and decent drinking water, one of which was the development of the concept of resource recovery and a circular economy. ⁵¹	<ul style="list-style-type: none"> • Provide training on CE to the public • Making regulations that support CE implementation in Indonesia • Provide incentives to businesses implementing CE • Conducting outreach about CE to business people • Provide technical assistance to business people who are implementing CE in their business activities • Create a joint work unit with other agencies that focus on discussing CE issues • Collaborate with the business sector to implement CE initiatives • Work with communities to implement CE initiatives • Collaborate with other institutions (eg NGOs, research institutions) to carry out CE initiatives

⁵⁰ Kementerian Pekerjaan Umum dan Perumahan Rakyat, "Rencana Strategis Direktorat Sanitasi 2020-2024," Kementerian Pekerjaan Umum dan Perumahan Rakyat (2020).

⁵¹ Kementerian PPN/Bappenas, "Rancangan Rencana Pembangunan Jangka Menengah Nasional 2020-2024," Kementerian PPN/Bappenas (2019).

Unidentified	Ministry of National Development Planning of the Republic of Indonesia/ National Development Agency (BAPPENAS) (Directorate of Planning and Development of National Priority Infrastructure Projects (P3IPN))	<i>Answered 'no'</i>	It is an institution whose contribution and direction to implement and formulate policies related to the circular economy have not yet been seen.	<ul style="list-style-type: none"> • Conduct public outreach on CE (eg webinars, conferences) • Educating the public through social media • Provide training on CE to the public • Making regulations that support CE implementation in Indonesia • Provide incentives to businesses implementing CE • Conducting outreach about CE to business people • Provide technical assistance to business people who are implementing CE in their business activities • Create a joint work unit with other agencies that focus on discussing CE issues • Attend a conference to discuss CE implementation in Indonesia • Initiating forums or activities that bring together stakeholders • Collaborate with the business sector to implement CE initiatives • Work with communities to implement CE initiatives • Collaborate with other institutions (eg NGOs, research institutions) to carry out CE initiatives
	Ministry of National Development Planning of the Republic of Indonesia/ National Development Agency (BAPPENAS) (Directorate of Transportation)	<i>Answered 'no'</i>	It is an institution whose contribution and direction to implement and formulate policies related to the circular economy have not yet been seen.	<ul style="list-style-type: none"> • Educating the public through social media • Provide training on CE to the public • Making regulations that support CE implementation in Indonesia • Provide incentives to businesses implementing CE • Conducting outreach about CE to business people • Provide technical assistance to business people who are implementing CE in their business activities • Create a joint work unit with other agencies that focus on discussing CE issues • Attend a conference to discuss CE implementation in Indonesia • Initiating forums or activities that bring together stakeholders • Collaborate with the business sector to implement CE initiatives • Work with communities to implement CE initiatives • Collaborate with other institutions (eg NGOs, research institutions) to carry out CE initiatives

Table 12. Grouping of Amoeba Government Agencies: Electronics

Amoeba Group	Agency Name	CE implementation and targets under development (based on questionnaire)	Desk Research Results	Recommended contributions to the implementation of a circular economy
Unidentified	National Standardization Agency (Directorate of Standard Development for Mechanics, Energy, Electrotechnics, Transportation, and Information Technology)	<i>Answered 'no'</i>	It is an institution whose contribution and direction to implement and formulate policies related to the circular economy have not yet been seen.	<ul style="list-style-type: none"> • Conduct public outreach on CE (eg webinars, conferences) • Educating the public through social media • Provide training on CE to the public • Making regulations that support CE implementation in Indonesia • Provide incentives to businesses implementing CE • Provide technical assistance to business people who are implementing CE in their business activities • Create a joint work unit with other agencies that focus on discussing CE issues • Attend a conference to discuss CE implementation in Indonesia • Initiating forums or activities that bring together stakeholders • Collaborate with the business sector to implement CE initiatives • Work with communities to implement CE initiatives
	Ministry of Industry (Directorate of Electronics and Telematics Industry)	<i>Did not fill out the questionnaire</i>	It is an institution whose contribution and direction to implement and formulate policies related to the circular economy have not yet been seen.	<ul style="list-style-type: none"> • Conduct public outreach on CE (eg webinars, conferences) • Educating the public through social media • Provide training on CE to the public • Making regulations that support CE implementation in Indonesia • Provide incentives to businesses implementing CE • Conducting outreach about CE to business people • Provide technical assistance to business people who are implementing CE in their business activities • Create a joint work unit with other agencies that focus on discussing CE issues • Attend a conference to discuss CE implementation in Indonesia • Initiating forums or activities that bring together stakeholders • Collaborate with business sector to implement CE initiatives • Work with communities to implement CE initiatives • Collaborate with other institutions (eg NGOs, research institutions) to carry out CE initiatives

Table 13. Grouping of Amoeba Government Agencies: Textile

Amoeba Group	Agency Name	CE implementation and targets under development (based on questionnaire)	Desk Research Results	Recommended contributions to the implementation of a circular economy
Unidentified	Ministry of Industry (BSKJI Textile Center)	<i>Answered 'no'</i>	It is an institution whose contribution and direction to implement and formulate policies related to the circular economy have not yet been seen.	<ul style="list-style-type: none"> • Provide training on CE to the public • Making regulations that support CE implementation in Indonesia • Provide incentives to businesses implementing CE • Create a joint work unit with other agencies that focus on discussing CE issues • Initiating forums or activities that bring together stakeholders • Work with communities to implement CE initiatives • Collaborate with other institutions (eg NGOs, research institutions) to carry out CE initiatives
	Ministry of Industry (Directorate of Textile, Leather and Footwear Industry)	<i>Answer 'do not know'</i>	It is an institution whose contribution and direction to implement and formulate policies related to the circular economy have not yet been seen.	<ul style="list-style-type: none"> • Conduct public outreach on CE (eg webinars, conferences) • Educating the public through social media • Provide training on CE to the public • Making regulations that support CE implementation in Indonesia • Provide incentives to businesses implementing CE • Conducting outreach about CE to business people • Provide technical assistance to business people who are implementing CE in their business activities • Create a joint work unit with other agencies that focus on discussing CE issues • Attend a conference to discuss CE implementation in Indonesia • Initiating forums or activities that bring together stakeholders • Collaborate with the business sector to implement CE initiatives • Work with communities to implement CE initiatives • Collaborate with other institutions (eg NGOs, research institutions) to carry out CE initiatives

Table 14. Grouping of Amoeba Government Agencies: Government Affiliated Associations

Amoeba Group	Agency Name	CE implementation and targets under development (based on questionnaire)	Desk Research Results	Recommended contributions to the implementation of a circular economy
Change Agent	Sustainable District Meeting Circle (LTKL)	<i>Did not fill out the questionnaire</i>	Is an institution that encourages its members to implement a circular economy. Lingkar Temu Kabupaten Lestari (LTKL) is a district government association formed and managed by the district government in order to realize sustainable development that protects the environment and improves the welfare of the community through mutual cooperation. ⁵² In LTKL, the circular economy is fully aligned with the vision of society, household waste is a priority because the majority of households are farmers. ⁵³	<ul style="list-style-type: none"> • Making regulations that support CE implementation in Indonesia • Create a joint work unit with other agencies that focus on discussing CE issues
	Association of Indonesian Regency Governments (APKASI)	Holding APKASI Expo for All Regencies in Indonesia.	It is an institution that has now begun to discuss and encourage the implementation of a circular economy and has the power to influence other institutions to start transitioning to a circular economy. APKASI is a forum for district government organizations in Indonesia. APKASI in collaboration with SYSTEMIQ, APEKSI, and FITRA compiled a waste management policy study entitled "Building Strong Governance and Adequate Funding to Achieve Indonesia's Waste Management Targets". In this policy review, several policy directions related to the circular economy are listed, one of which is the circular waste system. ⁵⁴	<ul style="list-style-type: none"> • Conduct public outreach on CE (eg webinars, conferences) • Provide training on CE to the public • Making regulations that support CE implementation in Indonesia • Provide incentives to businesses implementing CE • Provide technical assistance to business people who are implementing CE in their business activities • Create a joint work unit with other agencies that focus on discussing CE issues • Initiating forums or activities that bring together stakeholders • Collaborate with the business sector to implement CE initiatives • Work with communities to implement CE initiatives • Collaborate with other institutions (eg NGOs, research institutions) to carry out CE initiatives

⁵² Lingkar Temu Kabupaten Lestari, "Tentang LTKL", Lingkar Temu Kabupaten Lestari, accessed on February 13, 2022 <https://www.kabupatenlestari.org/apa/>.

