Ministry of Foreign Affairs

Market study circular economy Mexico

Commissioned by the Netherlands Enterprise Agency

>> *Sustainable. Agricultural. Innovative. International.*

MARKET STUDY
CIRCULAR ECONOMY MEXICO

MARCH 2025

ORBITAT

turn too

AUTHORS

Alejandra Sánchez Ayala

Jesús Enrique Cueva Lomas

Richard Greil

Rob Oomen

REPORT DESIGN

Adriana Vega

CONTACT DETAILS:

alejandra@orbitat.mx

www.orbitat.mx

rob.oomen@turntoo.com

www.turntoo.com

ORBITAT

turn too

TABLE OF CONTENTS

ACKNOWLEDGEMENTS

This market research was commissioned by the Embassy of the Netherlands in Mexico and the Netherlands Enterprise Agency (RVO). It was developed and executed by Órbitat and TurnToo, two consultancy firms specialized in circular economy.

This report was made possible by the generosity of over 30 stakeholders (some of who are listed below) who shared their time, expertise, and insights during the interview process. Their contributions provided crucial context and perspectives that enriched the development of this work.

We hope that this work will serve as a foundation for fostering stronger business relationships between the Netherlands and Mexico in the field of circular economy, encouraging collaboration and innovation for a more sustainable future.

ACKNOWLEDGEMENTS:

Adrián Velasco - Futuro Circular

Alessa Araiza - Sarape CircuLab

Alfonso Martínez - Industrias Marves / Recolecto

Anatt Finkler - Global Denim

Carin Verbree - Holland House Mexico

Denisse Navarro - UNIDO

Fátima Álvarez - Someone Somewhere

Han Hamers - Circularity

Jaime Gómez - Polder Estudio

Jan Lamme - CIBUTEX

Jared Jiménez Rodríguez - Materioteca ITESO

Jesse Dolstra - bAwear Score

John Smits - SAM Panels

Laura Reyes - SEDEMA

Marjolijn Versteegden - Arcadis

Mireille Acquart - Ethical Fashion Space

Ricardo Lozano - What Design Can Do

EXECUTIVE SUMMARY

In many countries around the world the circular economy is still in its infancy, including Mexico, nevertheless interest among both public and private stakeholders is increasing and this represents opportunities for companies offering products or services focused on the circular economy.

In Mexico, many states have already developed (or are currently developing) circular economy plans, and interest among the private sector is increasing. These states are taking their own approach in terms of definitions and measurement of the circular economy, focusing on the industries and sectors relevant to their local economies. In the short term, this might hinder harmonization and collective effort in some areas that require a national approach, it also demonstrates a proactive commitment to integrating circular economy principles into state-level planning. Although a holistic framework to steer and measure the circular economy in Mexico does not exist now, the national government is currently working on this. After the recent elections in Mexico in June 2024 and the change of government personnel in many governmental levels, reports indicate that existing circular economy plans will continue to be executed. For example, the Mexican government has stated in January 2025 [28], that with the aim of mitigating GHG emissions and to accomplish international environmental agreements, it will execute priority circular economy projects in the country.

The Dutch Embassy in Mexico is actively promoting the circular economy and fostering connections between Dutch and Mexican organizations. As part of this effort, the Embassy and RVO identified three key sectors for this study: textiles, construction, and circular design. These sectors were selected for their potential to drive impactful collaboration and innovation in the transition toward a more sustainable economy.

The textile sector is one of the key manufacturing industries in Mexico. In 1993, it represented 5.6% of the country' manufacturing GDP, although by the end of 2023, this figure had decreased to 1.9% [14], due to China joining the World Trade Organization in 2001. In 2022, approximately 519,000 people were employed in the textile sector. While sustainability and the circular economy have slowly gained attention in the industry, the primary push, from a big scale perspective, has come from international brands with production in Mexico. One of the major challenges identified is the lack of integration within the national supply chain, which complicates the implementation of changes throughout the supply chain and to keep the same sustainability standard for different factories. Also, an important challenge is the rise in manufacturing costs, driven by increasing minimum wages and employee benefits that are not offset by improvements in productivity, leaving less innovative budget available for sustainability initiatives. Nevertheless, there are companies, both corporates and start-ups, working on circular solutions or projects in Mexico and are looking to collaborate internationally.

The construction sector in Mexico is large and contributes to around 6% of GDP and employs around 8.38 million people [20]. A significant part of the sector is informal with many small companies and individual workers. It is estimated that 83.8% of the people employed in the construction sector are informal workers [21]. Due to the high level of informality in the sector, a general lack of awareness, lack of specific regulation, and no immediate interest, the concept of circular economy is not formally embedded with most actors in the sector. However, based on various interviews with local stakeholders and desk research, it becomes clear that sustainability in general is a topic with increasing interest especially among larger developers or for office buildings that house large international corporations. Also, various states propose concrete measures to stimulate the circular economy in the sector.

Both the public and private sector are starting to undertake initiatives in this area and opportunities for companies focused on the circular economy start to emerge. Some examples of this are Mexico's City's Construction and Demolition Waste Collection Program that has specific actions that aim to reduce, separate, valorize, and recycle the generated waste from the construction sector to be used again in the sector. Another growing area is the increased adoption of environmental certifications among large office buildings through Leadership in Energy and Environmental Design (LEED) certification.

Circular design can be applied across various industries and actors within a value chain. Unlike the traditional linear model—take, make, waste—circular design emphasizes sustainability, regeneration, and minimizing waste. It often serves as the starting point for companies embarking on their circular journey, influencing not only the design of products and services but also the development of related business models. There are some organizations stimulating circular design among designers and entrepreneurs by organizing events and training to accelerate circular design processes, and private initiatives, supported by local governments that aim to foster industrial symbiosis among local businesses. Mexico faces, like other countries aiming to stimulate circular solutions, challenges in areas such as regulation, collaboration networks and cultural shifts needed to embrace circular design. This presents an opportunity for companies seeking to innovate and implement sustainable practices. By transforming their production processes and customer relationships, they can establish new manufacturing standards and service offerings tailored to their specific sectors.

The Netherlands and Mexico have extensive trade relationships. In 2022 Mexico exported $1.55 billion to The Netherlands, and The Netherlands exported $3.95 billion to Mexico. The stakeholders interviewed for this report, mainly SMEs active in the circular economy, indicated being open to doing business in Mexico, but are often unfamiliar with the country, its customs and language, and unsure about the actual demand they will find for their product or service. This means that when presented with concrete opportunities, most companies are open to explore them, but many will not invest upfront to explore the market by themselves when demand is unclear. This presents a real opportunity for the Dutch Embassy in Mexico to function as a connector to match demand in Mexico for circular products and services, with Dutch companies offering their experience, circular products and services. Furthermore, there are some interesting funding opportunities available for (Dutch) companies, in the form of subsidies, investments or loans, that can assist them in their expansion to Mexico.

Dutch entrepreneurs considering entering the Mexican market will need to consider challenges such as language barriers and cultural differences. They will also need to find reliable local partners to work with. The Dutch Embassy can assist through its network and expertise in finding these partners. Although there are some challenges for the circular economy to take shape in Mexico, such as the lack of incentives, lack of standardization in circular economy plans, definition and measurement tools, as well as a complex competitive landscape in for example the textile sector, there are also opportunities emerging such as knowledge sharing in specific sectors and with governments as well as the introduction of innovative technologies in for example the textile sector. The government plans on a circular economy are a stimulating factor for this.

For Dutch companies wishing to be front-runners in the Mexican market in the area of circular economy, it is a good moment to start exploring the opportunities.

LIST OF ABBREVIATIONS

BREEAM	Building Research Establishment Environmental Assessment Method
CANAINTEX	Mexican National Chamber of the Textile Industry
CE	Circular Economy
CMIC	Mexican National Chamber of the Construction Industry
COPARMEX	Mexican Confederation of Employers
EDGE	Excellence in Design for Greater Efficiencies Certification
EPD	Environmental Product Declaration
EPR	Extended Producer Responsibility
GDP	Gross Domestic Product
GHG	Greenhouse Gas
GIZ	German Technical Cooperation
INEGI	Mexican National Institute of Statistics and Geography
MSMEs	Micro, Small, and Medium-sized Enterprises
NAFTA	North American Free Trade Agreement
NGO	Non-Governmental Organization
LEED	Leadership in Energy and Environmental Design (LEED) Certification
LCA	Life Cycle Assessment
OECD	Organization for Economic Co-operation and Development
SDG	Sustainable Development Goals
SEDEMA	Mexico City Ministry of the Environment
SEDECO	Jalisco State Ministry of Economic Development
SEMADET	Jalisco State Ministry of the Environment and Territorial Development
SEMARNAT	Mexican Ministry of Environment and Natural Resources
10 R's	10 R's are a way to define circular economy strategies, indicating different levels of circularity. R10. Regenerate, R9. Refuse, R8. Rethink/Redesign, R7. Reduce, R6. Reuse, R5. Repair, R4. Refurbish/Renovate, R3. Remanufacture, R2. Repurpose, R1. Recycle, R0. Recover.
RVO	The Netherlands Enterprise Agency
USMCA	United States-Mexico-Canada Agreement

1

INTRODUCTION

INTRODUCTION

1.1 PURPOSE OF THE MARKET STUDY

In line with the Dutch government's active promotion of the circular economy, the Embassy of The Netherlands in Mexico (hereinafter referred to as Dutch Embassy) and The Netherlands Enterprise Agency (RVO) initiated this market study on the circular economy in Mexico. The primary objective is to identify business opportunities for Dutch public and private organizations within the Mexican circular economy and subsequently develop a 2–3-year roadmap to support their market entry. This study focuses on three key sectors: textiles, construction and circular design. One of the reasons textiles was chosen is because of the proximity of the 2026 World Cup that will take place in Mexico, the USA and Canada, for which many textile items will be produced, and there is a special opportunity to introduce circular practices for the items produced for this event. Another reason is the large textile sector that Mexico has, that can potentially take advantage of Dutch innovations. The construction sector was chosen as this traditionally is a sector with large environmental impact and because of the high volume of construction in Mexico. As The Netherlands has many innovations to share in this area, it is an interesting opportunity to bring this knowledge to Mexico. Circular design is an overarching topic that can be applied to many industries and is one of the fundamental areas of knowledge needed to get started with circular products and services, and was therefore chosen as a focus topic.

TEXTILES	*The Textile sector encompasses a wide range of activities involved in the production, processing, and distribution of fabrics, yarns, and final products. This includes growing/extracting natural fibers or producing synthetic fibers, spinning yarn, weaving or knitting fabrics, dyeing and finishing materials, garment manufacturing, distributing textile products and the use and end of life of garments.*
CONSTRUCTION	*The Construction sector plays a crucial role in building and maintaining infrastructure, including residential structures, commercial buildings, public works, and more. It involves the production of construction materials like cement, steel, and bricks, as well as the actual construction processes.*
CIRCULAR DESIGN	*Circular design is a philosophy that prioritizes sustainability and resource efficiency. It focuses on creating products that are durable, modular, recyclable, and made from renewable materials. Circular design is not limited to the design of products or services but can and should also be applied to design the business model that will be used to bring the circular products or services to market.*

TABLE 1. DEFINITION OF THE FOCUS SECTORS.

The report is intended for Dutch stakeholders interested in doing business in Mexico, or fostering business relationships between Mexico and The Netherlands, with a focus on the circular economy. Dutch stakeholders can learn more about the state of the circular economy in Mexico and potential challenges and opportunities, whereas Mexican stakeholders can use this report to learn more about circular economy examples from The Netherlands and to identify opportunities for collaboration.
The study also shares details on topics such as how to do business in Mexico, and offers insights into financial opportunities through subsidies, projects, and investments.

1.2 CIRCULAR ECONOMY: *GLOBAL, MEXICO AND THE NETHERLANDS*

In recent years, the circular economy has garnered significant attention due to increasing concerns about resource depletion and environmental harm. Over the past five years, discussions, debates, and articles on circular economy have nearly tripled, reflecting a heightened awareness and interest in circularity. However, most materials entering the economy are still new ('virgin'), with the share of circular materials decreasing from 9.1% in 2018 to 7.2% in 2023, according to the Circularity Gap Report. Meanwhile, global material consumption continues to rise, with over half a trillion tons consumed in the last six years—almost matching the total consumption of the entire 20th century. Despite the circular economy being recognized as a 'megatrend,' ambitious goals and speeches have yet to result in concrete actions and measurable outcomes. Without urgent and bold steps towards a practical circular economy, broader social and environmental objectives —such as reducing emissions and increasing the use of recycled materials— are at risk. Industries and governments might end up engaging in superficial efforts towards circularity, missing out on substantial impacts [1].

In many countries around the world the circular economy is still in its infancy, including Mexico, with only an estimated share of 0.4% circularity compared to 7.2% average worldwide according to SEMARNAT (Mexican Ministry of the Environment). The Mexican economy is still mainly based on the linear 'take, make, and waste' economic system. In society, sustainable consumption habits are not yet engrained. There are a variety of local initiatives by companies, and the government on both Federal and State level have launched circular economy plans. On top of that, many international corporations with activities in Mexico are bringing their international ambitions on the circular economy to Mexico [2].

While recent years have seen the creation and implementation of laws and roadmaps aimed at promoting circular economy projects at both state and national levels, many of these initiatives have struggled to take hold due to a dispersed approach, meaning that policies and plans between federal and state level are not sufficiently aligned. For example, according to data from the National Institute of Statistics and Geography (INEGI), it was estimated in 2022, as part of a study focused on measuring Mexico's circularity, that the country is considered 15,14% circular due to national efforts primarily in material recycling. It is important to note that this study only focuses on recycling, hence compared to the percentage of 0.4% mentioned in the previous paragraph, it shows a clear discrepancy between methods to measure circularity.

In 2024, there were federal elections to elect a new president, as well as state elections in eight states of Mexico, and a change in the Head of Government of Mexico City. Additionally, there was voting to renew the Chamber of Deputies and the Senate. At the local level, elections were held for local deputies in 31 states, except for Coahuila, as well as for municipal presidents, syndicates, and councilors. These were the largest elections in the country's history. Many government projects and initiatives, focused on promoting the circular economy, both at the state and national levels, could be delayed or changed due to a change in government administration. However, the Mexican government has stated in January 2025 [28], that with the aim of mitigating GHG emissions and to accomplish international environmental agreements, it will execute priority circular economy projects in the country.

The Netherlands has emerged as a leader in circular economy initiatives, driven by its innovative companies and clearly defined circularity goals for 2030 and 2050 set by the Dutch government. Globally, The Netherlands is estimated to be at the forefront of the circular economy movement, boasting a circularity metric of 24.5%. Each year it consumes around 221 million tons of materials (minerals, fossil fuels, metals, and biomass), leaving 167 million tons to be incorporated into the circular economy. In the medium and long term, the Dutch government has ambitious goals: a 50% circular economy by 2030 and 100% by 2050 (CGR, 2022b).

1.3 METHODOLOGY OF THE MARKET STUDY

For this market study, a hybrid approach was used, combining desk research with direct interviews with relevant Dutch and Mexican stakeholders. Desk research was utilized to analyze the regulatory landscape and overall state of the circular economy within the selected industries. Direct interviews were conducted to gain insights into the practical experiences of stakeholders and identify potential areas for collaboration between The Netherlands and Mexico. For a more detailed explanation of the methodology, please refer to Annex 1.

The study was executed by Órbitat and Turntoo. Órbitat is a Mexico-based consultancy firm focused on the development of circular economy projects. Turntoo, founded in 2010 is a Dutch-based consultancy firm specializing in the circular economy, with years of experience in the field and pioneering solutions such as Light-as-a-Service and material passports.

1.4 SET-UP OF THIS REPORT

The first part of the report is focused on the market analysis, identifying and defining the state of the circular economy in Mexico, focusing on both the public and private sector. This is followed by an overview of Dutch circular economy innovations in the focus sectors. After that the report provides insight in the interest of interviewed Dutch stakeholders to bring their circular solutions to Mexico, as well as an overview of the potential funding opportunities (subsidies, loans and investments). The report closes by identifying the challenges and opportunities for the circular economy in Mexico and provides recommendations on how the Dutch Embassy and RVO can best develop activities to stimulate circular business opportunities between The Netherlands and Mexico.

2

MARKET ANALYSIS

MARKET ANALYSIS

This market analysis provides an overview of the state of the circular economy in Mexico and identifies interest from stakeholders in the Textile, Construction and Circular Design industries. From a public sector perspective, the analysis identifies relevant government plans and ambitions on the circular economy on federal, state and city level. From a private sector perspective, the market analysis identifies the interest among Mexican stakeholders in the circular economy in the aforementioned industries, existing initiatives they are undertaking, and their potential interest to work with Dutch stakeholders in furthering the circular economy.

Like in many parts of the world, Mexico has a growing group of stakeholders, concerned citizens, companies, and NGOs who are introducing the topic of the circular economy to society. Several Mexican states have circular economy plans, and some large multinationals and SMEs have circular economy ambitions.

2.1 PUBLIC SECTOR LANDSCAPE

This section provides an overview of current national, state, local legal initiatives and public programs relevant to the focus sectors: Textiles, Construction and Circular Design. While many Mexican circular economy initiatives prioritize end-of-life management and waste reduction, this section focuses on jurisdictions with a more holistic approach to circular economy principles and those directly impacting the focus sectors. It is important to note that there is not a cohesive use of terms and definitions throughout the different laws and programs, and each state uses different terminology and methodologies while addressing circular economy.

2.1.1 FEDERAL LEVEL

On a Federal level, the General Law of Circular Economy of Mexico (Ley General de Economía Circular, in Spanish) aims to promote a sustainable economic model that maximizes the efficient use of resources and minimizes environmental impact [3]. Approved in November 2021, the law encourages the design and production of goods with a focus on reuse, repair, refurbishment, and recycling, thus extending the lifecycle of products and reducing waste. It mandates the creation of strategies and programs to foster circular economy practices across industries, involving stakeholders such as government, private sector, and civil society. In august 2024, the Ministry of Environment and Natural Resources (SEMARNAT) launched a report with the baselines for creating the national strategy for the circular economy in Mexico [2]. The report states that Mexico currently lacks a standardized method to measure the state of the circular economy at a national level [3]. Instead, existing indicators are being used that measure the flow of material, water and energy, and can be verified through the Organization for Economic Co-operation and Development (OECD).

One example of the discrepancy between methodologies is the varying measurements of the country's circularity in different reports. According to the 2024 SEMARNAT report, Mexico's circularity index is 0.4%, although the Ministry remarks that there is complexity in harmonizing methodologies and data points. In contrast, a 2022 report from the National Institute of Statistics and Geography (INEGI, by its Spanish acronym) estimates that the country is 15.14% circular, primarily due to national efforts in material recycling [4]. Some key points from the SEMARNAT report's calculation, relevant to understand the current state of the circular economy in Mexico are the following:

- *44% of domestically extracted materials are exported, while 56% are used for domestic consumption, emphasizing Mexico's export-driven economy.*
- *In 2019, Mexico's raw material extraction was 1.3 billion tons.*
- *43% of Mexico's raw material extraction is imported from other countries.*
- *As a point of reference, the circularity index for countries in Latin America and the Caribbean is an average of 0.3%, and the estimate for the global economy is 7.2%, according to circle economy.*

Mexico has an extractive and high-consumption economy characterized by significant water resource consumption, inadequate wastewater treatment, deforestation, and soil contamination, primarily driven by agroindustry activities. An important aspect of Mexico's economic development model—also present in most countries of the region—is that it consists of a formal economy that generates 75% of the national GDP, alongside an underlying productive dynamic driven by informality. It is essential to recognize that supply chains largely rely on the various economic activities carried out both within the formal and informal sectors. With this socioeconomic context, here are some of the SEMARNAT conclusions on how to build a foundation for a widespread national circular economy initiative across industries and states [2]:

- *There is a need to create an overarching National Circular Economy Strategy that encompasses a long-term, unified vision for the country.*
- *A systemic governance model is essential. This model should have national, multisectoral leadership to coordinate efforts among circular economy promoters, sustainable development funders, technical circularity experts, companies and committees.*
- *High-level coordination will be required between government ministries and decentralized technical agencies. A unified framework for policy formulation, implementation, and continuous evaluation will provide reliable information for strategic decision-making, addressing key priorities such as reducing social inequality, poverty alleviation, and climate change mitigation/ adaptation.*
- *Efforts should focus on extending these initiatives to various regions of the country, particularly those with a wider socioeconomic gap.*
- *Emerging industries can serve as catalysts for implementing CE practices, such as bioeconomy, electromobility, clean energy, hydrogen and digitalization.*
- *Mexico should set ambitious goals to invest more of its GDP in innovation, research and development. This horizon of investment in R&D&I requires both national and foreign private investment, as well as public investment funds and programs channeled through its three levels of government, thus creating a system for financing the CE.*
- *In addition to financial resources, it will be necessary to strengthen micro, small, and medium-sized enterprises (MSMEs) and local producers through technical assistance processes, technology transfer programs and digitalization of production and technical training in areas such as: biobased materials or substances, eco-design of sustainable products, formulation of projects for the circularity of value chains, incubation and acceleration of technology-based circular business models based on the 10 R's, among others.*

The SEMARNAT report also mentioned various challenges when implementing a circular economy:

- ***Weaknesses in legislation and lack of an institutional framework for the circular economy:*** *The current legal and regulatory framework in Mexico does not incorporate the circular economy principles or provide specific concepts, mechanisms, and actions to promote strategies such as eco-design of products, industrial symbiosis, and the revalorization of water, energy, and material flows. It lacks the concept of Extended Producer Responsibility (EPR) and fails to clearly define the roles and responsibilities of all agents in the economic chain.*

- ***Regulatory barriers to promoting industrial symbiosis:*** *Current legislation does not facilitate synergies in areas like the exchange of by-products or secondary materials between industries that are not traditionally part of the same supply chain. For instance, there is a lack of technical standards for minimum recovered material content in new production processes. Additionally, there are no provisions for the development of bioeconomy activities, which could help utilize and revalue biological by-products and secondary materials.*

- ***Fiscal policy for the linear economy:*** *Mexico lacks fiscal provisions to discourage or penalize production practices and consumption patterns that cause socio-environmental externalities and pollution. While there are some tax incentives aimed at promoting sustainability, they represent*

less than 5% of tax revenue from the productive sector. Conversely, there is significant fiscal support for linear economy practices, such as fossil fuel consumption subsidies. Although the Income Tax Law allows deductions for renewable energy equipment, it does not cover specialized equipment for reducing water consumption, increasing recycling rates, or treating wastewater.

