

Initial recommendations for a Decision-Making Framework and related Indicators for the transition to a Sustainable Circular Island Economy making Aruba's economy more resilient and sustainable

(working paper)

For:
The Minister's Council of the Government of Aruba

Prepared by:
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Objective:

Provide general recommendations and suggest a series of circular economy indicators to include in the overarching decision-making framework and systemic monitoring and evaluation mechanism to be used by the Steering Committee of the National Commission for the Reactivation and Innovation of the Aruban Economy in order to enable the objective evaluation and selection of “go / no go” interventions.

This within the context of reactivating our economy and set the stage for the transition to a sustainable circular island economy and achieve the overarching goal of making Aruba's economy more resilient and sustainable.

Disclaimer:

This report is a work in progress, and is to no extend an academic peer-reviewed paper nor can it be considered an all-encompassing technical analysis of all available public data, statistics, and information pertaining to the understanding and application of the Sustainable Circular Economy and its related indicators, but reflects a practical approach based on the professional judgement and hands-on experience of the author, which is one of the pioneers and leading international experts on sustainable circular economy. **This report is prepared within a timeframe of 24 hours**, under critical conditions as a consequence of the COVID-19 global pandemic crisis, with the aim to give fundamental guidance and enable our decision makers in the Government of Aruba (in particular the Ministers Council) to make structured and systemic decisions in line with the overarching goal of making Aruba's economy more resilient and sustainable.

Need for a proper Decision-Making Framework and related Indicators

We, as the Aruban people, are dealing at this moment with unprecedented conditions and socio-economic realities as a consequence of the COVID-19 global pandemic crisis. In order to reactivate our economy and set the stage for the transition to a sustainable circular island economy and achieve the overarching goal of making Aruba's economy more resilient and sustainable, this will require bold and decisive action through a structured decision-making framework and systemic monitoring and evaluation mechanism.

This report is prepared in line with the Prime Minister's Decree for the establishment of the **National Commission for the Reactivation and Innovation of the Aruban Economy**. With as main objectives (1) formulating opinions and making recommendations on emergency and/or incentive measures to minimize the negative economic impact of the COVID-19 pandemic on society in the short term and to reactivate the economy, and (2) formulate advice and issue recommendations for a national economic recovery and innovation plan for Aruba¹.

More specifically, temporary and ad-hoc Task Forces are created to feed the **Reactivation and Innovation Commission (RIC)** with ideas and recommendations, where a Circular Economy Task Force is established among other task forces and tasked to provide advice and recommendations on a national circular economy policy within the framework of the master plan.

As the **Circular Economy Task Force (CE Task Force)**, part of the organizational structure of the RIC, the first concrete recommendations to the Ministers Council are the following:

1. To take notice that the Government of Aruba has recently (in June 2019) completed a Circular Economy Policy Vision and a Statement of Intent for 2050, entitled "**Aruba's Circular Economy Vision 2050 (CEV2050)**" presented by the Ministry of Education, Science and Sustainable Development and approved by the Ministers Council for publication. This could serve as our collective guiding framework for the purposes of setting the stage for the transition toward a circular island economy (and not having to reinvent the wheel); and
2. There is an identified need to aid the Steering Committee under National Commission for the Reactivation and Innovation of the Aruban Economy with **specific Circular Economy evaluation criteria and indicators**, that to my understanding has the particular role to evaluate and determine whether the recommended interventions and projects originating from the several Task Forces and Sub-Committees fit within the Master Plan of the National Commission, in order to reactivating our economy and **set the stage for the transition to a sustainable circular island economy** and achieve the overarching goal of **making Aruba's economy more resilient and sustainable**.

¹ Ministeriele Beschikking (MB) van de Minister van Algemene Zaken, Integriteit, Overheidszorg, Innovatie en Energie, 14 April 2020.

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The Government's overarching goal in this CEV2050 policy document is to concentrate on Aruban people as the most valuable asset for Aruba's sustainable future with the intention to accelerate the transition to become the leading Sustainable Circular Island Economy in the globe, and thereby making Aruba's economy more resilient and sustainable in the long-term.