⁵³ Lingkar Temu Kabupaten Lestari, "Circular Economy for Sustainable Districts: Translating Concept into Implementation," *Lingkar Temu Kabupaten Lestari* (2020).

⁵⁴ SYSTEMIQ, APKASI, APEKSI, FITRA, "Membangun Tata Kelola yang Kuat dan Pendanaan yang Memadai untuk Mencapai Target-target Pengelolaan Sampah Indonesia," *SYSTEMIQ, APKASI, APEKSI, FITRA* (2021).

<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Transformers</p>	<p>Association of Indonesian City Governments (APEKSI)</p>	<p>There are no policies related to the circular economy in particular, but it has started to implement paperless, goods that are no longer used will be auctioned off or given to those in need.</p>	<p>It is an institution that has now begun to discuss and encourage the implementation of a circular economy and has the power to influence other institutions to start transitioning to a circular economy. APEKSI is a forum consisting of 98 cities in urban areas aimed at assisting its members in implementing regional autonomy and creating a conducive climate for the establishment of cooperation between local governments. APEKSI in collaboration with SYSTEMIQ, APKASI, and FITRA compiled a waste management policy study entitled "Building Strong Governance and Adequate Funding to Achieve Indonesia's Waste Management Targets". In this policy review, several policy directions related to the circular economy are listed, one of which is the circular waste system.⁵⁵</p>	<ul style="list-style-type: none"> • Conduct public outreach on CE (eg webinars, conferences) • Educating the public through social media • Provide training on CE to the public • Making regulations that support CE implementation in Indonesia • Provide incentives to businesses implementing CE • Provide technical assistance to business people who are implementing CE in their business activities • Create a joint work unit with other agencies that focus on discussing CE issues • Initiating forums or activities that bring together stakeholders • Collaborate with the business sector to implement CE initiatives • Work with communities to implement CE initiatives • Collaborate with other institutions (eg NGOs, research institutions) to carry out CE initiatives
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Unidentified</p>	<p>Association of Districts/ Cities Concerned for Sanitation (AKKOPSI)</p>	<p><i>Answered 'no'</i></p>	<p>It is an institution whose contribution and direction to implement and formulate policies related to the circular economy have not yet been seen.</p>	<ul style="list-style-type: none"> • Making regulations that support CE implementation in Indonesia • Provide incentives to businesses implementing CE • Provide technical assistance to business people who are implementing CE in their business activities • Create a joint work unit with other agencies that focus on discussing CE issues • Attend a conference to discuss CE implementation in Indonesia • Initiating forums or activities that bring together stakeholders • Collaborate with the business sector to implement CE initiatives

⁵⁵ Ibid.

Table 15. Grouping of Amoeba Government Agencies: Energy

Amoeba Group	Agency Name	CE implementation and targets under development (based on questionnaire)	Desk Research Results	Recommended contributions to the implementation of a circular economy
Controller	DPR RI Commission VII	Law No. 16 of 2016 concerning Ratification of the Paris Agreement To The United Nations Framework Convention On Climate Change (Paris Agreement on the United Nations Framework Convention on Climate Change).	It is an institution that is developing the implementation and mechanism of a circular economy within its agency.	
	Ministry of National Development Planning of the Republic of Indonesia/ National Development Agency (BAPPENAS) (Directorate of Electricity, Telecommunication and Information Technology)	Utilization of new and renewable energy to achieve net-zero emission including Waste Power Plants.	It is an institution that is developing the implementation and mechanism of a circular economy within its agency.	<ul style="list-style-type: none"> • Educating the public through social media • Provide training on CE to the public • Provide incentives to businesses implementing CE • Provide technical assistance to business people who are implementing CE in their business activities • Create a joint work unit with other agencies that focus on discussing CE issues • Collaborate with the business sector to implement CE initiatives • Work with communities to implement CE initiatives
	Ministry of Energy and Mineral Resources (Directorate of Various New Energy and Renewable Energy)	<i>Answered 'no'</i>	It is an institution that is developing the implementation and mechanism of a circular economy within its agency. In the Strategic Plan of the Directorate General of New, Renewable Energy and Energy Conservation 2020-2024, the policy direction to be implemented is to increase efficiency in energy use. The strategies include 1) energy-saving campaigns, and 2) developing incentives and funding mechanisms for financing in an effort to achieve energy efficiency. ⁵⁶	<ul style="list-style-type: none"> • Conduct public outreach on CE (eg webinars, conferences) • Educating the public through social media • Provide training on CE to the public • Making regulations that support CE implementation in Indonesia • Provide incentives to businesses implementing CE • Conducting outreach about CE to business people • Provide technical assistance to business people who are implementing CE in their business activities • Create a joint work unit with other agencies that focus on discussing CE issues • Initiating forums or activities that bring together stakeholders • Collaborate with the business sector to implement CE initiatives • Work with communities to implement CE initiatives • Collaborate with other institutions (eg NGOs, research institutions) to carry out CE initiatives
	Ministry of Energy and Mineral Resources (Directorate of Energy Conservation)	Energy usage savings.		<ul style="list-style-type: none"> • Conduct public outreach on CE (eg webinars, conferences) • Educating the public through social media • Provide training on CE to the public • Making regulations that support CE implementation in Indonesia • Provide incentives to businesses implementing CE

⁵⁶ Kementerian Energi dan Sumber Daya Mineral, "Rencana Strategis Direktorat Jenderal Energi Baru, Terbarukan dan Konservasi Energi 2020-2024," *Kementerian Energi dan Sumber Daya Mineral* (2020).

<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Controller</p>				<ul style="list-style-type: none"> ▪ Provide technical assistance to business people who are implementing CE in their business activities ▪ Create a joint work unit with other agencies that focus on discussing CE issues ▪ Attend a conference to discuss CE implementation in Indonesia ▪ Initiating forums or activities that bring together stakeholders ▪ Collaborate with the business sector to implement CE initiatives ▪ Work with communities to implement CE initiatives ▪ Collaborate with other institutions (eg NGOs, research institutions) to carry out CE initiatives
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Unidentified</p>	<p>Ministry of National Development Planning of the Republic of Indonesia/ National Development Agency (BAPPENAS) (Directorate of Energy, Mineral and Mining Resources)</p>	<p><i>Answered 'no'</i></p>	<p>It is an institution whose contribution and direction to implement and formulate policies related to the circular economy have not yet been seen.</p>	<ul style="list-style-type: none"> ▪ Educating the public through social media ▪ Provide training on CE to the public ▪ Making regulations that support CE implementation in Indonesia ▪ Provide incentives to businesses implementing CE ▪ Provide technical assistance to business people who are implementing CE in their business activities ▪ Create a joint work unit with other agencies that focus on discussing CE issues ▪ Attend a conference to discuss CE implementation in Indonesia ▪ Collaborate with the business sector to implement CE initiatives

Table 16. Grouping of Amoeba Government Agencies: Manufacturing

Amoeba Group	Agency Name	CE implementation and targets under development (based on questionnaire)	Desk Research Results	Recommended contributions to the implementation of a circular economy
Controller	Ministry of Industry (Green Industry Center)	<i>Answered 'no'</i>	It is an institution that is developing the implementation and mechanism of a circular economy within its agency. The Center for Green Industry encourages the industry to optimize environmental management through incentive mechanisms for green industries. In addition, through Law no. 3 of 2014 concerning Industry, the Ministry of Industry has put forward the concepts of the Green Industry, one of which is a circular economy to support a green economy and low-carbon development through the 5R approach, namely Reuse, Reduce, Recycle, Repair, and Recovery. ⁵⁷	<ul style="list-style-type: none"> • Create a joint work unit with other agencies that focus on discussing CE issues • Work with communities to implement CE initiatives • Collaborate with other institutions (eg NGOs, research institutions) to carry out CE initiatives
	Ministry of Industry (Head of Center for Metal and Machinery)	<i>Did not fill out the questionnaire</i>	It is an institution that is developing the implementation and mechanism of a circular economy within its agency. One of the technical services for the industry is green industry certification services. Based on (Law No. 3 of 2014 concerning Industry, the green industry is an industry that in its production process prioritizes efforts for efficiency and effectiveness in the use of resources in a sustainable manner to be able to harmonize industrial development with the preservation of environmental functions and can provide benefits to the community.	
	Ministry of Industry (Head of Center for Optimizing the Utilization of Industrial Technology and Industrial Services Policy)	<i>Answered 'no'</i>	Green Industry Standards are compiled based on the type of industry according to the Indonesian Standard Classification of Business Fields (KBLI) digit 5 (BPS Regulation No. 19 of 2017 concerning Amendments to BPS Perka No. 95 of 2015 concerning Standard Classification of Indonesian Business Fields). ⁵⁸	
	Kementerian Perindustrian (Direktorat Industri Kimia Hulu)	Regulation of the Minister of Industry concerning Green Industry Standards.	It is an institution that is developing the implementation and mechanism of a circular economy within its agency.	