- ***Absence of a federal institutional framework for implementing the circular economy:*** *While there have been significant advances in developing subnational circular economy laws, these have emerged under different conceptual frameworks without harmonization. Therefore, there is an urgent need for a general law framework that establishes definitions, conceptual bases, and the scope of the transition to a circular economy in Mexico. This framework should include existing public policy laws and those in development, focusing on comprehensive principles for the circular economy, designing mechanisms and instruments that incentivize sustainable production-consumption patterns while discouraging linear economy practices like planned obsolescence.*

Several stakeholders interviewed for this report also shared these conclusions, especially the need for an overarching circular economy National Strategy that establishes the same terminology and methodologies of measurement, and the importance of support from the government for this transition. Additionally, the critical need to enhance capacity-building across various parts of supply chains and among business owners was highlighted.

In early October 2024, the recently elected President of Mexico, Claudia Sheinbaum, announced in a press conference the creation of the first Circular Economy Industrial Park, which will be established in the municipality of Tula (Hidalgo). The federal government has shared that the project will cover 700 hectares, which will initially be used to set up two organic waste treatment plants using gasification and carbonization processes. The project will be coordinated by SEMARNAT and the National Autonomous University of Mexico (UNAM, by its acronym in Spanish) Institute of Engineering, with the goal of developing technology to convert organic waste into biochar for use as fertilizer and fuel [5].

2.1.2 STATE AND CITY LEVEL

Mexico is a federal republic integrated by 32 entities: 31 states and Mexico City, the capital. Each state operates with a degree of autonomy, having its own constitution, governor, and legislature, which allows them to enact local laws and regulations. While federal laws provide overarching governance, states can develop their own policies and legal frameworks to address specific local needs, including environmental management and economic development. This decentralized structure allows for diverse approaches across states when implementing circular economy strategies. However, it can also cause a lack of harmonizations across the country, preventing or delaying standardization.

For this report, a detailed analysis was conducted of the most relevant initiatives and/or projects occurring in each of the featured states. Of the 32 states, 11 states do not have any legislation or programs dedicated to the circular economy. While 21 states have implemented some form of state-level legislation or programs related to the CE, the majority primarily focus on waste management.

Six territories, five states and a city, have emerged as leaders in CE initiatives (see figure 1) that do not exclusively focus on waste management, and have been identified as a greater potential for collaboration between The Netherlands and Mexico: Mexico City, Chihuahua, Jalisco, Puebla, Querétaro and Guanajuato.

The following section will provide a summary of the CE landscape in these six territories. It is important to note that the content of the circular laws, roadmaps and plans are direct translations from the content published by the states and Mexico City.

FIGURE 1. MAP OF STATES WITH WELL ADVANCED CIRCULAR ECONOMY PLANS, REVIEWED IN THIS REPORT.

MEXICO CITY

MEXICO CITY

DESCRIPTION	*Mexico City is the capital and largest city of Mexico, and the most populous city in North America. Mexico City is one of the most important cultural and financial centers in the world and an economic hub in Latin America. With an area of 1.495 square kilometers, the city produces 15.8% of the country's gross domestic product. The high spending power of Mexico City's inhabitants makes the city attractive for companies offering prestige and luxury goods. Due to the limited non-urbanized space in the south—most of which is protected through environmental laws—the contribution of Mexico City in agriculture is the smallest of all federal entities in the country.*
POPULATION (2022)	*9.259.354 (City)* *23.146.802 (Urban area)*
GROSS DOMESTIC PRODUCT (GDP) 2021	*212 billion USD*

TABLE 2. MEXICO CITY GENERAL PROFILE.

There are two relevant frameworks in Mexico City related to the circular economy:

- **Circular Economy Law of Mexico City and Circular Economy Regulation for Mexico City (2023):** Published in 2023, this law aims to promote and increase the circular economy practices in Mexico City, through the promotion of tax incentives for productive sectors, avoiding the destruction of value in economic chains, increasing efficiency and reducing the ecological footprint by reducing the use of natural resources and energy. Additionally, the law mandates the creation of a Circular Economy Program and a Circularity Certification ("Distintivo"), which will allow companies to perform self-assessments of their circularity practices. This certification is set to be implemented in 2025 [6].

- **Circular Economy Program of Mexico City 2024-2030:** From a government point of view, the Circular Economy Program (2024-2030) aims to integrate, align and expand the programs and actions that contribute to the circular economy [7]. There are eleven strategic pillars:

    1. *Responsible production and consumption*
    2. *Adoption of service models*
    3. *Supply chain*
    4. *Circular markets*
    5. *Zero waste*
    6. *Reuse*
    7. *Right to repair*
    8. *Efficient use of water*
    9. *Efficient use of energy*
    10. *Culture of circularity*
    11. *Circularity evaluation*

The implementation of this program is overseen by various government agencies, including: Ministry of the Environment, Ministry of Economic Development, Ministry of Education, Science, Technology and Innovation, Ministry of Labor and Employment Promotion.

Additionally, there is a Circular Economy Network, implemented by the Ministry of the Environment (Sedema) in Mexico City, aimed at fostering knowledge generation, partnerships, and sustainable solutions. The first session of this network was held in September 2024 [8]. This network is coordinated by Sedema and the Ministry of Education, Science, Technology, and Innovation (Sectei) and includes the Ministries of Administration and Finance, Economic Development (Sedeco), Urban Development and Housing (Seduvi), Mobility (Semovi), Public Works and Services (Sobse), Labor and Employment Promotion (STyFE), Tourism (Sectur), and the Digital Agency for Public Innovation (ADIP). Additionally, representatives from the private sector, civil society organizations, and institutions of higher education and research might be invited to participate in future sessions. During the First Ordinary Session representatives from each ministry reviewed the strategy for involving other sectors, forming working groups, and creating a Circularity Baseline. This baseline will address aspects such as adoption of service models, reuse, the right to repair, productive chain integration, waste reduction and utilization with a zero-waste perspective, and efficient resource use.

COLLABORATION OPPORTUNITIES

Based on the Circular Economy Program of Mexico City (2024-2030), the activities listed in the table below are considered collaboration opportunities with Mexico City. During stakeholder interviews, city representatives expressed interest in partnering with Dutch organizations. It is important to note that the activities listed below fall under the responsibility of various government agencies (as detailed in the previous section), so additional coordination with relevant government contacts may be necessary. The activity descriptions are direct transcriptions of the objectives outlined in the Circular Economy City Program. At the end of each collaboration opportunity, the number indicates the chapter where this can be found in the Circular Economy City Program document.

MEXICO CITY: COLLABORATION OPPORTUNITIES	
GENERAL	• *Develop training courses and workshops aimed at businesses about the circular economy' transition (1.2).* • *Training in compost production, use, and commercialization under a circular economy approach (1.7).* • *Advisory for business projects focused on adopting service models (2.4).* • *Organization of Second-Hand Market Fairs (4.4).* • *Reuse and refill schemes in hotels and restaurants (5.15).* • *Train individuals on rainwater harvesting system installation (8.5).* • *Create a digital platform to promote the use of secondary raw materials and link businesses (3.1).* • *Create a food recovery program to recover good-conditioned food from hotels and restaurants and channel it to food banks (5.16).* • *Develop Competency Standards for repair, refurbishment, and remanufacturing of electronic devices (7.2).* • *Propose a regulatory framework to guarantee the right to repair (7.5).* • *Conduct an energy efficiency diagnostic to improve energy efficiency in MSMEs in Mexico City, promoting efficient energy use and renewable energy sources (9.1).* • *Propose the inclusion of circular economy concepts and examples in the curricula of basic, upper secondary, and higher education (10.2).*
SPECIFIC PER SECTOR	*No sector-specific opportunities were identified*

TABLE 3. MEXICO CITY COLLABORATION OPPORTUNITIES.

CHIHUAHUA

CHIHUAHUA

DESCRIPTION

Chihuahua is located in the northwestern part of Mexico and is bordered by the states of Sonora to the west, Sinaloa to the southwest, Durango to the south, and Coahuila to the east. To the north and northeast, it shares an extensive border with the U.S. adjacent to the U.S. states of New Mexico and Texas. The state was named after its capital city, Chihuahua City; the largest city is Ciudad Juárez. Chihuahua is the largest state in Mexico by area, with an area of 247.455 square kilometers. The three most important economic centers in the state are: Ciudad Juárez, an international manufacturing center; Chihuahua, the state capital; and Cuauhtémoc, the state's main agriculture hub and an internationally recognized center for apple production. Today, Chihuahua serves as an important commercial route prospering from billions of dollars from international trade as a result of USMCA (formerly known as NAFTA.)

CAPITAL CITY	POPULATION (2022)	GROSS DOMESTIC PRODUCT (GDP) 2021
Chihuahua	*3.789.509*	*52.2 billion USD*

TABLE 4. CHIHUAHUA STATE GENERAL PROFILE.

Although currently the state lacks a specific legislative framework on circular economy, the Ministry of Environment is diligently developing a draft law. This law aims to define the principles of circular economy policy and establish instruments to incentivize and implement these principles in the state of Chihuahua. As part of this project, the Ministry provided a draft law, now ready for review.

The document provided, from October 2024, outlines the proposed objectives of a new law in Chihuahua aimed at promoting efficient resource use and achieving zero waste through the reuse, recycling, and redesign of products. It seeks to foster sustainable and restorative development while encouraging responsible consumption habits among citizens. By applying circular economy principles to economic activities and facilitating technological advancements in recycling and product redesign, the initiative aims to stimulate sustainable economic growth. Collaboration is a central theme, emphasizing the link between civil society, academia, and both public and private sectors to enhance innovation. This approach aids businesses—including small and medium-sized enterprises and large corporations—in transitioning to circular models. The law intends to embed circular economy principles into products and value chains, fostering a culture of environmental responsibility throughout the region. Key goals include promoting the transformation towards sustainable cities and communities, encouraging the use of clean and renewable energy, and generating green jobs that extend product lifespans and reduce reliance on natural resources. By creating knowledge and collaboration networks, Chihuahua aims to facilitate a transition toward sustainable development. Additionally, promoting institutional agreements for international cooperation on the circular economy enables Chihuahua to contribute to local, national, and international commitments on sustainable development and climate change mitigation, including the transition to a net-zero emissions economy.

There is an active effort to create public-private coalitions to impulse circular economy in the state: In 2023, the "Circular Economy Pact: Accelerating Transitions in Latin America from Chihuahua" was launched, with an objective of bringing together international companies, opinion leaders, and professionals to promote collective actions and initiatives in the circular economy [9].

The State also has an initiative called "Chihuahua Green City" which focuses on developing strategies for a change of mentality that promotes the conservation, management and sustainable use of natural resources and the environment, with the aim of Chihuahua to be "The Green Capital of Mexico", from their website [10]:

"Chihuahua Green City is a pilot project of Industrial Symbiosis in the Municipality of Chihuahua, financed and led by the European Union in conjunction with COPARMEX Chihuahua and with the technical support of the expert company Símbiosy from Barcelona, Spain."

The initiative in Chihuahua seeks to foster networking and collaboration among the various industries present within the park. They maintain comprehensive data on all participating companies and provide technical support to help them transition to a circular economy. One of their key initiatives is mapping surplus resources such as electricity, water, and waste among member companies. Their platform, "Syner," is a tool with an extensive database that tracks residual materials and identifies project opportunities to optimize resource use. Another tool, "Symtrack," manages projects and maps companies' procurement activities, facilitating resource efficiency and sustainable practices. There is another hub from the Chihuahua Green City initiative called "Juarez Circular Hub", based in Ciudad Juarez (border with El Paso, Texas), whose objective is to assist more than 48.000 companies in their transition towards the circular economy.

COLLABORATION OPPORTUNITIES

Considering the above, the following activities are suggested to enhance the collaboration with Chihuahua State, identified in interviews with relevant stakeholders.

CHIHUAHUA: COLLABORATION OPPORTUNITIES	
GENERAL	• *Introduction to circular economy: a foundational course about the circular economy to introduce more companies to the concept.* • *Residual materials management: specialized training on how to identify, classify, and track residual materials within different industries to improve resource efficiency and minimize waste.* • *Skills development for circular practices: practical workshops that focus on building the technical skills needed for companies to adopt and implement circular economy strategies effectively.* • *Understanding circular supply chains: a program to enhance comprehension of circular supply chains, helping businesses understand the flow of resources and how to integrate circular principles into their procurement and operations.*
SPECIFIC PER SECTOR	*Chihuahua Green initiative is a notable private endeavor led by COPARMEX Chihuahua with support from the European Union. This initiative aims to foster industrial symbiosis among local businesses. It is a public-private innovation program that guides companies in Chihuahua towards a circular economy and industrial symbiosis. Managed by COPARMEX Chihuahua in collaboration with the Government of the State of Chihuahua, it enhances the competitiveness of companies by assisting them in developing their sustainability plans. The program offers innovative services focused on CO2 reduction, material circularity, green energy, and industrial symbiosis. Several pilot projects have already been implemented, including:* • ***Construction blocks made from recycled materials:*** *a collaboration with Interceramic and Grupo Cementos de Chihuahua.* • ***Shoe soles manufactured from hospital waste:*** *a partnership with General Electric HealthCare and Recilogic.* • ***Organic soil conditioners:*** *developed in conjunction with Innovak.* • ***A waste processing plant:*** *This facility processes waste from the Chihuahua industrial complex, reintegrating materials into production processes or creating new eco-products. It's also known as the "Scrap Store."* • ***Wastewater treatment plant and photovoltaic park:*** *generating clean water and energy.* • ***End-of-life tire processing plant:*** *recycling used tires.* • ***Residual energy exchange networks:*** *utilizing excess heat or cold from local industries.* • ***Aluminum scrap recovery:*** *a partnership between Superior Industries and Grupo Cementos de Chihuahua.* • ***Reuse of rubber waste:*** *collaboration with Continental to repurpose vulcanized rubber.*

TABLE 5. CHIHUAHUA STATE COLLABORATION OPPORTUNITIES.

JALISCO

JALISCO

DESCRIPTION

Jalisco is located in western Mexico and is bordered by six states, Nayarit, Zacatecas, Aguascalientes, Guanajuato, Michoacán, and Colima. Jalisco is divided into 125 municipalities, and its capital and largest city is Guadalajara, the economic center of the "Bajío" area of Mexico. With an area of 78.599 square kilometers, Jalisco is one of the most economically and culturally important states in Mexico, owing to its natural resources as well as its long history and culture. The economy of the state accounts for 6.3% of Mexico's GDP. It is ranked third in socioeconomic indicators behind Nuevo León and the Federal District of Mexico City. The main sectors of the economy are commerce, restaurants and hotels at 26.1%, services at 21.5%, manufacturing (food processing, bottling and tobacco) at 19.4%, transport, storage and communications at 11.8%, financial services and real estate at 11.2%, agriculture, forestry and fishing at 5.5%, and construction at 4.4%. Jalisco earns just under six percent of Mexico's foreign earnings from tourism and employment from the various multinational corporations located in the state, exporting more than $5 billion annually to 81 countries and ranks first among the states in agribusiness, computers and the manufacturing of jewelry.

CAPITAL CITY	POPULATION (2022)	GROSS DOMESTIC PRODUCT (GDP) 2022
Guadalajara	*8.460.591*	*106.8 billion USD*

TABLE 6. JALISCO STATE GENERAL PROFILE.

The state of Jalisco is making significant progress in developing its own State Circular Economy Law. This law is based on the following legislations: the Waste Law, the Ecological Balance Law, and the Government Procurement Law. The law has the following objectives [11]:

1. *Ensure every person's right to a healthy environment and promote sustainable development by transforming production and consumption systems for more efficient resource use, reducing environmental impacts, and creating a more sustainable long-term economic model.*
2. *Define the principles of circular economy policy and the instruments to incentivize and implement its application in the State of Jalisco.*
3. *Encourage sustainable production actions in Jalisco's economic activities through redesign, reduction, reuse, repair, restoration, remanufacturing, readaptation, recycling, and recovery or any other circular economy criteria that enables restorative, regenerative, sustainable, cultural, inclusive, and community development.*
4. *Promote among the inhabitants of Jalisco the adoption of shared responsibility consumption habits, as well as efficient use of products, services, materials, secondary raw materials, and by-products through reuse, recycling, redesign, or any circular economy criteria.*
5. *Encourage research, development, and technological innovation related to responsible production and consumption, redesign, reduction, reuse, repair, restoration, remanufacturing, readaptation, recycling, and recovery of products and by-products, based on the principles of the circular economy.*
6. *Facilitate collaboration with the private sector to promote shared responsibility in the circular economy and the integration of value chains through material and input exchange models.*
7. *Contribute to fulfilling local, national, and international commitments and agreements to overcome sustainable development challenges, climate change mitigation, and adaptation under a circular economy approach.*
8. *Promote the use, generation, and access to clean and renewable energy in line with circular economy principles.*

Also, the state developed the Circular Economy Roadmap for five priority sectors of Jalisco. The roadmap, presented in 2023, focuses on making a series of recommendations and laying the foundations to promote public policy aimed at the diversification of the economy with a focus on circularity in the state of Jalisco. The priority sectors are:

- ***Agribusiness and bioeconomy:*** *proposes boosting the sustainable production and distribution of food, reducing food loss and waste (FLW), and ensuring sustainable management of water resources and waste. Additionally, it promotes the adoption of environmentally friendly agricultural production practices, the fostering of a circular economy throughout the supply chain, and the generation of value-added products through a circular bioeconomy and the development of nature-based solutions.*
- ***Advanced manufacturing, IT and electronics:*** *promotes the adoption of clean technologies for sustainable manufacturing processes, the adoption of models and technologies for the reuse and recycling of recovered secondary materials throughout the supply chain, with the aim of having a positive impact from the extraction of raw materials to the final disposal of goods in post-consumption. Additionally, active collaboration with companies and organizations is encouraged to boost the circular economy in this sector, including the creation of networks for the exchange of materials and knowledge.*
- ***Sustainable construction and resilient infrastructure:*** *it aims to transform the region through sustainable and resilient development. This involves transitioning the construction, real estate, and infrastructure sectors to a circular economy using circular business models, digital technologies, and eco-design. Key strategies include promoting eco-friendly materials, low-emission products, sustainable building practices, and the reuse of construction and demolition waste. The renovation of existing buildings with bioclimatic design is highlighted as a major decarbonization strategy. The roadmap emphasizes sustainable and resilient construction to adapt to climate change and enhance resilience to natural disasters.*
- ***Sustainable tourism and events:*** *it aims to transform the tourism and events industry in the region by adopting sustainable and circular practices that strengthen competitiveness and differentiate it as a hub for circular business and innovation. The actions developed within this focus industry mainly promotes good practices and operational models of sustainable tourism, as well as the reduction of waste generation in the hotel and restaurant industry, energy and water efficiency, traceability of the sector's socio-environmental impacts, and the promotion of events and/or business meetings that follow circular principles.*
- ***Logistics and transportation services:*** *it is considered a key industry for all production chains and consumption/post-consumption markets, making it urgent to implement measures that ensure its decarbonization in the first instance and enhance its long-term sustainability, generating a positive impact on the mitigation of the carbon footprint of all productive sectors to which they are linked. In this regard, a series of actions have been considered that directly contribute to the decarbonization—scope 1, 2, and 3—of other industries, the energy transition, and the deployment of infrastructure for electromobility that will be necessary to enable access to affordable, inclusive, sustainable, and resilient mobility.*

The roadmap has three implementation phases: a three-year period (2024-2027) for enabling conditions for accelerated circular economy transition, a medium-term period until 2030 to achieve Agenda 2030 SDG goals and subnational Paris Agreement targets, and a long-term horizon until 2040 for consolidating a sustainable development model based on a circular economy at the state level.

COLLABORATION OPPORTUNITIES

Given that Jalisco already has a roadmap for the circular economy, there is potential to strengthen the relationship with the local government to identify potential synergies for specific projects between The Netherlands and Mexico. It is recommended to build relationships with the Ministry of Environment and Territorial Development (SEMADET) and the Ministry of Economic Development (SEDECO), as these two ministries have been driving the topic at the state level. Additionally, due to the change in state government, it is important to consider that the

new administration must define the speed of progress of this program. The following activities are suggested to enhance the collaboration with Jalisco State, identified in the state's roadmap.

JALISCO: COLLABORATION OPPORTUNITIES	
GENERAL	*Advisory on consolidating a Circular Economy Law that aligns with the goals outlined in the CE Roadmap.*

SPECIFIC PER SECTOR	***Construction:***
	• *Promote the incorporation of design methodologies that includes a life cycle perspective.*
	  ▸ *Provide training and technical preparation for the implementation of regulations, guides and manuals for sustainable construction that consider all stages of management of buildings and infrastructure works, including the use of digital technologies.*
	  ▸ *Provide technical assistance for the use of technological tools that incorporate eco-efficiency and LCA in companies (with a focus on MSMEs) in prioritized value chains.*
	  ▸ *Implement mandatory LCA in construction projects, both public and private investment. (Long-term)*
	• *Guidelines on how to set-up fiscal incentives for companies to incorporate used materials into their projects.*
	• *Establish eco-design criteria and/or modular designs for public and private buildings that allow for the efficient use of elements and materials.*
	  ▸ *Implement awareness and training campaigns on the eco-design of buildings and infrastructure works and their benefits.*
	  ▸ *Develop technical standards for eco-design of buildings and infrastructure works based on bioclimatic design and the use of highly circular materials.*
	  ▸ *Promote investment in R&D to improve the technology and materials used in modular construction that allow parts to be disassembled and reused.*
	• *Promote the reuse of structural construction materials for repairs and/or new construction works.*
	  ▸ *Create an inventory of construction materials recovered from demolitions or old construction sites, classifying them and evaluating their condition and quality.*
	  ▸ *Promote sustainable disassembly practices and selective demolition projects to preserve the integrity of recovered materials.*
	• *The ambition to set-up processing plants for construction demolition waste in Jalisco, so that companies can comply with a new law that will be enacted, and to stimulate the actual reuse of raw materials. Jalisco is open to learn from other countries what steps have been taken to set-up a recycling industry for construction waste.*
	• *Knowledge on defining circular materials for the construction sector.*
	• *Knowledge on circular procurement.*
	• *Incorporate knowledge on sustainable and biomaterials in academics.*
	
	Circular Design:
	Advanced manufacturing, IT and electronics: Implement programs in partnership with research centers, business chambers or technical assistance entities for life cycle analysis in production chains.
	• *Promote LCA implementation programs in manufacturing production chains.*
	• *Promote the generation of information in companies for the creation of an LCA database system.*
	• *Develop an information system to provide traceability (and eventual certification) of electronic products.*

TABLE 7. JALISCO STATE COLLABORATION OPPORTUNITIES.