Five (5) strategic objectives are proposed:

- Build Aruban people's awareness, knowledge and skills;
- Build up capacity to manage preferred (circular) materials on the island;
- Create innovative and circular solutions;
- Develop and use suitable and available renewable resources; and
- Export Aruban knowledge and skills.

Short-, medium-, and long-term interventions are noted for each of these strategic objectives.

Steering Committee's role:

A critical issue observed, based on my present understanding of the latest structure of the National Committee and the assigned role to the Steering Committee, is the **need to incorporate Circular Economy evaluation criteria and indicators** in the decision-making framework to be used.

If the overarching goal indeed is to set the stage for the transition toward circular economy, this will have to be enabled across the board, through a structured decision-making framework and systemic monitoring and evaluation mechanism that includes Circular Economy evaluation criteria and indicators (key performance indicators – KPIs).

In this report I elaborate a bit on the **WHY**, and make suggestions on **WHICH** indicators to consider, and the **HOW**, we could incorporate these to help make objective and informed decisions.

Let's see this crisis as an opportunity and endeavor together on this new and sustainable pathway by putting in place the right fundamental conditions.

Aruba thanks you for your leadership and foresight to leapfrog to a sustainable and prosperous pathway. Let's aim to create shared values and mindset in our Aruban society to promote the sustainable circular economy and determine the most effective means to do it.

Sustainable Circular Economy:

Before entering into the description of the suggested Circular Economy indicators, I would like us to stand still for a moment on understanding the paradigm-shifting goal behind the Circular Economy.

Circular Economy is a decision-making framework, meant to align all our efforts for a transformative, paradigm shifting idea that replaces the current linear business model. It describes an alternative economic model and societal set-up applicable at global, national, regional and local community levels.

The economy itself can be defined from a fundamental point of view as a way **to satisfy our needs**. With respect to the circular economy, this means that the **ways in which we use products and materials to satisfy our needs will have to be drastically changed**.

Understanding the interaction between our people's **needs**, the **means** of satisfying these needs, and with **which economic goods**, allows us to reconsider how the economy should be redefined, and more specifically, our consumption, thus our lifestyles.

Why is this latter point important, it is because everything we consume/use is part of our lifestyle, and this means that extraction and production are required, and emissions and other environmental damage can occur along the way. So, **creating sustainable lifestyles consists of rethinking the way of life, in which consumption is a central part**.

Fundamental facts:

At its core, the paradigm of a sustainable circular economy is focused on **USE AND REUSE OF HEALTHY MATERIALS**.

The aim is to keep **products and materials** at their highest level of application (for example, through the circulation of materials, closure of cycles, extension of lifetime, etc.) and the second on **associated impacts**. Considering both elements is crucial to ensure that our decision-making framework and related monitoring mechanism is also capable of determining whether we are heading towards the desired impacts.

"Materials" are denominated as organic matter, (rare earth) metals, chemicals, and other tangible natural resources extracted from land and maritime sources.

Strategies and actions need to be more **EFFICIENT** in the use of and waste less of our materials resources. These actions slow down the negative effects in the current linear model and can often save money as well.

AS IMPORTANT are actions relating to the invention and design of **EFFECTIVE** ways to make, use, collect and reuse materials after their intended use to satisfy a need, and avoid the negative effects in the current linear model.

Movement and use of materials is directly correlated to among other, water-, energy-, and land-use and GHG emissions. So, there can be consequential benefit (feedback loop) on these elements **from better management and reutilization of materials**.

The significant growth of global manufacturing, use and waste of materials in a linear flow (take-make-sell-use-dispose), is responsible for many negative environmental impacts we face globally, including the effects of climate change from CO2 emissions. On the local level, we experience this with Parkietenbos, continuous expansion of the build environment without consideration for the remaining nature, with a tourism sector based on an expansionistic economic model.

Responding to our economic crisis requires a mobilization of all of us to first become aware of the situation, recognize the failures in our current macro-economic model, then set an intention to change our behaviors to both mitigate the negative effects and even set an intention to replace these with positive, beneficial and regenerative outcomes.