⁵⁷ Media Indonesia, "Kemenperin Dorong Industri untuk Optimalkan Pengelolaan Lingkungan", Media Indonesia, accessed on February 13, 2022 <https://mediaindonesia.com/ekonomi/400651/kemenperin-dorong-industri-untuk-optimalkan-pengelolaan-lingkungan>.

⁵⁸ Kementerian Perindustrian, "Sertifikasi Industri Hijau", *Kementerian Perindustrian* (2021).

Table 17. Grouping of Amoeba Government Agencies: Other Business Sector

Business Sector	Amoeba Group	Agency Name	CE implementation and targets under development (based on questionnaire)	Desk Research Results	Recommended contributions to the implementation of a circular economy
Wholesale and Retail (Plastic Packaging)	Controller	Ministry of Industry Directorate of Downstream Chemical and Pharmaceutical Industry	Development of the Circular Economy Concept in the Industrial Sector in the form of a Green Industry, and the Development of a Circular Economy in the form of a plastic recycling business.	Is an institution that is developing the application and mechanism of a circular economy within its agency.	<ul style="list-style-type: none"> Regarding CE for the public Making regulations that support CE implementation in Indonesia Provide incentives to businesses implementing CE Create a joint work unit with other agencies that focus on discussing CE issues Work with communities to implement CE initiatives Collaborate with other institutions (eg NGOs, research institutions) to carry out CE initiatives
Procurement of Goods and Services		Government Goods/ Services Procurement Policy Institute (Deputy for Strategy Development and General Procurement Policy)	Sustainable procurement takes into account social, economic, and environmental aspects.	Is an institution that is developing the application and mechanism of a circular economy within its agency.	<ul style="list-style-type: none"> Educating the public through social media Provide training on CE to the public Making regulations that support CE implementation in Indonesia Provide incentives to businesses implementing CE Conducting outreach about CE to business people Provide technical assistance to business people who are implementing CE in their business activities Initiating forums or activities that bring together stakeholders Collaborate with the business sector to implement CE initiatives Work with communities to implement CE initiatives
Waste Management		Coordinating Ministry for Maritime Affairs and Investment (Assistant Deputy for Waste and Waste Management)	<i>Answered 'there is not any'</i>	It is an institution that is developing the implementation and mechanism of a circular economy within its agency. Based on the Strategic Plan of the Deputy for Coordination of Environmental and Forestry Management 2020-2024, one of the policy directions to be implemented is low-carbon development which is pursued by increasing the achievement of emission reductions and GHG emission intensity. One of the baselines is the development of green industry, with several indicators, one of which is the number of standard designs for handling B3 waste problems	<ul style="list-style-type: none"> Conduct public outreach on CE (eg webinars, conferences) Educating the public through social media Provide training on CE to the public Making regulations that support CE implementation in Indonesia Provide incentives to businesses implementing CE Conducting outreach about CE to business people Provide technical assistance to business people who are implementing CE in their business activities Create a joint work unit with other agencies that focus on discussing CE issues Initiating forums or activities that bring together stakeholders

Waste Management		Controller		
			in the industrial sector and the application of a circular economy in sustainable industrial development from 3 standard designs to 20 standard designs (2024). ⁵⁹	<ul style="list-style-type: none"> Collaborate with the business sector to implement CE initiatives Work with communities to implement CE initiatives
Ministry of Environment and Forestry (Directorate of Waste Management)	LHK Ministerial Regulation No. 75 of 2019 concerning Roadmap for Reducing Waste from Producers, LHK Ministerial Regulation No. 14 of 2014 concerning Waste Management in Waste Banks.	Is an institution that is developing the application and mechanism of a circular economy within its agency.		<ul style="list-style-type: none"> Provide training on CE to the public Create a joint work unit with other agencies that focus on discussing CE issues Attend a conference to discuss CE implementation in Indonesia Initiating forums or activities that bring together stakeholders Collaborate with the business sector to implement CE initiatives
Ministry of Industry (Center for Industrial Pollution Prevention Technology)	Preparation of technical guidelines and Green Industry.	Is an institution that is developing the application and mechanism of a circular economy within its agency.		<ul style="list-style-type: none"> Provide training on CE to the public Making regulations that support CE implementation in Indonesia Provide incentives to businesses implementing CE Conducting outreach about CE to business people Provide technical assistance to business people who are implementing CE in their business activities Create a joint work unit with other agencies that focus on discussing CE issues Initiating forums or activities that bring together stakeholders Collaborate with the business sector to implement CE initiatives Work with communities to implement CE initiatives Collaborate with other institutions (eg NGOs, research institutions) to carry out CE initiatives
Secretariat of the National Coordination Team for Handling Marine Debris	<i>Answered 'there is not any'</i>	It is an institution that is developing the implementation and mechanism of a circular economy within its agency. The PSL TKN Secretariat sets out synergistic, measurable, and directed strategies, programs, and activities to reduce the amount of waste in the ocean, especially plastic waste, in the form of the 2018–2025 Marine Waste Management National Action Plan. ⁶⁰		<ul style="list-style-type: none"> Making regulations that support CE implementation in Indonesia Provide incentives to businesses implementing CE Provide technical assistance to business people who are implementing CE in their business activities Collaborate with the business sector to implement CE initiatives

⁵⁹ Kementerian Koordinator Bidang Kemaritiman dan Investasi, "Rencana Strategis Deputi Bidang Koordinasi Pengelolaan Lingkungan dan Kehutanan 2020-2024," *Kementerian Koordinator Bidang Kemaritiman dan Investasi* (2020).

⁶⁰ Lembaran Negara Republik Indonesia, "Peraturan Presiden Republik Indonesia Nomor 83 Tahun 2018 Tentang Penanganan Sampah Laut," *Lembaran Negara Republik Indonesia* (2018).

Other Business Sector	Controller	Ministry of Environment and Forestry (Center for Environmental and Forestry Standardization)	Use of recycled products, recycled plastic ecolabel.	Is an institution that is developing the application and mechanism of a circular economy within its agency.	<ul style="list-style-type: none"> Maintaining the current circular economy practice.
		Ministry of Environment and Forestry (Center for Standardization of Environmental Quality Instruments)	Reducing the use of plastic bags, Waste Banks, Waste Management.	Is an institution that is developing the application and mechanism of a circular economy within its agency.	<ul style="list-style-type: none"> Maintaining the current circular economy practice.
		Bali Regional Development Agency	In the Vision and Mission of the Governor of Bali, (Government Regulation 97 of 2018 concerning Restrictions on the Generation of Single-use Plastic Waste and Government Regulation 47 of 2019 concerning Source-Based Waste Management).	It is an institution that is developing the implementation and mechanism of a circular economy within its agency.	<ul style="list-style-type: none"> Provide training on CE to the public Making regulations that support CE implementation in Indonesia Conducting outreach about CE to business people Provide technical assistance to business people who are implementing CE in their business activities Create a joint work unit with other agencies that focus on discussing CE issues Attend a conference to discuss CE implementation in Indonesia Collaborate with the business sector to implement CE initiatives Collaborate with other institutions (eg NGOs, research institutions) to carry out CE initiatives
		West Java Regional Development Agency	Regional Low Carbon Development Plan as a transformation of the Regional Action Plan for Reducing Greenhouse Gas Emissions in West Java Province.	Is an institution that is developing the application and mechanism of a circular economy within its agency.	<ul style="list-style-type: none"> Provide training on CE to the public Making regulations that support CE implementation in Indonesia Provide incentives to businesses implementing CE Provide technical assistance to business people who are implementing CE in their business activities Create a joint work unit with other agencies that focus on discussing CE issues Attend a conference to discuss CE implementation in Indonesia Collaborate with the business sector to implement CE initiatives