PUEBLA

PUEBLA

DESCRIPTION

Located in the central highlands of Mexico, the state lies between the Sierra Nevada and the Sierra Madre Oriental Mountain ranges. The state shares its borders with Veracruz, Oaxaca, Guerrero, Morelos, the State of Mexico, Tlaxcala, and Hidalgo. Covering an area of 34,290 square kilometers, it ranks 20th in size among Mexico's 31 states and is home to 4,930 named communities. The state's economy is diverse, with industries such as textiles, tourism, agribusiness, storage, medical services, furniture manufacturing, and logistics services. The state's gross domestic product represents 3.4% of the national total, making it one of the most industrialized states in the country.

CAPITAL CITY	POPULATION (2022)	GROSS DOMESTIC PRODUCT (GDP) 2022
Puebla de Zaragoza	*6.682.040*	*44.9 billion USD*

TABLE 8. PUEBLA STATE GENERAL PROFILE.

In 2023, the state law on Sustainable Economic Development was updated to incorporate new definitions in several articles, including concepts related to the circular economy. Following this, the document "Circular and Social Bioeconomy Strategy for the State of Puebla" (Estrategia de Bioeconomía Circular y Social del Estado de Puebla, in Spanish) was published, outlining a long-term vision for 2050. This vision aims for a sustainable, resilient, and inclusive bioeconomy, emphasizing the integration of social, economic, and environmental dimensions to promote innovation and sustainable development [12]. The strategy was developed through collaborative efforts between government institutions, academic organizations, NGOs, representatives of Chambers of Commerce and consultants. The following are the key strategic lines of action outlined in the strategy:

1. ***Regenerative biocultural heritage:***
   - *1.1 Circularize waste from agri-food chains.*
   - *1.2 Promote sustainable innovation and dialogue of knowledge in agri-food systems.*
   - *1.3 Promote agroecological systems and the sustainable use of ecosystem services.*
   - *1.4 Regenerate and develop the state's biocultural heritage.*
2. ***Bio Circular Industry and Energy:***
   - *2.1 Support the transition of companies to circular and low-carbon models.*
   - *2.2 Promote industrial symbiosis to facilitate the transition to efficient, resilient and circular industrial processes.*
   - *2.3 Stimulate the development of bioenergy chains and products.*
3. ***Sustainable Business Models & Social Innovation:***
   - *3.1 Generate mechanisms and links to promote circular and social markets.*
   - *3.2 Develop legislation to promote the Circular and Social Bioeconomy in the state.*
   - *3.3 Promote research and social innovation towards sustainable socioeconomic models.*
4. ***Construction and Green Infrastructure:***
   - *4.1 Promote sustainability practices in the construction sector.*
   - *4.2 Encourage the development of regenerative and climate-resilient infrastructure.*

For each of the items, actions are defined related to the objectives of the plan, linked to the applicable SDGs. There are twenty specific performance indicators proposed in the strategy related to environmental and social impacts.

COLLABORATION OPPORTUNITIES

The overview below provides insight into the potential collaboration opportunities with Puebla. The descriptions of the opportunities are direct transcriptions of the objectives outlined in the Circular and Social Bioeconomy Strategy. At the end of each collaboration opportunity, the number indicates the action line as mentioned in the state strategy.

PUEBLA: COLLABORATION OPPORTUNITIES	
GENERAL	*No general opportunities were identified.*
SPECIFIC PER SECTOR	***Circular Design*** • *Promote the creation of Circularity and Decarbonization Action Plans in priority sectors and organizations (2.1.2)* • *Transition programs to support traditional entrepreneurship towards the creation of companies with sustainable and social business models. (2.1.3)* • *Promote research and implementation of biomaterials and circular processes in industrial sectors with the greatest environmental impact.(2.1.5)* • *Conduct analysis on flows, characterization and prioritization of waste from Puebla's industries. (2.2.2)* • *Develop research on mechanisms and regulations for extended responsibility schemes for implementation in the state. (3.3.4)* ***Construction*** • *Promote the teaching and implementation of bioconstruction, circular and sustainable construction materials, techniques and solutions in universities and companies in the sector. (4.1.2.)* • *Promote the application of good practices in terms of energy efficiency in new constructions, as well as the refurbishment of existing buildings. (4.1.3.)* • *Generate a roadmap for the implementation of construction material passports. (4.1.4.)* • *Promote the use of eco-technologies that contribute to energy and water savings in homes and businesses. (4.1.5.)* • *Promote infrastructure and solutions for circular and efficient water management. (4.3.3.)* • *Promote the establishment of water capture, storage and harvesting systems and practices that increase its availability, favoring areas of water' high vulnerability. (4.3.4.)*

TABLE 9. PUEBLA STATE COLLABORATION OPPORTUNITIES.

QUERETARO

QUERETARO

DESCRIPTION

Although one of the smallest states in Mexico (11.684 square kilometers), it boasts a highly diverse geography, ranging from deserts to tropical rainforests, particularly within the Sierra Gorda, which is rich in microecosystems. The state's economic activities are closely aligned with national trends, showing a decrease in the agricultural sector's GDP contribution and a rise in manufacturing and commerce/services. Queretaro city stands out as the state's primary economic hub, followed by San Juan del Río. Queretaro is not only the state's population center but also benefits from fertile soil suitable for irrigation farming and cattle raising. It enjoys direct highway connections to Mexico City, the nation's largest market, as well as to northern Mexico and the United States.

CAPITAL CITY	POPULATION (2022)	GROSS DOMESTIC PRODUCT (GDP) 2022
Santiago de Queretaro	*2.462.840*	*32.6 billion USD*

TABLE 10. QUERETARO STATE GENERAL PROFILE.

On December 3, 2021, the Law for the Prevention, Comprehensive Management, and Circular Economy of Waste in the State of Queretaro was enacted. This law aims to regulate the prevention and comprehensive management of waste to enhance the productivity of the materials, promote the regeneration of natural resources, and mitigate the release of greenhouse emissions. The goal is to achieve economic prosperity and social equity within the state. The objectives of this law, as stated through a direct translation, are:

1. *Promote sustainable development and initiate the transition from a linear economy to a circular economy within an articulated strategy of linked actions, through the prevention and comprehensive management of urban solid waste, biowaste, and special waste.*
2. *Ensure actions that guarantee the promotion of a cultural change focused on the transition to a circular economy in the public, private, and social sectors.*
3. *Promote the inclusion of the most vulnerable parts of society in circular economy systems for waste.*
4. *Promote the reuse of waste materials in various industries, with a focus on both biological and non-biological materials.*
5. *Encourage the utilization of waste by fostering the use of byproducts.*
6. *Prevent site contamination by waste, its remediation, and rehabilitation, based on the extended responsibility of different sectors.*
7. *Prioritize actions aimed at preventing and reducing the amount of waste, as well as decreasing the risk of causing harm to human health or the environment.*
8. *Promote and implement management, planning, inspection, verification, and control instruments that favor the prevention and efficiency of comprehensive waste management activities.*
9. *Guarantee citizens access to information about public action in terms of waste prevention and comprehensive management, promoting their participation in the development of planned actions.*
10. *Promote, induce, and, if necessary, ensure the separation of waste and its byproducts.*
11. *Encourage the prevention, minimization, and valorization of waste, energy utilization, or, if necessary, the disposal of waste in authorized final disposal sites.*
12. *Prohibit the disposal of waste in unauthorized sites.*

13. *Coordinate actions for the remediation or rehabilitation of sites contaminated with urban solid waste, biowaste, or special handling waste.*
14. *Guarantee safety and traceability in comprehensive waste management.*
15. *Encourage public, private, or mixed investment for the implementation of sustainable technology, renewable energies, and clean energy sources that allow the valorization and energy utilization of waste.*
16. *Promote the coordination of different authorities in terms of waste prevention, comprehensive management, and circular economy.*
17. *Prevent, reduce, substitute, limit, or, if necessary, eliminate the use of commercial products that are difficult to degrade naturally.*

Queretaro has been a pioneer state in waste management programs since the early 2010's, and was the first state to implement a public policy framework for circular economy. The state has a Circular Economy System promoted by the Queretaro Automotive Cluster and the state Secretary of Sustainable Development. Circular Economy Queretaro (In Spanish, Economia Circular Queretaro) is a public-private collaboration, founded in 2021, where the state government of Queretaro works together with the Queretaro Automotive Cluster (industry association) to implement circular economy initiatives and to train employees of participating companies. Currently, the collaboration is not only with the Automotive Cluster, but with more industries. The initiative already works together with the Embassy of Canada in Mexico as well as with the Bilbao area in Spain. To date, over 250 companies and 40 institutions are involved in the initiative, having trained over 600 professionals within the participating companies and worked on over 350 projects. Furthermore, the initiative has realized over 775 million pesos in savings (approximately 40 million USD) and over 300.000 tons of materials saved from going to waste. This collaboration between the public and private sector can be regarded as successful and the awareness of the circular economy in Queretaro has grown as a result.

COLLABORATION OPPORTUNITIES

Considering the above, the following activities are suggested to enhance the collaboration with Queretaro State, identified in interviews with relevant stakeholders.

QUERETARO: COLLABORATION OPPORTUNITIES	
GENERAL	• *Training on circular economy from Dutch experts. This can be in the areas of circular design, business models, or materials.* • *Training on technologies to reduce CO2 emissions in production processes.* • *Knowledge sharing on water technology, and the efficient use of water in production processes.* • *Develop collaboration with European organizations and companies, also to potentially obtain international funding, for example from the European Union.*
SPECIFIC PER SECTOR	*No sector-specific opportunities were identified.*

TABLE 11. QUERETARO STATE COLLABORATION OPPORTUNITIES.

GUANAJUATO

GUANAJUATO

DESCRIPTION

Guanajuato is a state located in the central highlands of Mexico, bordered by the states of Jalisco, Zacatecas, San Luis Potosí, Querétaro, and Michoacán. It covers an area of 30,607 square kilometers. Known for its rich colonial heritage, it features picturesque cities like Guanajuato City—with its winding alleyways, tunnels, and historic buildings—and San Miguel de Allende, famed for its baroque architecture and thriving arts scene. Economically, Guanajuato has diverse industries, focusing on agriculture, leather production, and a booming automotive sector concentrated in its industrial corridor, which includes cities like León, Celaya, and Irapuato. This economic development has attracted significant foreign investment and job opportunities, solidifying Guanajuato as an important industrial hub in Mexico.

CAPITAL CITY	POPULATION (2022)	GROSS DOMESTIC PRODUCT (GDP) 2022
Guanajuato	*6.166.934*	*60.3 billion USD*

TABLE 12. GUANAJUATO STATE GENERAL PROFILE.

In 2023, the state presented the "Guanajuato Circular, Roadmap to 2050" a document elaborated by the state level Ministry of Environment and Territorial Planning and the Ministry of Sustainable Economic Development in alliance with the Resource Efficiency and Climate Action Initiative program, implemented by the German Technical Cooperation (GIZ, by its acronym in German). For the development of the roadmap, several workshops were held to identify and improve company processes, aiming for a more circular approach. In these workshops over 180 companies from various sectors participated, including construction, agribusiness, manufacturing, chemical industries, services, municipalities, academia, and leatherworking [13].

The vision for 2050 of Guanajuato is to have a model of resource efficiency and a circular economy, which will create an economic system that considers externalities whilst taking advantage of biological and technical cycles. The specific objectives of this roadmap are:

- *Establish conceptual foundations for developing a circular economy roadmap that engages the interest and commitment of key institutions in Guanajuato's main economic sectors.*
- *Promote communication and trust between the public and private sectors to create action plans, indicators, and appropriate sectoral regulations. These measures aim to encourage resource efficiency, sustainable production and consumption, prevent ecosystem degradation, and ensure vital resources for future generations.*

In this roadmap, Guanajuato identifies three major sectors where circular economy strategies will be deployed: Waste Management, Construction and Manufacturing (automotive, metals, leather/footwear industry and chemical industry).

Leather and footwear manufacturing hold cultural significance in Guanajuato, often passed down within families, from parents to children, preserving artisanal skills and heritage across generations. 76.4% of Mexico's leather tanning and finishing is manufactured in 3 cities in Guanajuato. However, this activity is one of the main pollutants of water in the state. Currently there are some actions related to improving the waste management for this industry and a certification called Econtannery from the State's Tanning Chamber, which is a voluntary certification on environmental and safety standards in the industry. In the roadmap, DyeCoo, a Dutch company which specializes

in dyeing textiles without water or chemical dyes, is mentioned as a good example of best practices around the world. Although DyeCoo does not have any program related to dyeing leather now, it might be an interesting opportunity for knowledge sharing.

For the construction sector, the roadmap highlights that construction in Guanajuato grew 15% in 2020, in contrast to the national decrease of 30% in the same year. Construction workers make up approximately 6.9% of the employed workforce in the state. Currently there is a Sustainable Industry Model for Construction Supplies, that aims to provide training and support programs for brick producers. The state also developed the Sustainable Construction Inputs Industry Work Center in Salamanca. Additionally, a Circular Waste Management Protocol for Construction and Demolition has been created as an action document to strengthen the value chain of the brick industry in the state.

COLLABORATION OPPORTUNITIES

The Guanajuato Circular Roadmap to 2050 details some of the short-term steps for 2024 and 2030, more ambitious goals for 2050, and some general opportunity areas for the different sectors identified by the state. The following collaboration opportunities were identified:

GUANAJUATO: COLLABORATION OPPORTUNITIES	
GENERAL	• *Workshops on efficient resource use and circular economy* • *Organization of sector-specific workshops (construction and tanning industry)* • *Advise on defining indicators by company or sector*
SPECIFIC PER SECTOR	***Textiles: (Leather / Footwear industry)*** • *Development of a marketplace/space focused on reusing, recycling, reparation and remanufacturing leather products.* • *Develop and implement financial mechanisms that enable companies to adopt circular practices.* • *Creation of synergies with the chemical industry to create bio-chemical products.* ***Construction*** • *Encourage inclusion of bioclimatic design to reduce energy requirements for heating and cooling.* • *Management of construction waste and exploration of revalorization opportunities.* • *Develop plan to progressively replace virgin materials with recovered materials.*

TABLE 13. GUANAJUATO STATE COLLABORATION OPPORTUNITIES.

2.2

PRIVATE SECTOR LANDSCAPE

TEXTILES

2.2 PRIVATE SECTOR LANDSCAPE

This chapter provides an overview of the state of the textile, construction and circular design sectors in Mexico. It provides general data on the sector, insights into circular economy initiatives and an overview of collaboration opportunities with each sector.

2.2.1 TEXTILES

The global textile sector is one of the largest and most influential sectors in the world economy, deeply integrated into international trade and affecting millions of people across various continents. Encompassing the entire process of fabric production —from the cultivation and processing of raw materials to the manufacturing of yarn, fabric, and final garments— this sector is characterized by its intricate, multi-stage production processes and widespread geographic dispersion, which presents challenges for implementing sustainability strategies across the entire supply chain.

As a high labor intensity industry, it relies heavily on manual labor for manufacturing, garment assembly, and finishing processes. This has led to both economic opportunities and social challenges, such as low wages and poor working conditions in developing countries. Additionally, the industry is resource-intensive, consuming vast amounts of water, energy, and chemicals throughout production. The environmental impact extends beyond manufacturing, as the volume of garments produced contributes to significant waste at the end of their lifecycle, an escalating issue for countries like Ghana, Kenya, and Chile. Due to these issues, NGOs and citizen groups frequently push brands and retailers to take responsibility for the industry's diverse impacts on people and the environment. In response, many international retailers have adopted sustainability strategies that integrate social and environmental objectives throughout their supply chains. A 2024 report by the Business & Human Rights Resource Centre highlights human rights challenges in Mexico, noting that eighteen companies analyzed in the research have both the power and responsibility to strengthen their policies from a human rights perspective [29].

In Mexico, the textile industry is one of the key manufacturing industries. In 1993, the textile industry represented 5.6% of Mexico's manufacturing GDP, although by the end of 2023, this figure had decreased to 1.9% [14]. Between 1995 and 2000, the textile industry's GDP experienced an average growth of 6.5%, primarily due to the impact of the North American Free Trade Agreement (NAFTA, now USMCA). This growth trend shifted in 2001 when China joined the World Trade Organization, resulting in a decline in the textile GDP from $7.60 billion USD to $6.71 billion USD.

According to the National Chamber of the Textile Industry (CANAINTEX, in Spanish), production levels in Mexico's textile industry have yet to recover to the figures seen in 2019. The industry is divided into two main sectors: the textile sector, which focuses on finished materials, and the manufacturing sector, which produces finished garments. For every job created in the textile industry, an additional four jobs are generated in the manufacturing sector, making textile stakeholders crucial drivers of employment growth throughout the supply chain [15].

The primary products manufactured in Mexico are cotton denim fabrics, blended yarns of soft fibers (mainly cotton), coated and waterproof plasticized fabrics, and nonwoven fabrics for industrial use. In 2023, the main finished products manufactured in the country were uniforms (53.4%), t-shirts (13.6%), and denim jeans (6%) [16].

According to data from CANAINTEX, for every 100 MXN (5 USD) of materials used, 55.5MXN (2.75 USD) came from domestic sources, while 44.5MXN (2.25 USD) were imported. It's important to note that nearly all equipment and machinery used in the industry is also imported, which places a lower priority on local innovation [16]. This reliance on foreign technology limits the development of domestic advancements and reduces the industry's ability to adapt production processes to regional sustainability needs or improve efficiencies through local solutions.

In 2022, approximately 519,000 people were employed in the textile industry. Notably, 95.6% of textile production units have fewer than 10 employees, while only 0.3% employ more than 250. In 2018, six federal entities accounted for 65.6% of the total gross production in the textile and clothing sector: Estado de Mexico, Puebla, Mexico City, Hidalgo, Guanajuato, and Coahuila [16].

While sustainability and the circular economy have slowly gained attention in the manufacturing industry, the primary push, from a big scale perspective, has come from international brands with production in Mexico. In 2021, Fashion Revolution released the second edition of the Fashion Transparency Index for Mexico, revealing that the 31 brands evaluated had an average score of just 6% [17]. The three international brands analyzed—C&A, Levi Strauss & Co., and Zara (Inditex)—received the highest scores on the index, while nearly all national brands averaged zero points. Other international brands with manufacturing operations in Mexico include Nike, Adidas, Puma, Carhartt, among others.

During interviews with stakeholders, several key challenges that Mexican manufacturers are facing were mentioned. Among these are the lack of integration within the national supply chain, which complicates the implementation of changes throughout the supply chain and keeping the same sustainability standard for different factories. Also, an important challenge is the rise in manufacturing costs, driven by increasing minimum wages and employee benefits that are not offset by improvements in productivity. This issue is compounded by intense competition from Chinese brands, such as Shein, which benefit from low import barriers. Additionally, widespread safety concerns across the country, particularly in distribution and logistics, further complicate operations. These factors create a complex environment for growth and competitiveness in the Mexican fashion industry, which further decreases the willingness and/or ability to implement sustainability programs.

Nevertheless, there are companies, both corporates and start-ups, working on circular solutions or projects in Mexico. Notable examples include Industrias Marves, which has been involved in textile recycling for decades; their startup, Recolecto, focuses specifically on extending garment life cycles through resale stores and by recycling unusable textiles into materials for the automotive and furniture industry. Another pioneer in sustainable and social manufacturing is Someone Somewhere, a Mexican brand that defines themselves as a social enterprise on a mission to lift millions of artisans and textile workers out of poverty, while reducing the environmental impact of the textile industry. Someone Somewhere is currently working on several circular projects for brands like IKEA and Decathlon [18].

From a business perspective, Dutch companies can benefit from collaboration with Mexico to access a well-developed industry. Mexico benefits from a broad network of free trade agreements, such as the United States-Mexico-Canada Agreement (USMCA), formerly known as NAFTA. Currently this agreement allows Mexico to export textile products to the United States and Canada with no taxes or low tariffs, giving the country a competitive advantage over Asian countries, however this might change because of the new US government administration starting in January 2025. Thanks to the "yarn-forward" rule in the USMCA, textile products must be made with yarns sourced from North America to qualify for duty-free access, helping to encourage a local value chain [19]. Mexico also has free trade agreements with over 40 countries, including the European Union and Japan, which facilitate its participation in the global textile and apparel trade. At the same time, the USMCA enforces labor standards that promote fair wages and workers' rights, encouraging better practices across industry.

Additionally, the proximity to the United States allows companies to quickly respond to demand and provide fast delivery times with short lead times. This has made Mexico an attractive production destination for brands and retailers that are looking to diversify their supply chains away from dependence on Asia.

Although there are still challenges in terms of a widespread sustainability culture, there are many factories and companies that have implemented strong social and environmental programs, and there are examples of textile companies working with high global standards. Examples of manufacturers of recycled textiles located in Mexican territory are Hilaturas Los Ángeles, Novabori, PETextil and Giotex.

Interviews with key stakeholders revealed that manufacturers primarily follow brand demands, which often extend their sustainability programs across global supply chains. In regions like Europe and the U.S., where consumer and NGO pressure on large retailers is stronger, the pressure for implementing sustainability programs is expected and this in turn pushes Mexican manufacturers to implement sustainability measures, especially those focused on exports. However, many stakeholders shared the view that Mexican consumers currently show limited demand

for sustainability, with only a few exceptions. Mexico's supply chain diversity, both in maturity and capabilities, further complicates these dynamics. At the same time, the increase of requirements of different certifications has added another layer of complexity and bureaucracy to the operation of major manufacturers and factories.

Another major challenge for circular initiatives lies in the complexity of reverse logistics, particularly the costs associated with retrieving products and revaluing them before remanufacturing, as well as current safety concerns around transporting goods in certain areas of the country. Additionally, stakeholders noted that many circular projects must be tailored to a very specific set of variables which complicates scaling. For example, one brand might be looking to remanufacture a variety of old textiles into new products, but with specific requirements in terms of colors and quality, and another brand might want to have a new product with materials exclusively sourced from their own inputs. Every project requires a tailored approach to define the best possible outcome, which increases the time and costs for the companies involved.