Circular economy spans economic, environment, industry and employment sectors, requiring a connected approach and means of coordination between various stakeholders.

Aruba needs and can create its own socially “human-centered” focused Circular Economy initiatives that speak directly to ways to improve the country’s specific social situation while creating a sustainable, circular economy that is climate compatible and more resilient to future global crises and economic shocks.

Aruba needs pioneering solutions to ensure that increased well-being is no longer based on a wasteful use of natural resources making its economy more resilient and sustainable.

What are the main gains to be obtained by going Circular?

In concrete terms, a properly implemented Sustainable Circular Economy should lead us to re-configuring our economy to better satisfy the needs of ourselves and that of future generations without impacting our island's carrying capacity and ourselves in the process.

SCE projects and businesses will:

- Help create new types of jobs in new types of productive economic activities that are compatible with our resources base and socio-economic conditions;
- Having domestic productive activities launched that enable Aruba to offset its dependency on import of energy, food, and essential products;
- Position Aruba to transition from a net-import dependent nation to a net-exporter of value-added products and services;
- And many other, please see Aruba's Circular Economy Vision 2050 policy document.

How do we measure our level of success?

In general terms, for monitoring the transition toward circular economy there is a significant challenge. It is known that data availability is a clear bottleneck for monitoring the circular economy in Aruba.

It is possible to provide a full description of what should ideally be measured to cover all aspects of the circular economy in each of the transition phases but under present Aruban conditions, these should be nurtured with the data available today.

Thus, for practical reasons and under this crisis situation, we need to make the best use of existing data so as not to increase administrative burdens for government departments, companies and other stakeholders.

NOW, most of the indicators to be used for the overarching decision-making framework, will have to be taken from other previously developed frameworks, such as the one used by the SDG committee, other standard macro-economic indicators used by the Central Bank of Aruba, standard socio-economic indicators used by the Central Bureau of Statistics, and to complement these, we need to include specific **Sustainable Circular Economy (SCE) indicators** that are deemed viable to use at this moment in time.

This initial framework establishes the baseline of indicators from the outset that enables Aruba to monitor progress on its transition toward becoming a sustainable circular island economy. It has to be set up in a manner to leave opportunity to incorporate additional SCE indicators as data becomes available over time at the country level (**macro level**). This to enable Aruba to better measure the effect or impact generated by the interventions brought about.

Thus, the conceptual basis and scope of this decision-making framework and monitoring system are crucial because they determine the feasibility of managing the information in those areas where the data is not yet available for the circular economy.

Concrete recommendations:

1. It is important to first determine what is really missing, and then try to build an evaluation and monitoring framework capable of incorporating circular economy aspects in the best possible way.
2. We need to build robust SCE indicators in the overarching decision making framework at this critical moment, to enable Aruba to monitor each phase of the transition: where we need to clearly define the input data and activities that catalyze this transformation of the development model and show the progress being made, as well as evidence that materials and products remain in the highest levels of recovery or use possible, all as a direct result in economic, social and environmental terms.
3. We need to mainly focus on the function or purpose of a product, material or service, and the **need** to be satisfied.
4. In addition to monitoring this transition, we need to use **macro, meso, and micro level** indicators. **Meso level** indicators are required to determine the results concerning the subsectors, industries and productive linkages and even industrial eco-parks (e.g. former refinery area) with potential for symbiosis. At the **micro level**, the transition to circularity must permeate companies, consumers, products and services. It is at this level that notable results will be obtained and in a more direct way, which will also facilitate the measurement of the impact of the regulatory framework and the innovation mechanisms that enable the sustainable circular economy (or doughnut economy).
5. We need to establish a clear causal link between the **micro, meso, and macro level indicators**. The added value at the micro level is that both **policy interventions** and **innovative practices or projects (projects/interventions proposed by all Task Forces)** are materializing there first, offering the opportunity for more direct feedback.
6. Progress towards the circular economy implies a transition, and this will require innovation in products and services. Therefore, at this level, this essential innovation will materialize at the micro level rather than at the macro level.
7. For the transition to happen, government interventions will be required and reflected in public policy measures. First, the effects of such measures will become visible at the product and service level.