Other Business Sector	Controller	Central Java Regional Development Agency	<i>Answered 'don't know'</i>	It is an institution that is developing the implementation and mechanism of a circular economy within its agency. Based on the Regional Medium-Term Development Plan (RPJMD) of Central Java Province, low-carbon development is one of the important elements in the development. The PRK in Central Java Province has two main focuses, namely improving the quality of development planning toward a green economy and implementing low-carbon development carried out in five areas, namely energy, industrial land, waste, coastal areas, and oceans. ⁶¹	<ul style="list-style-type: none"> Conduct public outreach on CE (eg webinars, conferences) Educating the public through social media Provide training on CE to the public Making regulations that support CE implementation in Indonesia Provide incentives to businesses implementing CE Conducting outreach about CE to business people Provide technical assistance to business people who are implementing CE in their business activities Create a joint work unit with other agencies that focus on discussing CE issues Attend a conference to discuss CE implementation in Indonesia Initiating forums or activities that bring together stakeholders Collaborate with the business sector to implement CE initiatives
		West Papua Regional Development Agency	Regional Regulation No. 10 on sustainability and conservation and the Governor of West Papua's MoU with Bappenas on Low Carbon Development in West Papua.	Is an institution that is developing the application and mechanism of a circular economy within its agency.	<ul style="list-style-type: none"> Educating the public through social media Provide incentives to businesses implementing CE Conducting outreach about CE to business people Provide technical assistance to business people who are implementing CE in their business activities Create a joint work unit with other agencies that focus on discussing CE issues Attend a conference to discuss CE implementation in Indonesia Initiating forums or activities that bring together stakeholders Collaborate with the business sector to implement CE initiatives Work with communities to implement CE initiatives Collaborate with other institutions (eg NGOs, research institutions) to carry out CE initiatives

⁶¹ Aprilia Ika, "Pembangunan Rendah Karbon di Jateng Dipantau Via Aplikasi Aksara", Low Carbon Development Indonesia, accessed on February 13, 2022 <https://lcdi-indonesia.id/2021/03/17/pembangunan-rendah-karbon-di-jateng-dipantau-via-aplikasi-aksara/>.

Financing	Controller	Ministry of Finance (Center for Climate Change and Multilateral Financing Policy (PKPPIM))	<i>Not filling out the questionnaire</i>	Based on the Strategic Plan of the Fiscal Policy Agency 2020-2024, one of the development agendas is Strengthening Economic Resilience for Quality and Equitable Growth. In this development agenda, one of the policy directions is the fulfillment of energy needs by prioritizing the increase in New and Renewable Energy (EBT). ⁶²	<ul style="list-style-type: none"> • Educating the public through social media • Provide training on CE to the public • Provide incentives to businesses implementing CE • Conducting outreach about CE to business people • Provide technical assistance to business people who are implementing CE in their business activities • Create a joint work unit with other agencies that focus on discussing CE issues • Attend a conference to discuss CE implementation in Indonesia • Initiating forums or activities that bring together stakeholders • Collaborate with the business sector to implement CE initiatives • Work with communities to implement CE initiatives
		Ministry of Industry (Head of Industrial Certification Center (BSI))	<i>Not filling out the questionnaire</i>	It is an institution that is developing the implementation and mechanism of a circular economy within its agency. One of the technical services for the industry is the green industry certification service.	<ul style="list-style-type: none"> • Create a joint work unit with other agencies that focus on discussing CE issues • Work with communities to implement CE initiatives • Collaborate with other institutions (eg NGOs, research institutions) to carry out CE initiatives
Industry Certification	Unidentified	Indonesian Ministry of National Development Planning (BAPPENAS) (Directorate of Industry, Tourism, and Creative Economy)	Low Carbon Development Indonesia (<i>carried out by the Directorate of the Environment</i>)	It is an institution whose contribution and leadership has not been seen in the implementation or formulation of circular economy policies.	<ul style="list-style-type: none"> • Educating the public through social media • Provide training on CE to the public • Making regulations that support CE implementation in Indonesia • Provide incentives to businesses implementing CE • Provide technical assistance to business people who are implementing CE in their business activities • Create a joint work unit with other agencies that focus on discussing CE issues
Sustainable Tourism					

Government Agencies: Other Business Sector

⁶² Fiscal Policy Agency, "Strategic Plan of Fiscal Policy Agency 2020-2024," *Badan Kebijakan Fiskal* (2020).

Sustainable Tourism	Unidentified			
	The Ministry of Tourism and Creative Economy (Directorate of Sustainable Tourism and Destination Governance)	<i>Answered, 'there is not any'</i>	It is an institution whose contribution and leadership has not been seen in the implementation or formulation of circular economy policies.	<ul style="list-style-type: none"> • Conduct public outreach on CE (eg webinars, conferences) • Educating the public through social media • Provide training on CE to the public • Making regulations that support CE implementation in Indonesia • Provide incentives to businesses implementing CE • Conducting outreach about CE to business people • Provide technical assistance to business people who are implementing CE in their business activities • Create a joint work unit with other agencies that focus on discussing CE issues • Attend a conference to discuss CE implementation in Indonesia • Initiating forums or activities that bring together stakeholders • Collaborate with the business sector to implement CE initiatives • Work with communities to implement CE initiatives • Collaborate with other institutions (eg NGOs, research institutions) to carry out CE initiatives
Agriculture	Indonesian Ministry of National Development Planning (BAPPENAS) (Directorate of Food and Agriculture)	<i>Answered, 'there is not any'</i>	It is an institution whose contribution and leadership has not been seen in the implementation or formulation of circular economy policies.	<ul style="list-style-type: none"> • Provide technical assistance to business people who are implementing CE in their business activities • Create a joint work unit with other agencies that focus on discussing CE issues • Attend a conference to discuss CE implementation in Indonesia • Initiating forums or activities that bring together stakeholders
	Ministry of Agriculture (Agricultural Research and Development Agency)	Research and development related to Crop-Livestock systems, organic farming, balanced fertilization, and more.	It is an institution whose contribution and leadership has not been seen in the implementation or formulation of circular economy policies.	<ul style="list-style-type: none"> • Conduct public outreach on CE (eg webinars, conferences) • Provide training on CE to the public • Provide incentives to businesses implementing CE • Conducting outreach about CE to business people • Create a joint work unit with other agencies that focus on discussing CE issues • Attend a conference to discuss CE implementation in Indonesia • Initiating forums or activities that bring together stakeholders • Collaborate with the business sector to implement CE initiatives • Work with communities to implement CE initiatives • Collaborate with other institutions (eg NGOs, research institutions) to carry out CE initiatives

Agriculture	Unidentified	Ministry of Agriculture (Agricultural Data and Information System Center)	<i>Answered, 'there is not any'</i>	It is an institution whose contribution and leadership has not been seen in the implementation or formulation of circular economy policies.	<ul style="list-style-type: none"> • Educating the public through social media • Provide training on CE to the public • Provide incentives to businesses implementing CE • Conducting outreach about CE to business people • Provide technical assistance to business people who are implementing CE in their business activities • Create a joint work unit with other agencies that focus on discussing CE issues • Attend a conference to discuss CE implementation in Indonesia • Collaborate with the business sector to implement CE initiatives • Work with communities to implement CE initiatives • Collaborate with other institutions (eg NGOs, research institutions) to carry out CE initiatives
		Ministry of Agriculture (Agricultural Environmental Research Center)	<i>Answered, 'there is not any'</i>	It is an institution whose contribution and leadership has not been seen in the implementation or formulation of circular economy policies.	<ul style="list-style-type: none"> • Conduct public outreach on CE (eg webinars, conferences) • Educating the public through social media • Provide training on CE to the public • Making regulations that support CE implementation in Indonesia • Provide incentives to businesses implementing CE • Create a joint work unit with other agencies that focus on discussing CE issues • Initiating forums or activities that bring together stakeholders • Collaborate with the business sector to implement CE initiatives
		Indonesian Ministry of National Development Planning (BAPPENAS) (Directorate of SME and Cooperative Development)	<i>Answered, 'there is not any'</i>	It is an institution whose contribution and leadership has not been seen in the implementation or formulation of circular economy policies.	<ul style="list-style-type: none"> • Conduct public outreach on CE (eg webinars, conferences) • Educating the public through social media • Provide training on CE to the public • Making regulations that support CE implementation in Indonesia • Provide incentives to businesses implementing CE • Conducting outreach about CE to business people • Provide technical assistance to business people who are implementing CE in their business activities • Create a joint work unit with other agencies that focus on discussing CE issues • Initiating forums or activities that bring together stakeholders • Collaborate with the business sector to implement CE initiatives • Work with communities to implement CE initiatives • Collaborate with other institutions (eg NGOs, research institutions) to carry out CE initiatives
MSMEs (Micro, Small, Medium Enterprises)					