On a positive note, there is a consensus among the interviewed stakeholders, that the circular economy is highly relevant and applicable to the fashion industry. Collaboration among countries and organizations will be essential for developing innovative approaches to materials sourcing, manufacturing, use and new possibilities in the end-of-life of garments.

COLLABORATION OPPORTUNITIES

GENERAL OPPORTUNITIES	

GENERAL OPPORTUNITIES	• *Connect Dutch start-up with mechanical recycling technology to Mexican textile producers.*
	• *Connect Dutch start-ups in the textile space with Mexican experts/ consultants in the textile industry, for them to get to know available innovations.*
	• *Connect Dutch initiatives like "The Denim Deal" with Mexican manufacturers of denim.*
	• *For specific brands, there is interest in knowledge sharing on these topics:*
	  ▸ *Know-how on material variants and how to make them more cost competitive (for example virgin vs recycled polyester).*
	  ▸ *Experience in managing recycled non-woven material with a high percentage of recycled material.*
	  ▸ *Sharing experience with companies making 100% circular garments, especially the ones implementing circularity in closed cycles.*
	  ▸ *Experience in reverse logistics, for example in the hotel industry that uses high volumes of textiles.*

SPECIFIC OPPORTUNITIES	
MEXICO CITY	*SEDEMA is working on a specific Policy for the Management of Textile Waste, with a focus on circularity. There is potential for collaboration on implementation of strategies with textile waste at the city level.*
GUANAJUATO	*Connect with leather industry experts for expertise on more sustainable practices. For example, Dutch Leather Vision or ECCO Leather.*

TABLE 14. TEXTILES SECTOR COLLABORATION OPPORTUNITIES.

CONSTRUCTION

2.2.2 CONSTRUCTION

The construction sector in Mexico is large and contributes to around 6% of GDP and employs around 8.38 million people [20]. A significant part of the sector is informal with many small companies and individual workers. It is estimated that 83.8% of the people employed in the construction sector are informal workers[1] [21]. Mexico City, the State of Mexico, Jalisco and Nuevo Leon have the biggest construction industries, compared to other states in the country.

Due to the high level of informality in the sector, a general lack of awareness, lack of specific regulation, and no immediate interest, the concept of circular economy is not formally embedded with most actors in the sector. For example, recycling of demolition waste is not common yet in every State and a large amount of demolition waste still goes to landfills. Many small-scale projects are built traditionally, with the focus on saving costs or a focus on aesthetics, and not on sustainability. More than half of the specially treated waste comes from the construction sector according to the Mexican Ministry of Environment [2]. The fact that the circular economy is not yet embedded in the sector provides both opportunities and barriers. Opportunities because companies that can provide innovative services early on can take advantage of a lack of competition in the market for circular solutions. At the same time, a lack of awareness of the concept might be a barrier to acceptance of new solutions.

Based on various interviews with local stakeholders and desk research, it becomes clear that sustainability in general is a topic with increasing interest. Both the public and private sector are starting to undertake initiatives in this area.

On the national level, SEMARNAT mentions in their report "Baselines for creating the national strategy for the circular economy in Mexico", that construction is an industry with potential for circularity [2]. According to the report some of the major opportunities are:

- *Replacing fossil fuels with low-emission fuels or biofuels in construction material manufacturing processes.*
- *Upgrading outdated or polluting technologies with smart systems to ensure energy and water efficiency and improved building comfort.*
- *Building green infrastructure, bioclimatic designed buildings, and green roofs for sustainable resource management.*
- *Developing ecosystems to manage and revalue secondary materials from waste streams, such as hazardous waste, mining waste, electronic waste and construction debris.*
- *Implementing eco-design and low-carbon materials for construction and building operations.*
- *Using digital systems for measurement, monitoring, and traceability in public and private buildings.*
- *Creating Product Category Rules (PCR) and Environmental Product Declarations (EPD) for construction manufacturers.*
- *Expanding certification processes for sustainable construction materials and products.*
- *Certifying buildings that follow circularity and sustainable construction standards such as Building Research Establishment Environmental Assessment Method (BREEAM), Leadership in Energy and Environmental Design (LEED) Certification LEED and Excellence in Design for Greater Efficiencies Certification (EDGE).*
- *Updating building codes to incorporate bioclimatic design and sustainable construction criteria according to regional needs.*
- *Developing financial instruments to support the construction or purchase of sustainable housing.*
- *Technological conversion of logistics systems to low-emission, electric, or hybrid vehicles.*

---

[1] *An informal worker is a person engaged in economic activities outside formal labor protections, contracts, or regulatory oversight. They often lack access to benefits such as social security, health insurance, and pensions, and may operate in unregistered or untaxed sectors.*

In Mexico City, the Construction and Demolition Waste Collection Program is part of the actions included in the Comprehensive Waste Management Program 2021-2025, implemented by the Government of Mexico City. The aim is to reduce, separate, valorize, and return the generated waste to production chains. The recovered waste from processing and recycling includes sand and clay bricks, plain concrete, reinforced concrete, excavation waste such as soil mixed with rocks (commonly known as tepetate), and stone materials of various sizes. According to data from the Ministry of the Environment, it is estimated that approximately 47.488 tons of this type of waste has been recycled so far. These are processed and reintroduced into the market as recycled aggregates to be used in both public and private construction projects [22].

Following Mexico City's example, the state of Jalisco has also launched a circular economy plan, with construction as one of its focus areas. It is estimated that approximately 7 million tons of construction and demolition waste are generated annually in Jalisco. As part of its efforts to promote circular solutions, the state government has proposed more detailed measurements of the waste generated on construction sites, as well as the adoption of strategies for the reduction and valorization of residual materials. Additionally, the state aims to ensure proper final disposal through recycling plants for materials from demolitions. This initiative will be carried out in collaboration with the private sector [23].

Another area where sustainability is gaining increased awareness for example is in large office buildings in Mexico City. This is done through Leadership in Energy and Environmental Design (LEED) certification. In the 4.1 version, LEED certification addresses several circular economy interventions, from promoting building reuse to designing spaces for flexibility, as well as encouraging reuse and recycling. The certification offers points for all these strategies by supporting shifting from fossil-fuel based materials to sustainably harvested, biobased materials, a key component of moving away from a linear fossil fuel–based economy. One case study for these principles is the Circular Products pilot credit in LEED v4.1. This credit addresses emerging areas of the circular economy for building products. These new concepts include[2]:

- ***More accurate recycled content disclosure:*** It's not only required to know if a product has recycled content; it is also required to know where it came from and if there are any legacy ingredients that may be harmful as the material is reused in new products.
- ***Designed for circularity:*** credits for products that are designed to be disassembled and put back into commerce, rather than disposed of.
- ***Zero waste:*** Manufacturers are increasingly cutting their waste during manufacturing processes, a key element of circularity. Their TRUE Zero Waste is one program that helps support these goals.
- ***Closed-loop product:*** The certification rewards products that are made anew or made again using post-consumer materials. Product leasing or sharing is also encouraged and gives more emphasis to remanufactured and refurbished products.

Like LEED, also EDGE certification has gained popularity among Mexican developers for its ability to quickly identify costs associated with energy and water efficiency. While it does not have a specific section on the circular economy, it promotes the selection of materials with a lower environmental impact, contributing to circularity principles. EDGE building certification, or Excellence in Design for Greater Efficiencies, is a green building certification system developed by the International Finance Corporation (IFC) that focuses on making buildings more resource efficient. It requires projects to achieve at least a 20% reduction in energy use, water use, and embodied energy in materials compared to standard buildings, promoting sustainable construction practices globally.

[2] For more information, please refer to: https://www.usgbc.org/articles/circular-economy-and-leed

There are more examples of circular economy initiatives both from small companies and organizations as well as large corporations. One example is the work of Programaviva, an association active mainly in Valle de Bravo, working on many social issues, one of them focusing on sustainable housing for rural communities. The initiative has a broad scope and looks at sustainable material use, for example earthwalls, but also pays attention to energy conservation and water use. Moreover, based in the state of Jalisco and with projects across Mexico, consultancies such as Civita, EOSIS, and Revitaliza offer environmental advisory and certification services. They specialize in energy efficiency, waste management, water efficiency, commissioning, and the design and construction of buildings with a smaller environmental footprint. By helping construction companies reduce their environmental impact and fostering innovation in the sector, these firms are pivotal in promoting sustainability and driving the transition toward a more sustainable construction industry.

Another example is of the corporate CEMEX, the largest cement producer of Mexico, that has a business unit called "Regenera CEMEX" (Regenerate CEMEX), operating various recycling plants for construction demolition waste. In Mexico these kinds of recycling plants are not that common, and therefore a good first step in valorizing existing waste material. CEMEX has developed specific projects aimed at the following[3]:

- Reuse and repurposing of residual materials from the construction industry. The Regenera CEMEX program effectively manages construction debris and waste by using them as aggregates to produce new concrete or as decarbonated raw material for a lower-carbon-emission cement, reducing the need for virgin materials.
- Energy recovery of construction waste materials. Cemex cement plants are consumers of waste, designed to process non-recyclable materials, offering a cleaner and safer option than landfill disposal. By using waste as fuel, the need for fossil fuels is reduced.

COLLABORATION OPPORTUNITIES

GENERAL OPPORTUNITIES	
GENERAL OPPORTUNITIES	*Provide general training on the circular economy for the construction sector. This training should aim to encourage the use of Environmental Product Declarations (EPDs) when selecting materials correctly during the building process. Additionally, the training should focus on circular design principles and identify mechanisms for the proper treatment and management of construction waste materials during both the construction process and at the end of the building's life cycle.*
SPECIFIC OPPORTUNITIES	
CHIHUAHUA	*Chihuahua Green City is an example of collaboration between companies on achieving industrial symbiosis and to search for opportunities of using waste of one company's processes as a resource for another company. Chihuahua Green is open for international collaboration to learn from industrial symbiosis initiatives in other countries.*

[3] *For more information, please refer to: https://www.cemex.com/es/productos-soluciones/regenera*

JALISCO	• *Promote the incorporation of design methodologies that incorporate a life cycle perspective.*
	  ▸ *Provide training and technical preparation for the implementation of regulations, guides and manuals for sustainable construction that consider all stages of management of buildings and infrastructure works, including the use of digital technologies.*
	  ▸ *Provide technical assistance for the use of technological tools that incorporate eco-efficiency and LCA in companies (with a focus on MSMEs) in prioritized value chains.*
	  ▸ *Implement mandatory LCA in construction projects, both public and private investment. (Long-term)*
	• *Guidelines on how to set-up fiscal incentives for companies to incorporate used materials into their projects.*
	• *Establish eco-design criteria and/or modular designs for public and private buildings that allow for the efficient use of elements and materials.*
	  ▸ *Implement awareness and training campaigns on the eco-design of buildings and infrastructure works and their benefits.*
	  ▸ *Develop technical standards for eco-design of buildings and infrastructure works based on bioclimatic design and the use of highly circular materials.*
	  ▸ *Promote investment in R&D to improve the technology and materials used in modular construction that allow parts to be disassembled and reused.*
	• *Promote the reuse of structural construction materials for repairs and/or new construction works.*
	  ▸ *Create an inventory of construction materials recovered from demolitions or old construction sites, classifying them and evaluating their condition and quality.*
	  ▸ *Promote sustainable disassembly practices and selective demolition projects to preserve the integrity of recovered materials.*
	• *The ambition to set-up processing plants for construction demolition waste in Jalisco, so that companies can comply with a new law that will be enacted, and to stimulate the actual reuse of raw materials. Jalisco is open to learn from other countries what steps have been taken to set-up a recycling industry for construction waste.*
	• *Knowledge on defining circular materials for the construction industry.*
	• *Knowledge on circular procurement.*
	• *Incorporate knowledge on sustainable and biomaterials in academics.*

MEXICO CITY	*Create a digital platform to promote the use of secondary raw materials and link businesses.*
GUANAJUATO	*Knowledge sharing on bioclimatic design, management of construction waste and exploration of revalorization opportunities, and use of recovered materials in constructions.*

TABLE 15. CONSTRUCTION SECTOR COLLABORATION OPPORTUNITIES.

CIRCULAR DESIGN

2.2.3 CIRCULAR DESIGN

Circular design can be applied across various industries and actors within a value chain. Unlike the traditional linear model—take, make, waste—circular design emphasizes sustainability, regeneration, and minimizing waste. It often serves as the starting point for companies embarking on their circular journey, influencing not only the design of products and services but also the development of related business models. In Mexico, this concept is gaining momentum but remains in its infancy. Key areas under development include the use of alternative materials with a lower environmental footprint, incorporation of circular principles by reusing materials and implementing some eco design techniques, extending the life cycle or refurbishing some products. Furthermore, there are organizations that provide specialized consulting services to assist companies in crafting circular economy strategies. These services focus on incorporating waste materials from other industries into their processes and developing effective end-of-life solutions for their products.

According to What Design Can Do (Mexico office), an international organization that seeks to accelerate the transition to a sustainable, just and fair society using the power of design, there is still a lack of understanding in the market about circularity. Too often, the focus in society is only on recycling, whereas the circular economy covers more areas. However, companies are slowly changing their approach as there is increasing social pressure to become more sustainable. In their years' operating in Mexico, What Design Can Do has learned that their approach used in Europe, cannot be copied one-on-one to Mexico. The approach had to be adapted to fit better with Mexico's culture and customs, as well as the level of understanding on circular design. For example, What Design Can Do had to put more effort to convince governments and companies of the importance of circular design, and also fundraising strategy had to be adapted to the local situation.

Mexico faces unique challenges in areas such as regulation, collaboration networks and cultural shifts needed to embrace circular design. This presents an exciting opportunity for innovation and leadership in sustainable practices, potentially setting a benchmark for other emerging markets.

Circular design is still an emerging field in Mexico, and there are several initiatives pushing forward the thinking on circular design. Three examples highlighted in this chapter are Materioteca ITESO, What Design Can Do and Chihuahua Green.

Materioteca ITESO, a multidisciplinary environmental research center at ITESO University in Jalisco, Mexico, is at the forefront of promoting a new material culture. As a pioneer in Mexico, its physical and digital platform facilitates material research and offers a comprehensive catalog of sustainable material options. By emphasizing novel, bio-based, and locally sourced materials, Materioteca ITESO is driving innovation in the circular economy through circular design, particularly within the context of developing countries. The guiding principles of Materioteca ITESO are ecodesign, Life Cycle Assessment, and the principles of the circular economy, applied to emerging solutions from the Global South.

The international organization What Design Can Do with offices in Mexico City, has its focus on creating positive change through design. Circular economy is one of the focus areas and the organization has launched many challenges to stimulate circular design among designers and entrepreneurs. The organization conducts challenges and has attracted over 7,000 applicants, mastering the intricacies of open calls, from design research, brand identity, and application platforms to marketing campaigns, judging criteria, juries, and expert bootcamps. Their global design ecosystem provides them with extensive research opportunities, design projects, and support for creative start-ups. Additionally, they offer Creative Leadership Courses, a transformative 10+ week program designed to help organizations advance in circularity, impact, and the regenerative agenda by developing change-making leaders. Renowned for their annual conferences on design and innovation, they excel at hosting panels, workshops, design jams, and training sessions, supported by a robust network of thought leaders.

COLLABORATION OPPORTUNITIES

GENERAL OPPORTUNITIES	
GENERAL OPPORTUNITIES	*Provide comprehensive circular design courses to equip the public and private sector with the knowledge and skills needed to drive the circular economy. These courses will foster a deeper understanding of sustainable design principles and practices.*
SPECIFIC OPPORTUNITIES	
JALISCO	*Materioteca ITESO: As an academic institution affiliated with ITESO University, Materioteca ITESO is committed to promoting ecodesign practices. Given its academic standing and mission, the organization is open to collaborating with national and international partners to expand its impact. The organization's academic affiliation provides a unique advantage, as it attracts the attention of both the public and potential industry partners interested in circular economy initiatives.*
MEXICO CITY	*Collaborate with local initiatives such as 'What Design Can Do' during the planning and celebration of media events to raise awareness of the circular economy among designers, decision-makers, and the general public.*
CHIHUAHUA	*Establish a direct collaboration with the Chihuahua Green project to strengthen the industrial symbiosis initiatives they have been developing in recent years. The goal is for them to serve as a model for other industrial parks in Mexico, especially considering the new federal government's plan to create more of these types of spaces.*

TABLE 16. CIRCULAR DESIGN SECTOR COLLABORATION OPPORTUNITIES.

3

DUTCH CIRCULAR INNOVATIONS

The Netherlands is known worldwide as a pioneer in the field of circular economy. The country has the ambition to be fully circular by 2050 (with mid-term goals to be 50% circular in 2030), and many public and private initiatives contribute to this goal. Various sectors are working on innovative methods to minimize waste and reuse materials. In short, The Netherlands offers fertile ground for growth and innovation in the circular economy and shows that sustainable transformation can be feasible and attractive in various sectors [24].

Since 2015 The Netherlands has been working actively on a circular economy and gained a lot of experience in organizing and stimulating this transition both within government and the private sector. The Dutch government has used its procurement volume to stimulate demand for new solutions, providing companies with a certain level of certainty that allows them to invest in circular solutions within their industry. In these years, the government has gained a lot of experience in circular procurement on how to encourage the best outcomes in terms of circularity whilst taking in account other important factors such as quality and price [25].

In the private sector, many collaboration pacts have been signed by industries on stimulating the circular economy within their sectors. Examples are the 'concrete pact' (in Dutch 'betonakkoord'), bringing together industry players from the concrete industry focused on circularity, reducing CO_2 and increasing biodiversity. Another example is Platform CB23, a collaboration platform for the construction industry that developed guidelines on circular construction with a focus on material passports, circular design and circular tendering. In the textile industry there are initiatives such as the Denim Deal and the Dutch Agreement on Sustainable Garments and Textiles. Many of these initiatives foster collaboration within the private sector and between the private and public sector, both of which are key to developing a functioning circular economy.

This chapter provides an overview of leading circular economy examples in the focus sectors.

3.1 TEXTILES

The Dutch textile sector is an innovative and forward-thinking industry that has embraced sustainability and circular economy principles to address global challenges such as resource scarcity, waste, and environmental impact. Although The Netherlands is not a global textile producer compared to countries like China, India or Mexico, it plays a significant role in driving sustainable practices and technological advancements in the industry. The Dutch textile sector is characterized by its emphasis on eco-friendly materials, recycling technologies, and circular business models that aim to close the loop in the textile lifecycle.

1. Textile Recycling and Waste Management
The Netherlands has established a comprehensive system for textile recycling, aiming to minimize textile waste and recover valuable materials from used garments. Some examples are:

- ***Circularity-Works:*** *this company has developed a mechanical recycling process, to recycle textiles and make new fiber and textile products, without loss of fiber. There is no need to add virgin material to the process.*
- ***Fibersort (Belgian-Dutch collaboration):*** *Fibersort is an innovative sorting technology developed in The Netherlands that automatically identifies and separates textiles based on fiber composition. This technology can process large volumes of used textiles, enabling them to be recycled into new products.*
- ***Recover (Spanish-Dutch collaboration):*** *This company produces high-quality recycled cotton from post-industrial and post-consumer waste.*
- ***Cure polyester rejuvenation:*** *Innovators supported by Fashion for Good that recycles any type of used polyester by purifying it and converting it into high-grade, ready-to-use 100% rPET which can replace PET from fossil-derived sources.*
- ***FastFeetGrinded:*** *Company focused on disassembly of shoes into their macro-components (uppers, shoes, etc.), then these components are grinded into small pieces producing output material streams. These material streams can feed back into the footwear manufacturing supply chain.*

2. Circular Fashion Design and Eco-Friendly Materials

Dutch fashion designers and companies are pioneers in integrating circular design principles, focusing on eco-friendly materials, modular designs, and durable products. These practices promote the use of biodegradable, or recyclable materials, reducing the environmental impact of clothing production. Some examples are:

- ***Dutch aWEARness (Circular Textile Design):*** *This Dutch company is known for creating "infinite" recyclable textiles. Their garments are made with materials that can be recycled multiple times without losing quality. They also implement a closed-loop system where garments can be returned and remanufactured.*
- ***Flocus:*** *FLOCUS™ is the trademark for Kapok fibers offering an assortment of kapok textile materials such as fibers, yarns, textiles and non-wovens for a wide range of applications. Kapok is a natural fiber found in a non-food fruit crop that grows in many subtropical areas, and their trees need no irrigation, pesticides and fertilizers thus offering a more environmentally friendly alternative to cotton.*
- ***Mycotex:*** *Technology to create custom-fit products out of biodegradable textiles made from mycelium. The technology reduces waste associated with cut & sew operations and replaces plastics and leathers with compostable materials.*

3. Product-as-a-Service (PaaS) Models

The Netherlands has embraced the "Product-as-a-Service" (PaaS) business model, where consumers rent or lease clothes instead of purchasing them outright. This model encourages reuse, reduces the need for constant production, and prolongs the life cycle of textiles. Although the majority of clothes sold in The Netherlands do not yet use the PaaS model, here are some examples:

- ***MUD Jeans:*** *This Dutch company offers a "Lease a Jeans" service, allowing customers to rent jeans for a monthly fee. At the end of the lease period, the jeans can be returned, refurbished, and re-leased or recycled as new garments. This circular business model helps reduce the demand for new raw materials and minimizes waste.*
- ***Hulaaloop:*** *Another Dutch company offering a circular subscription service for baby clothing. Customers subscribe to regularly receiving new clothes and return outgrown items, which are then reused or recycled.*

4. Circular Economy Hubs and Collaboration Platforms

The Netherlands has created collaboration platforms and circular economy hubs that bring together stakeholders from across the textile value chain to share knowledge, resources, and innovations. Some examples are:

- ***House of Denim:*** *the mission of House of Denim is to connect and inspire denim stakeholders, to conceive and initiate platforms, projects and events to make denim dry, clean and smart. House of Denim is a nonprofit organization to promote best practices in the denim industry, with a focus on sustainability, good labor practices, and a focus on education (circularity, innovation, and craftsmanship).*
- ***CIBUTEX:*** *Circularity for Business Textiles is a collaborative platform in The Netherlands where industry leaders join forces to bring post-use B2B textiles back into the production cycle. The initiative was started by several industrial textile service companies in The Netherlands which serve the hospitality-, health care-, industry- and airline customers. These companies bundled their volumes to make high quality recycling of the post-use textiles viable. Since 2022 CIBUTEX expanded rapidly in terms of members as well as activities, having more producers and brands along the value chain join the initiative. CIBUTEX now also operates a marketplace where parties can offer their post-use textiles, and actively helps their members in increasing the amount of recycling.*
- ***Circle Economy (Amsterdam):*** *This platform connects businesses, governments, and academia to promote circular economy solutions, including the textile sector. Through its "Circle Textiles Programme," it facilitates textile recycling and reuse initiatives across Europe.*

- ***Fashion for Good**, a platform for sustainable innovation, connecting brands, retailers, manufacturers and funders to scale innovations in the textile industry. With more than 3000 innovators scouted and 184 supported, Fashion for Good has helped bring to life 571 pilots from different stages in the supply chain, from raw materials, processing, retail, end of use and transparency & traceability.*

5. Sustainable Textile Certification and Standards

The Netherlands has adopted global certifications and standards for sustainable textiles, which ensure that garments are produced using eco-friendly processes and materials. Some examples are:

- ***The Global Organic Textile Standard (GOTS):** Widely used in The Netherlands, GOTS ensures that textiles are made from organic fibers and processed in an environmentally and socially responsible manner.*
- ***Ecolabel (EU):** The Netherlands promotes the use of the EU Ecolabel for textiles, which ensures that clothing meets high environmental and health standards throughout its lifecycle.*
- ***bAwear:** bAwear provides quick and reliable access to environmental footprint data, specifically designed for the textile industry. Powered by SimaPro software, bAwear solutions enable brands, retailers, manufacturers, and procurement teams to efficiently calculate and analyze their impact. With the growing importance of data as a license to operate, bAwear helps stakeholders in the textile supply chain not only comply with regulations but also gain detailed insights into their environmental performance. This allows for targeted improvements, fostering sustainable practices and driving informed decision-making across the supply chain.*

The Netherlands offers a wide array of innovations, business models, and technologies that can assist Mexico to transition to a more sustainable and circular textile sector. From advanced recycling technologies to product-as-a-service models and eco-friendly textile design, Dutch experts can partner with Mexico's textile sector leaders toward reducing waste, conserving resources, and improving sustainability. By adopting successful Dutch initiatives such as MUD Jeans' leasing model and Fibersort's recycling technology, Mexico can create a textile sector that aligns with circular economy principles, reducing its environmental footprint and contributing to a more resilient and sustainable industry.