8. The inclusion of the micro level offers the possibility of obtaining more direct feedback on the policy and better visibility of the initial phases of the transition.
9. We need to develop a mechanism to **assess** the development and potential of **circular business models**. Monitoring these elements will allow public policy makers to verify if progress moves away from the current linear economy model of doing business where the transfer of a product is central. It is essential to take circular business models into account in the monitoring framework.
10. Establish a link with the possible impacts of the circular economy on **people**, the **planet** and **society**, including impacts outside Aruba. Here is where the elements of the Doughnut Economy framework come in handy (Raworth, 2017). The objective is to clearly describe the desired impacts. In terms of sustainability, it is important to include performance indicators that shed light on the economy, the environment and society, in order to have a balanced vision.

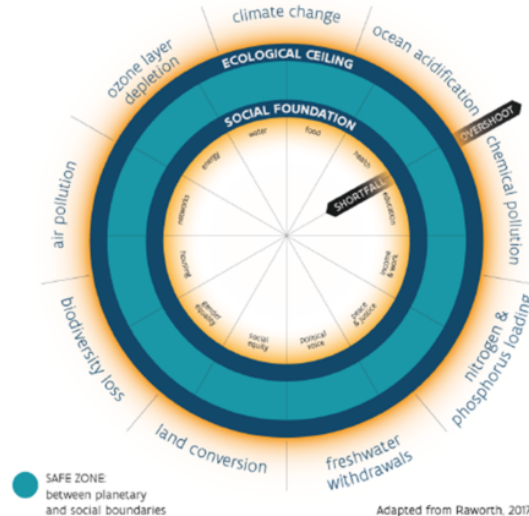


Figure 1: Representation of the safe and just zone for the economy to develop within, in between planetary and social boundaries (adapted from Raworth, 2017).

11. A transition to a sustainable circular economy is not assessed only from a material perspective, but also includes other environmental impacts such as climate change. Indicators that monitor environmental impacts already exist and can be easily combined and integrated into a set of indicators to monitor the sustainable circular economy.

In summary, it is highly recommended to focus on **impact driven indicators**, which helps **measure or value the effect** generated to the Aruban population and its wellbeing.