MSMEs (Micro, Small, Medium Enterprises)

Unidentified

Ministry of Cooperatives and SMEs (Deputy for Entrepreneurship)	Factory Sharing Program, and facilitation program for social entrepreneurs.	It is an institution whose contribution and leadership has not been seen in the implementation or formulation of circular economy policies.	<ul style="list-style-type: none"> Conduct public outreach on CE (eg webinars, conferences) Provide training on CE to the public Making regulations that support CE implementation in Indonesia Provide technical assistance to business people who are implementing CE in their business activities Create a joint work unit with other agencies that focus on discussing CE issues Attend a conference to discuss CE implementation in Indonesia Collaborate with the business sector to implement CE initiatives Work with communities to implement CE initiatives Collaborate with other institutions (eg NGOs, research institutions) to carry out CE initiatives
Indonesian Ministry of Cooperatives and SMEs (Deputy Secretary of Cooperatives)	<i>Not filling out the questionnaire</i>	It is an institution whose contribution and leadership has not been seen in the implementation or formulation of circular economy policies.	<ul style="list-style-type: none"> Conduct public outreach on CE (eg webinars, conferences) Educating the public through social media Provide training on CE to the public Making regulations that support CE implementation in Indonesia Provide incentives to businesses implementing CE Conducting outreach about CE to business people Provide technical assistance to business people who are implementing CE in their business activities Create a joint work unit with other agencies that focus on discussing CE issues Attend a conference to discuss CE implementation in Indonesia Initiating forums or activities that bring together stakeholders Collaborate with the business sector to implement CE initiatives Work with communities to implement CE initiatives Collaborate with other institutions (eg NGOs, research institutions) to carry out CE initiatives
Ministry of Cooperatives and Small and Medium Enterprises (Deputy for Small and Medium Enterprises)	Reduce and reuse targets for Small and Medium Enterprises (SMEs).	It is an institution whose contribution and leadership has not been seen in the implementation or formulation of circular economy policies.	<ul style="list-style-type: none"> Conduct public outreach on CE (eg webinars, conferences) Educating the public through social media Provide training on CE to the public Making regulations that support CE implementation in Indonesia Provide incentives to businesses implementing CE Provide technical assistance to business people who are implementing CE in their business activities

Other Business Sector	Unidentified				<ul style="list-style-type: none"> • Create a joint work unit with other agencies that focus on discussing CE issues • Attend a conference to discuss CE implementation in Indonesia • Initiating forums or activities that bring together stakeholders • Work with communities to implement CE initiatives • Collaborate with other institutions (eg NGOs, research institutions) to carry out CE initiatives
		Indonesian Ministry of National Development Planning (BAPPENAS) (Directorate of Marine Affairs and Fisheries)	Fishery management in terms of upstream-downstream including supply chain logistics systems.	It is an institution whose contribution and leadership has not been seen in the implementation or formulation of circular economy policies.	<ul style="list-style-type: none"> • Educating the public through social media • Provide training on CE to the public • Making regulations that support CE implementation in Indonesia • Provide incentives to businesses implementing CE • Provide technical assistance to business people who are implementing CE in their business activities • Create a joint work unit with other agencies that focus on discussing CE issues • Initiating forums or activities that bring together stakeholders • Collaborate with the business sector to implement CE initiatives • Work with communities to implement CE initiatives • Collaborate with other institutions (eg NGOs, research institutions) to carry out CE initiatives
		Development Planning Agency of Riau	Informal policies, namely reducing paper use (via e-office) and reusing used paper for notes/ draft reports/work.	It is an institution whose contribution and leadership has not been seen in the implementation or formulation of circular economy policies.	<ul style="list-style-type: none"> • Conduct public outreach on CE (eg webinars, conferences) • Educating the public through social media • Provide training on CE to the public • Making regulations that support CE implementation in Indonesia • Provide incentives to businesses implementing CE • Provide technical assistance to business people who are implementing CE in their business activities • Create a joint work unit with other agencies that focus on discussing CE issues • Attend a conference to discuss CE implementation in Indonesia • Initiating forums or activities that bring together stakeholders • Collaborate with the business sector to implement CE initiatives • Work with communities to implement CE initiatives • Collaborate with other institutions (eg NGOs, research institutions) to carry out CE initiatives

Other Business Sector

Unidentified

Development Planning Agency of South Sulawesi	<i>Answered, 'there is not any'</i>	It is an institution whose contribution and leadership has not been seen in the implementation or formulation of circular economy policies.	<ul style="list-style-type: none"> Conduct public outreach on CE (eg webinars, conferences) Educating the public through social media Provide training on CE to the public Making regulations that support CE implementation in Indonesia Provide incentives to businesses implementing CE Conducting outreach about CE to business people Provide technical assistance to business people who are implementing CE in their business activities Create a joint work unit with other agencies that focus on discussing CE issues Attend a conference to discuss CE implementation in Indonesia Initiating forums or activities that bring together stakeholders Collaborate with the business sector to implement CE initiatives Work with communities to implement CE initiatives Collaborate with other institutions (eg NGOs, research institutions) to carry out CE initiatives
Development Planning Agency of Papua	<i>Answered, 'there is not any'</i>	It is an institution whose contribution and leadership has not been seen in the implementation or formulation of circular economy policies.	<ul style="list-style-type: none"> Conduct public outreach on CE (eg webinars, conferences) Educating the public through social media Provide training on CE to the public Provide incentives to businesses implementing CE Conducting outreach about CE to business people Provide technical assistance to business people who are implementing CE in their business activities Create a joint work unit with other agencies that focus on discussing CE issues Attend a conference to discuss CE implementation in Indonesia Initiating forums or activities that bring together stakeholders Collaborate with business sector to implement CE initiatives Work with communities to implement CE initiatives Collaborate with other institutions (eg NGOs, research institutions) to carry out CE initiatives

Other Business Sector	Unidentified	Indonesian Ministry of National Development Planning (BAPPENAS) (Directorate of Macro Planning and Statistical Analysis)	<i>Answered 'don't know'</i>	It is an institution whose contribution and leadership has not been seen in the implementation or formulation of circular economy policies.	<ul style="list-style-type: none"> • Educating the public through social media • Provide training on CE to the public • Create a joint work unit with other agencies that focus on discussing CE issues • Attend a conference to discuss CE implementation in Indonesia • Collaborate with the business sector to implement CE initiatives • Work with communities to implement CE initiatives
		Ministry of Home Affairs (Directorate of Synchronization of Regional Government Affairs I)	<i>Answered 'don't know'</i>	It is an institution whose contribution and leadership has not been seen in the implementation or formulation of circular economy policies.	<ul style="list-style-type: none"> • Conduct public outreach on CE (eg webinars, conferences) • Educating the public through social media • Provide training on CE to the public • Making regulations that support CE implementation in Indonesia • Provide incentives to businesses implementing CE • Conducting outreach about CE to business people • Provide technical assistance to business people who are implementing CE in their business activities • Create a joint work unit with other agencies that focus on discussing CE issues • Initiating forums or activities that bring together stakeholders • Collaborate with the business sector to implement CE initiatives • Work with communities to implement CE initiatives

In the amoeba grouping for government agencies, only agencies that belong to the Controller, Change Agent, Transformer, and Unidentified groups are identified in this stakeholder scope and the circular economy context. In the amoeba grouping, government agencies are the controllers if they make regulations related to the circular economy, apart from that they belong to the Unidentified group. Then the government-affiliated associations cannot be grouped as controllers because they do not have the authority to make public policies.



3

Mapping and Grouping based on the Role of Stakeholders in a Circular Business Ecosystem with 9R Principles

The shift from a linear economy model of production based on the take-make-out principle to a circular economy model with a restorative design, i.e. reusing materials as efficiently as possible and imposing value throughout the life cycle of the finished product, is what needs to be highlighted in the circular economy. So, the circular economy is not only about handling waste but also about preventing material from becoming waste from the start through the 9R principle.

Mapping and grouping based on the 9R production chain cycle will describe what forms of business can be carried out by policymakers following these 9R principles.