3.2 CONSTRUCTION

In The Netherlands, the construction sector is recognized as one of the most resource-intensive, as well as one of the key sectors in the transition to a circular economy with focus on the reuse of building materials, sustainable demolition methods and circular design[26]. To minimize waste and maximize resource efficiency, Dutch construction companies are experimenting with demountable structures and using materials such as recycled concrete and reclaimed steel to drastically reduce their ecological footprint.

This Dutch expertise and experience can provide Mexican public and private organizations with practical solutions for reducing environmental impact, conserving resources, and adopting circular economy principles in construction. Here are some key areas where The Netherlands can contribute, along with specific examples:

1. Design for Disassembly and Reuse

The concept of "design for disassembly" emphasizes designing buildings and structures so that materials and components can be easily dismantled, reused, or recycled at the end of the building's life. This approach significantly reduces waste and encourages material recovery. Some examples are:

- ***Circl Building (Amsterdam):** This circular office building by ABN AMRO is designed for disassembly, meaning that every element can be easily removed and reused. The building uses materials such as wood, steel, and glass that are recycled and/or recyclable.*

- ***Triodos Bank (Zeist):*** *RAU Architects and Ex Interiors designed a fully remountable, wooden 'cathedral', which sets the tone worldwide in the circular and sustainable field. The office is the first large-scale 100% wooden, removable office building. This building also serves as the first temporary materials bank and stores more CO2 than has been consumed.*

2. Digital Solutions for Circularity:

To enable circularity in the construction sector, data and digital solutions can fulfill an important role. This is to be able to track products and materials, and to match supply and demand of reused construction materials. Some examples are:

- ***Madaster Platform:*** *This Dutch initiative is a "material passport" system that tracks all the materials used in buildings and infrastructure objects, making it easier to reuse or recycle them at the end of the building's life cycle. The Madaster system is already used by numerous construction projects in The Netherlands and abroad and offers a concrete means of extending the life cycle of building materials and preventing waste.*
- ***Marketplaces for used building materials:*** *several companies have started online marketplaces to facilitate the selling and buying of second-hand construction materials. The marketplaces do the matchmaking between buyers and sellers, and in this way valorizing products and materials that would otherwise go to waste. Examples are the companies Insert, New Horizon Urban Mining, Madopt and Excess Materials Exchange.*

3. Waste Reduction and Recycling in Construction

The Netherlands has developed sophisticated methods for recycling construction and demolition waste. Dutch construction companies often reuse materials from demolished buildings or infrastructure, thereby reducing the need for new materials and lowering waste sent to landfills. Some examples are:

- ***Circular Bridges and Roads:*** *In Almere, The Netherlands, the city has constructed circular bridges made from 100% reused materials. Recycled concrete and steel are used extensively in these structures, with the intention of dismantling and reusing these components in the future.*
- ***BlueCity (Rotterdam):*** *A former swimming pool complex transformed into a circular economy hub, BlueCity demonstrates how old buildings can be repurposed.*

4. Modular and Prefabricated Construction

Modular and prefabricated buildings are key components of circular construction, as they reduce construction time, minimize waste, and enable easy disassembly and relocation of building components. Dutch companies have made significant strides in this area. Some examples are:

- ***Van Wijnen - prefabricated housing:*** *Van Wijnen, a Dutch construction firm, developed prefabricated homes that are fully modular and can be assembled in one-day on its final location. Besides many other benefits, the houses are designed in a modular way so that in the future they can be dismantled and installed somewhere else if needed. In this way, the concept is preventing traditional demolition and the destruction of materials and value.*
- ***NEZZT (De Meeuw):*** *focuses on flexible, modular housing solutions that can be quickly realized and relocated. The company builds, for example, residential complexes and temporary homes for students and starters and can quickly respond to changing housing needs with their modular units.*

The concept "Product as a Service" (PaaS), where a manufacturer offers its products as a performance (instead of selling them) to end-users while maintaining ownership, is increasingly applied for various construction (related) products. Examples include lighting (by the company Signify), to pilots with windows and window frames as a service. Offering products in this manner, places the responsibility for a long as possible lifespan and end of life scenario with the manufacturer. PaaS can be considered an enabler to bring modular and prefabricated housing concepts to market.

5. Urban Circularity and Regenerative City Design

The Netherlands embraced the concept of regenerative cities, where urban development reduces environmental harm but also actively restores ecosystems and enhances biodiversity. Some examples are:

- *Circular Buiksloterham* ***(Amsterdam):*** *This is a circular neighborhood project that integrates circular principles across housing, infrastructure, and public spaces. Buildings are energy-neutral, materials are recycled, and waste is minimized through composting and water recycling systems.*
- *Park 20|20* ***(Amsterdam):*** *This business park was designed following Cradle-to-Cradle® principles, where all materials are part of a closed-loop cycle and can be reused at the end of the building's life. The park integrates renewable energy, green roofs, and rainwater harvesting.*

6. Innovation in Low-Carbon Construction Materials

Dutch companies are leaders in developing low-carbon construction materials, which significantly reduce the carbon footprint of building projects. Some examples are:

- *Low-Carbon Concrete****:*** *Dutch firms have developed innovative concrete mixtures with a much lower carbon footprint than traditional concrete. These materials use recycled aggregates and lower-carbon cement alternatives.*
- ***Biobased Building Materials:*** *Dutch companies are innovating in the use of materials like hemp, flax, and mycelium (fungi) to create biodegradable building materials.*

The Netherlands has a range of innovations and practices that can help Mexico adopt circular construction principles. In fast-growing cities, where urban expansion creates significant demand for new buildings, adopting Dutch principles of design for disassembly and recycling and waste management practices could help mitigate construction waste and promote material reuse, reducing the environmental impact of rapid urbanization. In regions with rapid urban development or where building materials are scarce, incorporating circular materials in construction projects could reduce construction waste, reduce its reliance on new raw materials and lower its carbon footprint. Adopting similar prefabricated solutions in housing and infrastructure could meet the demand for affordable, environmentally sustainable housing. Transforming old or abandoned industrial sites or public buildings into circular economy hubs, reduces the need for new construction and supports local green business development. Adopting circular urban design principles could help create sustainable neighborhoods that minimize environmental impact, improve public health, and enhance resource efficiency. Integrating Dutch innovations in low-carbon materials, could significantly reduce the environmental impact of the construction industry, particularly in large infrastructure projects like airports, highways, and urban housing developments.

3.3 CIRCULAR DESIGN

The Netherlands has many initiatives in circular design, promoting sustainable, resource-efficient solutions across various sectors including architecture, fashion, consumer goods, and industrial design. Rooted in the principles of the circular economy, circular design in The Netherlands has evolved as a strategic approach to addressing environmental challenges such as resource depletion, pollution, and climate change.

The Dutch government plays a crucial role in advancing the circular design sector by setting ambitious sustainability goals and supporting the transition to a circular economy. These national goals provide a framework that encourages businesses and designers to adopt circular design principles. The Dutch Circular Economy Program promotes collaboration between businesses, knowledge institutions, and government bodies to accelerate the adoption of circular practices. Here are several ways The Netherlands can support Mexico's circular design sector, along with specific examples.

1. Circular Design Principles and Methodologies

Dutch designers are at the forefront of incorporating circular economy principles into their work. These principles include designing for longevity, modularity, reparability, and recyclability, aiming to create products and systems that minimize waste and maximize efficient resource use. Some examples are:

- ***Fairphone:*** *Fairphone is a Dutch company that designs modular smartphones to promote longevity and reduce electronic waste. The phones are built with easily replaceable parts, allowing users to repair or upgrade components rather than replace the entire device. This approach encourages a shift away from the "take-make-dispose" model typical of many electronics.*
- ***REPEAT audio:*** *REPEAT audio is a Dutch company producing and selling modular headphones. The company offers a repair service for their headphones and replacement parts in case certain elements of the headphones break or become worn out. In this way, it is not necessary to buy new headphones each time, but simply replace parts when necessary.*
- ***Philips Circular Economy Strategy:*** *Philips, a Dutch multinational, integrates circular design across its healthcare, lighting, and consumer electronics products. By designing products that can be refurbished, upgraded, or recycled, Philips reduces waste and promotes the circular economy in various industries.*
- ***Plastic Whale:*** *Plastic Whale is a circular design initiative that uses plastic waste collected from Amsterdam's canals to create office furniture, such as desks and chairs. By transforming waste into new products, Plastic Whale reduces environmental impact and promotes recycling.*

2. Circular Product-as-a-Service (PaaS) Business Models

The Netherlands has been a pioneer in circular business models, particularly Product-as-a-Service (PaaS) approaches, where products are leased, shared, or rented rather than sold. This model encourages manufacturers to design more durable, repairable, and recyclable products, shifting the focus from ownership to product performance and longevity. Some examples are:

- ***Swapfiets:*** *Swapfiets is a Dutch company offering a subscription service for bikes. Instead of buying a bike, people can take a subscription on Swapfiets (from simple bikes to electric ones), including service and maintenance. Swapfiets remains owner of the bikes and guarantees their functioning.*
- ***Signify Light as a Service:*** *Signify (formerly Philips) offers its corporate clients light as a service, meaning that Signify maintains ownership of the lights and installation, and the user pays a monthly fee for a functioning system. Signify takes care of service and maintenance. In this model Signify has an incentive to develop light bulbs and lighting systems that work as long as possible and to realize energy savings, aligning their business interest with a circular economy.*

3. Circular Design Collaboration Platforms

The Netherlands has developed collaborative platforms that bring together designers, businesses, researchers, and governments to advance circular design practices. These platforms foster knowledge sharing and innovation across sectors. Examples:

- ***Circular Design Challenge:*** *This challenge encourages designers to create innovative products and services that align with circular economy principles. It brings together designers, businesses, and organizations to rethink how products are made, used, and disposed of.*
- ***CIRCO (The Netherlands & International):*** *stands for 'creating business through circular design' and aims to accelerate the transition to a circular economy by educating organizations on the power of circular design for both product design as well as the design of business models for a circular economy. With their proven method, international interest made the concept go global. CIRCO has indicated their interest to explore the Mexican market and the possibility to set-up a hub in the country. CIRCO started in the year 2015, and with support of the Dutch government provides workshops on circular design. To date, CIRCO has trained over 2000 companies, and operates 30 CIRCO hubs around the world.*
- ***Dutch Design Week (DDW):*** *As one of Europe's largest design festivals, DDW showcases*

innovative eco-design solutions that prioritize sustainability and circularity. Projects include the use of biodegradable materials, bio-based plastics, and recycled materials in everything from furniture to fashion.

4. Education and Knowledge Transfer in Circular Design

The Netherlands places a strong emphasis on educating designers, engineers, and business leaders about circular economy principles. Examples:

- ***Design Academy Eindhoven:*** *One of the world's leading design schools, it integrates circular economy principles into its curriculum, focusing on sustainable materials, systems thinking, and waste reduction in design.*
- ***TU Delft (Delft University of Technology):*** *TU Delft offers courses and research programs focused on circular product design, sustainable architecture, and environmental engineering. Mexican universities could collaborate with institutions like TU Delft to promote circular economy education and research, equipping students with the skills needed to design sustainable products and systems.*

The Netherlands offers expertise and practical solutions in the circular design sector. From circular product design and business models to sustainable and eco-friendly materials, Dutch innovations can support Mexico to transition to a more resource-efficient and sustainable economy. By adopting successful Dutch initiatives such as Fairphone's modular design, Swapfiets' subscription model, and CIRCO's circular design methodology, Mexico can strengthen its circular design sector, reduce waste, and promote sustainability across industries. This collaboration could create new opportunities for innovation, economic growth, and environmental stewardship in both countries.

4

DOING BUSINESS IN MEXICO

4.1 DUTCH INTEREST IN MEXICO FOR CIRCULAR ECONOMY

In general, there are extensive (trade) relationships between Mexico and The Netherlands. On trade, in 2022 Mexico exported $1.55 billion to The Netherlands, and The Netherlands exported $3.95 billion to Mexico [27]. Many large Dutch companies such as Heineken, C&A (formerly Dutch owned), Arcadis, Trouw Nutrition and KLM have operations in Mexico.

The Dutch Embassy in Mexico and the local NBSO office in Queretaro actively work on stimulating business between both countries through various programs and trade missions. Specifically for this research, Dutch stakeholders in the focus sectors were interviewed to determine their interest to operate in Mexico and/or to offer specific circular economy propositions in the Mexican market. From these interviews various insights emerged:

1. ***Open to explore potential:*** *Dutch companies with circular propositions that are not yet active in Mexico are open to exploring the potential. However, most of them indicate not being familiar with the country, its economy and potential opportunities.*
2. ***Actual demand needed:*** *The companies interviewed, mostly SMEs, are open to the idea of operating in Mexico. Their decision to invest effort in the Mexican market depends on being able to identify actual demand for their products and services. Most have indicated not being willing to invest too much upfront time and money in exploring opportunities when potential demand is unclear.*
3. ***Proactively offer circular propositions:*** *Many Dutch companies (mainly large multinationals, but also specialized companies in agriculture and water for example) are already active in Mexico. If these companies already offer circular products or services in The Netherlands, it might be a good opportunity to explore whether these can be more actively offered in Mexico as well.*
4. ***Construction companies mostly work local:*** *Companies in the Dutch construction industry mostly work nationwide, or have activities in Europe, while only a limited few have operations on a global level. Because of the characteristics of the construction industry (dependence on geography, capital assets in specific locations, etc.), it is not that obvious for construction companies to work globally.*
5. ***Culture and language barrier:*** *Distinct culture that is often unknown to Dutch entrepreneurs and the Spanish language is perceived as a barrier to be able to operate successfully. A solution to overcome this barrier can be having a strategic local partner.*
6. ***Time difference:*** *For the smaller companies that were interviewed, physical distance and time difference between the countries is seen as a barrier. With a 7-to-8-hour time difference, it is more difficult to schedule meetings and maintain a continuous working relationship.*
7. ***Safety:*** *There is a concern about safety, and to what extent this inhibits Dutch stakeholders to start operating in Mexico.*
8. ***Support from the Embassy:*** *Companies indicated that when exploring potential demand and setting up operations in Mexico, they find it helpful to receive support from the Dutch Embassy to understand better on how business is being conducted in Mexico, and what risk factors there are.*
9. ***Find reliable business partners:*** *Company representatives experience a barrier in identifying reliable business partners. They see a role for the Embassy in facilitating this process.*
10. ***Reducing risks:*** *Because of the earlier mentioned barriers, most companies indicated that to operate in Mexico, they need to find a local partner, in order to reduce the risks and required investments mentioned before.*

4.2 FUNDING OPPORTUNITIES

This paragraph provides a summary of the funding opportunities, - subsidies, investments and loans - that might assist Dutch companies in exploring or setting up operations in Mexico. There are funding options from The Netherlands, the EU, Mexico and from other international entities, offered by both the public and private sector. Please note that the availability and criteria of these funding opportunities might change.

4.2.1 FUNDING OPPORTUNITIES FROM THE NETHERLANDS

Subsidies:

The clearest form of financing are several subsidies that are available from the Dutch Enterprise Agency (RVO). Provided one complies with the prerequisites of these subsidies, applicants are eligible to receive up to 50% (for some 'green' subsidies up to 80%) of the project/activity cost. The remaining investment is expected to be covered by the applicant. The following subsidies from RVO are available:

SUPPORT INTERNATIONAL BUSINESS (SIB)	*Subsidy enables Dutch companies to partly (up to 50%, and in some instances up to 80%) finance activities to take the step towards international business e.g. participation in trade fairs, to hire expertise in the foreign market to understand the legal and fiscal landscape and/or to explore and introduce an organization to relevant contacts in Mexico. In most cases this SIB subsidy amount is up to €2.500.*
DHI SUBSIDIES	*Subsidies that offer financing for a demonstration project, feasibility study or investment preparation project abroad.* ***Demonstration project*** *(Dutch: "Demonstratieproject"): subsidy, up to 50%, to showcase your product or service in Mexico, and to prove that the product or service works, is effective and economically viable. Maximum subsidy amount is €200.000.* ***Feasibility study*** *(Dutch: "Haalbaarheidsstudie"): subsidy, up to 50%, for your potential Mexican business partner to research if purchasing your technology is viable. Maximum subsidy amount is €100.000.* ***Investment Preparation (Dutch:*** *"Investeringsvoorbereidingsproject"): subsidy, up to 50%, for your organization to investigate if the foreseen investment in Mexico is viable. Maximum subsidy amount is €100.000.*
PARTNERS FOR INTERNATIONAL BUSINESS (PIB)	*PIB is a program where a group of Dutch companies can work together with the Dutch government (mainly RVO) to facilitate market entrance into a new country in a specific industry. Activities include promotions, trade fairs and missions.* *Maximum subsidy amount is €350.000 (can increase to €400.000 for focus on green activities), where a similar amount is expected to be contributed by the group participants. This subsidy is in-kind, meaning that the participating companies won't directly receive money, but receive subsidies in the form of active support from the government.*

4.2.2 FUNDING OPPORTUNITIES FROM THE EUROPEAN UNION

INNOWWIDE	*European Commission (EC) program that encourages Dutch SMEs to internationalize their products and services. Innowwide funds market research and preparatory work for R&D projects of Dutch SMEs in cooperation with local partners in Africa, North and South America, the Middle East, Asia or Oceania. The program exclusively funds projects with civil applications. An estimated €24.000.000 will be granted over the period from 2022-2027. This is equivalent to 400 projects. The subsidy is a fixed amount of € 60,000 per project. The minimum project costs are € 86.000. This equals a maximum subsidy rate of 70%.*
DG INTPA	*The EU's Directorate General for International Partnerships is committed to promoting international cooperation, reducing poverty, sustainable development and strengthening democratic values worldwide. This directorate offers various financing options, including subsidies and technical support for Dutch companies that want to expand internationally, for example to Mexico. Dutch companies that want to contribute to international cooperation and development goals can use European funds focused on sustainable growth, climate measures and social infrastructure.*
GLOBAL EUROPE	*The EU's main financial tool for promoting sustainable development, peace and stability across the globe. With an envelope of €79.5 billion for the period 2021-2027, the EU's external actions support partner countries in achieving the Sustainable Development Goals.*
GLOBAL GATEWAY	*New strategy to ensure worldwide investments in infrastructure and knowledge based on the Team Europe approach in the areas of digitalization, climate, energy, transportation, health, education, innovation. The new strategy is sustainable and inclusive, demand-driven and seeks collaboration with the private sector. The EU member states jointly pledged €300 billion in financing for the period 2021-2027.* *Current EU action in Mexico aims at building a partnership to work towards achieving the SDGs, fostering sustainable and inclusive development, and a fair green and digital transition, in line with the Global Gateway Investment Agenda. The EU institutions and EU Member States have prioritized two themes for their cooperation with Mexico: Green and inclusive transition and Social cohesion. Multiannual Indicative Programme 2021-2027 for Americas and the Caribbean.*
OVERSEAS COUNTRIES AND TERRITORIES	*Program aims to promote the economic and social development of the EU's 13 Overseas Countries and Territories, to increase their resilience and competitiveness, and to reduce their economic and environmental vulnerability. Total budget for the period 2021-2027 is €500 million. Minor of this funding will also support OCTs (incl. Aruba, Bonaire, Curaçao, Saba, Sint Eustatius and Sint Maarten linked to The Netherlands) in building their capacities and promoting OCTs' cooperation with their regional partners.*

BILATERAL COOPERATION:
SCIENCE AND TECHNOLOGY AGREEMENTS WITH NON-EU COUNTRIES

The EU has bilateral agreements with 20 individual countries around the world, including Mexico. These agreements are based on common interests and priorities, aiming to increase cooperation in research and innovation.

EU-Mexico relations have developed in a large number of policy areas, especially since the entry into force of the EU-Mexico Economic Partnership, Political Coordination and Cooperation Agreement (Global Agreement) in 2000. The 2008 Strategic Association, comprises four thematic areas (politics, security, the environment and socioeconomic matters) further strengthened bilateral relations.