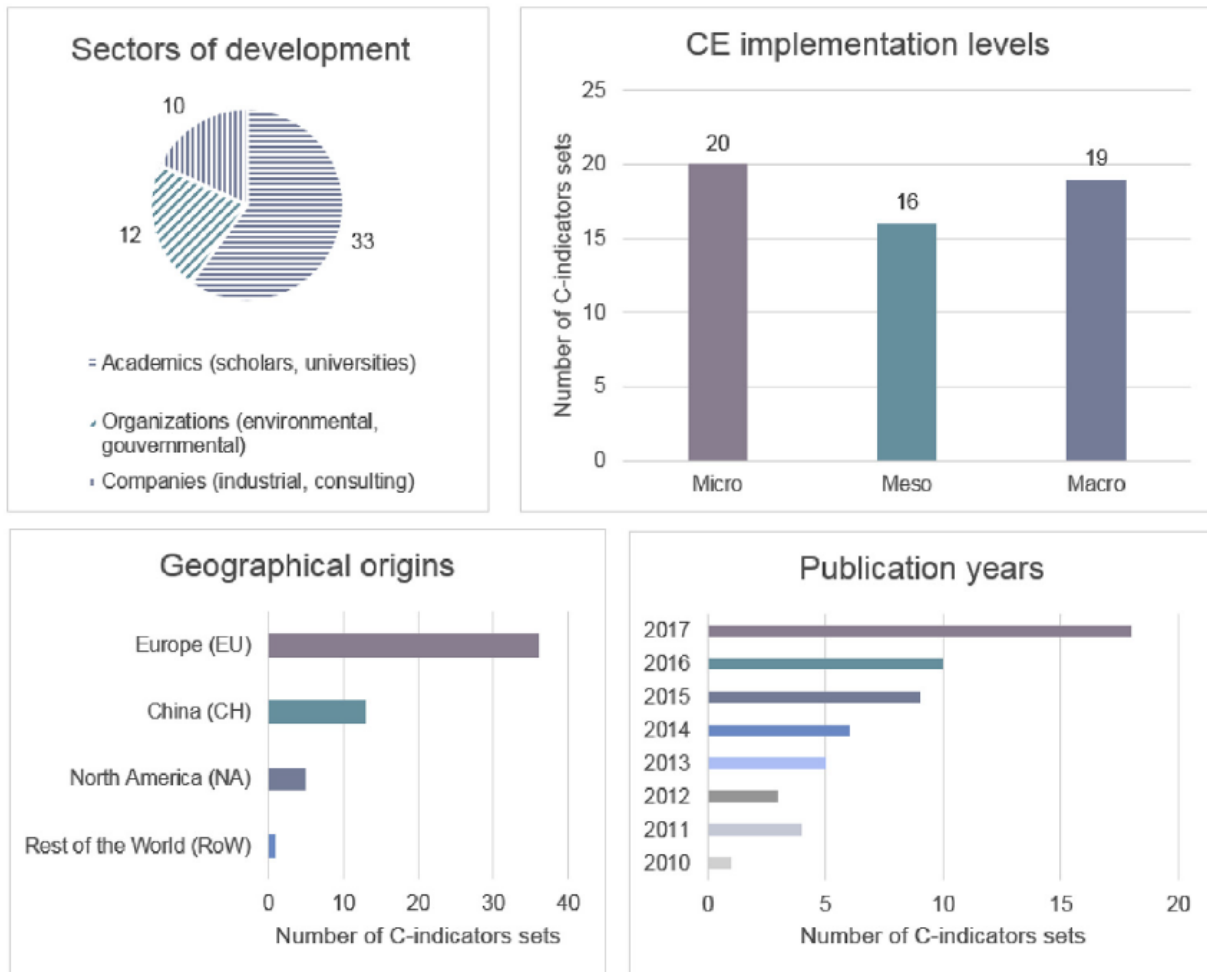
PLEASE NOTE: The transition to the sustainable circular economy is directly anchored to technological development, mainly due to the complexity in the composition of a high percentage of the materials and products that circulate today in the Aruban economy and that must go towards recovery and use chains (recovery, re-use, re-manufacturing, recycling, closing material loops, restauration, regeneration, etc.).

In this sense, the measurement of supply and material flows at the **macro level**, and of the properties of the products at the **micro level**, should also be considered. However, the transition to the SCE must also include socio-institutional changes, in which technology is not the protagonist, but acts as an enabler of the model.

An example of this is the emergence of the collaborative economy, which depends to a great extent on the mobile/digital networks that facilitate and support shared service models, and that although the technology was not developed for this purpose, it plays a fundamental role in supporting it. It is also very important to reflect on aspects that go beyond technology and material flows, such as innovation in production and consumption/use models, in product or service design and in socio-institutional evolution, among others.

Evolution of Design and Development of Circular Indicators

In order to understand the evolution of design and development of CE criteria or indicators, a study by (Saidani et. al., 2018)² revealed the following:



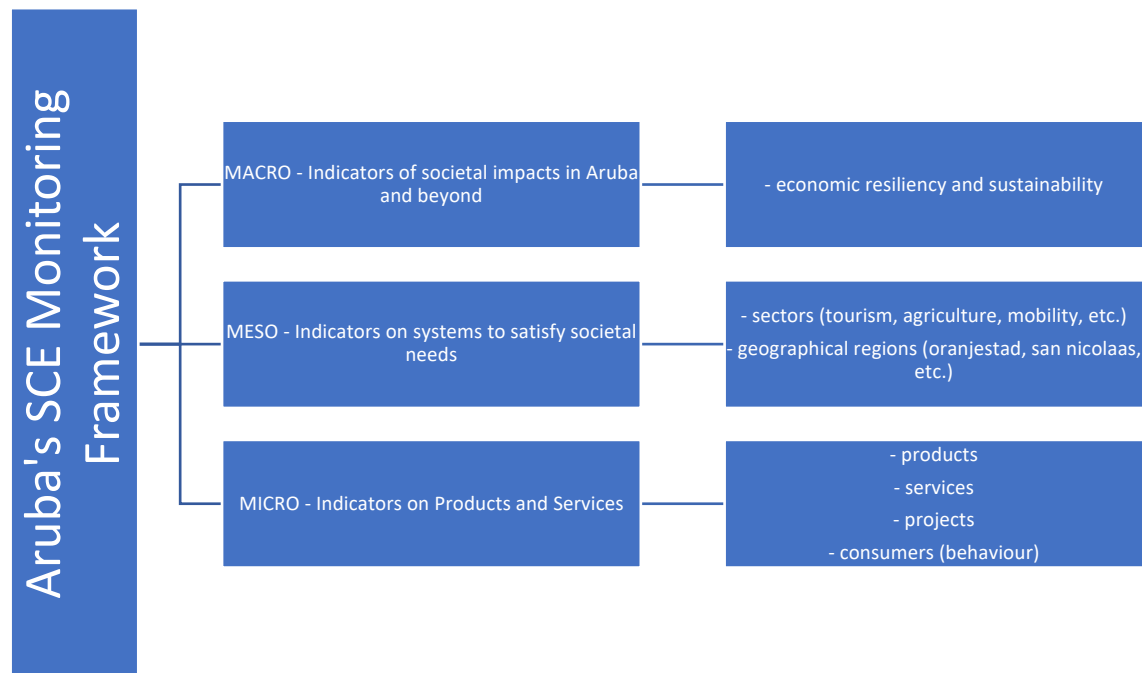
The number of CE indicator series have drastically increased in the past couple of years. With Europe leading in the development of new CE indicators. An interesting observation is that CE indicators are developed for measuring progress at the micro (business/project level/consumer/etc.); meso (sectorial/geographical level/industrial parks/etc.); and macro level (city/province/national/regional/etc.). And for the purposes of Aruba, this may be a suitable approach.

² Saidani, M., Yannou, B. Et. Al. (2019). A Taxonomy of circular economy indicators. Disponible en: <https://www.sciencedirect.com/science/article/pii/S0959652618330221>.

Proposed SCE indicators for Aruba

I recommend to the following structure to organize the several types of indicators to be used to enable the evaluation, selection, and monitoring.

- **MACRO:** Composed of indicators that focus on material flows throughout society and the environmental, economic and social impacts associated with Aruba, including effects outside the island's borders.
- **MESO:** Composed of indicators that focus on achieving the circular economy in particular systems to satisfy **needs**.
- **MICRO:** Composed of a set of specific products and services, aimed at establishing a representative and broad sample of **our daily consumption** and which is also relevant taking into account the transition of a sustainable circular economy.



Initial list of potential SCE indicators (**NOTE:** these will all have to be discussed and agreed upon):

MACRO	\$ net-value of imports – exports per year (foreign exchange expenditures)
	X ton of GHG-emissions per year avoided due to circular economy business or activity
	X m ³ /year of water that is reused in cascade or closed cycle for secondary productive activities
	X ton of food (fruits and vegetables) per year offset by local organic and healthy production
	X gallons of gasoline per year offset by local alternative fuel or transition to electric mobility
	X gallons of diesel per year offset by local alternative fuel or transition to electric mobility
	X gallons of jet fuel per year offset by local alternative fuel (e.g. 3rd generation biofuels such as algae)
	X tons of valuable materials (rare ores, metals, etc.) recovered / year and used for secondary productive activities
	% of population per year with connection to reliable internet
	X ton of protein per year offset by local production or substitution with healthier meals
	\$ generated from export of locally produced products / year
	X km ² of protected natural area and habitats (including maritime) / year
	# of plants planted / year
	% of green coverage of the island / 5 years
MESO	X tons/year of organic matter deviated from landfill into secondary productive circular activities
	X tons/year of glass recovered and converted into new products