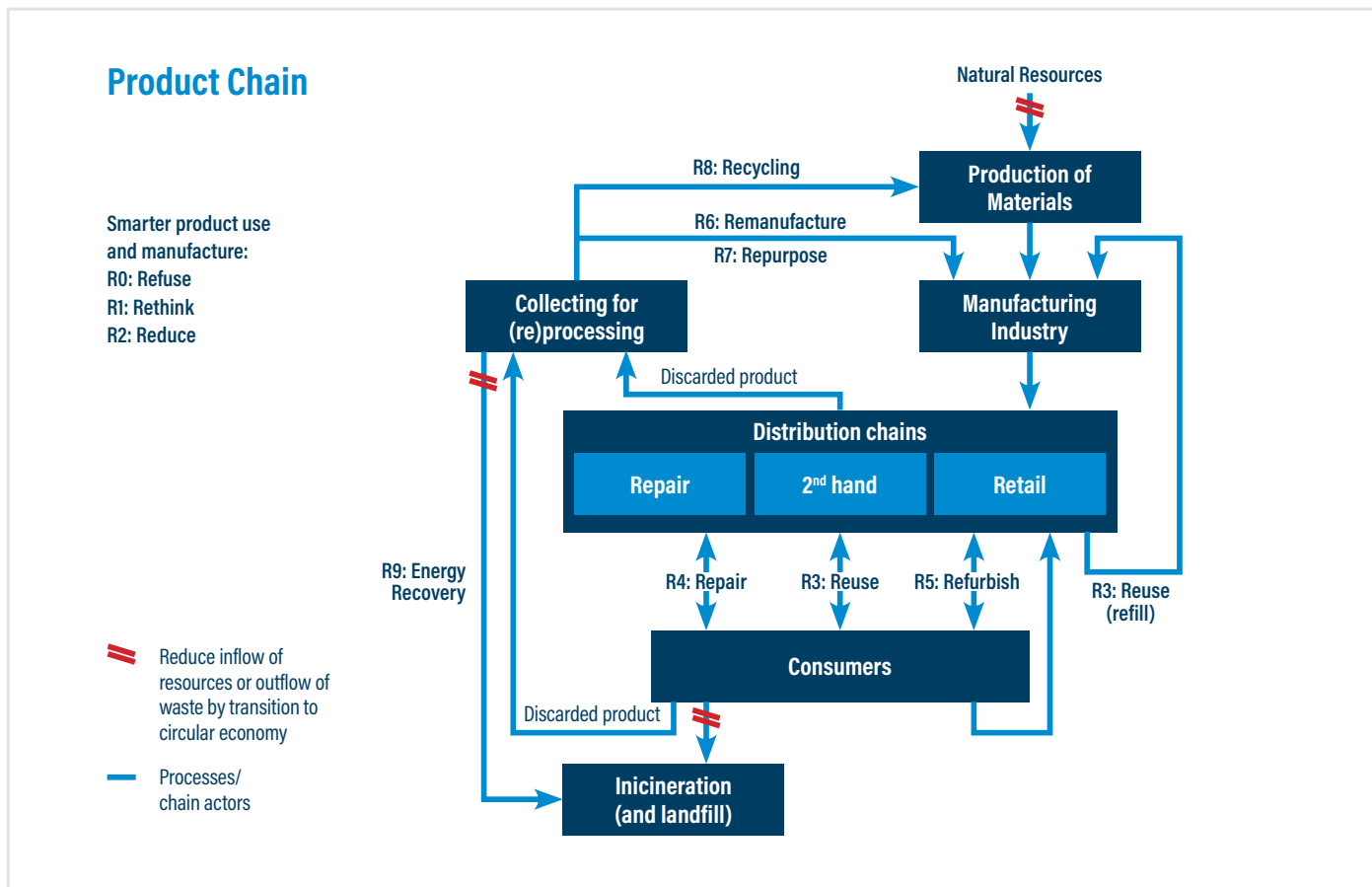


Figure 2. Production Chain Cycle according to the 9R Principle
 Source: Potting, et al. (2017)

The circular economy potential from the implementation of the 9R principle varies between priority business sectors. Two factors influence this variation: 1) the level of product resilience, and 2) the feasibility of circular technology (Ministry of National Development Planning, 2021). The level of product durability, for example, affects the potential for Rethink, Reduce and Reuse. **Figure 3** illustrates the circularity opportunities of each circular economy priority business sector based on the 9Rs, and the grouping of stakeholders who are business actors and NGOs according to the form of business carried out.

In this method, the temporary grouping of stakeholders is only carried out for business actors and NGOs. This is done to see and classify the forms of business that they have done so far against the 9R principles through desk research. Government agencies are present as support for the production cycle that has been carried out by business actors and NGOs.

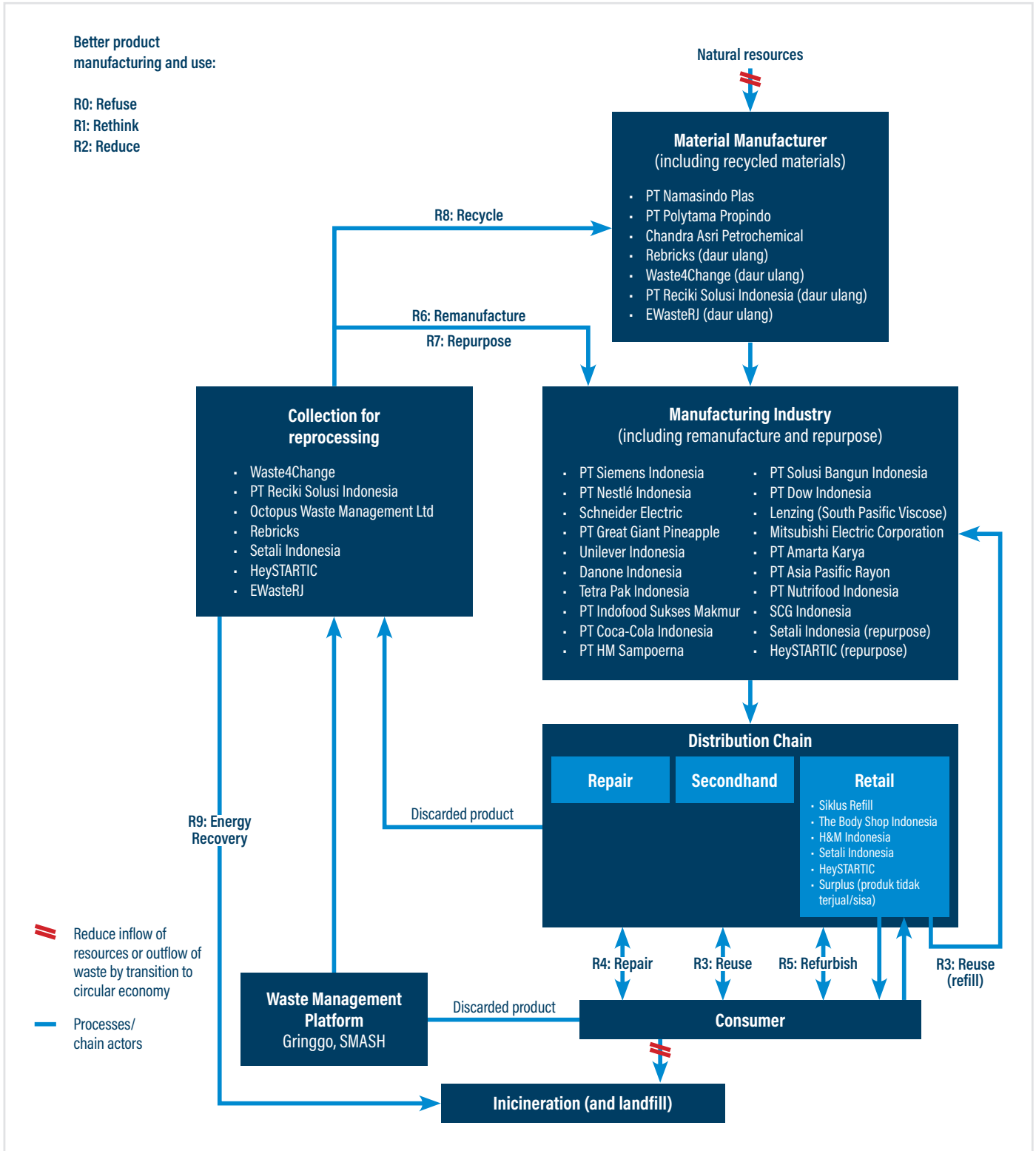


Figure 3. Grouping of Business Actors & NGOs into a Business Ecosystem Diagram (9R)
 Source: Analysis Results of the Author Team (2021)

In this diagram, stakeholders are grouped based on their business model in the 9R diagram, it can also be seen that one stakeholder can have several roles in the business ecosystem. Although within the scope of this stakeholder there are still some empty columns, this diagram shows that transitioning to a circular economy requires collective efforts, and it is also important to see the potential for collaboration.