- *In line with the EU Global Approach, Horizon Europe is fully open to the participation of Mexican researchers and research organizations (in principle the EU does not provide funding for the participation of Mexican research entities in collaborative research projects, however Mexico has put in place a co-funding mechanism to facilitate cooperation in Horizon Europe. It has a budget of €1 million to co-fund ca. 8 projects in the areas of health, energy, and human security.*
- *Mexican researchers may of course also participate in Horizon Europe with other funding.*
- *In addition, Mexican entities are eligible for EU funding through the European Research Council and Marie Skłodowska Curie Actions.*
- *EU-funded research projects involving Mexico*

4.2.3 FUNDING OPPORTUNITIES FROM AROUND THE WORLD

This paragraph provides a general overview of European and global organizations such as the European Investment Bank and the World Bank and their respective programs in which they provide either financing or tenders for specific projects. Based on this overview, interested organizations can investigate further on the respective websites what opportunities there are specifically for Mexico:

EUROPEAN INVESTMENT BANK(EIB)

EIB's services consist of lending, blending (combining EU subsidies with EIB financing) and advice. The EIB is active inside and outside the EU. The majority of financial support goes to EU countries and is aimed at the development and integration of the union. Outside the EU, the EIB provides financial support for the implementation of EU development cooperation policy. The EIB is part of the EIB Group. The other part of the EIB group is the European Investment Fund (EIF). This fund provides risk capital to support equity investments by SMEs in EU Member States, candidate countries and developing countries. Companies can carry out projects themselves and apply for loans from the EIB. They can also compete for tenders that arise from other people's projects. The EIF instruments are available through EIF intermediaries

DUTCH FUND FOR CLIMATE AND DEVELOPMENT	*The Dutch Fund for Climate and Development (DFCD) is a climate resilience fund, dedicated to supporting climate adaptation and mitigation projects which benefit vulnerable communities and landscapes. The DFCD is funded by the Dutch government and powered by a consortium of expert organisations: FMO (Dutch Entrepreneurial Development Bank), CFM (Climate Fund Managers), SNV, a global development partner, and WWF Netherlands.*
INTER-AMERICAN DEVELOPMENT BANK (IDB)	*IDB provides loans to countries in Latin America and the Caribbean. The aim is to stimulate economic and social development and combat poverty. In addition, the IDB also provides subsidies, guarantees and investments and is active in almost all economic sectors. The IADB is part of the IADB group. This also includes IDB Lab focuses on the development of the private sector and more specifically on innovations.*
UNITED NATIONS (UN)	*The UN purchases approximately $18 billion annually through tenders. The majority of all tenders from UN organizations are found on the Global Marketplace website. This concerns a variety of products and services. Dutch companies supply the UN with a value of approximately $500 million per year.*
WORLD BANK	*The World Bank provides loans, credits, guarantees and technical assistance to developing countries and countries in transition. The aim is to combat poverty and distribute prosperity. World Bank loans largely serve to finance government investments in borrowing countries. These authorities themselves issue the tenders. This creates opportunities for Dutch companies to supply the necessary goods, works and knowledge. Because the priorities and processes are largely determined in advance, companies can proactively respond to future tenders together with the Dutch government (International Organizations Team)*

4.2.4 INVESTMENTS AND FINANCING FROM THE PRIVATE SECTOR

This section focuses on providing an overview of private sector entities that either invest for equity or debt in sustainable/circular economy focused companies.

GENEROUS MINDS: CIRCULARITY CAPITAL	*Generous Minds is an organization dedicated to helping start-ups into their next phases of growth. They specifically focus on assisting in innovating a company's products, scaling up, and financing through loans or investments.*
CLOSED LOOP PARTNERS	*US based investment firm, fully focused on the circular economy. The firm has a multi-year track record investing in circular economy start-ups and initiatives.*
SYSTEMIQ	*Investor in early-stage circular economy companies (seed, Series A/B). Systemiq is also a consultancy firm, focused on the circular economy.*
INVEST INTERNATIONAL	*Dutch organization, helping to fund the international expansion of Dutch start-ups, SME's and corporates, that is owned by the Dutch Ministry of Finance and FMO. It has a focus on sustainable investments, investing in Dutch solutions for global challenges, focusing on contributing to the Sustainable Development Goals (SDG's). Focus sectors are: agri-food, energy & climate, healthcare, manufacturing (including circular economy) and water & infrastructure.* *Invest International:* • *has various conditions for financing businesses, such as a well-developed business plan, positive impact on SDG's, contribution to the Dutch economy, involvement of other investors and the compliance with ESG principles.* • *provides financing to foreign governments, financing solutions for public infrastructure projects in developing countries.* • *includes Dutch Good Growth Fund (DGGF): financing for Dutch entrepreneurs who want to invest in or export to emerging markets and developing countries.* • *offers loans, guarantees and participations with repayment obligations for Dutch entrepreneurs, and also for start-ups. Exporting section offers credit insurance and financing options.*

4.2.5 FUNDING OPPORTUNITIES IN MEXICO/FROM MEXICAN ENTITIES

In Mexico, there are very few specific financing opportunities for circular economy projects. While some states offer loans with preferential interest rates to promote such projects, most of the opportunities available to organizations are more in the form of calls for proposals and/or awards for specific merits. Nevertheless, there are some funds for general environmental projects, among which circular economy initiatives could be presented.

RECURRING FINANCING OPPORTUNITIES:	
FOJAL	*Offers preferential conditions to Jalisco State based companies for sustainable equipment and infrastructure projects. The Jalisco Enterprise Development Fund (FOJAL, by its acronym in spanish) joins forces with the Ministry of Economic Development (SEDECO, by its acronym in spanish), the Ministry of Environment and Territorial Development (SEMADET, by its acronym in spanish), and the Energy Agency of the State of Jalisco (AEEJ, by its acronym in spanish). It offers loans in the following areas: wastewater treatment, circular economy (management, valorization, recycling, and reuse of waste) and distributed energy generation (photovoltaics). The loans go from 7.500 USD up to 750.000 USD approximately.*
FONADIN	*The National Infrastructure Fund supports the planning, promotion, construction, conservation, operation, and transfer of infrastructure projects with social impact or economic or financial profitability, in which the private sector participates, mainly in the areas of communications, transportation, hydraulics, environment, and tourism.* *Public sector entities may request "Recoverable"[4] and "Non-recoverable"[5] financial support for conducting the necessary studies to determine the feasibility of projects. In the case of investment projects, these entities can also request the granting of Recoverable and Non-Recoverable Funds. For Non-Recoverable Funds, the request must be made before the bidding process for the relevant infrastructure project begins. When it comes to Recoverable Funds, to maximize their impact, the request should preferably be made before the bidding process for the project begins. In the case of private sector entities benefiting from a concession, permit, or other public-private partnership contract, they may request Recoverable Funds, including guarantees and subordinated loans. Depending on the type of support and the amount, the corresponding sectoral Directorate of the Deputy General Directorate of Investment Banking will submit it to the decision-making bodies of FONADIN. In all cases, the Directorate will request the relevant information for the purpose of financial analysis and project structuring.*

[4] *Recoverable Supports: Resources granted by the Trust under the financing modalities authorized by its Technical Committee or Evaluation and Financing Subcommittee, as appropriate, to finance investments in Infrastructure Projects that have a recovery source. These may include the following: financing to Federal Public Administration agencies and entities, state productive enterprises, including their subsidiaries and affiliates, state and municipal governments for conducting studies and hiring consultants; guarantees in various forms; capital contributions, subordinated and/or convertible loans, or any other type of credit or financing to Public Beneficiary Companies and Private Beneficiary Companies, trusts, investment funds, societies and associations, as well as specialized financial vehicles.*

[5] *Non-Recoverable Supports: Resources provided by the Trust to Public Sector Entities to cover expenses and investments related to Infrastructure Projects that do not have a recovery source, as well as grants awarded to Infrastructure Projects to ensure their financial balance.*

VARIABLE FUNDING OPPORTUNITIES AND/OR PER CALL FOR PROPOSALS:	
SOLVEAWARDS A.C.	*Civil Association whose objective is to connect the efforts of different actors in the entrepreneurial and sustainable ecosystem, including social organizations, companies, the academic and research sector, multilateral agencies, local and federal governments, as well as legislators and public policy promoters, and the general community in generating solutions that affect the environment and its surroundings. The funds are directed to entrepreneurs committed to the planet, who lead sustainable companies or projects with high growth potential and whose innovation and technology generate a significant impact on the community and the ecosystem, and who are interested in competing for a monetary prize of USD $10,000 (ten thousand US dollars).*
CIRCULAR CULTURE FUND	*The Fund for the Development of Sustainable Festivals in Mexico provides resources to foster cultural exchange between Mexico and the United Kingdom, aiming to strengthen the development of Mexican festivals and promote sustainable culture. The Circular Culture Fund is aimed at cultural and artistic festivals in Mexico that are interested in collaborations and/or showcases focused on sparking a change in attitudes, narratives, and practices related to culture, with an emphasis on climate change and biodiversity. The amount of support that can be requested is between 13.800 USD and 22.100 USD.*
SANTANDER X MEXICO CHALLENGE	*Challenge that seeks high-impact projects and Startups focused on solutions that address climate change. The program promotes acceleration and facilitates the creation of entrepreneurial projects and startups focused on the preservation, restoration and protection of the environment and natural resources.*

4.3 INSIGHTS INTO THE MEXICAN BUSINESS CULTURE

For the Dutch reader of this report, this paragraph provides insights into some unique elements of Mexican (business) culture. The goal of this information is to give the reader a better understanding of the culture and how it might differ from doing business in The Netherlands.

- ***Language:*** *The main language in Mexico is Spanish. The level of English proficiency varies a lot throughout the country and on different socio-economic levels. When a foreign company considers doing business in Mexico it is imperative to have a Spanish speaker on its team. It will greatly increase the acceptance of the foreign company and make it easier to communicate necessary details and nuances. Also for socializing as part of the business relationship, speaking Spanish is a great advantage.*

- ***Examples on how business is conducted:*** *Mexico is a large country with a lot of economic development, which provides opportunities for many foreign companies. However, it is important to understand how business in Mexico is being conducted, how relationships are developed and how this might differ from what you are used to. In Mexico, there exists both formal and informal structures when it comes to doing business. In organizations there is usually more hierarchy than what someone from The Netherlands might be used to. It is therefore important to take this into account and to make sure that during (initial) business meetings you are represented with someone at an equal or higher hierarchical level. Other examples of informality exist appointment times are decided upon at the last minute, with the scheduled meeting time frequently changing on the day itself and arrival of meeting participants after the agreed meeting time. A lot of the business communication goes through WhatsApp, whilst many organizations in The Netherlands are used to e-mail.*

- ***Finding local partners:*** *Depending on the scale your organization wishes to enter Mexico, it is recommended to have a local representative, or a team member who at least is familiarized with the country, its language and customs. Alternatively, it can be considered setting up a local partnership or joint venture. In any case it is important to get to know your potential business partner or local representative well. Although it is recommended to enter into formal written agreements, it is valuable to first take sufficient time in exploring the collaboration in an informal way to see if the mutual interest is not temporary and to confirm the interest to collaborate is genuine. Although you might enter into formal agreements, if the collaboration does not work out as expected, it can be time-consuming and costly to seek compensation through legal procedures.*

- ***Government:*** *In Mexico, the government is organized in national, state and municipal governments. Individual states in Mexico have a lot of independence and regulation can vary from state to state. It can be said that for foreigners it might be hard to find out what are the exact regulations or permits needed to operate in a certain industry. Some permits and procedures can be done online, but there are also many procedures that can only be performed at local government offices, where the spoken language is always Spanish. The national tax agency in Mexico is called SAT (Servicio de Administración Tributaria, by its acronym in Spanish), and the tax systems are quite complex. For example, to have an invoice count for the official books, the invoice must be created through the system of the tax agency SAT. Only these invoices (incoming and outgoing) are valid and subject to the tax regime. It is therefore recommended to work with a local accountant to make sure your organization is compliant with its tax obligations.*

- ***Safety:*** *Mexico is known for having security issues. However, many parts of the country are safe, and it is possible for foreign companies to do business in Mexico. It is important to do business in formalized industries and to invest effort in getting to know your partners and customers well. However, it is important to be aware of the local context regarding the topic of safety as it varies greatly from region to region. It is recommended to adhere to standard safety precautions, such as not walking alone late at night on the streets, not traveling large distances in the night and to observe your surroundings more actively.*

HSBC bank has created a 'business guide to Mexico' that gives further insights on how to do business in Mexico. The report can be found via this link.

5

OPPORTUNITIES AND CHALLENGES

OPPORTUNITIES AND CHALLENGES

Based on the market analysis, the opportunities and challenges within the circular economy landscape in Mexico have been identified. This chapter provides a summarized overview of these opportunities and challenges.

5.1 OPPORTUNITIES

Although the circular economy is still emerging in Mexico, interest is gradually increasing among the government, businesses, and consumers. This creates numerous short- and long-term opportunities for collaboration between Mexico and The Netherlands. Overall, Mexico is an attractive country for business. With a population nearing 130 million, it offers a substantial internal market. Furthermore, Mexico's numerous free trade agreements, skilled and competitively priced labor force, make it an appealing location for setting up production aimed at exporting to the United States and other countries.

In relation to the circular economy, the biggest opportunity for Dutch stakeholders is in the area of knowledge sharing, with the objective of increasing the awareness of the concept of circular economy and its potential solutions to Mexican stakeholders. The Embassy could engage with Dutch experts from various sectors and facilitate this knowledge sharing in Mexico. As several Mexican States have launched circular economy plans, this is a good moment to start developing relationships. Knowledge sharing could take place in the form of specific training or workshops on topics mentioned in this report. Many Mexican stakeholders have indicated their interest in receiving training and/or collaborating with Dutch stakeholders to increase their knowledge of the circular economy.

Several Dutch companies have indicated (by way of an interview) being open to explore the opportunities in the Mexican market. The Dutch Embassy could actively identify the needs of local stakeholders in relation to their circular economy plans, and match these with the circular solutions of the Dutch companies that indicated their interest for the Mexican market. In this way short-term business opportunities could be created. Another opportunity is the presence of multinational companies in Mexico, that often have circular economy ambitions on a global level, bringing these ambitions to Mexico. The Dutch Embassy could fulfill a key role in connecting the circular economy ambitions of these corporations with Dutch or Mexican solutions.

Furthermore, active development of relationships with local stakeholders such as state governments and industry associations can pave the way for Dutch companies to gain access to the Mexican market with their innovative circular solutions. The Embassy can organize trade missions on the topic of circular economy as well.

In all 3 focus sectors - textiles, construction and circular design - concrete opportunities have emerged for potential collaboration, with a focus on knowledge sharing, that can be developed over the coming years.

By sharing knowledge on the circular economy and developing relationships with local actors, the Embassy builds a foundation on which Dutch companies can start introducing and offering their services to the Mexican market. As the topic of the circular economy will be gaining traction in Mexico in the coming years, the Dutch companies will have an advantage as relations will be already established in the country. This can then lead to increased demand for Dutch expertise and might lead to more Dutch companies setting up operations in Mexico on the premise of their circular economy offerings. This will be a multi-year process in which The Netherlands builds its reputation as a circular economy expert.

Dutch entrepreneurs have access to some subsidies from RVO to explore the viability of their solution in the Mexican market. These subsidies can facilitate a more easy entrance and give some more time and budget to Dutch companies to launch their solution in Mexico.

5.2 CHALLENGES

The implementation of the circular economy in Mexico also encounters challenges. These include specific issues related to the circular economy itself, as well as broader national challenges that shift government priorities to other areas.

One relevant barrier is the lack of incentives for citizens and the private sector to switch to circular solutions. Currently, there are not many specific tax incentives or subsidies designed for a circular economy. In the short term, it is generally cheaper to maintain standard (linear) models of operation and generate waste in traditional ways rather than invest in circular solutions. Due to the limited structural effort to stimulate investments in sustainable solutions, the private sector is not incentivized to make this shift.

Additionally, there is a lack of standardized knowledge and terminology around the circular economy which poses a significant challenge. Both on national and state level, there is not yet one set of definitions to set up circular economy policies or to measure progress in this area. Concepts and terms related to CE vary widely across different stakeholders, in legislation, and with organizations, leading to confusion and misalignment. Adding to this, there is limited public conversation about sustainability in comparison to Europe, which makes that Mexican stakeholders are less engaged with the topic and therefore there also exists less demand for circular solutions.

In certain industries such as construction, the large number of informal workers (and with that informal companies and structures), make it more difficult to implement circular economy solutions across the entire sector. This informality is most evident at the base of the employment pyramid, where most construction workers are engaged in short term projects, and are not part of formal chambers of commerce that could stimulate the implementation of CE solutions.

In the textile sector, Mexican manufacturers face numerous challenges regarding competitiveness in costs. These challenges are largely driven by rising wages and employee benefits, with minimal government support to offset these costs. Therefore, the industry has less capacity and resources to dedicate to sustainability. Also nearly all equipment and machinery used in the industry is also imported, which hinders the opportunity for local innovation.

In terms of projects involving reverse logistics, there are safety concerns across the country, which disincentivize the willingness to invest in circular projects that require additional movement of goods, for the added risk of losing materials.
In terms of government implementation, it is needed to allocate significant budgets to circular economy practices in order to stimulate the transition to a circular economy in the private sector. Often these budgets are not available, which hinders the actual implementation of circular economy plans. Additionally, during government transitions, shifts in political priorities could lead to delays or even cancellations of circular economy initiatives. These changes in focus can disrupt long-term planning, stall ongoing projects, and create uncertainty for investors, making it challenging to establish a stable foundation for circular practices.

In the private sector, circular solutions often require a medium- to long-term horizon to be economically profitable, as benefits arise over the longer term. As in many other countries, companies usually optimize for short-term profits that improve their quarterly or annual results. Long-term investments in the circular economy are therefore not always made, as it does not improve the short-term bottom line.

Implementing new CE initiatives in Mexico will require a tailored approach that aligns with the country's unique conditions and vision, rather than a direct replication of models like the Dutch framework. Adapting CE principles to Mexico's social, economic, and environmental context ensures that solutions are effective, relevant, and sustainable, addressing local challenges.

Aside from the specific challenges mentioned above, Mexico has several other public challenges that often demand more attention than a topic like circular economy. Safety remains a top priority nationwide, along with enhancing

public services and creating employment opportunities. This means that, with limited resources, the circular economy is not always a priority.

Dutch entrepreneurs considering entering the Mexican market will need to consider challenges such as language barriers, cultural differences, and the need to find reliable local partners. When bidding for government projects, it is important to have local partners and to maintain good business relations with government officials. Also, it is always important to consider safety challenges and investigate well in which sector and part of the country one plans to do business.

6

CONCLUSIONS AND RECOMMENDATIONS

6.1 CONCLUSIONS

The circular economy in Mexico is still in its infancy. Both the government and private sector have yet to undertake many visible projects. Existing circular economy programs are often constrained by limited budgets and project allocations. However, there are promising signs of progress. The national and several state governments have introduced initial circular economy plans and there are an increasing number of private initiatives as well, such as Queretaro Circular, and Chihuahua Green City. There is a growing interest in environmental sustainability in Mexico among the private sector and citizens. Both public and private entities are looking for solutions and new innovations, and therefore are open to collaborate with international organizations to advance circular economy initiatives.

The new government's emphasis on environmental protection is particularly encouraging. The recently elected president has outlined a plan to prioritize waste treatment, energy generation, and recycling. This shift towards a more sustainable future presents significant opportunities for Dutch companies to engage with the Mexican market and contribute to the country's circular economy transition.

As The Netherlands is already known as a leader in this field, it can work in the coming years to position itself as a specialist, just like The Netherlands does this in the water and agricultural sector. As Mexico's Federal and State governments start to implement their circular economy plans, they will be searching, together with the Mexican private sector, for circular solutions in their preferred sectors. The Dutch Embassy has the opportunity to start building relationships with these stakeholders to identify their needs and upcoming projects, and to match this with Dutch solutions.

Dutch and Mexican companies can start to participate in events, networking sessions and incoming or outgoing trade missions organized by the Embassy, to showcase their solutions and to build relationships with Mexican stakeholders.

Although there are some challenges for the circular economy to take shape in Mexico, such as the lack of (fiscal) incentives, lack of standardization in circular economy plans, definition and measurement tools, as well as a complex competitive landscape in for example the textile sector, there are also opportunities emerging because of the government plans on circular economy and several public and private initiatives.

For Dutch companies wishing to be front-runners in the Mexican market in the area of circular economy, it is a good moment to start exploring the opportunities.

6.2 RECOMMENDATIONS

Based on the research executed, a first step the Dutch Embassy in Mexico can undertake to stimulate the development of the circular economy in Mexico is in network development. Other areas are knowledge sharing in collaboration with the Dutch private sector, and actively supporting Dutch organizations in their expansion to Mexico in the field of circular economy.

NETWORK DEVELOPMENT

An area of focus for the Dutch Embassy should be on actively building and maintaining relationships with Mexican stakeholders that show interest in, or are already active in the circular economy. Dutch stakeholders have indicated they find it valuable if the Embassy can facilitate trustworthy relationships with potential customers. Or if the potential customers are Mexican government entities, the Embassy could play a crucial role in facilitating the relationship with Dutch companies. This research provided a first insight on who these stakeholders are and what they might be interested in. However, in order to create potential opportunities for Dutch organizations it is important to actively build these relationships with Mexican stakeholders, to find out how the Embassy can support their ambitions and to actively make connections between them and relevant Dutch stakeholders.