	%/year of renewable energy powered circular businesses and activities
	%/year of total procured products by the government composed of preferred circular products and materials
	\$ government funding per year to R&D in SCE solutions
	# of peer-reviewed and published scientific papers per year covering sustainable circular economy research topics
	# of patented SCE solutions per year
	% of land per year destined for agriculture for food and biomaterials production
	X tons of nutrients / year recovered from wastewater streams
	X GJ of energy / year recovered from wastewater streams
	X GJ of energy / year recovered from adequate wasted material streams
	X gallons wastewater collections for treatment versus water production / year
	# of certified in SCE training programs per year
	# of graduated in SCE academic programs per year
	# of high schools with a SCE curriculum adopted / year
	% of high school students that receive education in line with SCE principles/year
	# of primary schools with a SCE curriculum adopted / year
	% of primary school children that receive education in line with SCE principles/year
	# of buildings with rain-water catchment / year
	X m ³ of rainwater captured and stored / year
	# of buildings with LEED/C2C certification (designed for disassembly) / year
	X minutes of public SCE awareness raising and education programs / year

	# or \$ of purchased SCE labelled or circular products / year
	Quality of soil composition at strategic locations / year
	# of circular businesses and activities categorized as “ resource-efficient ” to <u>slow down</u> the negative effects in the current linear economic model
	# of circular businesses and activities categorized as “ resource-effective ” to <u>solve</u> the negative effects in the current linear economic model by inventing and designing new ways to make, use, collect and reuse materials after their intended use
MICRO	# of jobs created by the circular business or activity
	% of female and male distribution in all circular businesses and activities
	X gallons wastewater collections for treatment versus water production / year
	# of certified in SCE training programs per year
	X m ³ of rainwater captured and stored / year
	# or \$ of purchased SCE labelled or circular products / year
	# of circular businesses and activities categorized as “ resource-efficient ” to <u>slow down</u> the negative effects in the current linear economic model
	# of circular businesses and activities categorized as “ resource-effective ” to <u>solve</u> the negative effects in the current linear economic model by inventing and designing new ways to make, use, collect and reuse materials after their intended use

NON-Quantifiable SCE indicators:

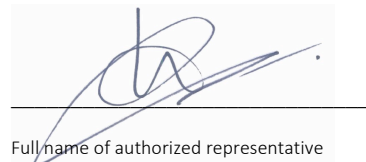
- The degree to which the collection, repair, reuse and recycling infrastructure is in place.
- Degree to which economic incentives, legislation or comparable rules are applied in relation to product standards, standards for reused or recycled products / raw materials, waste management, better materials management
- Degree to which companies participate in the management of material cycles in a circular manner and are empowered to make the correct decisions, either on a compulsory or voluntary basis.

- Degree to which circular business models are adopted.
- Degree to which citizens participate in the management of material cycles in a circular manner and are empowered to make the right decisions
- Extent to which systems are in place to make more efficient use of resources, such as arrangements for sharing or repairing and reusing products, exchanging information on the availability of reusable or recyclable materials (for example, to improve industrial symbiosis)
- Degree of information, education and awareness on circular economy (integration into the school and university curriculum, public communication and information campaigns)
- Extent to which there are voluntary collaboration schemes that promote the value chain and intersectoral initiatives and the exchange of information;
- The integration of circular aspects in public procurement schemes.
- Product standards related to defined circular strategies.

Certification

I, the undersigned, certify that to the best of my knowledge and belief, this Report correctly describes my recommendations and suggestions to contribute to Aruba's overarching goal of becoming more resilient and sustainable.

Date: 01/MAY/2020

A handwritten signature in blue ink, appearing to read 'Kevin de Cuba', is written over a horizontal line.

Full name of authorized representative

ing. Kevin de Cuba, MSc.

Independent Senior Circular Economy Advisor