In more detail, what forms of circular economy practice (9R) have been implemented in the 5 priority business sectors of the circular economy in Indonesia and several other business sectors, can be seen in the following table:

Table 18. Grouping of Business Actors and NGOs into the Business Ecosystem Table (9R)

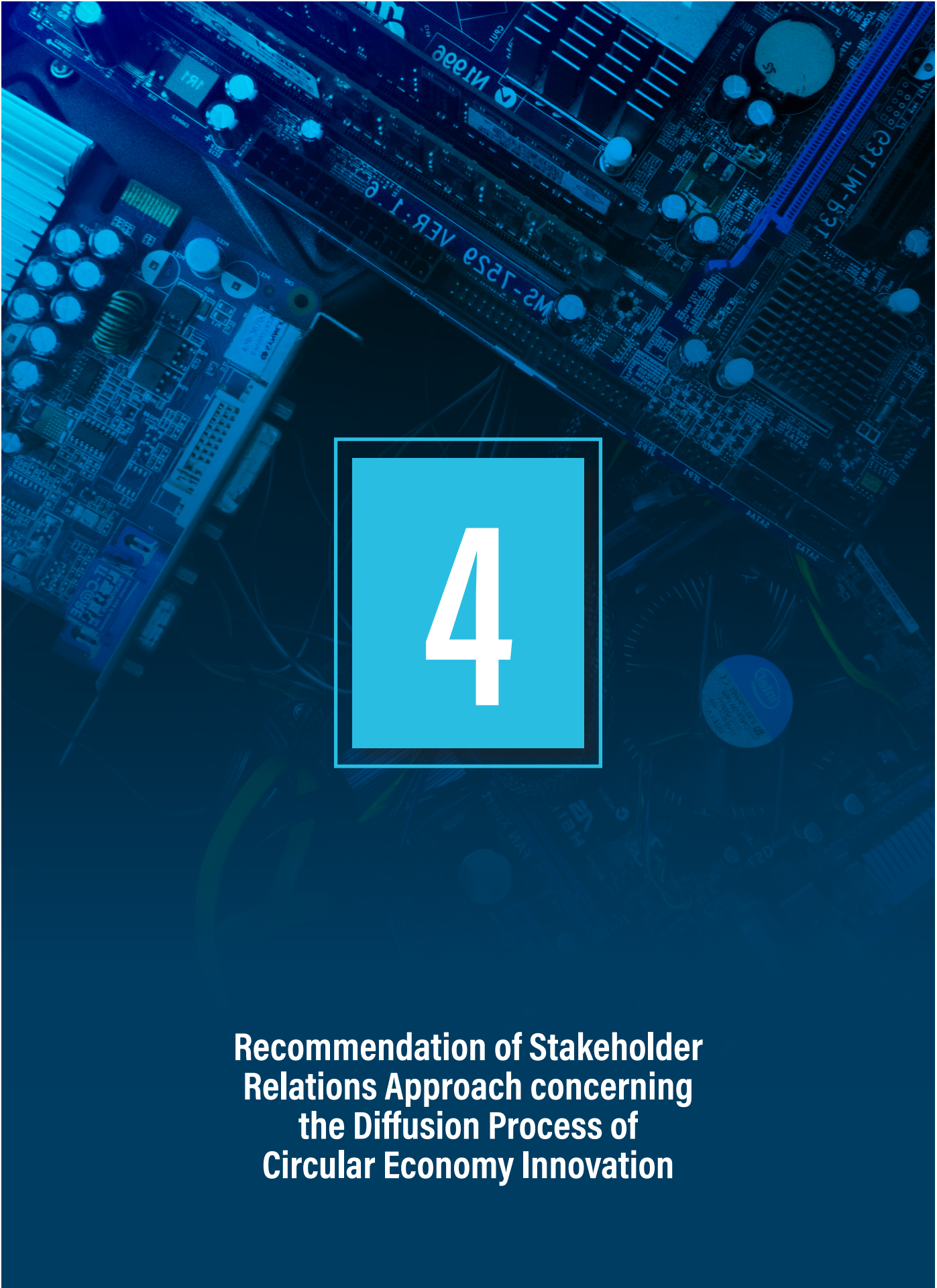
9R	Business Sector					
	Foods and Drinks	Textile	Construction	Wholesale and Retail Trade (Plastic)	Electrical and Electronic Equipment	Other Business Sector
R0 Refuse		<p>Reducing the use of materials that are difficult to reuse or recycle</p> <p>Examples: Lenzing, Asia Pacific Rayon, Mycotech</p>	<p>Reducing the use of materials that are difficult to reuse or recycle</p> <p>Examples: Green Sense Concrete, Mycotech</p>	<ul style="list-style-type: none"> Refusal to use plastic packaged products Replacement of liquid beverage products into concentrates Use of alternative packaging materials or recycled plastic <p>Examples: The Plastic Bag Diet Movement, Evoware, Sukkha Citta</p>	<p>Reduction/ replacement of the use of hazardous materials (such as beryllium, mercury, and lead used in today's electronic devices) with alternative materials</p>	<p>Examples: Xurya Daya (Energy)</p>
R1 Rethink	<p>Increased food production yields using fewer resources through new systems or technologies</p> <p>Examples: DamoGo, Agrodite</p>	<p>Lease system</p> <p>Examples: Style Theory, Rentique</p>	<ul style="list-style-type: none"> Construction of housing that accommodates many people Effective use of the office for 24 hours (shared use) <p>Examples: Co-Hive, GoWork, Kolega, and UnionSPACE</p>	<ul style="list-style-type: none"> Improve the reparability of retail products Modular product design Modification of materials or logistics for the transition from single-use consumption models to refill or reuse models <p>Examples: Siklus, Evoware, Danone (Aqua)</p>	<ul style="list-style-type: none"> Include maintenance, repair, and renewal costs in the purchase contract System for sharing electronic goods Improve the reparability of electronic products Modular product design <p>Examples: Atlas Copco, Asani Indonesia</p>	<p>Examples: Gojek (Transportation), SMASH (Waste Management Services), Gringgo (Waste Management Services), Xurya Daya (Energy)</p>
R2 Reduce	<ul style="list-style-type: none"> Reduction of post-harvest food loss Reduction of food loss and food waste in the supply chain Reduction of consumer food waste <p>Examples: DamoGo, Garda Pangan, Surplus, Foodbank of Indonesia, Limakilo, Sayurbox, Tanihub, Eden Farm, Foodcycle</p>	<p>Reduction of waste in production</p> <p>Examples: Threadapeutic, H&M</p>	<ul style="list-style-type: none"> Waste reduction through existing processes/ technology Waste reduction through new processes/ technology Optimization of building usage 	<p>Plastic packaging reduction</p> <p>Examples: Siklus, The Plastic Bag Diet Movement, CupKita, Evoware, Sukkha Citta</p>	<p>Dematerialization directly and indirectly</p>	