Concrete recommendations for network development:

- ***Governments:*** *the states and cities with active circular economy plans as identified in this report, such as Mexico City, Jalisco, Chihuahua, Guanajuato, Puebla and Queretaro, are a good starting point to develop and maintain an active network. Together with these governments the Embassy can identify their needs in relation to the circular economy and actively share Dutch expertise (from the government and private sector).*

- ***Chambers of commerce:*** *Work together with local chambers of commerce and industry associations to make connections with local companies and projects. This will increase chances of being invited into certain networks that could provide interesting opportunities for Dutch organizations. Examples of relevant chambers are the National Chamber of Commerce (CANACO, by its acronym in Spanish) and the Confederation of Employers of the Mexican Republic (COPARMEX, by its acronym in Spanish), as they have a presence in almost all of Mexico with significant commercial activities.*

- ***Work more actively with Dutch multinationals in Mexico:*** *most Dutch multinationals have ambitions or goals in the area of circular economy, which they want to achieve in their worldwide operations. Connecting with Dutch multinationals in Mexico such as Arcadis, Heineken, Philips or Frieslandcampina can be a gateway to accelerating the circular economy in Mexico.*

- ***Participate in relevant events:*** *Create a list of relevant circular economy-related events that can help the Embassy build upon its circular economy plans. Examples of these events include Talent Land, What Design Can Do, and Mexico Circular Hotspot, as well as academic events held at universities or other institutions that aim to promote environmental conservation and solutions.*

- ***Organize study trips to The Netherlands:*** *to better connect Dutch and Mexican stakeholders, it can be considered to organize sector specific study trips to The Netherlands, where Dutch innovations can be showcased to Mexican stakeholders, enabling better matchmaking between them.*

KNOWLEDGE SHARING

Another step the Dutch Embassy in Mexico can take to stimulate the development of the circular economy is to facilitate knowledge sharing. A greater number of stakeholders from both the government and the private sector should be made aware of the potential the circular economy has to offer and should be equipped with practical tools and examples from other countries on how to increase the share of circular economic activity in the Mexican economy. Interest for this was also indicated by various Mexican stakeholders. Concrete recommendations for knowledge sharing:

- ***Government to government:*** *With the Mexican government on how the Dutch government initiated and stimulated circular economy practices in the country over the past 10 years. Focusing on the regulatory framework, incentives, as well as circular procurement strategies. Tailored training could be offered, provided by the Dutch government, in collaboration with the private sector.*

- ***Circular design for the private sector:*** *to get started with circular economy, design is one of the first steps. Both the design of products as well as business models. In The Netherlands, there are various organizations active in circular design training, and they can assist in sharing this knowledge with Mexican stakeholders. It is advised that the training can best be provided to stakeholders that already have some awareness and interest in the circular economy. An example is the circular economy collective in Queretaro, which already has a network of companies with interest in the concept. This work could be done in collaboration with organizations such as What Design Can Do or CIRCO.*

- ***Training and workshops for the construction sector:*** *Mexican stakeholders from both the public and private sector have indicated their interest in expanding their knowledge on circularity in the construction sector. Specific topics such as environmental product declarations, LCA tools, guidelines for sustainable construction, and expertise on how to set up processing plants for construction waste were mentioned. The Dutch construction sector has extensive experience in these topics and could facilitate knowledge exchange with both the public and private sector in Mexico.*

- ***Training and workshops for the textile sector:*** *Many stakeholders mentioned interest in participating in workshops or forums where companies share technical knowledge in reverse logistics, scaling up CE pilots in the industry, technology for recycling and closed-loop strategies. House of Denim suggested an "Embassy Day" to share their expertise with Mexican partners, an interesting proposal given that denim is one of the main exports from Mexican producers.*

- ***Circular progress measurement tool for the private sector:*** *an effective and practical way for Mexican companies to become aware of the circular economy and what it could mean for their organization, is to do an initial measurement of their circular performance. Several tools exist in The Netherlands, for example from the company Route Circulair, which can be adapted to the Mexican market.*

When setting up a program for knowledge sharing, it is important to take into account the local context. The 'Dutch approach' cannot be copied directly due to a different cultural and organizational context in Mexico.

SUPPORT DUTCH ORGANIZATIONS IN THEIR EXPANSION TO MEXICO:

In the interviews with Dutch companies (mostly SME's), many indicate not being familiar with doing business in Mexico, the country, the customs and its language. Therefore many suggested it would be helpful if the Dutch Embassy or RVO could organize some workshops where these companies can learn more about how to do business in Mexico, and what opportunities there are for them. Practical recommendations for supporting Dutch organizations are:

- ***Workshop on how to do business in Mexico:*** *organize an (online) workshop where companies can learn more about what it is like to do business in Mexico. This workshop will inform the participants about the culture, way of doing business, local customs and government policies.*

- ***Overview of available subsidies or funding opportunities:*** *not all Dutch companies are aware there might be subsidies or other funding opportunities available to help with their exploration or expansion into the Mexican market. The Dutch Embassy could pro-actively organize a workshop in collaboration with RVO to inform participants about the possibilities.*

- ***(Online) networking sessions:*** *before deciding to invest in an expansion into Mexico, or investing in a trip to Mexico to explore the possibilities, Dutch companies might want to experience first what the potential opportunities are with local contacts. One way to facilitate this is to organize an online networking session between Dutch and Mexican stakeholders, where the Embassy actively facilitates matchmaking.*

- ***Trade Mission:*** *to facilitate matchmaking, the exchange of knowledge, and development of business relationships, a trade mission to Mexico, focused on the circular economy, could be organized by RVO and the Embassy.*

---

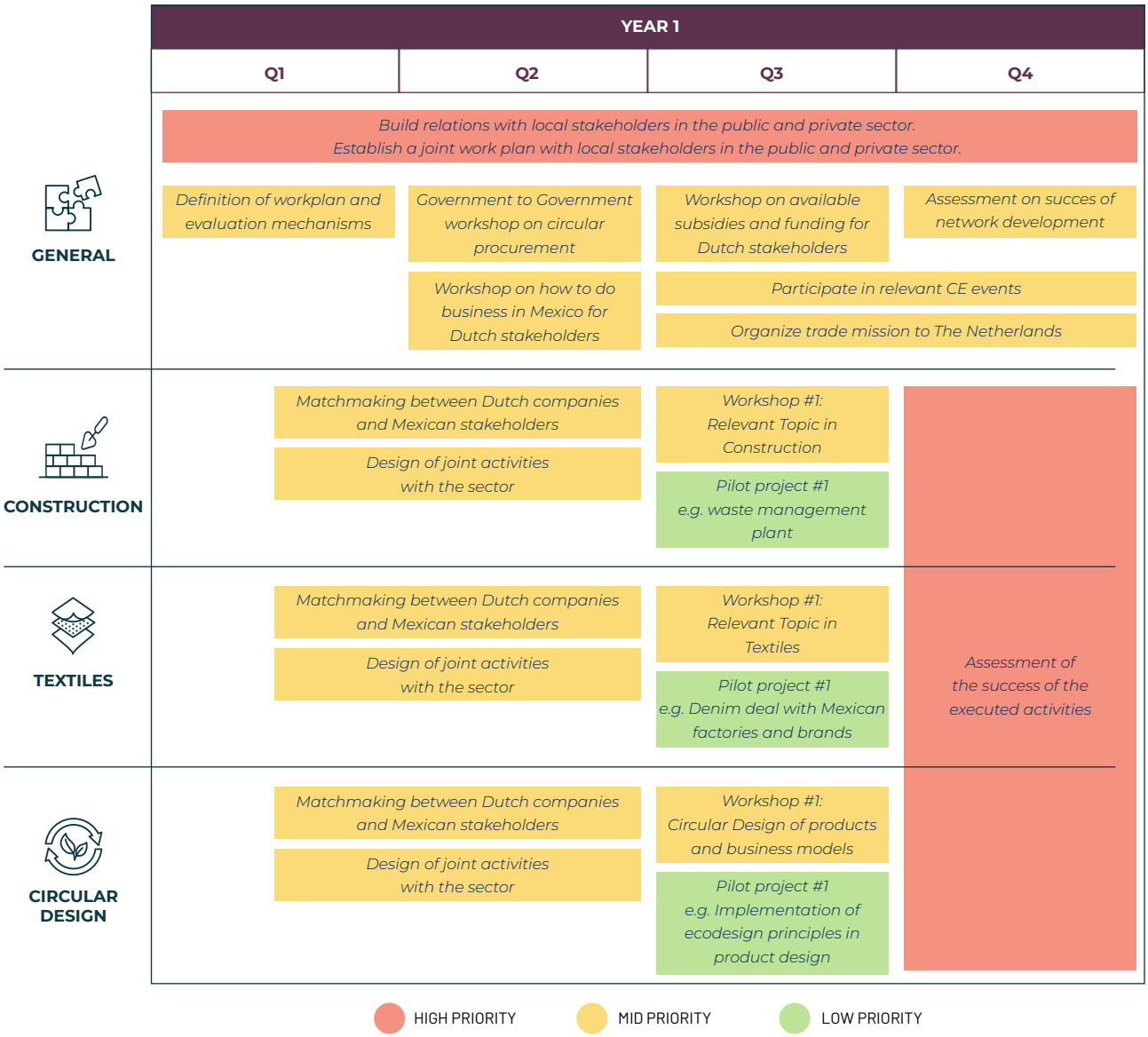
[6] *The term "Global South" is used to refer to countries and regions that, although not always geographically located in the Southern Hemisphere, share similar socio-economic characteristics and challenges. This concept goes beyond a simple geographical division and recently, it has replaced the use of terms like "developed countries" versus "developing countries".*

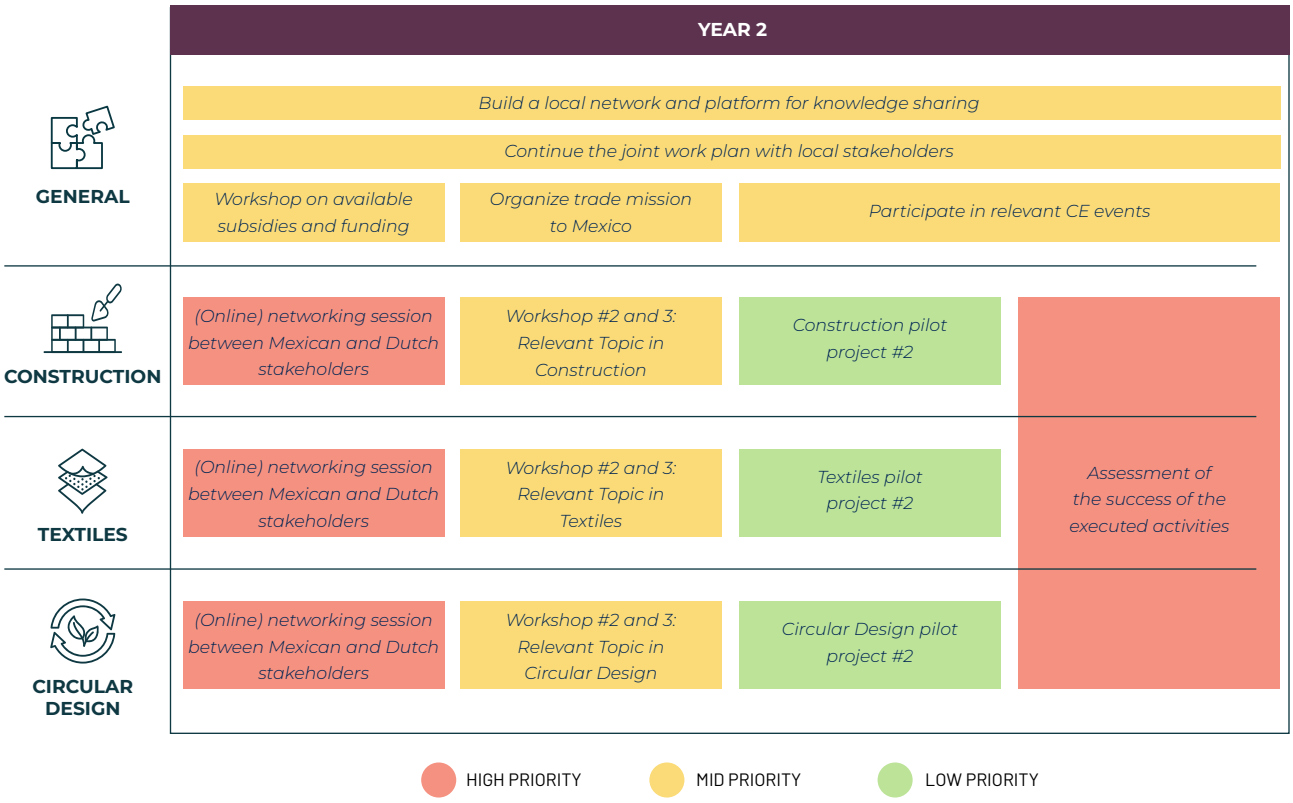
INTEGRATION OF SOCIAL ASPECTS:

While most current circular economy strategies focus on the rational use of materials and waste minimization, it is crucial to not overlook social aspects that ensure respect for human rights and promote inclusion and poverty reduction in certain economic sectors. In the Global South[6], there are many communities that are disproportionately affected by environmental degradation and economic inequality. Integrating social considerations into circular economy initiatives can provide opportunities for these communities to participate in decision-making processes, develop new skills, and benefit from the creation of green jobs. However, challenges such as limited access to resources, lack of infrastructure, and weak governance structures may hinder progress.

6.3 ROADMAP PROPOSAL

Based on the findings in this report and specifically the recommendations made in this chapter, a three-year roadmap is proposed on how to best foster business relationships in the field of circular economy between Mexico and The Netherlands. This roadmap suggests activities tailored to the objectives of the Dutch Embassy and RVO, organized in a logical sequence aligned with the state of the circular economy in Mexico.





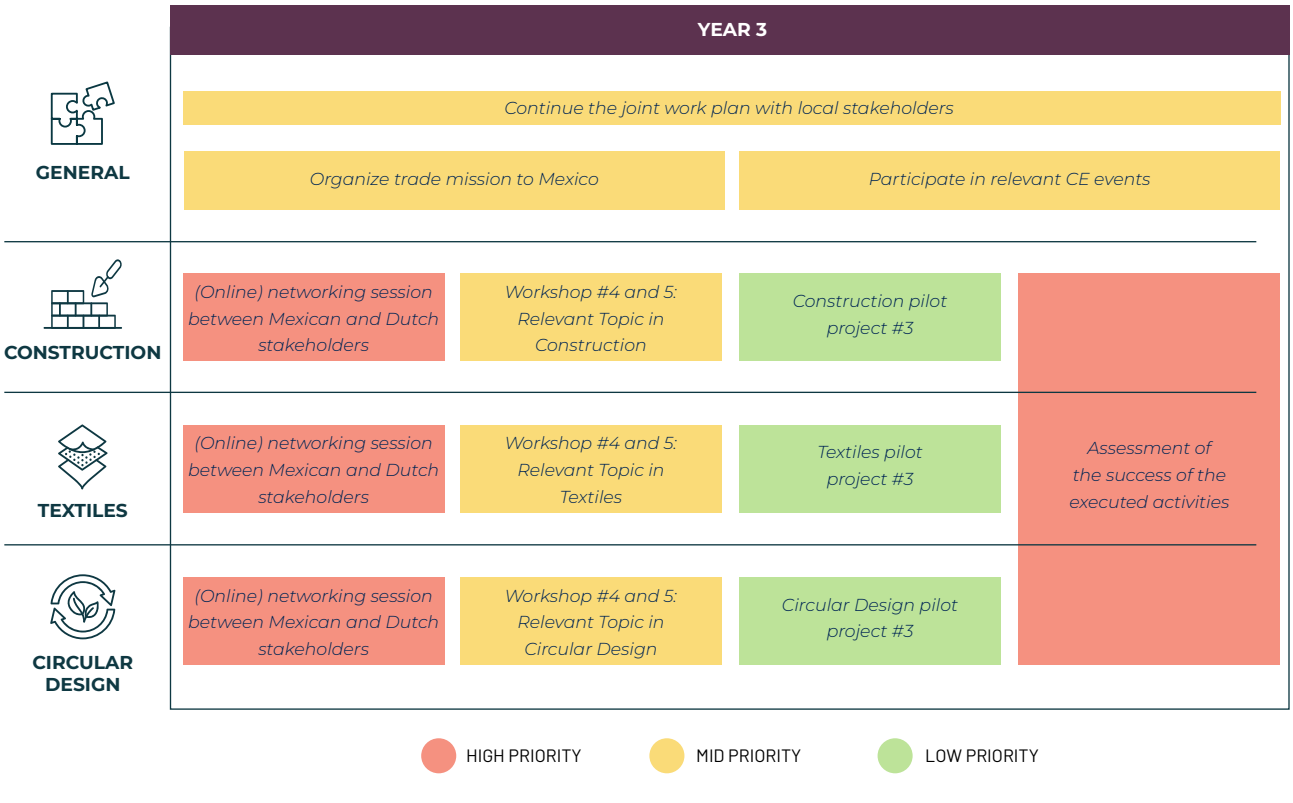


FIGURE 2. ROADMAP PROPOSAL OVER A 3-YEAR HORIZON. SOURCE: OWN CREATION.

REFERENCES

[1] Circle Economy Foundation, "The Circularity GAP Report 2024," 2024. [Online]. Available: https://cdn.prod.website-files.com/5e185aa4d27bcf348400ed82/65ae7d516defe92cc1988a47_CGR%20Global%202024%20-%20Executive%20Summary.pdf

[2] Secretaría de Medio Ambiente y Recursos Naturales, "Bases para la Elaboración de un Diagnóstico de la Estrategia Nacional de Economía Circular en México." Aug. 2024. [Online]. Available: https://dsiappsdev.semarnat.gob.mx/datos/portal/publicaciones/2024/BASES_ELABORACION_DIAGNOSTICO_PARA_ENEC.pdf

[3] LXIV Legislatura del Senado de la República, "Proyecto de Decreto por el que se Expide la Ley General de Economía Circular." Nov. 2021. [Online]. Available: https://infosen.senado.gob.mx/sgsp/gaceta/65/1/2021-10-26-1/assets/documentos/Dictamen_LGEC_FINAL_INSCRIPCION.pdf

[4] E. Sandoval García, G. G. Ramos Rodríguez, and A. Correa Torres, "Measuring the Circular Economy in Mexico," REALITY, DATA AND SPACE INTERNATIONAL JOURNAL OF STATISTICS AND GEOGRAPHY, vol. 14, no. 1, Jan. 2023. [Online]. Available: https://rde.inegi.org.mx/index.php/2023/01/04/midiendo-la-economia-circular-en-mexico/

[5] Secretaría de Medio Ambiente y Recursos Naturales, "Secretaria Bárcena supervisa proyecto de economía circular en Tula, Hidalgo." [Online]. Available: https://www.gob.mx/semarnat/prensa/secretaria-barcena-supervisa-proyecto-de-economia-circular-en-tula-hidalgo

[6] Congreso de la Ciudad de México II Legislatura, "LEY DE ECONOMÍA CIRCULAR DE LA CIUDAD DE MÉXICO." Feb. 2023. [Online]. Available: https://www.sedema.cdmx.gob.mx/storage/app/uploads/public/640/775/796/640775796545e564034573.pdf

[7] Secretaría de Medio Ambiente (SEDEMA), "PROGRAMA DE ECONOMÍA CIRCULAR DE LA CIUDAD DE MÉXICO 2024-2030." Mar. 2024. [Online]. Available: http://data.sedema.cdmx.gob.mx:9000/datos/storage/app/media/gacetas/programacircular2430.pdf

[8] Secretaría de Medio Ambiente (SEDEMA), "Instalan en la Ciudad de México Red de Economía Circular." [Online]. Available: https://www.sedema.cdmx.gob.mx/comunicacion/nota/instalan-en-la-ciudad-de-mexico-red-de-economia-circular

[9] Gobierno del Estado de Chihuahua, "Anuncian Pacto de Economía Circular 'Acelerando Transiciones en América Latina desde Chihuahua.'" [Online]. Available: https://chihuahua.gob.mx/prensa/anuncian-pacto-de-economia-circular-acelerando-transiciones-en-america-latina-desde#:~:text=La%20Secretar%C3%ADa%20de%20Innovaci%C3%B3n%20y,en%20la%20capital%20del%20estado.

[10] COPARMEX Chihuahua, "Chihuahua Green City." [Online]. Available: https://www.coparmexchihuahua.org/proyectos/chihuahua-green-city

[11] LXIII Legislatura Congreso del Estado de Jalisco, "PRESENTAN INICIATIVA PARA FAVORECER LA ECONOMÍA CIRCULAR EN JALISCO." [Online]. Available: https://www.congresojal.gob.mx/boletines/presentan-iniciativa-para-favorecer-la-econom-circular-en-jalisco#:~:text=Avanzar%20en%20el%20cumplimiento%20de,Jalisco%20y%20sus%20Municipios%2C%20que

[12] Secretaría de Medio Ambiente, Desarrollo Sustentable y Ordenamiento Territorial (SMADSOT), "Estrategia de Bioeconomía Circular y Social del Estado de Puebla." Jun. 2023. [Online]. Available: https://smadsot.puebla.gob.mx/images/Estrategia%20de%20Bioeconom%C3%ADa%20Circular%20y%20Social_Final.pdf

[13] Gobierno del Estado de Guanajuato, "Guanajuato Circular: Eficiencia de Recursos y Economía Circular 2050." Dec. 2022. [Online]. Available: https://iki-alliance.mx/wp-content/uploads/GUANAJUATO-CIRCULAR-Eficiencia-de-Recursos-y-Economi%CC%81a-Circular-2050.pdf

[14] J. Galindo, "Canaintex presenta panorama de la industria textil en México," T21. [Online]. Available: https://t21.com.mx/canaintex-presenta-panorama-de-la-industria-textil-en-mexico/

[15] Cámara Nacional de la Industria Textil (CANAINTEX), "Información Estadística." [Online]. Available: https://canaintex.org.mx/informacion-estadistica-mayo-2024/

[16] Instituto Nacional de Estadística y Geografía (INEGI) and Cámara Nacional de la Industria Textil (CANAINTEX), "Conociendo la industria textil y de la confección." 2024. [Online]. Available: https://www.inegi.org.mx/contenidos/productos/prod_serv/contenidos/espanol/bvinegi/productos/nueva_estruc/889463918141.pdf

[17] Fashion Revolution, "Índice de Transparencia de la Moda en México." 2021. [Online]. Available: https://issuu.com/fashionrevolution/docs/006ar_fti_reporte_2021_espan_ol_071221#:~:text=El%20%C3%8Dndice%20de%20Transparencia%20de%20la%20Moda%20en%20M%C3%A9xico%20es,en%20sus%20propias%20operaciones%20y%20a

[18] Someone Somewhere, "Delta Air Lines x Someone Somewhere." [Online]. Available: https://someonesomewhere.mx/blogs/news/delta-someone-somewhere?srsltid=AfmBOopbNqY8r3BiT0BwCyYRfJTQtzsz2hzb43WSIWAuN9mWIxXXA_oX

[19] International Trade Administration, "Summary of the U.S-Mexico-Canada Agreement (USMCA)." [Online]. Available: https://www.trade.gov/summary-usmca-fta-textiles

[20] statista, "El sector de la construcción en México – Datos estadísticos," Construcción. [Online]. Available: https://es.statista.com/temas/6622/el-sector-de-la-construccion-en-mexico/#topicOverview

[21] Gobierno de México, "DATA MÉXICO: Construcción." [Online]. Available: https://www.economia.gob.mx/datamexico/es/profile/industry/construction?genderOrInformal=totalOption

[22] Secretaría de Medio Ambiente (SEDEMA), "Recupera Ciudad de México más de 47 mil toneladas de Residuos de la Construcción y Demolición." [Online]. Available: https://www.sedema.cdmx.gob.mx/comunicacion/nota/recupera-ciudad-de-mexico-mas-de-47-mil-toneladas-de-residuos-de-la-construccion-y-demolicion

[23] El Occidental, "Urge revisar qué pasa con los residuos de construcción y demoliciones, dice diputada." [Online]. Available: https://www.eloccidental.com.mx/local/urge-revisar-que-pasa-con-los-residuos-de-construccion-y-demoliciones-dice-diputada-10907214.html

[24] Circle Economy Foundation, "The Circularity GAP Report 2024: The Netherlands." [Online]. Available: https://www.circularity-gap.world/netherlands

[25] Ministerie van Binnenlandse Zaken en Koninkrijksrelaties, Rijkswaterstaat Ministerie van Infrastructuur en Milieu, REBus, Life, and PIANOO, "THE PATH TOWARDS A CIRCULAR CATEGORY OFFICE FURNITURE - A CHANGE IN PERSPECTIVE: FROM A CIRCULAR PRODUCT TO A CIRCULAR CATEGORY." 2016. [Online]. Available: https://www.pianoo.nl/sites/default/files/documents/documents/reportcircularcategoryenoktober2016.pdf

[26] Rijksdienst voor Ondernemend Nederland, "Circular Buildings: constructing a sustainable future." May 2022. [Online]. Available: https://www.rvo.nl/sites/default/files/2024-02/NL%20Branding-Circular%20Buildings-v9-T.pdf

[27] Observatory of Economic Complexity (OEC), "Netherlands-Mexico Trade." [Online]. Available: https://oec.world/en/profile/bilateral-country/nld/partner/mex

[28] El Sol de Puebla, "Impulsa gobierno federal la economía circular para mitigar emisiones." [Online]. Available: https://oem.com.mx/elsoldepuebla/mexico/impulsa-gobierno-federal-la-economia-circular-para-mitigar-emisiones-21450729

[29] Business & Human Rights Resource Centre (2024). "Labour rights in fashion: Policy and practice in Mexico's apparel supply chains". Available: https://www.business-humanrights.org/en/from-us/briefings/labour-rights-in-fashion-policy-and-practice-in-mexicos-apparel-supply-chains/

ANNEX 1: METHODOLOGY DESCRIPTION

For this research, a hybrid methodology was employed, combining desk research and in-depth interviews with key stakeholders. Desk research was conducted to establish the regulatory framework and overall state of the circular economy within the selected sectors. To gain firsthand insights into the practical experiences of stakeholders and identify potential avenues for collaboration between the Netherlands and Mexico, direct interviews were conducted. The research methodology encompassed the following steps:

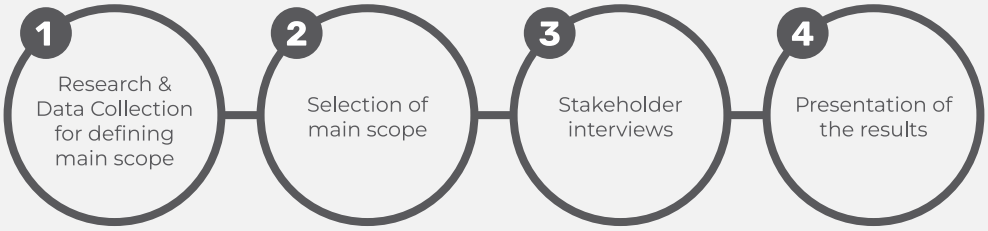


FIGURE 3. GRAPHICAL REPRESENTATION OF THE EXECUTED METHODOLOGY. SOURCE: OWN CREATION.

Below is the detailed methodology:

RESEARCH & DATA COLLECTION

- *Identification of relevant stakeholders in the Mexican market for three specific sectors: textiles, circular design and building materials.*
- *Identification of relevant stakeholders and interested parties in the Netherlands to potentially set-up activities in Mexico.*
- *Desk research of current legislation regarding circular economy on federal and state level, focused on selecting the relevant states with current advancement in circular economy legislation, roadmaps or programs in the three specific sectors of the study.*
- *Identify existing circular economy networks, initiatives and projects in Mexico.*
- *Desk research on funding opportunities, including:*
  - *Funding sources of the Dutch government or EU for Dutch companies wanting to expand to Mexico.*
  - *Funding sources of the Mexican government (federal, state, local) for Dutch companies, either direct or through project funding.*
  - *Funding sources of international organizations focused on promoting circular and sustainable initiatives in Mexico.*
- *Cultural differences and its impact on doing business in Mexico.*

SELECTION OF MAIN SCOPE

The goal of this project is to provide concrete opportunities for collaboration between Dutch and Mexican companies and organizations and to provide a roadmap on how to realize these opportunities. Therefore, based on the initial desk research and in collaboration with the Embassy, the project was scoped further if deemed necessary in order to provide more tangible results.

STAKEHOLDERS INTERVIEWS	*With the main scope and a clear set of data, the next phase consists of in-depth stakeholder interviews to get a clear overview of specific opportunities and the willingness for collaboration between Mexican and Dutch entities. These stakeholder interviews will be key to form the roadmap for the Dutch Embassy in the coming years.*
	• *Identify key current players in the circular economy in Mexico in the three chosen sectors.*
	• *The interviews have the following main objectives:*
	  ▸ *Learn more about the initiatives the stakeholder is undertaking*
	  ▸ *Identify the stakeholder's main challenges and opportunities, in order to identify where Dutch organizations might be able to offer value*
	  ▸ *Identify the willingness to collaborate with Dutch organizations.*
	  ▸ *Learn about potential new projects and financing opportunities.*
	• *Execute interviews for relevant stakeholders in the circular economy ecosystem in Mexico, including representatives of: Mexico.*
	  ▸ *Public Sector*
	  ▸ *Private Sector*
	  ▸ *NGOs*
	  ▸ *Financial entities*
	• *Execute interviews with Dutch organizations that are potentially interested in entering the Mexican market.*
	
	The detailed questionnaire is presented in Annex 2 of this document.

PRESENTATION OF THE RESULTS	*A report that presents the results of this study, and aims to provide a comprehensive overview of the potential for the circular economy in Mexico.*

TABLE 17. DESCRIPTION OF THE EXECUTED METHODOLOGY. SOURCE: OWN CREATION.

ANNEX 2. STAKEHOLDER INTERVIEWS

The following annex presents the questionnaires used to interview the identified stakeholders in Mexico and the Netherlands. Some questions were adjusted during the interviews to obtain the most information from the stakeholders.

MEXICO	NETHERLANDS
• *Describe your product or service:* • *Main industry you are active in?* • *What do you consider to be the main opportunities for the implementation of circular practices and/or projects in Mexico?* • *What are the main activities and/or initiatives that your organization is promoting related to the circular economy in Mexico?* • *What barriers and/or obstacles do you perceive to the widespread adoption of circular practices in Mexico?* • *What key lessons and/or learnings have you gained from implementing circular practices in your company and/or organization?* • *In what ways do you consider that your organization and/or sector can collaborate with other actors to promote the circular economy in Mexico?* • *Would you be interested in collaborating with different organizations (national and international) to promote circular economy initiatives?* • *How do you envision the future of the circular economy in Mexico in the coming years?* • *Are there any other contacts of people or organizations relevant to this study that you could share?*	• *Describe your product or service:* • *Main industry you are active in?* • *Who are your main clients? (government, business, consumers)* • *What type of clients or opportunities are you looking for?* • *In general, are you interested in/open to doing business in Mexico?* • *Is your organization already doing business in North- or South-America?* • *Are there any barriers that withhold you from exploring the Mexican market? If yes, what is withholding you?* • *What type of knowledge do you need to be better informed about the Mexican market?* • *If these barriers are (partly) resolved, would you consider entering the Mexican market?* • *If there are subsidies available to explore the viability of your solution in the Mexican market, would that make it easier for you to try and enter the market?* • *Have you contacted the Dutch Embassy in Mexico for assistance?* • *Do you think they could help you resolve the barriers you foresee?* • *If the Dutch Embassy would organize activities such as a trade mission, or strategic support, would you be interested to participate?* • *Do you know other circular companies that might be interested in bringing their solutions to Mexico?*

TABLE 17. DESCRIPTION OF THE EXECUTED METHODOLOGY. SOURCE: OWN CREATION.

ANNEX 3: SUMMARY OF MARKET OPPORTUNITIES

COLLABORATION OPPORTUNITIES PER STATE	
MEXICO CITY	
GENERAL	• *Develop training courses and workshops aimed at businesses about the circular economy' transition (1.2).* • *Training in compost production, use, and commercialization under a circular economy approach (1.7).* • *Advisory for business projects focused on adopting service models (2.4).* • *Organization of Second-Hand Market Fairs (4.4).* • *Reuse and refill schemes in hotels and restaurants (5.15).* • *Train individuals on rainwater harvesting system installation (8.5).* • *Create a digital platform to promote the use of secondary raw materials and link businesses (3.1).* • *Create a food recovery program to recover good-conditioned food from hotels and restaurants and channel it to food banks (5.16).* • *Develop Competency Standards for repair, refurbishment, and remanufacturing of electronic devices (7.2).* • *Propose a regulatory framework to guarantee the right to repair (7.5).* • *Conduct an energy efficiency diagnostic to improve energy efficiency in MSMEs in Mexico City, promoting efficient energy use and renewable energy sources (9.1).* • *Propose the inclusion of circular economy concepts and examples in the curricula of basic, upper secondary, and higher education (10.2).*
SPECIFIC PER SECTOR	*No sector-specific opportunities were identified*
CHIHUAHUA	
GENERAL	• *Introduction to circular economy: a foundational course about the circular economy to introduce more companies to the concept.* • *Residual materials management: specialized training on how to identify, classify, and track residual materials within different industries to improve resource efficiency and minimize waste.* • *Skills development for circular practices: practical workshops that focus on building the technical skills needed for companies to adopt and implement circular economy strategies effectively.* • *Understanding circular supply chains: a program to enhance comprehension of circular supply chains, helping businesses understand the flow of resources and how to integrate circular principles into their procurement and operations.*

Chihuahua Green initiative is a notable private endeavor led by COPARMEX Chihuahua with support from the European Union. This initiative aims to foster industrial symbiosis among local businesses. It is a state public-private innovation program that guides companies in Chihuahua towards a circular economy and industrial symbiosis. Managed by COPARMEX Chihuahua in collaboration with the Government of the State of Chihuahua, it enhances the competitiveness of companies by assisting them in developing their sustainability plans. The program offers innovative services focused on CO2 reduction, material circularity, green energy, and industrial symbiosis. Several pilot projects have already been implemented, including:

SPECIFIC PER SECTOR

- ***Construction blocks made from recycled materials:*** *a collaboration with Interceramic and Grupo Cementos de Chihuahua.*
- ***Shoe soles manufactured from hospital waste:*** *a partnership with General Electric HealthCare and Recilogic.*
- ***Organic soil conditioners:*** *developed in conjunction with Innovak.*
- ***A waste processing plant:*** *This facility processes waste from the Chihuahua industrial complex, reintegrating materials into production processes or creating new eco-products. It's also known as the "Scrap Store."*
- ***Wastewater treatment plant and photovoltaic park:*** *generating clean water and energy.*
- ***End-of-life tire processing plant:*** *recycling used tires.*
- ***Residual energy exchange networks:*** *utilizing excess heat or cold from local industries.*
- ***Aluminum scrap recovery:*** *a partnership between Superior Industries and Grupo Cementos de Chihuahua.*
- ***Reuse of rubber waste:*** *collaboration with Continental to repurpose vulcanized rubber.*

JALISCO

GENERAL

Advisory on consolidating a Circular Economy Law that aligns with the goals outlined in the CE Roadmap.

SPECIFIC PER SECTOR

Construction:

- *Promote the incorporation of design methodologies that includes a life cycle perspective.*
  - *Provide training and technical preparation for the implementation of regulations, guides and manuals for sustainable construction that consider all stages of management of buildings and infrastructure works, including the use of digital technologies.*
  - *Provide technical assistance for the use of technological tools that incorporate eco-efficiency and LCA in companies (with a focus on MSMEs) in prioritized value chains.*
  - *Implement mandatory LCA in construction projects, both public and private investment. (Long-term)*
- *Guidelines on how to set-up fiscal incentives for companies to incorporate used materials into their projects.*

- *Establish eco-design criteria and/or modular designs for public and private buildings that allow for the efficient use of elements and materials.*
  - *Implement awareness and training campaigns on the eco-design of buildings and infrastructure works and their benefits.*
  - *Develop technical standards for eco-design of buildings and infrastructure works based on bioclimatic design and the use of highly circular materials.*
  - *Promote investment in R&D to improve the technology and materials used in modular construction that allow parts to be disassembled and reused.*
- *Promote the reuse of structural construction materials for repairs and/or new construction works.*
  - *Create an inventory of construction materials recovered from demolitions or old construction sites, classifying them and evaluating their condition and quality.*
  - *Promote sustainable disassembly practices and selective demolition projects to preserve the integrity of recovered materials.*

SPECIFIC PER SECTOR

- *The ambition to set-up processing plants for construction demolition waste in Jalisco, so that companies can comply with a new law that will be enacted, and to stimulate the actual reuse of raw materials. Jalisco is open to learn from other countries what steps have been taken to set-up a recycling industry for construction waste.*
- *Knowledge on defining circular materials for the construction sector.*
- *Knowledge on circular procurement.*
- *Incorporate knowledge on sustainable and biomaterials in academics.*

Circular Design:

Advanced manufacturing, IT and electronics: Implement programs in partnership with research centers, business chambers or technical assistance entities for life cycle analysis in production chains.

- *Promote LCA implementation programs in manufacturing production chains.*
- *Promote the generation of information in companies for the creation of an LCA database system.*
- *Develop an information system to provide traceability (and eventual certification) of electronic products.*

PUEBLA

GENERAL

No general opportunities were identified.

SPECIFIC PER SECTOR

Circular Design

- *Promote the creation of Circularity and Decarbonization Action Plans in priority sectors and organizations (2.1.2)*
- *Transition programs to support traditional entrepreneurship towards the creation of companies with sustainable and social business models. (2.1.3)*
- *Promote research and implementation of biomaterials and circular processes in industrial sectors with the greatest environmental impact.(2.1.5)*

- *Conduct analysis on flows, characterization and prioritization of waste from Puebla's industries. (2.2.2)*
- *Develop research on mechanisms and regulations for extended responsibility schemes for implementation in the state. (3.3.4)*

SPECIFIC PER SECTOR

Construction

- *Promote the teaching and implementation of bioconstruction, circular and sustainable construction materials, techniques and solutions in universities and companies in the sector. (4.1.2.)*
- *Promote the application of good practices in terms of energy efficiency in new constructions, as well as the refurbishment of existing buildings. (4.1.3.)*
- *Generate a roadmap for the implementation of construction material passports. (4.1.4.)*
- *Promote the use of eco-technologies that contribute to energy and water savings in homes and businesses. (4.1.5.)*
- *Promote infrastructure and solutions for circular and efficient water management. (4.3.3.)*
- *Promote the establishment of water capture, storage and harvesting systems and practices that increase its availability, favoring areas of water' high vulnerability. (4.3.4.)*

QUERETARO

GENERAL

- *Training on circular economy from Dutch experts. This can be in the areas of circular design, business models, or materials.*
- *Training on technologies to reduce CO2 emissions in production processes.*
- *Knowledge sharing on water technology, and the efficient use of water in production processes.*
- *Develop collaboration with European organizations and companies, also to potentially obtain international funding, for example from the European Union.*

SPECIFIC PER SECTOR

No general opportunities were identified.

GUANAJUATO

GENERAL

- *Workshops on efficient resource use and circular economy*
- *Organization of sector-specific workshops (construction and tanning industry)*
- *Advise on defining indicators by company or sector*

SPECIFIC PER SECTOR

Textiles: (Leather / Footwear industry)

- *Development of a marketplace/space focused on reusing, recycling, reparation and remanufacturing leather products.*
- *Develop and implement financial mechanisms that enable companies to adopt circular practices.*
- *Creation of synergies with the chemical industry to create bio-chemical products.*

SPECIFIC PER SECTOR	***Construction*** • *Encourage inclusion of bioclimatic design to reduce energy requirements for heating and cooling.* • *Management of construction waste and exploration of revalorization opportunities.* • *Develop plan to progressively replace virgin materials with recovered materials.*

COLLABORATION OPPORTUNITIES PER SECTOR

TEXTILE SECTOR

GENERAL OPPORTUNITIES

- *Connect Dutch start-up with mechanical recycling technology to Mexican textile producers.*
- *Connect Dutch start-ups in the textile space with Mexican experts/consultants in the textile industry, for them to get to know available innovations.*
- *Connect Dutch initiatives like "The Denim Deal" with Mexican manufacturers of denim.*
- *For specific brands, there is interest in knowledge sharing on these topics:*
  - *Know-how on material variants and how to make them more cost competitive (for example virgin vs recycled polyester).*
  - *Experience in managing recycled non-woven material with a high percentage of recycled material.*
  - *Sharing experience with companies making 100% circular garments, especially the ones implementing circularity in closed cycles.*
  - *Experience in reverse logistics, for example in the hotel industry that uses high volumes of textiles.*

SPECIFIC OPPORTUNITIES

MEXICO CITY	*SEDEMA is working on a specific Policy for the Management of Textile Waste, with a focus on circularity. There is potential for collaboration on implementation of strategies with textile waste at the city level.*
GUANAJUATO	*Connect with leather industry experts for expertise on more sustainable practices. For example, Dutch Leather Vision or ECCO Leather.*

CONSTRUCTION SECTOR

GENERAL OPPORTUNITIES

Provide a general training on the circular economy for the construction sector. This training should aim to encourage the use of Environmental Product Declarations (EPDs) when selecting materials correctly during the building process. Additionally, the training should focus on circular design principles and identify mechanisms for the proper treatment and management of construction waste materials during both the construction process and at the end of the building's life cycle.

SPECIFIC OPPORTUNITIES

CHIHUAHUA

Chihuahua Green City is an example of collaboration between companies on achieving industrial symbiosis and to search for opportunities of using waste of one company's processes as a resource for another company. Chihuahua Green is open for international collaboration to learn from industrial symbiosis initiatives in other countries.

JALISCO

- *Promote the incorporation of design methodologies that incorporate a life cycle perspective.*
  - *Provide training and technical preparation for the implementation of regulations, guides and manuals for sustainable construction that consider all stages of management of buildings and infrastructure works, including the use of digital technologies.*
  - *Provide technical assistance for the use of technological tools that incorporate eco-efficiency and LCA in companies (with a focus on MSMEs) in prioritized value chains.*
  - *Implement mandatory LCA in construction projects, both public and private investment. (Long-term)*
- *Guidelines on how to set-up fiscal incentives for companies to incorporate used materials into their projects.*
- *Establish eco-design criteria and/or modular designs for public and private buildings that allow for the efficient use of elements and materials.*
  - *Implement awareness and training campaigns on the eco-design of buildings and infrastructure works and their benefits.*
  - *Develop technical standards for eco-design of buildings and infrastructure works based on bioclimatic design and the use of highly circular materials.*
  - *Promote investment in R&D to improve the technology and materials used in modular construction that allow parts to be disassembled and reused.*
- *Promote the reuse of structural construction materials for repairs and/or new construction works.*
  - *Create an inventory of construction materials recovered from demolitions or old construction sites, classifying them and evaluating their condition and quality.*
  - *Promote sustainable disassembly practices and selective demolition projects to preserve the integrity of recovered materials.*

	• *The ambition to set-up processing plants for construction demolition waste in Jalisco, so that companies can comply with a new law that will be enacted, and to stimulate the actual reuse of raw materials. Jalisco is open to learn from other countries what steps have been taken to set-up a recycling industry for construction waste.* • *Knowledge on defining circular materials for the construction industry.* • *Knowledge on circular procurement.* • *Incorporate knowledge on sustainable and biomaterials in academics.*
GUANAJUATO	• *Knowledge sharing on bioclimatic design, management of construction waste and exploration of revalorization opportunities, and use of recovered materials in constructions.*

CIRCULAR DESIGN SECTOR	
GENERAL OPPORTUNITIES	
	*Provide comprehensive circular design courses to equip the public and private sector with the knowledge and skills needed to drive the circular economy. These courses will foster a deeper understanding of sustainable design principles and practices.*
SPECIFIC OPPORTUNITIES	
JALISCO	*Materioteca ITESO: As an academic institution affiliated with ITESO University, Materioteca ITESO is committed to promoting ecodesign practices. Given its academic standing and mission, the organization is open to collaborating with national and international partners to expand its impact. The organization's academic affiliation provides a unique advantage, as it attracts the attention of both the public and potential industry partners interested in circular economy initiatives.*
MEXICO CITY	*Collaborate with local initiatives such as 'What Design Can Do' during the planning and celebration of media events to raise awareness of the circular economy among designers, decision-makers, and the general public.*
CHIHUAHUA	*Establish a direct collaboration with the Chihuahua Green project to strengthen the industrial symbiosis initiatives they have been developing in recent years. The goal is for them to serve as a model for other industrial parks in Mexico, especially considering the new federal government's plan to create more of these types of spaces.*

This is a publication of
Netherlands Enterprise Agency
Prinses Beatrixlaan 2
PO Box 93144 | 2509 AC The Hague
T +31 (0) 88 042 42 42
Contact
www.rvo.nl

This publication was commissioned by the ministry of Foreign Affairs.

Publication number: RVO-035-2025/RP-INT

NL Enterprise Agency is a department of the Dutch ministry of Economic Affairs that implements government policy for Agricultural, sustainability, innovation, and international business and cooperation. NL Enterprise Agency is the contact point for businesses, educational institutions and government bodies for information and advice, financing, networking and regulatory matters.

Netherlands Enterprise Agency is part of the ministry of Economic Affairs .