<p>R3 Reuse</p>	<p>Currently not relevant for the food and beverage business sector, because it is a disposable item</p>	<ul style="list-style-type: none"> • Product reuse • Giving used products to others through a private network 	<p>Reuse of building materials</p>	<ul style="list-style-type: none"> • Reuse of plastic packaging • Consumers return the plastic packaging to retailers for washing and reuse <p>Examples: The Body Shop Indonesia, CupKita</p>	<ul style="list-style-type: none"> • Product reuse • Giving used products to other consumers through private networks • Sales of electronic goods that can still be used <p>Examples: BelanjaBekas.com, Atlas Copco, Asani Indonesia</p>	
<p>R4 Repair</p>	<p>Currently not relevant for the food and beverage business sector, because it is a disposable item</p>	<p>Textile product repair</p>	<p>Building repairs and renovations</p>	<p>Currently irrelevant because of the relatively cheap production of plastics and too varied products</p>	<p>Electronics repair</p> <p>Examples: PT Sigin Interactive Indonesia</p>	
<p>R5 Refurbish</p>	<p>Currently not relevant for the food and beverage business sector, because it is a disposable item</p>	<ul style="list-style-type: none"> • Increased product validity and reduced obsolescence • Product re-update 	<p>Building quality improvement</p>	<p>Currently irrelevant because of the relatively cheap production of plastics and too varied products</p>	<ul style="list-style-type: none"> • Increased product validity and reduced obsolescence • Product re-update <p>Examples: Schneider Electric, PT Sigin Interactive Indonesia</p>	
<p>R6 Remanufacture</p>	<p>Currently not relevant for the food and beverage business sector, because it is a disposable item</p>	<p>Re-manufacture of products with simple flaws</p>	<p>Use of materials from old buildings for new buildings</p>	<p>Currently irrelevant because of the relatively cheap production of plastics and too varied products</p>	<p>Using old components to improve new products</p>	
<p>R7 Repurpose</p>	<p>Currently not relevant for the food and beverage business sector, because it is a disposable item</p>	<p>The product is used for other things</p> <p>Examples: Setali Indonesia, HeySTARTIC</p>	<p>Using the product for other uses</p>	<p>Currently irrelevant because of the relatively cheap production of plastics and too varied products</p>	<p>Currently irrelevant for the electrical and electronics sector as it is difficult to exploit for any other purpose than its initial function</p>	
<p>R8 Recycle</p>	<p>Process materials from food waste and food waste during the processing stage</p> <p>Examples: Garda Pangan, Waste4Change</p>	<p>Recycle materials that cannot be renewed or used for other purposes</p> <p>Examples: Setali Indonesia, HeySTARTIC, TriUpcycle, Threadapeutic, H&M</p>	<p>Recycle materials that cannot be renewed or used for other purposes</p> <p>Examples: Rebricks, Green Sense Concrete</p>	<p>Improved recycling rate of recycled packaging</p> <p>Examples: PRAISE Member (Danone, Unilever Indonesia, Tetra Pak Indonesia, Coca Cola Indonesia, Nestle), Waste4Change, PT. Reciki Solusi Indonesia, Octopus, Re>Pal</p>	<p>Recycle materials that cannot be renewed or remanufactured</p> <p>Examples: EwasteRJ, PT. Teknotama Lingkungan, Ecoberingin, Mukti Mandiri Lestari</p>	

<p>R9 Recovery</p>	<p>Energy recovery from combustion (waste-to-energy)</p>	<p>Energy recovery from combustion (waste-to-energy)</p>	<p>Energy recovery from combustion (waste-to-energy) Examples: PT Solusi Bangun Indonesia</p>	<p>Energy recovery from combustion (waste-to-energy)</p>	<p>Energy recovery from combustion (waste-to-energy)</p>	
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Source: Analysis Results of the Author Team (2021)

The stakeholders in **Table 18** have been grouped based on the findings of desk research on circular economy projects performed in Indonesia. It is clear from this table that the 9R principles have been implemented by a variety of business actors. However, it is also evident that the 9R principles cannot always be applied in all sectors due to certain obstacles such as technology, resources, awareness, and so on.



Recommendation of Stakeholder Relations Approach concerning the Diffusion Process of Circular Economy Innovation

For Indonesia to transition from a linear to a circular economy, critical mass must be reached. This means that the concept of a circular economy must be promptly adopted by the majority of early adopters at the start of its implementation for the following stage to take place on its own (self-sustaining).

The diffusion of innovation theory emphasizes that it is not necessary to spend all of one's work and effort on making a substantial change in a short period. Instead, this theory emphasizes that bringing about change necessitates a unique approach, such as determining which stakeholders must be involved and which should be avoided. Stakeholder grouping is carried out to promote Indonesia's transition to a circular economy by ensuring that the circular economy innovation diffusion process is carried out successfully and efficiently.

In addition to optimizing the five acceptance criteria of an innovation that have been discussed previously, it is also important to pay attention to what situations make an innovation acceptable. This situation is described in the form of a simple equation called the "Gilman Equation", namely $N - O > CC$, which means the perceived benefits of innovations (Perceived Value of the New Way), in this case, the circular economy must be more profitable than the profits perceived value of the current practice (Perceived Value of the Old Way), in this case, the linear economy, and also the circular economy transition does not cause additional costs, time, or difficulties.⁶³

The innovation diffusion process will run effectively and can create change if the stakeholders involved are those who easily accept the concept of innovation. Therefore, this stakeholder mapping is also supported by a questionnaire analysis that aims to see the perceptions, understandings, and attitudes of respondents towards the circular economy. According to the results of the questionnaire analysis, the majority of respondents

are familiar with the circular economy, particularly its concept and benefits. This is reflected in the responses of those who agree on the definition of low-carbon development, see the Circular Economy as an alternative economic system for keeping resources usable for as long as possible by maximizing use-value and regenerating products and materials in the manufacturing process and see the Circular Economy as a way to reduce waste, to improve the environment, as well as see the connection between the Circular Economy and the low-carbon development principle.

Regarding respondents' attitudes toward the implementation of a circular economy, the expectation of benefits from implementing a circular economy in Indonesia is more focused on the benefits that will be received from reducing Greenhouse Gases (GHG) and managing waste. This is in line with the fact that most of the respondents, both private and government, are still focused on activities with 3 principles, namely Reduce, Reuse and Recycle. It is evidenced by the data that in the strategic plans of private respondents and the strategic plans and public policies of government respondents, most of the respondents have applied these 3 principles. Meanwhile, the other 2 principles, Renew and Refurbish, were applied by fewer respondents. Thus, it can be seen that there is an imbalance in the application of the principles in a circular economy which consists of 5 principles (5R), even the most recent being 9 principles (9R).

Based on the grouping of roles, characteristics, and stakeholder understanding of circular economy innovations carried out with the concept of Amoeba of Cultural Change, **the Writing Team recommends that the Ministry of National Development Planning as Controller focus on the involvement of Change Agents and Transformers, as well as involving Controllers for legal certainty.**

⁶³ Alan AtKisson, *op. cit.* pp. 192

The following are several approaches that the Ministry of National Development Planning can take to increase the rate of adoption of a circular economy in Indonesia, namely:

A Short-Term

- 1 Encourage, facilitate, and/or cooperate with Change Agents (either individually or collaboratively among several Change Agents) to clarify the relative advantages of the circular economy; improve circular economy compatibility with current transformer habits, reduce the complexity of implementing circular economy; allows transformers to be pilot tested; and improve the observability of the implementation and success of the circular economy so that it can be easily imitated and modified by Transformer.
- 2 Communicating with the majority of early adopters candidates, especially transformers, strategically, means applying the right communication mix between mass media and interpersonal so that the majority of early adopters can go through five stages of decision making in a relatively short time.
- 3 Facilitating meetings between Change agents and Transformers so that both parties can benefit from each other optimally. Stakeholder grouping based on the 9Rs can be used to bring together the two parties which are more technically appropriate.
- 4 Encourage, facilitate, and/or cooperate with the Controller to develop strategic plans and public policies related to the circular economy, both for the short, medium, and long term, including incentives and disincentives. Included in this activity is the elimination of public policies that are contrary to the principles of a circular economy. This activity may still need to be continued in the medium and long term, depending on the complexity of changing public policy from a linear to a circular economy.

B Medium-Term

- 1 Encourage, facilitate, and/or cooperate with Transformers who have implemented a circular economy to publish and inspire Mainstreamers through mass communication channels, including but not limited to conferences, seminars, and social media. This activity can be carried out in the short term if there is already a Transformer that has successfully implemented a circular economy.
- 2 Encourage, facilitate, and/or work with Controllers to communicate with Mainstreamers about the incentives they can get when implementing a circular economy.

C Long-Term

- 1 Encourage, facilitate, and/or cooperate with the Controller to communicate with Laggard about the disincentives they can get if they do not implement a circular economy. If the Controller has not applied disincentives, then this activity does not need to be carried out.
- 2 Involve Iconoclast to communicate with Reactionaries and Curmudgeon when the resistance from these two groups starts to consume time and energy. This activity can also be carried out in the short and medium-term if deemed necessary.
- 3 Involve Spiritual Recluse to communicate and increase the beliefs of Transformers and Mainstreamers to implement a circular economy from the point of view of vision, ethics, and trust. This activity can also be carried out in the short and medium-term if deemed necessary.

CIRCULAR ECONOMY
TRAINING AND CAPACITY
BUILDING WORKSHOP

STRENGTHENING THE IMPLEMENTATION OF A CIRCULAR ECONOMY IN INDONESIA

STAKEHOLDER MAPPING REPORT AND
RECOMMENDATIONS FOR THE DIFFUSION OF
CIRCULARITY INNOVATIONS IN SUPPORTING
THE CIRCULAR ECONOMIC TRANSITION IN INDONESIA

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